



PIPE & FITTINGS
 PURE WATER, INSTITUTIONAL
 & LAB PIPINGS
 VALVES & AUTOMATION
 PLASTIC SHEET & ROD

LIQUID MONITORING
 PUMPS & FILTRATION
 TANKS &
 ACCESSORIES
 VENTILATION

FLEXIBLE TUBE,
 HOSE & FITTINGS
 FRP PRODUCTS
 TOOLS
 ENGINEERING



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PLASTICS FOR TODAY'S INDUSTRIES

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 plastics with over 20,000 items in stock ready to ship!**



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- Established in 1962
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- Fast delivery across Canada direct to your office or job site
- Off-the-shelf or custom-fabricated product to suit your particular requirements
- Over 20,000 products in stock
- Competitive and firm pricing

We offer products from leading manufacturers of industrial plastics:



Westlake

Pipe & Fittings



Blue-White Industries, Ltd



+GF+ SIMONA

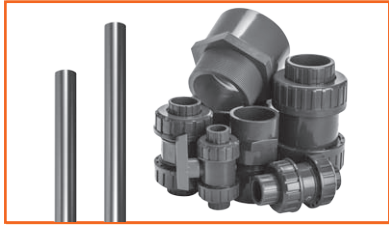


CHEMLINE PLASTICS

RTS PLASTICS
A Division of RTS Companies Inc.



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Pipe, Valves and Fittings

Fabco Plastics stocks the widest range of plastic pipe and fittings in the industry. We carry pipe up to 24" in diameter and lead the industry when it comes to highly engineered specialty piping systems. We are Canada's largest supplier of plastic valves from the world's leading manufacturers including Chemkor, Chemtrol, Georg Fischer and Hayward.



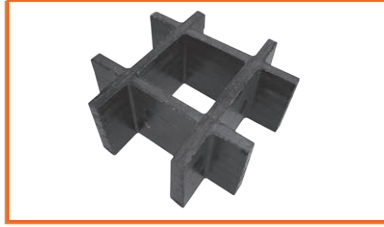
Ventilation Duct and Fittings

Fabco Plastics Instaduct® makes the designing, assembling and installing of Industrial Fume Exhaust systems much easier. Our belled-end PVC Fittings and extruded Duct Pipe are seamless and quick connecting. Fabco's HF thermoplastic radial fans are designed specifically for exhausting aggressive, low-aerosol gases, explosive atmosphere and ultraclean air. For humid and corrosive environments, we can supply a complete PVC and CPVC ventilation systems.



Flexible Tubing and Fittings

Our inclusive catalogue of hose and flexible tubing and fittings are sure to meet your challenging requirements. All tubing is available from 1/8" diameter to 2" diameter with a wide variety of pressure ratings and coil lengths.



Sheet, Rod and FRP Grating

Our plastic sheet and rod come in a variety of materials including PVC, CPVC, HDPE, LDPE, UHMW, PP, PVDF and more. Fabco's complete line of sheet products are each up to 4" thick and rod is up to 14" in diameter. We will cut sheets to your specifications and provide custom-machined components as well. We also have extensive experience in the composites industry and our material of choice is Fiberglass Reinforced Plastics (FRP). We offer grating and other FRP products in three corrosion-resistant resins.



Scrubber Packing

Fabco Plastics offers scrubber packing in Tri-Packs, rings and saddles. We have more than a dozen different plastics to meet your stringent chemical and heat-resistance requirements. All our packing media maximizes the transfer of mass and heat with minimal pressure drop. Scrubber packing is available in an assortment of plastic, stainless steel and ceramic materials.



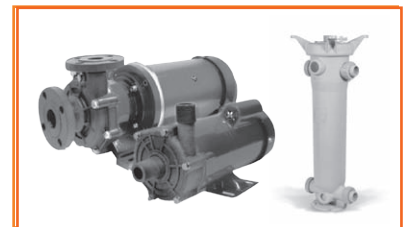
Liquid Monitoring

Fabco Plastics offers a full versatile line of Flowmeters and Instrumentation to suit your applications.



Tanks

We carry a full line of plastic tanks in a variety of configurations to meet the requirements of extremely demanding applications. Our rugged, naturally coloured tanks are available in a wide range of sizes from 15-16,500 gallons. All of our tanks are rotationally moulded from HDLPE or XLPE for years of trouble-free service.



Pumps and Filtration

Fabco Plastics stocks a wide range of pumps in various sizes and material both in AODD and Magnetic Drive. We also stock an extensive line of Y strainers and bag, basket, cartridge filters

Fabco Plastics supplies new and innovative products to a growing list of industrial and commercial market segments. We are committed to staying on the industry's leading edge and continue to provide products and services that create simplicity and efficiency for our customers. We offer the following:

- **Commitment to Customer Satisfaction**
- **Quality products, service and technical expertise**
- **Fast delivery across Canada direct to your office or job site**
- **Off-the-shelf or custom-fabricated product to suit your particular requirements**
- **Over 20,000 products in stock**
- **Competitive and firm pricing**

MONTREAL

2750 RUE BERNARD-LEFEBVRE
LAVAL, QC H7C 0A5

450.687.2721
888.637.5278

SASKATOON

3926 ARTHUR ROSE AVE.
SASKATOON, SK S7P 0C9

306.955.6005

TORONTO - HEAD OFFICE

2175-A TESTON RD.
MAPLE ON L6A 1T3

905.832.0600
800.565.6189

EDMONTON

24790 - 117 AVE.
ACHESON, AB T7X 6C2

780.451.0238
800.661.7926

VANCOUVER

9511 - 194A ST.
SURREY, BC V4N 4G4

604.882.1564
800.232.2422



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Pipe and Fittings

Fabco Plastics stocks the widest range of plastic pipe and fittings in the industry. We carry pipe and fittings up to 24" in diameter and lead in our ability to supply engineered specialty piping systems. Our product range includes – Pressure Process & Distribution Piping, Chemical Waste Drainage Piping, Double Containment Piping and Ultra High Purity Piping.

Fabco understands your applications and has the plastics material selection that meets your projects demands in either PVC, CPVC, Polypropylene, PVDF, Polyethylene or FRP - we have the materials you need.

ADVANTAGE:

- Available to meet Industry Standards and Regulatory demands
- IPS format in Sch 40 / 80 /120 or SDR Class in ¼" through 24"
- Metric PN 10 /16 in 12mm through 315mm
- IPS WELD- ON Cement Distributor [Bonder Training available for Solvent Cementing Qualification]
- Fusion Joint Tooling and installation Tools available

Your applications take our piping systems to many types of installations, our knowledgeable staff has the answers to your questions and our supply chain has the products for your needs.



Chemkor Schedule 80 Pipe



PVC is the most frequently specified of all plastic piping materials. It has been used successfully for over 60 years. PVC is characterized by distinctive physical properties and is resistant to corrosion and chemical attack by acids, alkalis, salt solutions and many other chemicals. It is attacked, however, by polar solvents such as ketones and aromatics. Of the various types and grades of PVC used in plastic piping, Type 1, Grade 1 PVC (Cell Classification 12454-B) conforming to ASTM D1784, is the most common. The maximum service temperature for PVC is 140°F.

With a design stress of 2,000 psi, PVC has the highest long-term hydrostatic strength (at 73°F) of any other major thermoplastic material used for piping.

Applications

- Swimming Pools and Spas
- Chemical Feed Systems
- Industrial Water Treatment Systems
- Municipal Water Treatment Systems
- Turn-key Treatment Skids
- Cooling Towers
- Metallic Plating Lines

Features

- Stocked in 10' or 20' lengths, bell and plain end
- Available in custom lengths as a special
- Bell end joints also available
- Lightweight for quick and easy installation
- Smooth interior walls reduce friction
- Reduced friction limits energy requirements
- Low maintenance reduces operating costs

MM	NOMINAL PIPE SIZE (INCHES)	PART NUMBER	OUTSIDE DIAMETER (IN)	MAX. INSIDE DIAMETER (IN)	MIN. WALL THICKNESS (IN)	WEIGHT PER 100 FEET (LB)	PRESSURE RATING AT 73.4°F PSI
6	1/4 x 20 ft	010304	0.540	0.302	0.119	10	1130
10	3/8 x 20 ft	010306	0.675	0.423	0.126	14	910
12	1/2 x 20 ft	010307	0.840	0.546	0.147	21	840
20	3/4 x 20 ft	010308	1.050	0.742	0.154	28	680
25	1 x 20 ft	010309	1.315	0.957	0.179	41	630
32	1 1/4 x 20 ft	010310	1.660	1.278	0.191	57	520
40	1 1/2 x 20 ft	010311	1.900	1.500	0.200	68	470
50	2 x 20 ft	010312	2.375	1.939	0.218	94	400
65	2 1/2 x 20 ft	010313	2.875	2.323	0.276	144	420
75	3 x 20 ft	010314	3.500	2.900	0.300	193	370
100	4 x 20 ft	010316	4.500	3.826	0.337	282	320
125	5 x 20 ft	010317	5.563	4.768	0.375	392	290
150	6 x 20 ft	010318	6.625	5.761	0.432	538	280
200	8 x 20 ft	010319	8.625	7.625	0.500	817	240
250	10 x 20 ft	010320	10.75	9.564	0.593	1212	230
300	12 x 20 ft	010322	12.75	11.376	0.687	1680	220
350	14 x 20 ft	010324	14.00	12.410	0.750	1979	220
400	16 x 20 ft	010326	16.00	14.214	0.843	2543	220
450	18 x 20 ft	010328	18.00	16.014	0.937	3183	220
500	20 x 20 ft	010330	20.00	17.814	1.031	4105	220
600	24 x 20 ft	010334	24.00	21.418	1.218	5823	210

Notes:

- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 12, Engineering Data.
- CHEMKOR pressure pipe conforms to CSA Standard B137.3 and ASTM D1784, D1785.
- Schedule 80 pipe is recommended for threading.
- Not recommended for compressed air or gas service.

Schedule 80 PVC Fittings

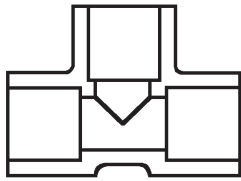
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Chemkor Schedule 80 Fittings

Notes:

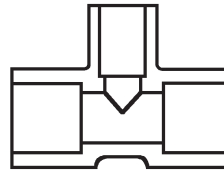
- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 12, Engineering Data.
- PVC Schedule 80 Fittings are produced in accordance with the following standards – ASTM D1784, ASTM D2467 (Soc Fittings), ASTM D2464 (Threaded Fittings).
- Flanges are 150 lb. ANSI B16.5 dimensioned.
- Threaded crosses, wyes, reducing wyes, 30° elbows, 22° elbows, threaded fittings, line couplings, repair couplings and many other fittings are available on request.
- F indicates a fabricated fitting. F* Indicates moulded or fabricated available.
- All 1/2" - 16" Molded flanges have a 150 psi Maximum Internal Pressure Rating @ 73°F (23°C).
- All 10" - 24" Fabricated flanges have a 50 psi Maximum Internal Pressure Rating @ 73°F (23°C).
- No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- All Socket Unions have a 235 psi Maximum Internal Pressure Rating @ 73°F (23°C).
- Please note some brands are not interchangeable, please specify if you are requesting a specific brand.

SOCKET TEES



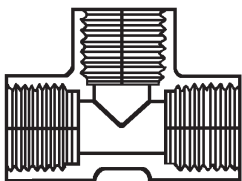
NOMINAL PIPE SIZE	PART NUMBER
1/4	801002
3/8	801003
1/2	801005
3/4	801007
1	801010
1 1/4	801012
1 1/2	801015
2	801020
2 1/2	801025
3	801030
4	801040
5	801050
6	801060
8	801080
10	801100F*
12	801120F*
14	801140F
16	801160F
18	801180F
20	801200F
24	801240F

SOCKET REDUCING TEES



NOMINAL PIPE SIZE	PART NUMBER
3/4x3/4x1/2	801101
1x1x1/2	801130
1x1x3/4	801131
1 1/2x1 1/2x3/4	801210
1 1/2x1 1/2x1	801211
2x2x1/2	801247
2x2x3/4	801248
2x2x1	801249
2x2x1 1/2	801251
3x3x2	801338
4x4x2	801420
3/4x3/4x1/2	801101
1x1x1/2	801130
1x1x3/4	801131
1 1/2x1 1/2x3/4	801210
1 1/2x1 1/2x1	801211
2x2x1/2	801247
2x2x 3/4	801248
2x2x1	801249
2x2x1 1/2	801251
3x3x2	801338
4x4x2	801420
4x4x3	801422
6x6x4	801532
8x8x2	801578
8x8x3	801580
8x8x4	801582
8x8x6	801585
10x10x3	801623F*
10x10x4	801624F*
10x10x6	801626F*
10x10x8	801628F*
12x12x4	801664F*
12x12x6	801666F*
12x12x8	801668F*
12x12x10	801670F*
14x14x8	801698F
14x14x10	801700F

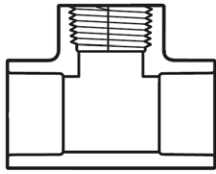
THREAD TEES



NOMINAL PIPE SIZE	PART NUMBER
1/4	805002
3/8	805003
1/2	805005
3/4	805007
1	805010
1 1/4	805012
1 1/2	805015
2	805020
2 1/2	805025
3	805030
4	805040

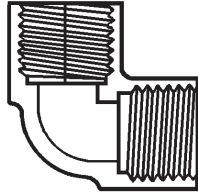
Schedule 80 PVC Fittings

SXFPT TEES



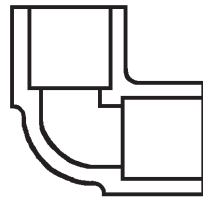
NOMINAL PIPE SIZE	PART NUMBER
1/4	802002
1/2	802005
3/4	802007
1	802010
2	802020
3	802030

90° THREAD ELBOWS



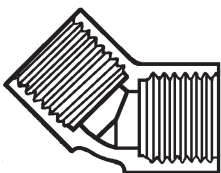
NOMINAL PIPE SIZE	PART NUMBER
1/4	808002
3/8	808003
1/2	808005
3/4	808007
1	808010
1 1/4	808012
1 1/2	808015
2	808020
2 1/2	808025
3	808030
4	808040

90° SOCKET ELBOWS



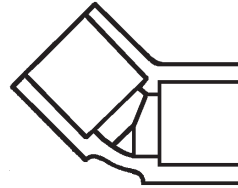
NOMINAL PIPE SIZE	PART NUMBER
1/4	806002
3/8	806003
1/2	806005
3/4	806007
1	806010
1 1/4	806012
1 1/2	806015
2	806020
2 1/2	806025
3	806030
4	806040
5	806050F*
6	806060
8	806080
10	806100F*
12	806120F*
14	806140F
16	806160F
18	806180F
20	829200F
24	829240F

45° THREAD ELBOWS



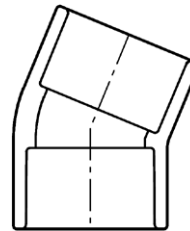
NOMINAL PIPE SIZE	PART NUMBER
1/4	819002
3/8	819003
1/2	819005
3/4	819007
1	819010
1 1/4	819012
1 1/2	819015
2	819020
2 1/2	819025
3	819030
4	819040

45° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/4	817002
3/8	817003
1/2	817005
3/4	817007
1	817010
1 1/4	817012
1 1/2	817015
2	817020
2 1/2	817025
3	817030
4	817040
5	817050F*
6	817060
8	817080
10	817100F*
12	817120F*
14	817140F
16	817160F
18	817180F
20	817200F
24	817240F

22-1/2° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/2	816005
3/4	816007
1	816010
1 1/4	816012
1 1/2	816015
2	816020
2 1/2	816025
3	816030
4	816040
6	816060
8	816080
10	816100F
12	816120F

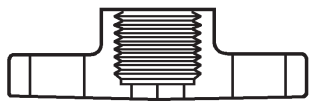
150LB SOCKET FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	851005
3/4	851007
1	851010
1 1/4	851012
1 1/2	851015
2	851020
2 1/2	851025
3	851030
4	851040
5	851050
6	851060
8	851080
10	851100F
12	851120F
14	851140F
16	851160F
18	851180F
20	851200F
24	851240F

Schedule 80 PVC Fittings

150LB THREADED FLANGES



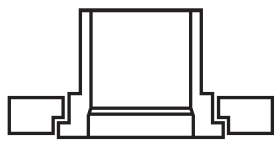
NOMINAL PIPE SIZE	PART NUMBER
1/2	852005
3/4	852007
1	852010
1 1/4	852012
1 1/2	852015
2	852020
2 1/2	852025
3	852030
4	852040
6	852060
8	852080

150LB BLIND FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	853005
3/4	853007
1	853010
1 1/4	853012
1 1/2	853015
2	853020
2 1/2	853025
3	853030
4	853040
5	853050F
6	853060
8	853080
10	853100
12	853120
14	853140F
16	853160F
18	853180F
20	853200F
24	853240F

SPIGOT VANSTONE FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	856005
3/4	856007
1	856010
1 1/4	856012
1 1/2	856015
2	856020
2 1/2	856025
3	856030
4	856040
6	856060
8	856080
10	856100
12	856120
14	856140P
16	856160P
18	856180P
20	856200S
24	856240S

P = GLASS FILLED
S = STEEL

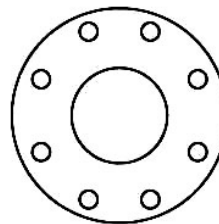
SOCKET VANSTONE FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	854005
3/4	854007
1	854010
1 1/4	854012
1 1/2	854015
2	854020
2 1/2	854025
3	854030
4	854040
5	854050
6	854060
8	854080
10	854100
12	854120
14	854140
16	854160
18	854180F
20	854200F
24	854240F

FLANGE GASKETS FLEX PVC 1/8"

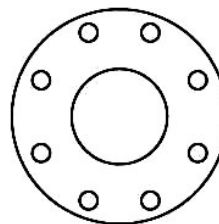
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NOMINAL PIPE SIZE	PART NUMBER
1/2"	P7000107
3/4"	P7000108
1"	P7000109
1 1/4"	P7000110
1 1/2"	P7000111
2"	P7000112
2 1/2"	P7000113
3"	P7000114
4"	P7000116
6"	P7000118
8"	P7000119
10"	P7000120
12"	P7000121

FLANGE GASKETS NEOPRENE 1/8"

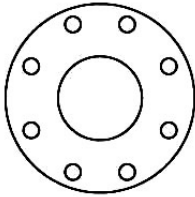
(PUNCHED)



NOMINAL PIPE SIZE	PART NUMBER
1/2"	7000107
3/4"	7000108
1"	7000109
1 1/4"	7000110
1 1/2"	7000111
2"	7000112
2 1/2"	7000113
3"	7000114
4"	7000116
6"	7000118
8"	7000119
10"	7000120
12"	7000121

LOW TORQUE FLANGE GASKETS

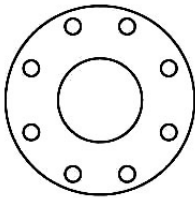
EPDM
(MOULDED)



NOMINAL PIPE SIZE	PART NUMBER
1/2"	E70001005
3/4"	E70001007
1"	E70001010
1 1/4"	E70001012
1 1/2"	E70001015
2"	E70001020
2 1/2"	E70001025
3"	E70001030
4"	E70001040
6"	E70001060
8"	E70001080
10"	E70001100
12"	E70001120

LOW TORQUE FLANGE GASKETS

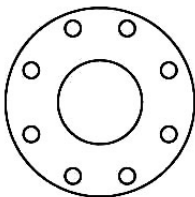
VITON



NOMINAL PIPE SIZE	PART NUMBER
1/2"	V70001005
3/4"	V70001007
1"	V70001010
1 1/4"	V70001012
1 1/2"	V70001015
2"	V70001020
2 1/2"	V70001025
3"	V70001030
4"	V70001040
6"	V70001060
8"	V70001080
10"	V70001100
12"	V70001120

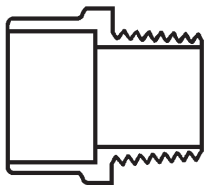
LOW TORQUE FLANGE GASKETS

TEFLON BONDED/EPDM
(MOULDED)



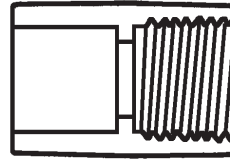
NOMINAL PIPE SIZE	PART NUMBER
1/2"	T70001005
3/4"	T70001007
1"	T70001010
1 1/4"	T70001012
1 1/2"	T70001015
2"	T70001020
2 1/2"	T70001025
3"	T70001030
4"	T70001040
6"	T70001060
8"	T70001080
10"	T70001100
12"	T70001120

MALE ADAPTERS



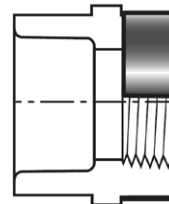
NOMINAL PIPE SIZE	PART NUMBER
1/2"	836005
3/4"	836007
1"	836010
1 1/4"	836012
1 1/2"	836015
2"	836020
2 1/2"	836025
3"	836030
4"	836040
5"	836050F
6"	836060
8"	836080F
10"	836100F
12"	836120F

FEMALE ADAPTERS



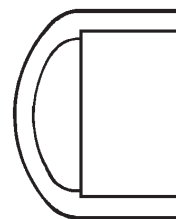
NOMINAL PIPE SIZE	PART NUMBER
1/4"	835002
3/8"	835003
1/2"	835005
3/4"	835007
1"	835010
1 1/4"	835012
1 1/2"	835015
2"	835020
2 1/2"	835025
3"	835030
4"	835040
6"	835060F
8"	835080F
10"	835100F
12"	835120F

REINFORCED FEMALE ADAPTERS



NOMINAL PIPE SIZE	PART NUMBER
1/4"	835002SR
3/8"	835003SR
1/2"	835005SR
3/4"	835007SR
1"	835010SR
1 1/4"	835012SR
1 1/2"	835015SR
2"	835020SR
2 1/2"	835025SR
3"	835030SR
4"	835040SR
6"	835060SR

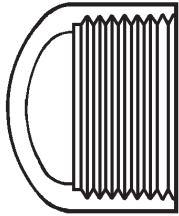
SOCKET CAPS



NOMINAL PIPE SIZE	PART NUMBER
1/4"	847002
3/8"	847003
1/2"	847005
3/4"	847007
1"	847010
1 1/4"	847012
1 1/2"	847015
2"	847020
2 1/2"	847025
3"	847030
4"	847040
6"	847060
8"	847080
10"	847100F
12"	847120F
14"	847140F
16"	847160F
18"	847180F
20"	847200F
24"	847240F

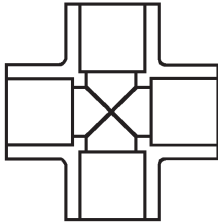
Schedule 80 PVC Fittings

THREADED CAPS



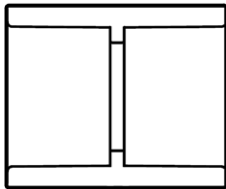
NOMINAL PIPE SIZE	PART NUMBER
1/4	848002
3/8	848003
1/2	848005
3/4	848007
1	848010
1 1/4	848012
1 1/2	848015
2	848020
2 1/2	848025
3	848030
4	848040
6	848060F
8	848080F

SOCKET CROSSES



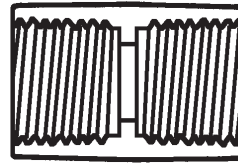
NOMINAL PIPE SIZE	PART NUMBER
1/4	820002
1/2	820005
3/4	820007
1	820010
1 1/4	820012
1 1/2	820015
2	820020
2 1/2	820025
3	820030
4	820040
6	820060F
8	820080F
10	820100F
12	820120F
14	820140F
16	820160F
18	820180F
20	820200F
24	820240F

SOCKET COUPLINGS



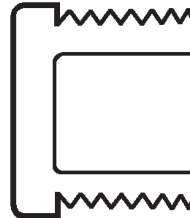
NOMINAL PIPE SIZE	PART NUMBER
1/4	829002
3/8	829003
1/2	829005
3/4	829007
1	829010
1 1/4	829012
1 1/2	829015
2	829020
2 1/2	829025
3	829030
4	829040
5	829050F
6	829060
8	829080
10	829100F
12	829120F
14	829140F
16	829160F
18	829180F
20	829200F
24	829240F

THREADED COUPLINGS



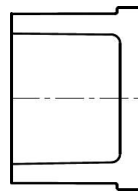
NOMINAL PIPE SIZE	PART NUMBER
1/4	830002
3/8	830003
1/2	830005
3/4	830007
1	830010
1 1/4	830012
1 1/2	830015
2	830020
2 1/2	830025
3	830030
4	830040
6	830060F
8	830080F
10	830100F

THREADED PLUGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	850002
3/8	850003
1/2	850005
3/4	850007
1	850010
1 1/4	850012
1 1/2	850015
2	850020
2 1/2	850025
3	850030
4	850040
6	850060F

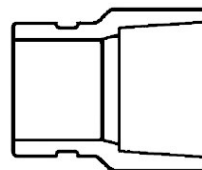
SPIG PLUGS



NOMINAL PIPE SIZE	PART NUMBER
1/2	849005
3/4	849007
1	849010
1 1/4	849012
1 1/2	849015
2	849020

GROOVED COUPLING ADAPTER

(groove x soc)

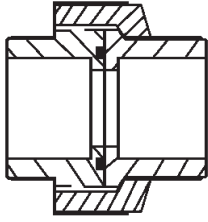


NOMINAL PIPE SIZE	PART NUMBER
1 1/4	833-012
1 1/2	833-015
2	833-020
2 1/2	833-025
3	833-030
4	833-040
5	833-050F
6	833-060
8	833-080F
10	833-100F
12	833-120F

Schedule 80 PVC Fittings

SOCKET UNIONS

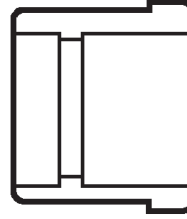
(Viton o-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	897002
3/8	897003
1/2	897005
3/4	897007
1	897010
1 1/4	897012
1 1/2	897015
2	897020
2 1/2	897025
3	897030
4	897040
6	897060

REDUCER BUSHINGS

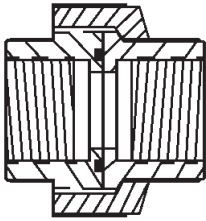
(socket x slip)



NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	837052
1/2 x 1/4	837072
1/2 x 3/8	837073
3/4 x 1/4	837098
3/4 x 1/2	837101
1 x 1/4	837128
1 x 1/2	837130
1 x 3/4	837131
1 1/4 x 1/2	837166
1 1/4 x 3/4	837167
1 1/4 x 1	837168
1 1/2 x 1/2	837209
1 1/2 x 3/4	837210
1 1/2 x 1	837211
1 1/2 x 1 1/4	837212
2 x 1/2	837247
2 x 3/4	837248
2 x 1	837249
2 x 1 1/4	837250
2 x 1 1/2	837251
2 1/2 x 1	837289
2 1/2 x 1 1/4	837290
2 1/2 x 1 1/2	837291
2 1/2 x 2	837292
3 x 1	837335
3 x 1 1/4	837336
3 x 1 1/2	837337
3 x 2	837338
3 x 2 1/2	837339
4 x 2	837420
4 x 2 1/2	837421
4 x 3	837422
6 x 3	837531
6 x 4	837532
8 x 6	837585
10 x 4	837624F
10 x 6	837626F
10 x 8	837628F
12 x 4	837664F
12 x 6	837666F
12 x 8	837668F
12 x 10	837670F
14 x 6	837696F
14 x 8	837698F
14 x 10	837700F
14 x 12	837704F
16 x 8	837734F
16 x 10	837736F
16 x 12	837738F
16 x 14	837740F

THREADED UNIONS

(Viton o-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	898002
3/8	898003
1/2	898005
3/4	898007
1	898010
1 1/4	898012
1 1/2	898015
2	898020
2 1/2	898025
3	898030
4	898040
6	898060

NO LEAK FLANGES

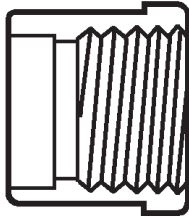


NOMINAL PIPE SIZE	PART NUMBER
1/2	8NLF005
3/4	8NLF007
1	8NLF010
1 1/4	8NLF012
1 1/2	8NLF015
2	8NLF020
2 1/2	8NLF025
3	8NLF030
4	8NLF040
5	8NLF050
6	8NLF060
8	8NLF080
10	8NLF100
12	8NLF120
14	8NLF140
16	8NLF160
18	8NLF180
20	8NLF200
24	8NLF240

Schedule 80 PVC Fittings

REDUCER BUSHINGS

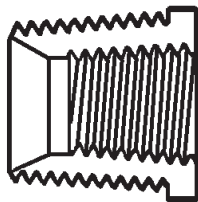
(slip x fpt)



NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	838052
1/2 x 1/4	838072
1/2 x 3/8	838073
3/4 x 1/4	838098
3/4 x 1/2	838101
1 x 1/4	838128
1 x 1/2	838130
1 x 3/4	838131
1 1/4 x 1/2	838166
1 1/4 x 3/4	838167
1 1/4 x 1	838168
1 1/2 x 1/2	838209
1 1/2 x 3/4	838210
1 1/2 x 1	838211
1 1/2 x 1 1/4	838212
2 x 1/2	838247
2 x 3/4	838248
2 x 1	838249
2 x 1 1/4	838250
2 x 1 1/2	838251
2 1/2 x 1	838289
2 1/2 x 1 1/4	838290
2 1/2 x 1 1/2	838291
2 1/2 x 2	838292
3 x 1	838335
3 x 1 1/4	838336
3 x 1 1/2	838337
3 x 2	838338
3 x 2 1/2	838339
4 x 2	838420
4 x 2 1/2	838421
4 x 3	838422
6 x 3	838531
6 x 4	838532
8 x 6	838585

REDUCER BUSHINGS

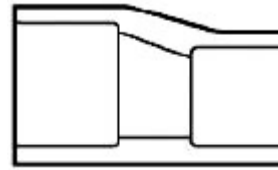
(mpt x fpt)



NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	839052
1/2 x 1/4	839072
1/2 x 3/8	839073
3/4 x 1/4	839098
3/4 x 1/2	839101
1 x 1/4	839128
1 x 1/2	839130
1 x 3/4	839131
1 1/4 x 1/2	839166
1 1/4 x 3/4	839167
1 1/4 x 1	839168
1 1/2 x 1/2	839209
1 1/2 x 3/4	839210
1 1/2 x 1	839211
1 1/2 x 1 1/4	839212
2 x 1/2	839247
2 x 3/4	839248
2 x 1	839249
2 x 1 1/4	839250
2 x 1 1/2	839251
2 1/2 x 1	839289
2 1/2 x 1 1/4	839290
2 1/2 x 1 1/2	839291
2 1/2 x 2	839292
3 x 1	839335
3 x 1 1/4	839336
3 x 1 1/2	839337
3 x 2	839338
3 x 2 1/2	839339
4 x 2	839420
4 x 2 1/2	839421
4 x 3	839422
6 x 3	839531
6 x 4	839532
8 x 6	839585

ECCENTRIC REDUCER COUPLING

(soc)

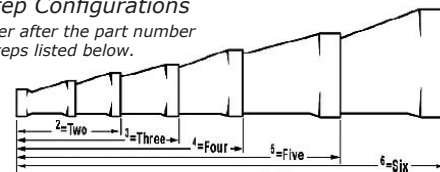


NOMINAL PIPE SIZE	PART NUMBER
1X3/4	829-131FE
1-1/4X1	829-168FE
1-1/2X1-1/4	829-212FE
2X1	829-249FE
2X1-1/4	829-250FE
2X1-1/2	829-251FE
2-1/2X1-1/4	829-290FE ²
2-1/2X1-1/2	829-291FE ²
2-1/2X2	829-292FE
3X1	829-335FE ²
3X1-1/4	829-336FE ²
3X1-1/2	829-337FE ²
3X2	829-338FE
3X2-1/2	829-339FE
4X1	829-417FE ³
4X1-1/4	829-418FE ³
4X1-1/2	829-419FE ³
4X2	829-420FE ²
4X2-1/2	829-421FE ²
4X3	829-422FE
5X4	829-490FE
6X2	829-528FE ³
6X2-1/2	829-529FE ³
6X3	829-530FE ²
6X4	829-532FE
6X5	829-533FE
8X1	829-575FE ⁵
8X1-1/2	829-577FE ⁵
8X2	829-578FE ⁴
8X3	829-580FE ³
8X4	829-582FE ²
8X5	829-583FE ²
8X6	829-585FE
10X4	829-624FE ³
10X5	829-625FE ³
10X6	829-626FE ²
10X8	829-628FE
12X4	829-664FE ⁴
12X6	829-666FE ³
12X8	829-668FE ²
12X10	829-670FE
14X6	829-696FE ³
14X8	829-698FE ²
14X10	829-700FE
14X12	829-702FE
16X6	829-756FE ⁵
16X8	829-758FE ⁴
16X10	829-760FE ²
16X12	829-762FE ²
16X14	829-764FE
18X6	829-786FE ⁶
18X8	829-788FE ⁵
18X10	829-790FE ⁴
18X12	829-792FE ³
18X14	829-794FE ²
18X16	829-796FE

Eccentric Reducer Coupling Footnotes

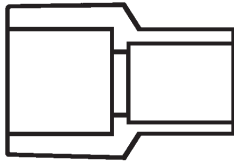
Multi-Step Configurations

The number after the part number denotes the number of steps listed below.



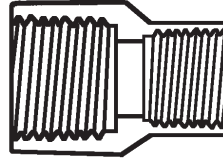
Example: 829-582 FE² (2 = 2 Step)

SOCKET REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	829072
3/4 x 1/2	829101
1 x 1/2	829130
1 x 3/4	829131
1 1/4 x 1/2	829166
1 1/4 x 3/4	829167
1 1/4 x 1	829168
1 1/2 x 1/2	829209
1 1/2 x 3/4	829210
1 1/2 x 1	829211
1 1/2 x 1 1/4	829212
2 x 1/2	829247
2 x 3/4	829248
2 x 1	829249
2 x 1 1/4	829250
2 x 1 1/2	829251
2 1/2 x 1 1/2	829291
2 1/2 x 2	829292
3 x 1 1/2	829337
3 x 2	829338
3 x 2 1/2	829339
4 x 2	829420
4 x 2 1/2	829421
4 x 3	829422
6 x 4	829532
8 x 4	829582
8 x 6	829585
10 x 4	829624F
10 x 6	829626F
10 x 8	829628F
12 x 4	829664F
12 x 6	829666F
12 x 8	829668F
12 x 10	829670F
14 x 6	829696F
14 x 8	829698F
14 x 10	829700F
14 x 12	829704F
16 x 8	829734F
16 x 10	829736F
16 x 12	829738F
16 x 14	829740F

THREADED REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	830072
3/4 x 1/2	830101
1 x 1/2	830130
1 x 3/4	830131
1 1/4 x 1/2	830166
1 1/4 x 3/4	830167
1 1/4 x 1	830168
1 1/2 x 1/2	830209
1 1/2 x 3/4	830210
1 1/2 x 1	830211
1 1/2 x 1 1/4	830212
2 x 1/2	830247
2 x 3/4	830248
2 x 1	830249
2 x 1 1/4	830250
2 x 1 1/2	830251
2 1/2 x 1 1/2	830291
2 1/2 x 2	830292
3 x 1 1/2	830337
3 x 2	830338
3 x 2 1/2	830339
4 x 2	830420
4 x 2 1/2	830421
4 x 3	830422
6 x 4	830532
8 x 4	830582
8 x 6	830585

THREADED NIPPLES

(close)



NOMINAL PIPE SIZE	PART NUMBER
1/4	861037
3/8	861055
1/2	861063
3/4	861104
1	861133
1 1/4	861170
1 1/2	861213
2	861251
2 1/2	861260
3	861338
4	861422

THREADED NIPPLES

(short)

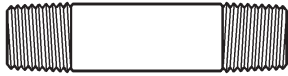


NOMINAL PIPE SIZE	PART NUMBER
1/4	861038
3/8	861056
1/2	861078
3/4	861105
1	861134
1 1/4	861171
1 1/2	861214
2	861252

Schedule 80 PVC Fittings

THREADED NIPPLES

(3 inches)



NOMINAL PIPE SIZE	PART NUMBER
1/4	861041
3/8	861058
1/2	861081
3/4	861106
1	861135
1 1/4	861172
1 1/2	861215
2	861253
2 1/2	861261
3	861339

THREADED NIPPLES

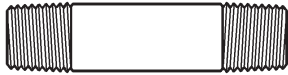
(4 inches)



NOMINAL PIPE SIZE	PART NUMBER
1/4	861042
3/8	861059
1/2	861082
3/4	861107
1	861136
1 1/4	861173
1 1/2	861216
2	861254
2 1/2	861265
3	861341
4	861423

THREADED NIPPLES

(5 inches)



NOMINAL PIPE SIZE	PART NUMBER
1/4	861043
3/8	861061
1/2	861083
3/4	861108
1	861137
1 1/4	861174
1 1/2	861217
2	861255
2 1/2	861268
3	861342
4	861430

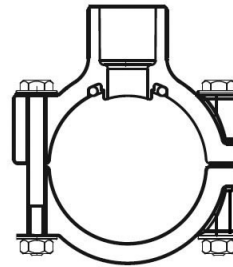
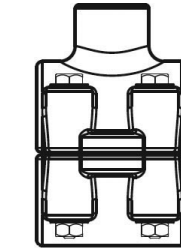
THREADED NIPPLES

(6 inches)



NOMINAL PIPE SIZE	PART NUMBER
1/4	861044
3/8	861062
1/2	861084
3/4	861109
1	861138
1 1/4	861175
1 1/2	861218
2	861256
2 1/2	861269
3	861343
4	861426

BOLT-ON SADDLES



NOMINAL PIPE SIZE	PART NUMBER
2 x 1/2	866SV247
2 x 3/4	866SV248
2 x 1	866SV249
2 x 1 1/4	866SV250
2 x 1 1/2	866SV251
2 1/2 x 1 1/2	866SV291
3 x 1/2	866SV333
3 x 3/4	866SV334
3 x 1	866SV335
3 x 1 1/4	866SV336
3 x 1 1/2	866SV337
3 x 2	866SV338
4 x 1/2	866SV415
4 x 3/4	866SV416
4 x 1	866SV417
4 x 1 1/4	866SV418
4 x 1 1/2	866SV419
4 x 2	866SV420
4x 2 1/2	866SV421
4 x 3	866SV422
6 x 1/2	866SV523
6 x 3/4	866SV524
6 x 1	866SV525
6 x 1 1/4	866SV526
6 x 1 1/2	866SV527
6 x 2	866SV528
6 x 2 1/2	866SV529
6 x 3	866SV530
6 x 4	866SV532
8 x 1/2	866SV573
8 x 3/4	866SV574
8 x 1	866SV575
8 x 1 1/4	866SV576
8 x 1 1/2	866SV577
8 x 2	866SV578
8 x 2 1/2	866SV579
8 x 3	866SV580
8 x 4	866SV582
8 x 6	866SV585
10 x 4	866SV624
10 x 6	866SV626
12 x 4	866SV664
12 x 6	866SV666

****CUSTOM SADDLES ARE AVAILABLE UP TO 24"*****

Clamp-It PVC Tapping Saddles



The Clamp-It Tapping saddles allow you to tap into existing piping systems without having to cut out and insert a tee. The O-ring and O-ring groove are designed so that there is no gap between the installed saddle and the pipe. When pressure is applied the pipe compression is replaced by the fluid pressure without increasing the pressure on the saddle. The hinge design eliminates the need for two clamping wedges. The clamping wedge equally distributes the pressure over the entire width of the saddle. It locks and aligns the saddle top and bottom into proper position.

Applications

- Variable grade pressure sewer systems
- Pressure water systems
- Golf club irrigation
- Mobile home parks

Notes:

- Meets ASTM D-1784 cell classification 12454B and ASTM D-2241; D-2466 and 1599 for dimensions and testing performance.

SIZE	3/4" TAP	1" TAP	1 1/4" TAP	1 1/2" TAP	2" TAP
IPS SLIP					
2"	432007	432010	432012	432015	
2-1/2"	432507	432510	432512	432515	432520
3"	453007	453010	453012	453015	453020
4"	454007	454010	454012	454015	454020
6"	456007	456010	456012	456015	456020
8"	458007	458010	458012	458015	458020
IPS FIPT					
2"	422007	422010	422012	422015	
2-1/2"	422507	422510	422512	422515	422520
3"	443007	443010	443012	443015	443020
4"	444007	444010	444012	444015	444020
6"	446007	446010	446012	446015	446020
8"	448007	448010	448012	448015	448020

Bolt-on Pipe Saddles



Features:

Maximum Pressure rating at 20C (68F)

- 235 psi (16 bar)

Maximum Temperature

- 100C (212F)

Standards

- Conform to Standards ANSI/ASME B1.20.1., ASTM, D3035, F714 and AWWA C-901/906

Chemline PS Series Bolt-on pipe saddles are for IPS size PVC or HDPE piping. Made of solid polypropylene, these fittings are durable and impact resistant. They are ideal for outdoor applications in irrigation and also widely used on water treatment skids. Polypropylene also has excellent chemical resistance.

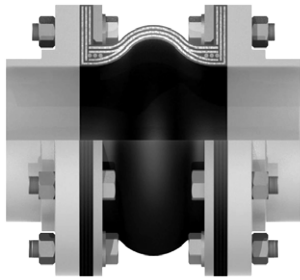
The female threaded branch comes standard with a 204 stainless steel reinforcing ring. Pipe saddles are normally supplied with a 304 stainless steel bolt, but are available special order with galvanized steel bolts at lower cost.

IPS PIPE SIZE (IN)	BRANCH FNPT (IN)	PART NUMBER
1-1/2	1/2	PSBR015-005-304
1-1/2	3/4	PSBR015-007-304
1-1/2	1	PSBR015-010-304
2	1/2	PSBR020-005-304
2	3/4	PSBR020-007-304
2	1	PSBR020-010-304
3	1/2	PSBR030-005-304
3	3/4	PSBR030-007-304
3	1	PSBR030-010-304
3	1-1/4	PSBR030-012-304
3	1-1/2	PSBR030-015-304
4	1/2	PSBR040-005-304
4	3/4	PSBR040-007-304
4	1	PSBR040-010-304
4	1-1/4	PSBR040-012-304
4	1-1/2	PSBR040-015-304
4	2	PSBR040-020-304
6	1/2	PSBR060-005-304
6	3/4	PSBR060-007-304
6	1	PSBR060-010-304
6	1-1/4	PSBR060-012-304
6	1-1/2	PSBR060-015-304
6	2	PSBR060-020-304

Expansion Joints

1

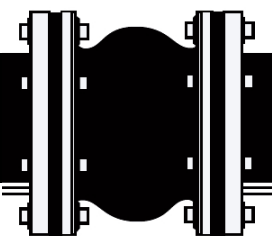
Proco 261R Series Molded Wide Arch Expansion Joints



Molded Wide Arch Expansion Joints are specifically designed for use with Plastic or FRP Piping Systems. PROCO Style 261R have lower spring forces to compress, extend or laterally offset and can be used on plastic or FRP pipes, pumps, valves and tanks without fear of the expansion joint being stronger than the pipe, pump, valve or tank flanges. These expansion joints may be used where metallic hoses/expansion joints or old design rubber expansion joints may have been specified previously. Used on plastic tanks, pumps, chillers, cooling towers, compressors, blowers, fans, absorption machines, etc to: (1) Absorb Pipe Movements/Stress, (2) Reduce System Noise, (3) Isolate Mechanical Vibrations, (4) Compensate Alignment/Offset, (5) Eliminate Electrolytic Action and Electrolysis, (6) Protect Against Start-Up/Surge Forces.

STYLE 261R SINGLE MOLDED WIDE ARCH PERFORMANCE DATA

EXPANSION JOINT SIZE NOM. I.D. X INCH (MM)	NEUTRAL LENGTH INCH (MM)	261R MOVEMENT CAPABILITY: FROM NEUTRAL POSITION SPRING RATES OPERATING						SPRING RATES LB/IN (N/MM)			OPERATING CONDITIONS 2		WEIGHTS LBS3 (KGS)		
		AXIAL COMPRESSION INCH (MM)	AXIAL EXTENSION INCH (MM)	LATERAL DEFLECTION INCH (MM)	ANGULAR DEFLECTION 4 (DEGREES)	TORSIONAL ROTATION 5 (DEGREES)	THRUST FACTOR 6 INZ (CMZ)	FORCE POUNDS FOR 1" AXIAL COMPRESSION	FORCE POUNDS FOR 1" AXIAL EXTENSION	FORCE POUNDS FOR 1" LATERAL DEFLECTION	POSITIVE PSIG / (BAR)	VACUUM INCHES OF HG / (MM OF HG)	EXPANSION JOINT	RETAINING RING SET	CONTROL UNIT ASSEMBLY 7
1.5 (40)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	28	5	11.04 (71)	126 (22)	182 (32)	149 (26)	225 (15.5)	24 (610)	1.3 (0.59)	2.5 (1.1)	2.3 (1.0)
2 (50)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	25	5	14.18 (92)	132 (23)	158 (28)	130 (23)	225 (15.5)	24 (610)	1.7 (0.77)	4.0 (1.8)	2.8 (1.3)
2.5 (65)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	20	5	17.71 (114)	128 (22)	141 (25)	111 (19)	225 (15.5)	24 (610)	2.1 (0.95)	4.5 (2.0)	2.8 (1.3)
3 (80)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	18	5	21.64 (140)	139 (24)	208 (36)	133 (23)	225 (15.5)	24 (610)	2.4 (1.0)	5.5 (2.5)	2.8 (1.3)
4 (100)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	14	4	30.66 (198)	110 (19)	180 (32)	105 (18)	225 (15.5)	24 (610)	3.2 (1.4)	6.0 (2.7)	2.8 (1.3)
5 (125)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	13	4	41.26 (266)	143 (25)	190 (33)	136 (24)	225 (15.5)	24 (610)	3.6 (1.6)	8.5 (3.9)	4.0 (1.8)
6 (150)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	12	4	53.43 (345)	136 (24)	166 (29)	147 (26)	225 (15.5)	24 (610)	4.9 (2.2)	9.5 (4.3)	4.0 (1.8)
8 (200)	6 (150)	1.5 (38)	0.625 (16)	0.750 (19)	12	4	82.47 (532)	226 (40)	230 (40)	210 (37)	210 (14.8)	24 (610)	7.7 (3.5)	14.5 (6.6)	8.0 (3.6)
10 (250)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	12	4	135.13 (872)	248 (43)	381 (67)	281 (49)	210 (14.8)	24 (610)	13.9 (6.3)	17.0 (7.7)	10.0 (4.5)
12 (300)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	11	4	179.46 (1158)	378 (66)	493 (86)	409 (72)	210 (14.8)	24 (610)	19.5 (8.8)	24.5 (11.0)	10.0 (4.5)
14 (350)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	11	3	230.08 (1484)	423 (74)	592 (104)	497 (87)	150 (10.3)	24 (610)	22.7 (10.3)	27.0 (12.3)	12.0 (5.4)
16 (400)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	10	3	286.98 (1852)	432 (74)	606 (106)	509 (89)	150 (10.3)	24 (610)	26.8 (12.2)	33.5 (15.3)	15.0 (6.8)
18 (450)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	8	3	350.15 (2259)	543 (95)	761 (133)	690 (121)	150 (10.3)	24 (610)	29.5 (13.4)	34.0 (15.5)	16.0 (7.2)
20 (500)	8 (200)	2.25 (57)	0.750 (19)	1.0 (25)	8	3	419.61 (2707)	628 (110)	829 (145)	776 (136)	150 (10.3)	24 (610)	31.8 (17.3)	38.0 (17.3)	16.0 (7.2)



Applications:

- Chemical & Petrochemical
- Pulp Paper
- Process Facilities
- Industrial Piping Pollution Control Systems

STYLE 261R AVAILABLE STYLES & MATERIALS

261-R*	PROCO MATERIAL CODE	COVER** ELASTOMER	TUBE ELASTOMER	MAX. OPERATING TEMP. °F (°C)	BANDING LABEL COLOR	F.S.A. MATERIAL CLASS
X	/BB	Chlorobutyl	Chlorobutyl	250 (121)	Black	STD. III
S	/EE	EPDM	EPDM	250 (121)	Red	STD. III
S	/NH	Neoprene	CSM	212 (100)	Green	STD. II
X	/NN	Neoprene	Neoprene	225 (107)	Blue	STD. II
S	/NP	Neoprene	Nitrile	225 (107)	Yellow	STD. II



Notes:

All products are reinforced with tire cord and metal materials.

* Products mark (S) are in stock items.

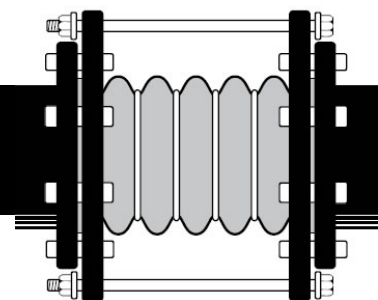
** All NN, NH & NP elastomer designated joints meet the Coast Guard Requirements and conform to ASTM F 1123-87.

Proco 440 Series Molded PTFE Expansion Joints

440 Series PTFE (TEFLON) expansion joints are available from 1"-20" designed for demanding corrosive applications, where typical Rubber style expansion joints cannot perform. These are great for expansion/contraction compensation for tank connections, industrial process piping connections, pump connections, or any chemical related process connection.

Available styles include:

- Style 442-BD: Features two convolutions for minimal movements, higher pressure/temperature ratings and short face-to-face opening requirements. Style 442-BD sizes range from 1" to 2" diameter.
- Style 443-BD: Features three convolutions and is designed for moderate movement and ease of system installation. Style 443-BD sizes range from 1" to 24" diameter.
- Style 445-BD: Features five convolutions, and is designed for maximum movements, low pressure/temperature ranges, vibration reduction and greater face-to-face lengths. Style 445-BD sizes range from 1" to 20" diameter.
- Style 440-BE: Features varying Neutral Lengths with Styles' 440-BD Limit Bolts.



Expansion Joints

1

PIPES & FITTINGS

Spears® - PVC & CPVC Expansion Joints

Features:

- PVC or CPVC & Bonded Elastomer Construction
- Double Spherical Arch, Reinforced Tube
- Convenient Double Union (True Union) Connectors
- Pressure Rated to 150 psi, Plus Vacuum Service
- Elastomer Material: EPDM listed, Neoprene also available



SIZE (IN)	PVC PART NUMBER	PVC REINFORCED PART NUMBER	CPVC PART NUMBER	CPVC REINFORCED PART NUMBER
3/4	EJ22-007S	EJ21-007SRS	EJ22-007CS	EJ21-007CSRS
1	EJ22-010S	EJ21-010SRS	EJ22-010CS	EJ21-010CSRS
1 1/4	EJ22-012S	EJ21-012SRS	EJ22-012CS	EJ21-012CSRS
1 1/2	EJ22-015S	EJ21-015SRS	EJ22-015CS	EJ21-015CSRS
2	EJ22-020S	EJ21-020SRS	EJ22-020CS	EJ21-020CSRS
2 1/2	EJ22-025S	EJ21-025SRS	EJ22-025CS	EJ21-025CSRS
3	EJ22-030S	EJ21-030SRS	EJ22-030CS	EJ21-030CSRS

PVC & CPVC S80 Expansion Joints

These expansion joints are fabricated from either PVC or CPVC and are available for Iron pipe sizes from 1/2" to as high as 12". They contain multi O-ring Viton® Seals with "Wiper" O-ring and requires no repair or replacement.

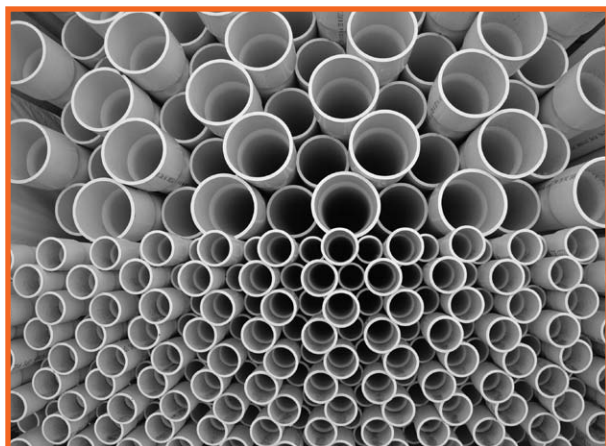


6" TRAVEL EXPANSION JOINTS

12" TRAVEL EXPANSION JOINTS

SIZE	PSI RATING @ 73°F	PVC	CPVC	PVC	CPVC
1/2	340	826-005X6	526-005X6	826-005X12	526-005X12
3/4	340	826-007X6	526-007X6	826-007X12	526-007X12
1	320	826-010X6	526-010X6	826-010X12	526-010X12
1-1/4	260	826-012X6	526-012X6	826-012X12	526-012X12
1-1/2	240	826-015X6	526-015X6	826-015X12	526-015X12
2	200	826-020X6	526-020X6	826-020X12	526-020X12
2-1/2	190	826-025X6	526-025X6	826-025X12	526-025X12
3	190	826-030X6	526-030X6	826-030X12	526-030X12
4	160	826-040X6	526-040X6	826-040X12	526-040X12
6	130	826-060X6	526-060X6	826-060X12	526-060X12
8	120	826-080X6	526-080X6	826-080X12	526-080X12
10	110	826-100X6	526-100X6	826-100X12	526-100X12
12	100	826-120X6	526-120X6	826-120X12	526-120X12

Chemkor Schedule 40 White Pipe



For more than a quarter of a century PVC Type I, Grade I, Schedule 40 piping systems have been successfully used for pressure and drainage systems in industrial, residential, commercial and agricultural installations. PVC Schedule 40 is ideal for applications where transmission of liquids or materials does not exceed 140°F. The life expectancy of plastic systems far exceeds that of metal systems and required maintenance is simpler and less costly. Systems are not adversely affected by environmental agents and buried systems are not adversely affected by normal soil contaminants. The inherent insulating qualities of PVC Schedule 40 provides substantial benefits in temperature control, and in commercial installations, sound transmission is greatly reduced. Joining is accomplished through solvent cementing, threading or flanging, insulation is generally not required, and extensive material handling and fabricating equipment is not necessary. Many fitting configurations available up to 24" in diameter upon request.

Applications

- Swimming Pools and Spas
- Marine
- Refrigeration
- Drainage
- Mobile Homes
- Cooling Towers
- Metallic Plating Lines

Features

- Stocked in 10' or 20' lengths, bell or plain end
- Available in various lengths as a special order
- Bell end joints also available
- Lightweight for quick and easy installation
- Smooth interior walls reduce friction
- Reduced friction limits energy requirements
- Low maintenance reduces operating costs

MM	NOMINAL PIPE SIZE (IN)	10 FT PLAIN END PART NUMBER	20 FT BOE PART NUMBER	O.D. (IN)	MAX. I.D. (IN)	MIN. WALL THICKNESS	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
12	1/2	010207WS	010207WB	0.84	0.622	0.109	16	590
20	3/4	010208WS	010208WB	1.05	0.824	0.113	22	480
25	1	010209WS	010209WB	1.315	1.049	0.133	32	450
32	1 1/4	010210WS	010210WB	1.66	1.38	0.14	43	370
40	1 1/2	010211WS	010211WB	1.9	1.61	0.145	52	330
50	2	010212WS	010212WB	2.375	2.069	0.154	69	280
65	2 1/2	010213WS	010213WB	2.875	2.469	0.203	109	300
75	3	010214WS	010214WB	3.5	3.068	0.216	144	260
100	4	010216WS	010216WB	4.5	4.026	0.237	203	220
150	6	010218WS	010218WB	6.625	6.031	0.28	354	180
200	8	-	010219WB	8.625	7.943	0.322	531	160
250	10	-	010220WB	10.75	9.976	0.356	753	140
300	12	-	010222WB	12.75	11.89	0.406	995	130
350	14	-	010224WB	14	13.072	0.438	1181	130
400	16	-	010226WB	16	14.94	0.5	1542	130
450	18	-	010228WB	18	16.809	0.562	2111	130
500	20	-	010230WB	20	18.743	0.593	2480	130
600	24	-	010234WB	24	22.544	0.687	3451	130

Notes:

- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 12, Engineering Data.
- Certain configurations not available
- CHEMKOR pressure pipe conforms to CSA Standard B137.3 and ASTM D1784, D1785.
- Schedule 40 pipe is not recommended for threading.
- Not recommended for compressed air or gas service.

Schedule 40 White PVC Fittings

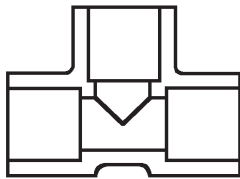
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Chemkor Schedule 40 White Fittings

Notes:

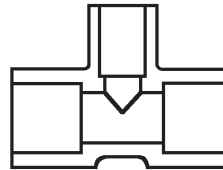
- PVC Schedule 40 Fittings are produced in accordance with the following standards – ASTM D1784, ASTM D2466.
- Many other fittings up to 24" in diameter are available on request.
- The maximum continuous working pressure of the fittings is equal to 150 PSI at 73.4°F (23°C). No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- All custom fabricated fittings are not subject to return.

SOCKET TEES



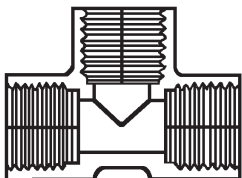
NOMINAL PIPE SIZE	PART NUMBER
1/4	401002W
3/8	401003W
1/2	401005W
3/4	401007W
1	401010W
1 1/4	401012W
1 1/2	401015W
2	401020W
2 1/2	401025W
3	401030W
4	401040W
5	401050W
6	401060W
8	401080W
10	401100WF*
12	401120WF*
14	401140WF
16	401160WF
18	401180WF
20	401200WF
24	401240WF

SOCKET REDUCING TEES



NOMINAL PIPE SIZE	PART NUMBER
3/4x3/4x1/2	401101W
1x1x1/2	401130W
1x1x3/4	401131W
1 1/2x1 1/2x3/4	401210W
1 1/2x1 1/2x1	401211W
2x2x1/2	401247W
2x2x3/4	401248W
2x2x1	401249W
2x2x1 1/2	401251W
3x3x2	401338W
4x4x2	401420W
3/4x3/4x1/2	401101W
1x1x1/2	401130W
1x1x3/4	401131W
1 1/2x1 1/2x3/4	401210W
1 1/2x1 1/2x1	401211W
2x2x1/2	401247W
2x2x 3/4	401248W
2x2x1	401249W
2x2x1 1/2	401251W
3x3x2	401338W
4x4x2	401420W
4x4x3	401422W
6x6x4	401532W
8x8x2	401578W
8x8x3	401580W
8x8x4	401582W
8x8x6	401585W
10x10x3	401623WF*
10x10x4	401624WF*
10x10x6	401626WF*
10x10x8	401628WF*
12x12x4	401664WF*
12x12x6	401666WF*
12x12x8	401668WF*
12x12x10	401670WF*
14x14x8	401698WF
14x14x10	401700WF

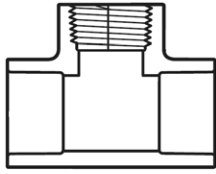
THREAD TEES



NOMINAL PIPE SIZE	PART NUMBER
1/4	405002W
3/8	405003W
1/2	405005W
3/4	405007W
1	405010W
1 1/4	405012W
1 1/2	405015W
2	405020W
2 1/2	405025W
3	405030W
4	405040W

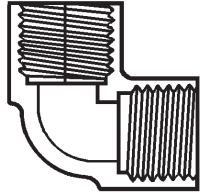
Schedule 40 White PVC Fittings

SXFPT TEES



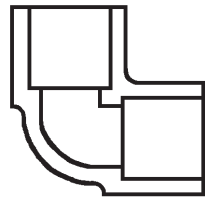
NOMINAL PIPE SIZE	PART NUMBER
1/4	402002W
1/2	402005W
3/4	402007W
1	402010W
2	402020W
3	402030W

90° THREAD ELBOWS



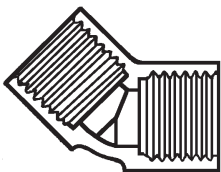
NOMINAL PIPE SIZE	PART NUMBER
1/4	408002W
3/8	408003W
1/2	408005W
3/4	408007W
1	408010W
1 1/4	408012W
1 1/2	408015W
2	408020W
2 1/2	408025W
3	408030W
4	408040W

90° SOCKET ELBOWS



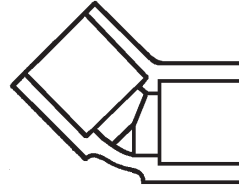
NOMINAL PIPE SIZE	PART NUMBER
1/4	406002W
3/8	406003W
1/2	406005W
3/4	406007W
1	406010W
1 1/4	406012W
1 1/2	406015W
2	406020W
2 1/2	406025W
3	406030W
4	406040W
5	406050WF*
6	406060W
8	406080W
10	406100WF*
12	406120WF*
14	406140WF
16	406160WF
18	406180WF
20	429200WF
24	429240WF

45° THREAD ELBOWS



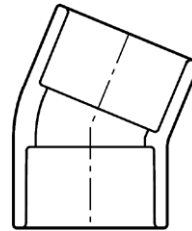
NOMINAL PIPE SIZE	PART NUMBER
1/4	419002W
3/8	419003W
1/2	419005W
3/4	419007W
1	419010W
1 1/4	419012W
1 1/2	419015W
2	419020W
2 1/2	419025W
3	419030W
4	419040W

45° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/4	417002W
3/8	417003W
1/2	417005W
3/4	417007W
1	417010W
1 1/4	417012W
1 1/2	417015W
2	417020W
2 1/2	417025W
3	417030W
4	417040W
5	417050WF*
6	417060W
8	417080W
10	417100WF*
12	417120WF*
14	417140WF
16	417160WF
18	417180WF
20	417200WF
24	417240WF

22-1/2° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/2	416005W
3/4	416007W
1	416010W
1 1/4	416012W
1 1/2	416015W
2	416020W
2 1/2	416025W
3	416030W
4	416040W
6	416060W
8	416080W
10	416100WF
12	416120WF

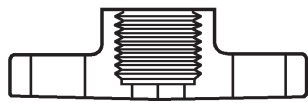
150LB SOCKET FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	851005
3/4	851007
1	851010
1 1/4	851012
1 1/2	851015
2	851020
2 1/2	851025
3	851030
4	851040
5	851050
6	851060
8	851080
10	851100F
12	851120F
14	851140F
16	851160F
18	851180F
20	851200F
24	851240F

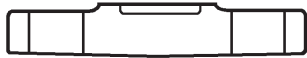
Schedule 40 White PVC Fittings

150LB THREADED FLANGES



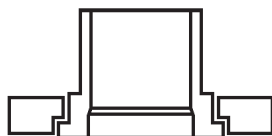
NOMINAL PIPE SIZE	PART NUMBER
1/2	852005
3/4	852007
1	852010
1 1/4	852012
1 1/2	852015
2	852020
2 1/2	852025
3	852030
4	852040
6	852060
8	852080

150LB BLIND FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	853005
3/4	853007
1	853010
1 1/4	853012
1 1/2	853015
2	853020
2 1/2	853025
3	853030
4	853040
5	853050F
6	853060
8	853080
10	853100
12	853120
14	853140F
16	853160F
18	853180F
20	853200F
24	853240F

SPIGOT VANSTONE FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	856005W
3/4	856007W
1	856010W
1 1/4	856012W
1 1/2	856015W
2	856020W
2 1/2	856025W
3	856030W
4	856040W
6	856060W
8	856080W
10	856100W
12	856120W
14	856140PW
16	856160PW
18	856180PW
20	856200SW
24	856240SW

P = GLASS FILLED
S = STEEL

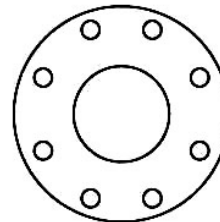
SOCKET VANSTONE FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	854005
3/4	854007
1	854010
1 1/4	854012
1 1/2	854015
2	854020
2 1/2	854025
3	854030
4	854040
5	854050
6	854060
8	854080
10	854100
12	854120
14	854140
16	854160
18	854180F
20	854200F
24	854240F

FLANGE GASKETS FLEX PVC 1/8"

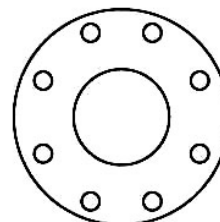
(PUNCHED)



NOMINAL PIPE SIZE	PART NUMBER
1/2"	P7000107
3/4"	P7000108
1"	P7000109
1 1/4"	P7000110
1 1/2"	P7000111
2"	P7000112
2 1/2"	P7000113
3"	P7000114
4"	P7000116
6"	P7000118
8"	P7000119
10"	P7000120
12"	P7000121

FLANGE GASKETS NEOPRENE 1/8"

(PUNCHED)

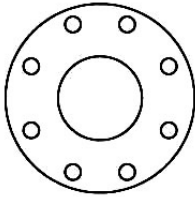


NOMINAL PIPE SIZE	PART NUMBER
1/2"	7000107
3/4"	7000108
1"	7000109
1 1/4"	7000110
1 1/2"	7000111
2"	7000112
2 1/2"	7000113
3"	7000114
4"	7000116
6"	7000118
8"	7000119
10"	7000120
12"	7000121

Schedule 40 White PVC Fittings

LOW TORQUE FLANGE GASKETS

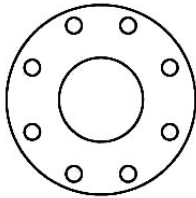
EPDM
(MOULDED)



NOMINAL PIPE SIZE	PART NUMBER
1/2"	E70001005
3/4"	E70001007
1"	E70001010
1 1/4"	E70001012
1 1/2"	E70001015
2"	E70001020
2 1/2"	E70001025
3"	E70001030
4"	E70001040
6"	E70001060
8"	E70001080
10"	E70001100
12"	E70001120

LOW TORQUE FLANGE GASKETS

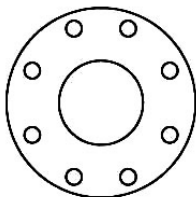
VITON



NOMINAL PIPE SIZE	PART NUMBER
1/2"	V70001005
3/4"	V70001007
1"	V70001010
1 1/4"	V70001012
1 1/2"	V70001015
2"	V70001020
2 1/2"	V70001025
3"	V70001030
4"	V70001040
6"	V70001060
8"	V70001080
10"	V70001100
12"	V70001120

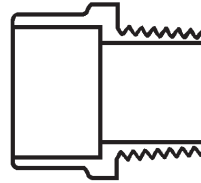
LOW TORQUE FLANGE GASKETS

TEFLON BONDED/EPDM
(MOULDED)



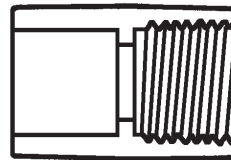
NOMINAL PIPE SIZE	PART NUMBER
1/2"	T70001005
3/4"	T70001007
1"	T70001010
1 1/4"	T70001012
1 1/2"	T70001015
2"	T70001020
2 1/2"	T70001025
3"	T70001030
4"	T70001040
6"	T70001060
8"	T70001080
10"	T70001100
12"	T70001120

MALE ADAPTERS



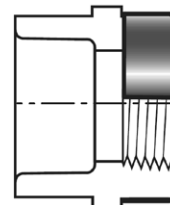
NOMINAL PIPE SIZE	PART NUMBER
1/2"	436005W
3/4"	436007W
1"	436010W
1 1/4"	436012W
1 1/2"	436015W
2"	436020W
2 1/2"	436025W
3"	436030W
4"	436040W
5"	436050WF
6"	436060W
8"	436080WF
10"	436100WF
12"	436120WF

FEMALE ADAPTERS



NOMINAL PIPE SIZE	PART NUMBER
1/4"	435002W
3/8"	435003W
1/2"	435005W
3/4"	435007W
1"	435010W
1 1/4"	435012W
1 1/2"	435015W
2"	435020W
2 1/2"	435025W
3"	435030W
4"	435040W
6"	435060WF
8"	435080WF
10"	435100WF
12"	435120WF

REINFORCED FEMALE ADAPTERS

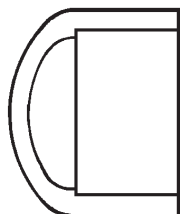


NOMINAL PIPE SIZE	PART NUMBER
1/4"	435002SR
3/8"	435003SR
1/2"	435005SR
3/4"	435007SR
1"	435010SR
1 1/4"	435012SR
1 1/2"	435015SR
2"	435020SR
2 1/2"	435025SR
3"	435030SR
4"	435040SR
6"	435060SR



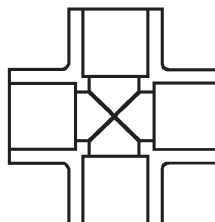
Schedule 40 White PVC Fittings

SOCKET CAPS



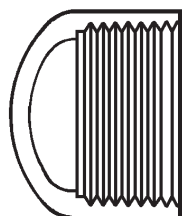
NOMINAL PIPE SIZE	PART NUMBER
1/4	447002W
3/8	447003W
1/2	447005W
3/4	447007W
1	447010W
1 1/4	447012W
1 1/2	447015W
2	447020W
2 1/2	447025W
3	447030W
4	447040W
6	447060W
8	447080W
10	447100WF
12	447120WF
14	447140WF
16	447160WF
18	447180WF
20	447200WF
24	447240WF

SOCKET CROSSES



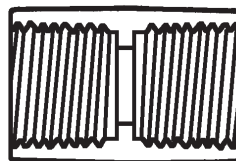
NOMINAL PIPE SIZE	PART NUMBER
1/4	420002W
1/2	420005W
3/4	420007W
1	420010W
1 1/4	420012W
1 1/2	420015W
2	420020W
2 1/2	420025W
3	420030W
4	420040W
6	420060WF
8	420080WF
10	420100WF
12	420120WF
14	420140WF
16	420160WF
18	420180WF
20	420200WF
24	420240WF

THREADED CAPS



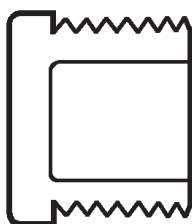
NOMINAL PIPE SIZE	PART NUMBER
1/4	448002W
3/8	448003W
1/2	448005W
3/4	448007W
1	448010W
1 1/4	448012W
1 1/2	448015W
2	448020W
2 1/2	448025W
3	448030W
4	448040W
6	448060WF
8	448080WF

THREADED COUPLINGS



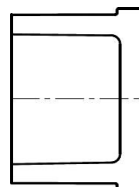
NOMINAL PIPE SIZE	PART NUMBER
1/4	430002W
3/8	430003W
1/2	430005W
3/4	430007W
1	430010W
1 1/4	430012W
1 1/2	430015W
2	430020W
2 1/2	430025W
3	430030W
4	430040W
6	430060WF
8	430080WF
10	430100WF

THREADED PLUGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	450002W
3/8	450003W
1/2	450005W
3/4	450007W
1	450010W
1 1/4	450012W
1 1/2	450015W
2	450020W
2 1/2	450025W
3	450030W
4	450040W
6	450060WF

SPIG PLUGS

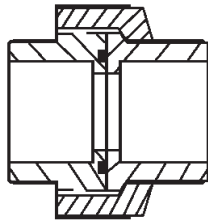


NOMINAL PIPE SIZE	PART NUMBER
1/2	449005W
3/4	449007W
1	449010W
1 1/4	449012W
1 1/2	449015W
2	449020W

Schedule 40 White PVC Fittings

SOCKET UNIONS

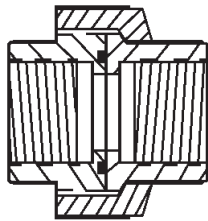
(Viton o-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	497002W
3/8	497003W
1/2	497005W
3/4	497007W
1	497010W
1 1/4	497012W
1 1/2	497015W
2	497020W
2 1/2	497025W
3	497030W
4	497040W
6	497060W

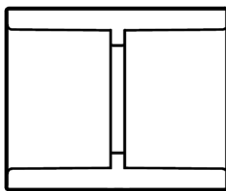
THREADED UNIONS

(Viton o-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	498002W
3/8	498003W
1/2	498005W
3/4	498007W
1	498010W
1 1/4	498012W
1 1/2	498015W
2	498020W
2 1/2	498025W
3	498030W
4	498040W
6	498060W

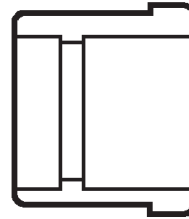
SOCKET COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	429002W
3/8	429003W
1/2	429005W
3/4	429007W
1	429010W
1 1/4	429012W
1 1/2	429015W
2	429020W
2 1/2	429025W
3	429030W
4	429040W
5	429050WF
6	429060W
8	429080W
10	429100WF
12	429120WF
14	429140WF
16	429160WF
18	429180WF
20	429200WF
24	429240WF

REDUCER BUSHINGS

(socket x slip)



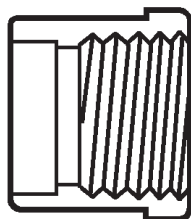
NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	437052W
1/2 x 1/4	437072W
1/2 x 3/8	437073W
3/4 x 1/4	437098W
3/4 x 1/2	437101W
1 x 1/4	437128W
1 x 1/2	437130W
1 x 3/4	437131W
1 1/4 x 1/2	437166W
1 1/4 x 3/4	437167W
1 1/4 x 1	437168W
1 1/2 x 1/2	437209W
1 1/2 x 3/4	437210W
1 1/2 x 1	437211W
1 1/2 x 1 1/4	437212W
2 x 1/2	437247W
2 x 3/4	437248W
2 x 1	437249W
2 x 1 1/4	437250W
2 x 1 1/2	437251W
2 1/2 x 1	437289W
2 1/2 x 1 1/4	437290W
2 1/2 x 1 1/2	437291W
2 1/2 x 2	437292W
3 x 1	437335W
3 x 1 1/4	437336W
3 x 1 1/2	437337W
3 x 2	437338W
3 x 2 1/2	437339W
4 x 2	437420W
4 x 2 1/2	437421W
4 x 3	437422W
6 x 3	437531W
6 x 4	437532W
8 x 6	437585W
10 x 4	437624WF
10 x 6	437626WF
10 x 8	437628WF
12 x 4	437664WF
12 x 6	437666WF
12 x 8	437668WF
12 x 10	437670WF
14 x 6	437696WF
14 x 8	437698WF
14 x 10	437700WF
14 x 12	437704WF
16 x 8	437734WF
16 x 10	437736WF
16 x 12	437738WF
16 x 14	437740WF



Schedule 40 White PVC Fittings

REDUCER BUSHINGS

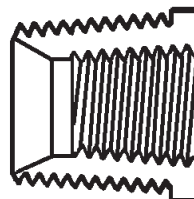
(slip x fpt)



NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	438052W
1/2 x 1/4	438072W
1/2 x 3/8	438073W
3/4 x 1/4	438098W
3/4 x 1/2	438101W
1 x 1/4	438128W
1 x 1/2	438130W
1 x 3/4	438131W
1 1/4 x 1/2	438166W
1 1/4 x 3/4	438167W
1 1/4 x 1	438168W
1 1/2 x 1/2	438209W
1 1/2 x 3/4	438210W
1 1/2 x 1	438211W
1 1/2 x 1 1/4	438212W
2 x 1/2	438247W
2 x 3/4	438248W
2 x 1	438249W
2 x 1 1/4	438250W
2 x 1 1/2	438251W
2 1/2 x 1	438289W
2 1/2 x 1 1/4	438290W
2 1/2 x 1 1/2	438291W
2 1/2 x 2	438292W
3 x 1	438335W
3 x 1 1/4	438336W
3 x 1 1/2	438337W
3 x 2	438338W
3 x 2 1/2	438339W
4 x 2	438420W
4 x 2 1/2	438421W
4 x 3	438422W
6 x 3	438531W
6 x 4	438532W
8 x 6	438585W

REDUCER BUSHINGS

(mpt x fpt)

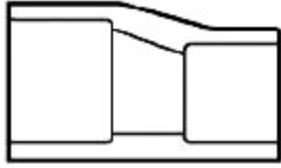


NOMINAL PIPE SIZE	PART NUMBER
3/8 x 1/4	439052W
1/2 x 1/4	439072W
1/2 x 3/8	439073W
3/4 x 1/4	439098W
3/4 x 1/2	439101W
1 x 1/4	439128W
1 x 1/2	439130W
1 x 3/4	439131W
1 1/4 x 1/2	439166W
1 1/4 x 3/4	439167W
1 1/4 x 1	439168W
1 1/2 x 1/2	439209W
1 1/2 x 3/4	439210W
1 1/2 x 1	439211W
1 1/2 x 1 1/4	439212W
2 x 1/2	439247W
2 x 3/4	439248W
2 x 1	439249W
2 x 1 1/4	439250W
2 x 1 1/2	439251W
2 1/2 x 1	439289W
2 1/2 x 1 1/4	439290W
2 1/2 x 1 1/2	439291W
2 1/2 x 2	439292W
3 x 1	439335W
3 x 1 1/4	439336W
3 x 1 1/2	439337W
3 x 2	439338W
3 x 2 1/2	439339W
4 x 2	439420W
4 x 2 1/2	439421W
4 x 3	439422W
6 x 3	439531W
6 x 4	439532W
8 x 6	439585W

Schedule 40 White PVC Fittings

ECCENTRIC REDUCER COUPLING

(soc)



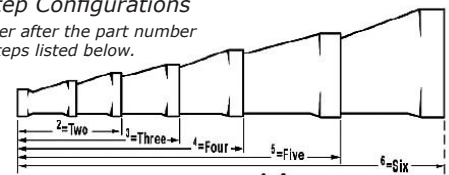
NOMINAL PIPE SIZE	PART NUMBER
1X3/4	429-131FE
1-1/4X1	429-168FE
1-1/2X1-1/4	429-212FE
2X1	429-249FE
2X1-1/4	429-250FE
2X1-1/2	429-251FE
2-1/2X1-1/4	429-290FE ²
2-1/2X1-1/2	429-291FE ²
2-1/2X2	429-292FE
3X1	429-335FE ²
3X1-1/4	429-336FE ²
3X1-1/2	429-337FE ²
3X2	429-338FE
3X2-1/2	429-339FE
4X1	429-417FE ³
4X1-1/4	429-418FE ³
4X1-1/2	429-419FE ³
4X2	429-420FE ²
4X2-1/2	429-421FE ²
4X3	429-422FE
5X4	429-490FE
6X2	429-528FE ³
6X2-1/2	429-529FE ³
6X3	429-530FE ²
6X4	429-532FE
6X5	429-533FE
8X1-1/2	429-577FE ⁵
8X2	429-578FE ⁴
8X3	429-580FE ³
8X4	429-582FE ²
8X5	429-583FE ²
8X6	429-585FE

NOMINAL PIPE SIZE	PART NUMBER
10X4	429-624FE ³
10X5	429-625FE ³
10X6	429-626FE ²
10X8	429-628FE
12X4	429-664FE ⁴
12X6	429-666FE ³
12X8	429-668FE ²
12X10	429-670FE
14X6	429-696FE ³
14X8	429-698FE ²
14X10	429-700FE
14X12	429-702FE
16X6	429-756FE ⁵
16X8	429-758FE ⁴
16X10	429-760FE ²
16X12	429-762FE ²
16X14	429-764FE
18X6	429-786FE ⁶
18X8	429-788FE ⁵
18X10	429-790FE ⁴
18X12	429-792FE ³
18X14	429-794FE ²
18X16	429-796FE

Eccentric Reducer Coupling Footnotes

Multi-Step Configurations

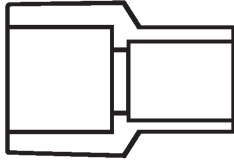
The number after the part number denotes steps listed below.



Example: 829-582 FE² (2=2 Step)

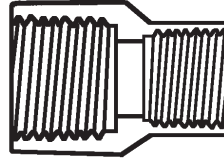
Schedule 40 White PVC Fittings

SOCKET REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	429072W
3/4 x 1/2	429101W
1 x 1/2	429130W
1 x 3/4	429131W
1 1/4 x 1/2	429166W
1 1/4 x 3/4	429167W
1 1/4 x 1	429168W
1 1/2 x 1/2	429209W
1 1/2 x 3/4	429210W
1 1/2 x 1	429211W
1 1/2 x 1 1/4	429212W
2 x 1/2	429247W
2 x 3/4	429248W
2 x 1	429249W
2 x 1 1/4	429250W
2 x 1 1/2	429251W
2 1/2 x 1 1/2	429291W
2 1/2 x 2	429292W
3 x 1 1/2	429337W
3 x 2	429338W
3 x 2 1/2	429339W
4 x 2	429420W
4 x 2 1/2	429421W
4 x 3	429422W
6 x 4	429532W
8 x 4	429582W
8 x 6	429585W
10 x 4	429624WF
10 x 6	429626WF
10 x 8	429628WF
12 x 4	429664WF
12 x 6	429666WF
12 x 8	429668WF
12 x 10	429670WF
14 x 6	429696WF
14 x 8	429698WF
14 x 10	429700WF
14 x 12	429704WF
16 x 8	429734WF
16 x 10	429736WF
16 x 12	429738WF
16 x 14	429740WF

THREADED REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	430072W
3/4 x 1/2	430101W
1 x 1/2	430130W
1 x 3/4	430131W
1 1/4 x 1/2	430166W
1 1/4 x 3/4	430167W
1 1/4 x 1	430168W
1 1/2 x 1/2	430209W
1 1/2 x 3/4	430210W
1 1/2 x 1	430211W
1 1/2 x 1 1/4	430212W
2 x 1/2	430247W
2 x 3/4	430248W
2 x 1	430249W
2 x 1 1/4	430250W
2 x 1 1/2	430251W
2 1/2 x 1 1/2	430291W
2 1/2 x 2	430292W
3 x 1 1/2	430337W
3 x 2	430338W
3 x 2 1/2	430339W
4 x 2	430420W
4 x 2 1/2	430421W
4 x 3	430422W
6 x 4	430532W
8 x 4	430582W
8 x 6	430585W

Chemkor Schedule 40 Gray Pipe



For more than a quarter of a century PVC Type I, Grade I, Schedule 40 piping systems have been successfully used for pressure and drainage systems in industrial, residential, commercial and agricultural installations. PVC Schedule 40 is ideal for applications where transmission of liquids or materials does not exceed 140°F. The life expectancy of plastic systems far exceeds that of metal systems and required maintenance is less complicated and cost effective. Systems are not adversely affected by environmental agents and buried systems are not adversely affected by normal soil contaminants. The inherent insulating qualities of PVC Schedule 40 provides substantial benefits in temperature control, and in commercial installations, sound transmission is greatly reduced. Joining is accomplished through solvent cementing, threading or flanging, insulation is generally not required, and extensive material handling and fabricating equipment is not necessary.

Applications

- Swimming Pools and Spas
- Chemical Feed Systems
- Refrigeration
- Drainage
- Municipal Water Treatment Systems
- Cooling Towers
- Metallic Plating Lines

Features

- Stocked in 10' or 20' lengths, bell or plain end
- Available in various lengths as a special
- Bell end joints also available
- Lightweight for quick and easy installation
- Smooth interior walls reduce friction
- Reduced friction limits energy requirements
- Low maintenance reduces operating costs

MM	NOMINAL PIPE SIZE (IN)	PART NUMBER	CRATE QTY FEET	OUTSIDE DIAMETER (IN)	MAX. INSIDE DIAMETER (IN)	MIN. WALL THICKNESS (IN)	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
12	1/2 x 10 ft	010207BS	3,000	0.840	0.622	0.109	16	590
20	3/4 x 10 ft	010208BS	2,200	1.050	0.824	0.113	22	480
25	1 x 10 ft	010209BS	1,800	1.315	1.049	0.133	32	450
32	1 1/4 x 10 ft	010210BS	1,600	1.660	1.380	0.140	43	370
40	1 1/2 x 10 ft	010211BS	1,800	1.900	1.610	0.145	52	330
50	2 x 10 ft	010212BS	1,400	2.375	2.069	0.154	69	280
65	2 1/2 x 10 ft	010213BS	990	2.875	2.469	0.203	109	300
75	3 x 10 ft	010214BS	880	3.500	3.068	0.216	144	260
100	4 x 20 ft	010216B	1,140	4.500	4.026	0.237	203	220
125	5 x 20 ft	010217B	260	5.563	5.017	0.258	273	190
150	6 x 20 ft	010218B	520	6.625	6.031	0.280	354	180
200	8 x 20 ft	010222B	200	8.625	7.943	0.322	531	160
250	10 x 20 ft	010219B	160	10.75	9.976	0.356	753	140
300	12 x 20 ft	010220B	120	12.75	11.89	0.406	995	130
350	14 x 20 ft	010224	60	14.00	13.072	0.438	1181	130
400	16 x 20 ft	010226	40	16.00	14.940	0.500	1542	130
450	18 x 20 ft	010228	20	18.00	16.809	0.562	2111	130
500	20 x 20 ft	010230	20	20.00	18.743	0.593	2480	130
600	24 x 20 ft	010234	20	24.00	22.544	0.687	3451	130

Notes:

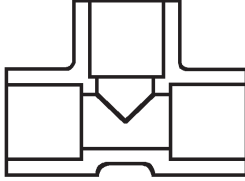
- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 10, Engineering Data.
- CHEMKOR pressure pipe conforms to CSA Standard B137.3 and ASTM D1784, D1785.
- Schedule 40 pipe is not recommended for threading.
- Not recommended for compressed air or gas service.

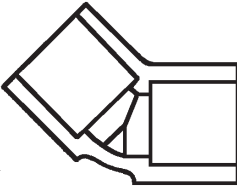
Schedule 40 Gray PVC Fittings

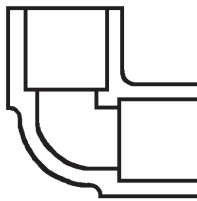
Chemkor Schedule 40 Gray Fittings

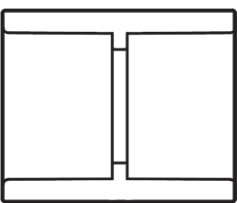
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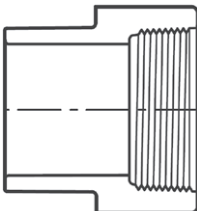
- PVC Schedule 40 Fittings are produced in accordance with the following standards – ASTM D1784, ASTM D2466.
- All 8" fittings available in white PVC material only. All Schedule 40 reducing tees are standard tees with a reducer bushing.
- PVC Schedule 40 Fittings are produced in accordance with the following standards ASTM D1784, ASTM D2466.
- The maximum continuous working pressure of the fittings is equal to 150 PSI at 73.4 °F (23 °C). No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- All custom fabricated fittings are not subject to return. Many other fittings are available on request.
- F indicates a fabricated fitting.

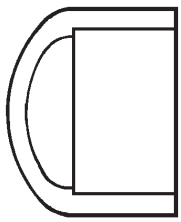
SOCKET TEES	NOMINAL PIPE SIZE	PART NUMBER
	1/2	401005
	3/4	401007
	1	401010
	1 1/4	401012
	1 1/2	401015
	2	401020
	2 1/2	401025
	3	401030
	4	401040
	5	401050
	6	401060
	8	401080
	10	401100F
	12	401120F
	14	401140F
	16	401160F
	18	401180F
	20	401200F
	24	401240F

45° SOCKET ELBOWS	NOMINAL PIPE SIZE	PART NUMBER
	1/2	417005
	3/4	417007
	1	417010
	1 1/4	417012
	1 1/2	417015
	2	417020
	2 1/2	417025
	3	417030
	4	417040
	5	417050
	6	417060
	8	417080
	10	417100
	12	417120
	14	417140F
	16	417160F
	18	417180F
	20	417200F
	24	417240F

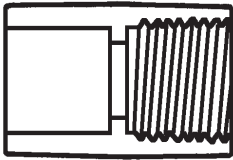
90° SOCKET ELBOWS	NOMINAL PIPE SIZE	PART NUMBER
	3/8	406003
	1/2	406005
	3/4	406007
	1	406010
	1 1/4	406012
	1 1/2	406015
	2	406020
	2 1/2	406025
	3	406030
	4	406040
	5	406050
	6	406060
	8	406080
	10	406100F
	12	406120F
	14	406140F
	16	406160F
	18	406180F
	20	406200F
	24	406240F

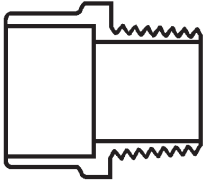
SOCKET COUPLINGS	NOMINAL PIPE SIZE	PART NUMBER
	1/2	429005
	3/4	429007
	1	429010
	1 1/4	429012
	1 1/2	429015
	2	429020
	2 1/2	429025
	3	429030
	4	429040
	5	429050
	6	429060
	8	429080
	10	429100F
	12	829120F
	14	429140F
	16	429160F
	18	429180F
	20	429200F
	24	429240F


FITTING ADAPTER (SPGT X FPT)	NOMINAL PIPE SIZE	PART NUMBER
	1/2	478005
	3/4	478007
	1	478010
	1 1/4	478012
	1 1/2	478015
	2	478020
	2 1/2	478025
	3	478030
	4	478040

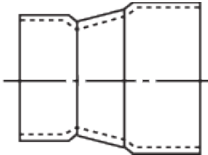
SOCKET CAPS	NOMINAL PIPE SIZE	PART NUMBER
	1/2	447005
	3/4	447007
	1	447010
	1 1/4	447012
	1 1/2	447015
	2	447020
	2 1/2	447025
	3	447030
	4	447040
	5	447050
	6	447060
	8	447080

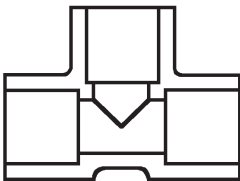
Schedule 40 Gray PVC Fittings

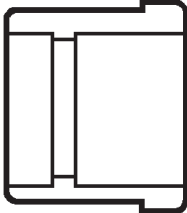
FEMALE ADAPTERS	NOMINAL PIPE SIZE	PART NUMBER
	1/2	435005
	3/4	435007
	1	435010
	1 1/4	435012
	1 1/2	435015
	2	435020
	2 1/2	435025
	3	435030
	4	435040
5	435050	

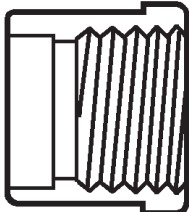
MALE ADAPTERS	NOMINAL PIPE SIZE	PART NUMBER
	1/2	436005
	3/4	436007
	1	436010
	1 1/4	436012
	1 1/2	436015
	2	436020
	2 1/2	436025
	3	436030
	4	436040
5	436050	
6	436060	
8	436080	


45° SOCKET LATERALS	NOMINAL PIPE SIZE	PART NUMBER
	10	475100F
	12	475120F
	14	475140F
	16	475160F
	18	475180F
	20	475200F
24	475240F	

SOCKET REDUCING COUPLING	NOMINAL PIPE SIZE	PART NUMBER
	3/4 x 1/2	429101
	1 x 3/4	429131
	1 1/4 x 1	429168
	1 1/2 x 1 1/4	429212
	2 x 1 1/2	429251
	3 x 2	429338
4 x 3	429422	

SOCKET REDUCING TEES	NOMINAL PIPE SIZE	PART NUMBER
	3/4 x 3/4 x 1/2	401101
	1 x 3/4 x 3/4	401125
	1 x 1 x 1/2	401130
	1 x 1 x 3/4	401131
	1 1/4x1 1/4x1/2	401166
	1 1/4x1 1/4x3/4	401167
	1 1/4x1 1/4x1	401168
	1 1/2x1 1/2x3/4	401210
	1 1/2x1 1/2x1	401211
	2 x 2 x 3/4	401248
	2 x 2 x 1	401249
	2 x 2 x 1 1/2	401251
	3 x 3 x 3/4	401334
	3 x 3 x 1	401335
	3 x 3 x 1 1/2	401337
	3 x 3 x 2	401338
	4 x 4 x 3/4	401416
	4 x 4 x 1	401417
	4 x 4 x 2	401420
	4 x 4 x 3	401422

REDUCER BUSHINGS (SOCKET X SLIP)	NOMINAL PIPE SIZE	PART NUMBER
	3/4 x 1/2	437101
	1 x 1/2	437130
	1 x 3/4	437131
	1 1/4 x 1/2	437166
	1 1/4 x 3/4	437167
	1 1/4 x 1	437168
	1 1/2 x 1/2	437209
	1 1/2 x 3/4	437210
	1 1/2 x 1	437211
	1 1/2 x 1 1/4	437212
	2 x 1/2	437247
	2 x 3/4	437248
	2 x 1	437249
	2 x 1 1/4	437250
	2 x 1 1/2	437251
	2 1/2 x 2	437292
	3 x 1 1/2	437337
	3 x 2	437338
	3 x 2 1/2	437339
	4 x 2	437420
	4 x 3	437422
6 x 4	437532	
8 x 3	437580F	
8 x 4	437582F	
8 x 6	437585F	

REDUCER BUSHINGS (SLIP X FPT)	NOMINAL PIPE SIZE	PART NUMBER
	3/4 x 1/2	438101
	1 x 1/2	438130
	1 x 3/4	438131
	1 1/4 x 1/2	438166
	1 1/4 x 3/4	438167
	1 1/4 x 1	438168
	1 1/2 x 1/2	438209
	1 1/2 x 3/4	438210
	1 1/2 x 1	438211
	1 1/2 x 1 1/4	438212
	2 x 1/2	438247
	2 x 3/4	438248
	2 x 1	438249
	2 x 1 1/4	438250
	2 x 1 1/2	438251
	2 1/2 x 2	438292
	3 x 1 1/2	438337
	3 x 2	438338
	3 x 2 1/2	438339
	4 x 2	438420
	4 x 3	438422
6 x 4	438532	

45° SOCKET REDUCING LATERAL	NOMINAL PIPE SIZE	PART NUMBER
	3/4 x 3/4 x 1/2	475101
	1 x 3/4 x 3/4	475125
	1 x 1 x 1/2	475130
	1 x 1 x 3/4	475131
	1 1/4x1 1/4x1/2	475166
	1 1/4x1 1/4x3/4	475167
	1 1/4x1 1/4x1	475168
	1 1/2x1 1/2x3/4	475210
	1 1/2x1 1/2x1	475211
	2 x 2 x 3/4	475248
	2 x 2 x 1	475249
	2 x 2 x 1 1/2	475251

Schedule 80 & 40 Clear PVC Pipe

1

Clear PVC Pipe

PIPES & FITTINGS



Fabco Clear Rigid PVC piping provides a versatile, cost-effective alternative for many piping applications, particularly those where visual monitoring of processes is critical.

The benefits of rigid PVC piping are well recognized: exceptional corrosion resistance; smooth interior walls for unimpeded flow and reduced sediment buildup; non-contaminating for purity applications; fast, reliable solvent-welded connections; good pressure-bearing capability; and ease of handling and installation, to name a few.

All of these important benefits are now available in a unique product with optimum clarity. This clarity provides the all-round visibility that specialized applications demand — whether it be clean room applications, sight glass, dual-containment or various other processing applications where continuous monitoring is necessary.

Applications

- Sight Glass
- Dual Containment
- Food Processing
- Chemical Processing
- Medical use
- Cosmetics
- Visual Testing Equipment

Features

- Available in SCH 40 and 80 dimensions
- Available in 1/4" to 12" diameters
- Available in 10' lengths, plain end
- Joined using simple solvent weld joining
- Fully compatible with standard PVC pipe and fittings
- Corrosion resistant and lightweight
- Packaged in bags and boxes on line to eliminate scratching

Notes:

- * This size does not comply with Schedule 40 as to I.D. and Wall Thickness.
- For water at 73.4 °F (23 °C) with solvent cemented joints. Working pressure decreases by approximately 1.29% per degree F over 73.4 °F (23 °C).
- Complies with title 21 food & drug, part #121 paragraph 121.2521 & 121.2597
- Threading not recommended.
- Schedule 40 type II grade I.
- Per ASTM D-1784-cell classification 12454B.
- Schedule 40 pipe also available in 20 ft lengths upon request.

NOMINAL PIPE SIZE (IN)	MIN. WALL THICKNESS (IN)	WEIGHT PER FOOT	PART NUMBER	CRATE QTY (FT)	PRESSURE RATING AT 73.4°F	OD (IN)	ID (IN)
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SCHEDULE 80 PIPE (10 FT LENGTHS)

1/4 x 10	0.119	0.1	R8-250	100	570	0.540	0.302
3/8 x 10	0.126	0.138	R8-375	100	460	0.675	0.423
1/2 x 10	0.147	0.202	R8-500	350	420	0.840	0.546
3/4 x 10	0.154	0.273	R8-750	250	340	1.050	0.742
1 x 10	0.179	0.402	R8-1000	200	320	1.315	0.957
1 1/4 x 10	0.191	0.554	R8-1250	120	260	1.660	1.278
1 1/2 x 10	0.200	0.673	R8-1500	100	240	1.900	1.500
2 x 10	0.218	0.932	R8-2000	60	200	2.375	1.939
3 x 10	0.300	1.903	R8-3000	40	190	3.500	2.900
4 x 10	0.337	2.782	R8-4000	30	160	4.500	3.826
6 x 10	0.432	5.913	R8-6000	10	140	6.625	5.761

SCHEDULE 40 PIPE (10 FT LENGTHS)

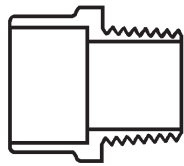
1/4 x 10	0.088	0.086	R4-250	350	390	0.540	0.344
3/8 x 10	0.091	0.115	R4-375	350	310	0.675	0.473
1/2 x 10	0.109	0.170	R4-500	350	300	0.840	0.602
3/4 x 10	0.113	0.226	R4-750	250	240	1.050	0.804
1 x 10	0.133	0.333	R4-1000	250	220	1.315	1.029
1 1/4 x 10	0.140	0.450	R4-1250	200	180	1.660	1.360
1 1/2 x 10	0.145	0.537	R4-1500	160	170	1.900	1.590
2 x 10	0.154	0.720	R4-2000	120	140	2.375	2.047
2 1/2 x 10	0.203	1.136	R4-2500	80	150	2.875	2.445
3 x 10	0.216	1.488	R4-3000	60	130	3.500	3.042
3 1/2 x 10	0.226	1.789	R4-3500	50	120	4.000	3.521
4 x 10	0.237	2.118	R4-4000	50	110	4.500	3.998
6 x 10	0.280	3.733	R4-6000	10	90	6.625	6.031
6x 1/8 x10	0.110	1.647	R4-6500*	10	45	6.625	6.335
8 x 10	0.322	5.619	R4-8000	10	80	8.625	7.942
10 x 10	0.365	7.966	R4-10000	10	70	10.75	9.976
12 x 10	0.406	10.534	R4-12000	10	70	12.75	11.889

Schedule 40 Clear PVC Fittings

Notes:

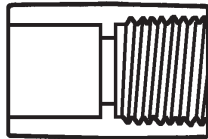
- For water at 73.4 °F (23 °C) with solvent cemented joints. Working pressure decreases by approximately 1.29% per degree F over 73.4°F.
- Complies with title 21 food & drug, part #121 paragraph 121.2521 & 121.2597.
- Threading not recommended.
- Schedule 40 type II grade I.
- Per ASTM D-1784-cell classification 12454B.
- Fittings are not a standard stock item/made to order or on special request.

MALE ADAPTERS



NOMINAL PIPE SIZE	PART NUMBER
3/8	436003C
1/2	436005C
3/4	436007C
1	436010C
1-1/4	436012C
1-1/2	436015C
2	436020C
2-1/2	436025C
3	436030C
4	436040C

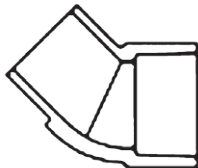
FEMALE ADAPTERS



NOMINAL PIPE SIZE	PART NUMBER
1/4	435002C
3/8	435003C
1/2	435005C
3/4	435007C
1	435010C
1-1/4	435012C
1-1/2	435015C
2	435020C
2-1/2	435025C
3	435030C
4	435040C

45° STREET ELBOWS

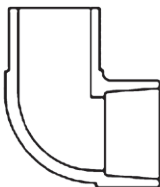
(slip x soc)



NOMINAL PIPE SIZE	PART NUMBER
1/2	427005C
3/4	427007C
1	427010C
1-1/4	427012C
1-1/2	427015C
2	427020C
2-1/2	427025C
3	427030C
4	427040C

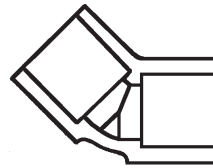
90° STREET ELBOWS

(spg x slp)



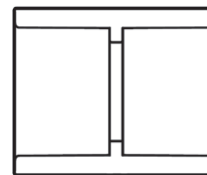
NOMINAL PIPE SIZE	PART NUMBER
1/2	409005C
3/4	409007C
1	409010C
1-1/4	409012C
1-1/2	409015C
2	409020C
2-1/2	409025C

45° SOCKET ELBOWS



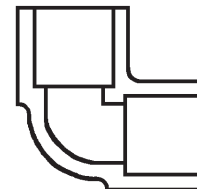
NOMINAL PIPE SIZE	PART NUMBER
1/4	417002C
3/8	417003C
1/2	417005C
3/4	417007C
1	417010C
1-1/4	417012C
1-1/2	417015C
2	417020C
2-1/2	417025C
3	417030C
4	417040C
6	417060C
8	417080C

SOCKET COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	429002C
3/8	429003C
1/2	429005C
3/4	429007C
1	429010C
1-1/4	429012C
1-1/2	429015C
2	429020C
2-1/2	429025C
3	429030C
4	429040C
6	429060C
8	429080C

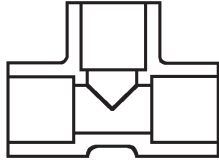
90° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/4	406002C
3/8	406003C
1/2	406005C
3/4	406007C
1	406010C
1-1/4	406012C
1-1/2	406015C
2	406020C
2-1/2	406025C
3	406030C
4	406040C
6	406060C
8	406080C

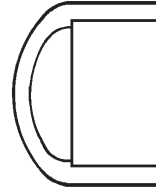
Schedule 40 Clear PVC Fittings

SOCKET TEES



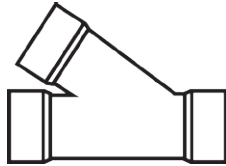
NOMINAL PIPE SIZE	PART NUMBER
1/4	401002C
3/8	401003C
1/2	401005C
3/4	401007C
1	401010C
1-1/4	401012C
1-1/2	401015C
2	401020C
2-1/2	401025C
3	401030C
4	401040C
6	401060C
8	401080C

SOCKET CAPS



NOMINAL PIPE SIZE	PART NUMBER
1/4	447002C
3/8	447003C
1/2	447005C
3/4	447007C
1	447010C
1-1/4	447012C
1-1/2	447015C
2	447020C
2-1/2	447025C
3	447030C
4	447040C
6	447060C
8	447080C

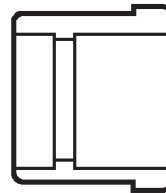
SOCKET WYE



NOMINAL PIPE SIZE	PART NUMBER
1-1/2	475015C
2	475020C
2-1/2	475030C
3	475040C
4	475060C
6	475532C

REDUCER BUSHINGS

(Socket x Slip)



NOMINAL PIPE SIZE	PART NUMBER
3/4X1/2	437101C
1X3/4	437131C
1-1/4X1	437168C
1-1/2X1	437211C
1-1/2X1-1/4	437212C
2X1-1/2	437251C
2-1/2X2	437292C
3X2	437338C
3X2-1/2	437339C
4X3	437422C
6X4	437532C
8X6	437585C



Chemkor CPVC Pipe



Fabco CPVC pipe is produced from a specialty blend of Corzan® CPVC material with unique physical properties desirable for piping applications (i.e., improved impact resistance and good fire resistance capabilities). CPVC piping systems can handle more than 75% of the temperature/pressure requirements of today's typical process plants. CPVC pressure pipe has an upper working temperature limit of 200°F (93°C). Fabco CPVC Pipe meets 25/50 Flame-Smoke Development Standards (CAN/ULC-S102.2).

As with all thermoplastic piping systems, CPVC's ability to withstand pressure varies with pipe diameter, wall thickness, and temperature. For pressure piping applications it is recommended for temperatures as high as 200°F (93°C) when appropriate temperature de-rating factors are applied. As the pipe diameter and temperature increases, the pressure rating of the product decreases.

MM	NOMINAL PIPE SIZE (IN)	PART NUMBER	OUTSIDE DIAMETER (IN)	MAX. INSIDE DIAMETER (IN)	MIN. WALL THICKNESS (IN)	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
SCHEDULE 80- PLAIN END							
6	1/4 x 20 ft	020304	0.54	0.302	0.119	12	1130
12	1/2 x 20 ft	020307	0.84	0.546	0.147	24	850
20	3/4 x 20 ft	020308	1.05	0.742	0.154	33	690
25	1 x 20 ft	020309	1.315	0.957	0.179	49	630
32	1 1/4 x 20 ft	020310	1.66	1.278	0.191	67	520
40	1 1/2 x 20 ft	020311	1.9	1.5	0.2	81	470
50	2 x 20 ft	020312	2.375	1.939	0.218	109	400
65	2 1/2 x 20 ft	020313	2.875	2.323	0.276	165	425
75	3 x 20 ft	020314	3.5	2.9	0.3	221	375
100	4 x 20 ft	020316	4.5	3.826	0.337	323	320
150	6 x 20 ft	020318	6.625	5.761	0.432	617	280
200	8 x 20 ft	020319	8.625	7.625	0.5	937	250
250	10 x 20 ft	020320	10.75	9.564	0.593	1342	230
300	12 x 20 ft	020322	12.75	11.376	0.687	1846	230
350	14 x 20 ft	020324	14	12.41	0.75	2222	220
400	16 x 20 ft	020326	16	14.214	0.843	2856	220
SCHEDULE 40- PLAIN END							
12	1/2 x 10 ft	020204	0.84	0.622	0.109	16	590
20	3/4 x 10 ft	020207	1.05	0.824	0.113	22	480
25	1 x 10 ft	020308	1.315	1.049	0.133	32	450
32	1 1/4 x 10 ft	020209	1.66	1.38	0.14	43	370
40	1 1/2 x 10 ft	020210	1.9	1.61	0.145	52	330
50	2 x 10 ft	020211	2.375	2.069	0.154	69	280
65	2 1/2 x 10 ft	020212	2.875	2.469	0.203	109	300
75	3 x 10 ft	020213	3.5	3.068	0.216	144	260
100	4 x 20 ft	020214	4.5	4.026	0.237	203	220
125	5 x 20 ft	020216	5.563	5.017	0.258	273	190
150	6 x 20 ft	020218	6.625	6.031	0.28	354	180
200	8 x 20 ft	020219	8.625	7.943	0.322	531	160
250	10 x 20 ft	020220	10.75	9.976	0.356	753	140
300	12 x 20 ft	020222	12.75	11.89	0.406	995	130
350	14 x 20 ft	020224	14	13.072	0.438	1181	130
400	16 x 20 ft	020226	16	14.94	0.5	1542	130

Notes:

- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 12, Engineering Data.
- We do not recommend schedule 40 pipe for threading. Schedule 80 pipe is recommended for threading. Not recommended for compressed air or gas service.
- Pipe also available up to 24" diameter upon request.

Schedule 80 CPVC Fittings

Chemkor Schedule 80 CPVC Fittings

Specify Fabco CPVC Piping for Commercial and Residential Water Applications

Use CPVC Schedule 80 Piping Systems instead of Copper for Hot and Cold water. Fabco CPVC Pipe meets 25/50 Flame-Smoke Development Standards (CAN/ULC-S102.2). Sweating copper is time-consuming and expensive. Copper prices, along with higher installation costs can put Copper expenses to almost triple the installed cost of Fabco's CPVC System. For Hot and Cold water, Specify CPVC Schedule 80 from Fabco for your next Commercial or Residential project. (See notes)

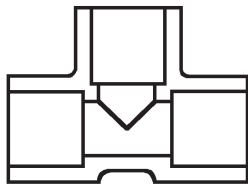
Notes:

- Applicable pressure de-ratings at elevated temperatures apply. All Plastic Piping systems must be designed for potential Hydraulic Shock (water hammer), see Section 12, Engineering Data.
- CPVC SCH 80 fittings are produced in accordance with the following standards: ASTM D1784, ASTM F-439 (socket fittings), ASTM F-437 (threaded fittings).
- Flanges are 150 lb. ANSI B.16.5 dimensioned.
- Heavy duty wyes are produced from CPVC according to ASTM D1784, Cell Class 23447B and are pressure rated to 217 PSI.
- Many other fittings are available on request. Some Schedule 80 reducing tees are standard tees with a reducer bushing
- The maximum continuous working pressure of the fittings is equal to 150 PSI at 73.4°F(23°C). No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- All custom fabricated fittings are not subject to return. Many other fittings are available on request.
- F indicates a fabricated fitting. F* indicates fitting is available molded or fabricated.
- Fabricated fittings, custom manufactured and/or modified FABCO products (Products, machined products, modified standard products, etc.) cannot be returned for credit or with restocking charge.

CPVC benefits over Copper include:

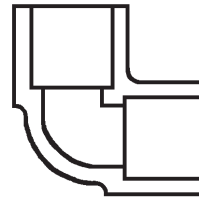
- 50% less material cost
- 66% less labor cost
- Less attractive to jobsite theft
- Lower heat-loss
- Easier to handle
- Easy transition to copper/PEX
- Corrosion free

SOCKET TEES



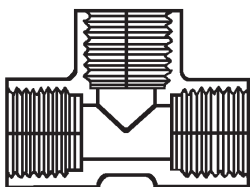
NOMINAL PIPE SIZE	PART NUMBER
1/4	501002
3/8	501003
1/2	501005
3/4	501007
1	501010
1 1/4	501012
1 1/2	501015
2	501020
2 1/2	501025
3	501030
4	501040
5	501050
6	501060
8	501080
10	501100F*
12	501120F*
14	501140F
16	501160F
18	501180F
20	501200F
24	501240F

90° SOCKET ELBOWS



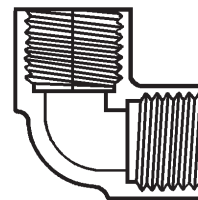
NOMINAL PIPE SIZE	PART NUMBER
1/4	506002
3/8	506003
1/2	506005
3/4	506007
1	506010
1 1/4	506012
1 1/2	506015
2	506020
2 1/2	506025
3	506030
4	506040
5	506050F
6	506060
8	506080
10	506100F
12	506120F
14	506140F
16	506160F
18	506180F
20	506200F
24	506124F

THREADED TEES



NOMINAL PIPE SIZE	PART NUMBER
1/4	505002
3/8	505003
1/2	505005
3/4	505007
1	505010
1 1/4	505012
1 1/2	505015
2	505020
2 1/2	505025
3	505030
4	505040

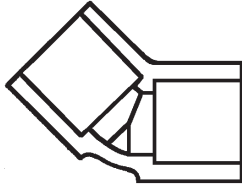
90° THREADED ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/4	508002
3/8	508003
1/2	508005
3/4	508007
1	508010
1 1/4	508012
1 1/2	508015
2	508020
2 1/2	508025
3	508030
4	508040

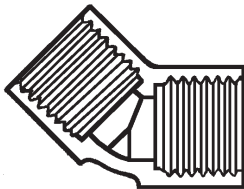
Schedule 80 CPVC Fittings

45° SOCKET ELBOWS



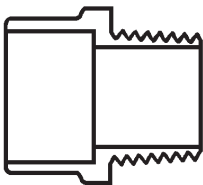
NOMINAL PIPE SIZE	PART NUMBER
1/4	517002
3/8	517003
1/2	517005
3/4	517007
1	517010
1 1/4	517012
1 1/2	517015
2	517020
2 1/2	517025
3	517030
4	517040
5	517050F
6	517060
8	517080
10	517100F*
12	517120F*
14	517140F
16	517160F
18	517180F
20	517200F
24	517240F

45° THREADED ELBOWS



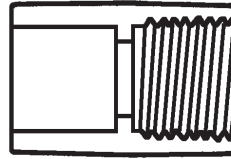
NOMINAL PIPE SIZE	PART NUMBER
1/4	519002
3/8	519003
1/2	519005
3/4	519007
1	519010
1 1/4	519012
1 1/2	519015
2	519020
2 1/2	519025
3	519030
4	519040

MALE ADAPTERS



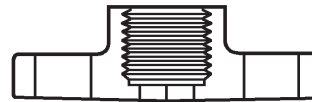
NOMINAL PIPE SIZE	PART NUMBER
1/2	536005
3/4	536007
1	536010
1 1/4	536012
1 1/2	536015
2	536020
2 1/2	536025
3	536030
4	536040
6	536060F
8	536080F
10	536100F

FEMALE ADAPTERS



NOMINAL PIPE SIZE	PART NUMBER
1/4	535002
3/8	535003
1/2	535005
3/4	535007
1	535010
1 1/4	535012
1 1/2	535015
2	535020
2 1/2	535025
3	535030
4	535040
6	535060F
8	535080F
10	535100F
12	535120F

150 LB THREADED FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	552005
3/4	552007
1	552010
1 1/4	552012
1 1/2	552015
2	552020
2 1/2	552025
3	552030
4	552040
6	552060F
8	552080F

150 LB SOCKET FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	551005
3/4	551007
1	551010
1 1/4	551012
1 1/2	551015
2	551020
2 1/2	551025
3	551030
4	551040
5	551050
6	551060
8	551080
10	551100F*
12	551120F*
14	551140F
16	551160F
18	551180F
20	551200F
24	551240F

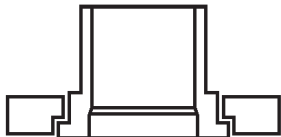
Schedule 80 CPVC Fittings

150 LB BLIND FLANGES



NOMINAL PIPE SIZE	PART NUMBER
1/2	553005
3/4	553007
1	553010
1 1/4	553012
1 1/2	553015
2	553020
2 1/2	553025
3	553030
4	553040
5	553050F
6	553060
8	553080
10	553100
12	553120
14	553140F
16	553160F
18	553180F
20	553200F
24	553240F

SPIGOT VANSTONE FLANGES



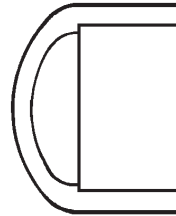
NOMINAL PIPE SIZE	PART NUMBER
1/2	556005
3/4	556007
1	556010
1 1/4	556012
1 1/2	556015
2	556020
2 1/2	556025
3	556030
4	556040
6	556060
8	556080
10	556100
12	556120
14	556140F
16	556160F
18	556180F
20	556200F
24	556240F

SOCKET VANSTONE FLANGES



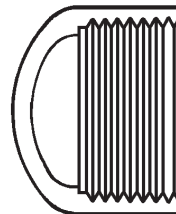
NOMINAL PIPE SIZE	PART NUMBER
1/2	554005
3/4	554007
1	554010
1 1/4	554012
1 1/2	554015
2	554020
2 1/2	554025
3	554030
4	554040
5	554050
6	554060
8	554080
10	554100
12	554120
14	554140
16	554160
18	554180F
20	554200F
24	554240F

SOCKET CAPS



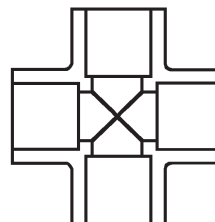
NOMINAL PIPE SIZE	PART NUMBER
1/4	547002
3/8	547003
1/2	547005
3/4	547007
1	547010
1 1/4	547012
1 1/2	547015
2	547020
2 1/2	547025
3	547030
4	547040
6	547060
8	547080
10	547100F
12	547120F
14	547140F
16	547160F
18	547180F
20	547200F
24	547240F

THREADED CAPS



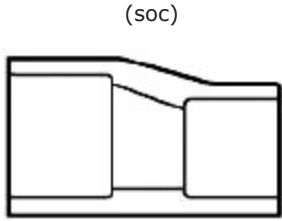
NOMINAL PIPE SIZE	PART NUMBER
1/4	548002
3/8	548003
1/2	548005
3/4	548007
1	548010
1 1/4	548012
1 1/2	548015
2	548020
2 1/2	548025
3	548030
4	548040
6	548060F
8	548080F

SOCKET CROSSES



NOMINAL PIPE SIZE	PART NUMBER
1/4	520002
1/2	520005
3/4	520007
1	520010
1 1/4	520012
1 1/2	520015
2	520020
2 1/2	520025
3	520030
4	520040
6	520060F
8	520080F
10	520100F
12	520120F
14	520140F
16	520160F
18	520180F
20	520200F
24	520240F

ECCENTRIC REDUCER COUPLING

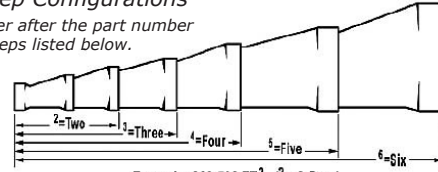


NOMINAL PIPE SIZE	PART NUMBER
1X3/4	829-131CFE
1-1/4X1	829-168CFE
1-1/2X1-1/4	829-212CFE
2X1	829-249CFE
2X1-1/4	829-250CFE
2X1-1/2	829-251CFE
2-1/2X1-1/4	829-290CFE ²
2-1/2X1-1/2	829-291CFE ²
2-1/2X2	829-292CFE
3X1	829-335CFE ²
3X1-1/4	829-336CFE ²
3X1-1/2	829-337CFE ²
3X2	829-338CFE
3X2-1/2	829-339CFE
4X1	829-417CFE ³
4X1-1/4	829-418CFE ³
4X1-1/2	829-419CFE ³
4X2	829-420CFE ²
4X2-1/2	829-421CFE ²
4X3	829-422CFE
5X4	829-490CFE
6X2	829-528CFE ³
6X2-1/2	829-529CFE ³
6X3	829-530CFE ²
6X4	829-532CFE
8X2	829-578CFE ⁴
8X3	829-580CFE ³
8X4	829-582CFE ²
8X5	829-583CFE ²
8X6	829-585CFE
10X4	829-624CFE ³
10X5	829-625CFE ³
10X6	829-626CFE ²
10X8	829-628CFE
12X4	829-664CFE ⁴
12X6	829-666CFE ³
12X8	829-668CFE ²
12X10	829-670CFE
14X6	829-696CFE ³
14X8	829-698CFE ²
14X10	829-700CFE
14X12	829-702CFE
16X6	829-756CFE ⁵
16X8	829-758CFE ⁴
16X10	829-760CFE ³
16X12	829-762CFE ²
16X14	829-764CFE
18X6	829-786CFE ⁶
18X8	829-788CFE ⁵
18X10	829-790CFE ⁴
18X12	829-792CFE ³
18X14	829-794CFE ²
18X16	829-796CFE

Eccentric Reducer Coupling Footnotes

Multi-Step Configurations

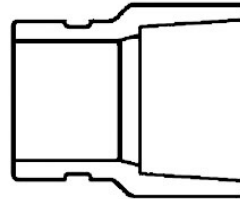
The number after the part number denotes steps listed below.



Example: 829-582 FE² (2= 2 Step)

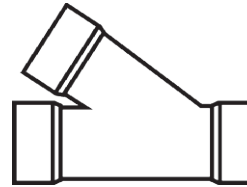
GROOVED COUPLING ADAPTER

(groove x soc)



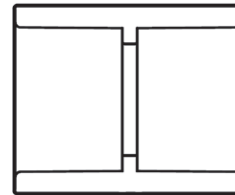
NOMINAL PIPE SIZE	PART NUMBER
1 1/4	533-012
1 1/2	533-015
2	533-020
2 1/2	533-025
3	533-030
4	533-040
5	533-050F
6	533-060
8	533-080F
10	533-100F
12	533-120F

45° SOCKET LATERALS



NOMINAL PIPE SIZE	PART NUMBER
8	575080F
10	575100F
12	575120F
14	575140F
16	575160F
18	575180F
20	575200F
24	575240F

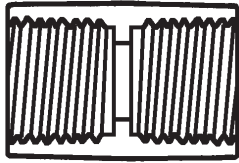
SOCKET COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	529002
3/8	529003
1/2	529005
3/4	529007
1	529010
1 1/4	529012
1 1/2	529015
2	529020
2 1/2	529025
3	529030
4	529040
5	529050
6	529060
8	529080
10	529100
12	529120
14	529140F
16	529160F
18	529180F
20	529200F
24	529240F

Schedule 80 CPVC Fittings

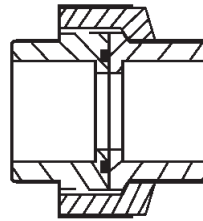
THREADED COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	530002
3/8	530003
1/2	530005
3/4	530007
1	530010
1 1/4	530012
1 1/2	530015
2	530020
2 1/2	530025
3	530030
4	530040
6	530060F

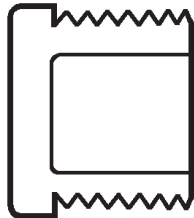
SOCKET UNIONS

(Viton O-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	557002
3/8	557003
1/2	557005
3/4	557007
1	557010
1 1/4	557012
1 1/2	557015
2	557020
2 1/2	557025
3	557030
4	557040
6	557060

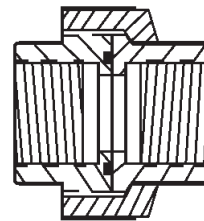
THREADED PLUGS



NOMINAL PIPE SIZE	PART NUMBER
1/4	550002
3/8	550003
1/2	550005
3/4	550007
1	550010
1 1/4	550012
1 1/2	550015
2	550020
2 1/2	550025
3	550030
4	550040
6	550060F

THREADED UNIONS

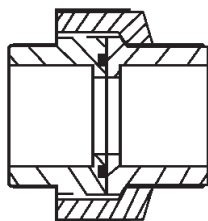
(Viton O-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	558002
3/8	558003
1/2	558005
3/4	558007
1	558010
1 1/4	558012
1 1/2	558015
2	558020
2 1/2	558025
3	558030
4	558040
6	558060

SOCKET UNIONS

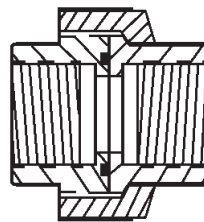
(epdm O-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	597002
3/8	597003
1/2	597005
3/4	597007
1	597010
1 1/4	597012
1 1/2	597015
2	597020
2 1/2	597025
3	597030
4	597040
6	597060

THREADED UNIONS

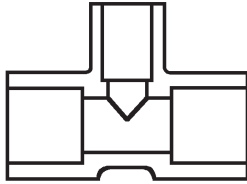
(epdm O-rings)



NOMINAL PIPE SIZE	PART NUMBER
1/4	598002
3/8	598003
1/2	598005
3/4	598007
1	598010
1 1/4	598012
1 1/2	598015
2	598020
2 1/2	598025
3	598030
4	598040
6	598060

Schedule 80 CPVC Fittings

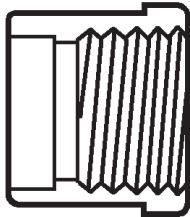
SOCKET REDUCING TEES



NOMINAL PIPE SIZE	PART NUMBER
3/4x3/4x1/2	501101
1 x 1 x 1/2	501130
1 x 1 x 3/4	501131
1 1/2x1 1/2x3/4	501210
1 1/2x1 1/2x1	501211
2 x 2 x 1/2	501247
2 x 2 x 3/4	501248
2 x 2 x 1	501249
2 x 2 x 1 1/2	501251
3 x 3 x 2	501338
4 x 4 x 2	501420
4 x 4 x 3	501422
6 x 6 x 4	501532
8 x 8 x 4	501582
8 x 8 x 6	501585
10 x 10 x 6	501626F
10 x 10 x 8	501628F
12 x 12 x 8	501668F
12 x 12 x 10	501670F

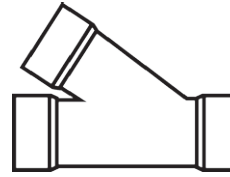
REDUCER BUSHINGS

(Slip x fpt)



NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	538072
1/2 x 3/8	538073
3/4 x 1/4	538098
3/4 x 1/2	538101
1 x 1/2	538130
1 x 3/4	538131
1 1/4 x 1/2	538166
1 1/4 x 3/4	538167
1 1/4 x 1	538168
1 1/2 x 1/2	538209
1 1/2 x 3/4	538210
1 1/2 x 1	538211
1 1/2 x 1 1/4	538212
2 x 1/2	538247
2 x 3/4	538248
2 x 1	538249
2 x 1 1/4	538250
2 x 1 1/2	538251
2 1/2 x 2	538292
3 x 1 1/2	538337
3 x 2	538338
3 x 2 1/2	538339
4 x 2	538420
4 x 2 1/2	538421
4 x 3	538422
6 x 4	538532

HEAVY DUTY WYES

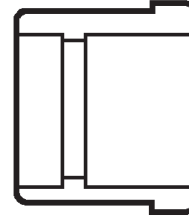


Larger Sizes Available on request

NOMINAL PIPE SIZE	PART NUMBER
1/2	575005
3/4	575007
1	575010
1 1/4	575012
1 1/2	575015
2	575020
3	575030
4	575040
6	575060

REDUCER BUSHINGS

(socket x slip)



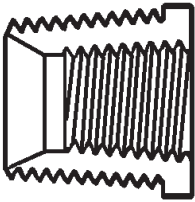
NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	537072
1/2 x 3/8	537073
3/4 x 1/4	537098
3/4 x 1/2	537101
1 x 1/2	537130
1 x 3/4	537131
1 1/4 x 1/2	537166
1 1/4 x 3/4	537167
1 1/4 x 1	537168
1 1/2 x 1/2	537209
1 1/2 x 3/4	537210
1 1/2 x 1	537211
1 1/2 x 1 1/4	537212
2 x 1/2	537247
2 x 3/4	537248
2 x 1	537249
2 x 1 1/4	537250
2 x 1 1/2	537251
2 1/2 x 2	537292
3 x 1 1/2	537337
3 x 2	537338
3 x 2 1/2	537339
4 x 2	537420
4 x 2 1/2	537421
4 x 3	537422
6 x 4	537532
8 x 6	537585
10 x 4	537624F
10 x 6	537626F
10 x 8	537628F
12 x 4	537664F
12 x 6	537666F
12 x 8	537668F
12 x 10	537670F
14 x 6	537696F
14 x 8	537698F
14 x 10	537700F
18 x 8	537748F
18 x 10	537750F
18 x 12	537752F
18 x 14	537754F
18 x 16	537756F



Schedule 80 CPVC Fittings

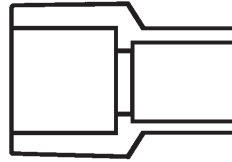
REDUCER BUSHINGS

(mpt x fpt)



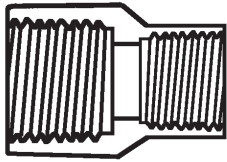
NOMINAL PIPE SIZE	PART NUMBER
1/2 x 1/4	539072
1/2 x 3/8	539073
3/4 x 1/4	539098
3/4 x 1/2	539101
1 x 1/2	539130
1 x 3/4	539131
1 1/4 x 1/2	539166
1 1/4 x 3/4	539167
1 1/4 x 1	539168
1 1/2 x 1/2	539209
1 1/2 x 3/4	539210
1 1/2 x 1	539211
1 1/2 x 1 1/4	539212
2 x 1/2	539247
2 x 3/4	539248
2 x 1	539249
2 x 1 1/4	539250
2 x 1 1/2	539251
2 1/2 x 2	539292
3 x 1 1/2	539337
3 x 2	539338
3 x 2 1/2	539339
4 x 2	539420
4 x 2 1/2	539421
4 x 3	539422
6 x 4	539532
8 x 6	539585
18 x 8	529748F
18 x 10	529750F
18 x 12	529752F
18 x 14	529754F
18 x 16	529756F
20 x 12	529768F
20 x 14	529770F
20 x 16	529772F
20 x 18	529774F
24 x 14	529788F
24 x 16	529790F
24 x 18	529792F
24 x 20	529794F

SOCKET REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
3/4 x 1/2	529101
1 x 1/2	529130
1 x 3/4	529131
1 1/4 x 1/2	529166
1 1/4 x 3/4	529167
1 1/4 x 1	529168
1 1/2 x 1/2	529209
1 1/2 x 3/4	529210
1 1/2 x 1	529211
1 1/2 x 1 1/4	529212
2 x 1/2	529247
2 x 3/4	529248
2 x 1	529249
2 x 1 1/4	529250
2 x 1 1/2	529251
2 1/2 x 1 1/2	529291
2 1/2 x 2	529292
3 x 1 1/2	529337
3 x 2	529338
3 x 2 1/2	529339
4 x 2	529420
4 x 2 1/2	529421
4 x 3	529422
6 x 4	529532
8 x 4	529582
8 x 6	529585
10 x 4	529624F
10 x 6	529626F
10 x 8	529628F
12 x 4	529664F
12 x 6	529666F
12 x 8	529668F
12 x 10	529670F
14 x 4	529-694F
14 x 6	529-696F
14 x 8	529-698F
14 x 10	529-700F
14 x 12	529-702F
16 x 4	529-754F
16 x 6	529-756F
16 x 8	529-758F
16 x 10	529-760F
16 x 12	529-762F
16 x 14	529-764F
18 x 3	529-783F
18 x 4	529-784F
18 x 6	529-786F
18 x 8	529-788F
18 x 10	529-790F
18 x 12	529-792F
18 x 14	529-794F
18 x 16	529-796F
20 X 8	529-818F
20 x 16	529-826F
20 x 18	529-828F
24 x 6	529-906F
24 x 18	529-918F
24 x 20	529-920F

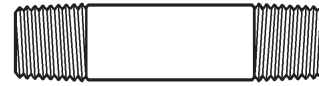
THREADED REDUCING COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
3/4 x 1/2	530101
1 x 1/2	530130
1 x 3/4	530131
1 1/4 x 1/2	530166
1 1/4 x 3/4	530167
1 1/4 x 1	530168
1 1/2 x 1/2	530209
1 1/2 x 3/4	530210
1 1/2 x 1	530211
1 1/2 x 1 1/4	530212
2 x 1/2	530247
2 x 3/4	530248
2 x 1	530249
2 x 1 1/4	530250
2 x 1 1/2	530251
2 1/2 x 1 1/2	530291
2 1/2 x 2	530292
3 x 1 1/2	530337
3 x 2	530338
3 x 2 1/2	530339
4 x 2	530420
4 x 2 1/2	530421
4 x 3	530422

THREADED NIPPLES

(3 inches)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561041
	3/8	561058
	1/2	561081
	3/4	561106
	1	561135
	1 1/4	561172
	1 1/2	561215
	2	561253
	2 1/2	561261
	3	561339



THREADED NIPPLES

(4 inches)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561042
	3/8	561059
	1/2	561082
	3/4	561107
	1	561136
	1 1/4	561173
	1 1/2	561216
	2	561254
	2 1/2	561265
	3	561341
	4	561423



THREADED NIPPLES

(close)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561037
	3/8	561055
	1/2	561063
	3/4	561104
	1	561133
	1 1/4	561170
	1 1/2	561213
	2	561251
	2 1/2	561260
	3	561338
	4	561422



THREADED NIPPLES

(5 inches)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561043
	3/8	561061
	1/2	561083
	3/4	561108
	1	561137
	1 1/4	561174
	1 1/2	561217
	2	561255
	2 1/2	561268
	3	561342
	4	561430



THREADED NIPPLES

(short)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561038
	3/8	561056
	1/2	561078
	3/4	561105
	1	561134
	1 1/4	561171
	1 1/2	561214
	2	561252



THREADED NIPPLES

(6 inches)	NOMINAL PIPE SIZE	PART NUMBER
	1/4	561044
	3/8	561062
	1/2	561084
	3/4	561109
	1	561138
	1 1/4	561175
	1 1/2	561218
	2	561256
	2 1/2	561269
	3	561343
	4	561426



PVC SDR Pressure Pipe

PVC SDR Pressure Pipe



PVC is the most frequently specified of all plastic piping materials. It has been used successfully for over 60 years. PVC is characterized by distinctive physical properties and is resistant to corrosion and chemical attack by acids, alkalies, salt solutions and many other chemicals. It is attacked, however, by polar solvents such as ketones and aromatics. Of the various types and grades of PVC used in plastic piping, SDR conforming to ASTM D1784, is the most common. The maximum service temperature for PVC is 140°F.

PART NUMBER	MM	NOMINAL PIPE SIZE (INCHES)	OUTSIDE DIAMETER	INSIDE DIAMETER	MIN. WALL THICKNESS	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
SERIES 160 (SDR-26) PRESSURE PIPE, PLAIN END							
010911	40	1 1/2 x 20 ft	1.900	1.734	0.080	28.4	160
010912	50	2 x 20 ft	2.375	2.173	0.091	43.2	160
010913	65	2 1/2 x 20 ft	2.875	2.635	0.110	62.2	160
010914	75	3 x 20 ft	3.500	3.210	0.135	91.5	160
010916	100	4 x 20 ft	4.500	4.134	0.173	149.4	160
010917	125	5 x 20 ft	5.563	5.109	0.214	228.8	160
010918	150	6 x 20 ft	6.625	6.085	0.255	322.8	160
010919	200	8 x 20 ft	8.625	7.921	0.332	546.8	160
010920	250	10 x 20 ft	10.750	9.874	0.413	849.2	160
010922	300	12 x 20 ft	12.750	11.710	0.490	1195.6	160
010924	350	14 x 20 ft	14.000	12.860	0.538	1443.0	160
010926	400	16 x 20 ft	16.000	14.696	0.615	1881.0	160
010928	450	18 x 20 ft	18.000	16.534	0.693	2386.0	160
010930	500	20 x 20 ft	20.000	18.370	0.769	2947.0	160
010934	600	24 x 20 ft	24.000	22.043	0.923	4252.0	160
SERIES 100 (SDR-41) PRESSURE PIPE, PLAIN END							
010628	450	1/2 x 10 ft	20.000	18.970	0.488	1892.0	100
010630	500	3/4 x 10 ft	18.000	17.070	0.439	1537.0	100
010634	600	1 x 10 ft	24.000	22.748	0.585	2732.0	100
SERIES 200 (SDR-21) PRESSURE PIPE, PLAIN END							
011007	12	1/2 x 20 ft	1.050	0.910	0.060	12.9	200
011008	20	3/4 x 20 ft	0.840	0.696	0.062	10.4	200
011009	25	1 x 20 ft	1.315	1.169	0.063	17.0	200
011010	32	1 1/4 x 20 ft	1.660	1.482	0.079	26.3	200
011011	40	1 1/2 x 20 ft	1.900	1.700	0.090	33.9	200
011012	50	2 x 20 ft	2.375	2.129	0.113	52.1	200
011013	65	2 1/2 x 20 ft	2.875	2.581	0.137	75.4	200
011014	75	3 x 20 ft	3.500	3.146	0.167	110.6	200
011016	100	4x 20 ft	4.500	4.046	0.214	182.5	200
011017	125	5 x 20 ft	5.563	5.001	0.265	279.2	200
011018	150	6 x 20 ft	6.625	5.995	0.316	396.4	200
011019	200	8 x 20 ft	8.625	7.755	0.410	667.9	200
011020	250	10 x 20 ft	10.750	9.667	0.511	1039.2	200

Notes:

- Pressure Rating at 73.4°F(23°C).
- FABCO Pressure Pipe conforms to CSA standard B 137.3 and ASTM D 1784.
- Pipe can be supplied on request as bell end or roll grooved (SDR21 and SDR 26).

NAPSYS™-HR (High Rise) PVC DWV 25/50 Pipe and Fittings

Superior Performance and Flexibility for High-Rise and Plenum Applications

NAPSYS-HR PVC DWV 25/50 Pipe and Fittings

The Smart Choice for High-Rise and Plenum Installations

When it comes to installing drain, waste and vent (DWV) systems in high-rise and plenum applications, heavy cast iron and copper piping has been the preferred option for meeting existing fire and smoke regulations. All that changed with the introduction of a new wave of advanced PVC (Polyvinyl Chloride) pipe systems that are accepted by regulators.

PVC systems are light and easy to install, but more importantly, the new systems have been designed to meet flame spread and smoke development code requirements.

NAPSYS-HR PVC DWV 25/50: A SAFE CHOICE

The Brand New Westlake Pipe & Fittings NAPSYS-HR PVC DWV 25/50 is a cost-effective specialty product family specifically designed for high-rise and plenum applications.

PVC compounds used in the manufacture of NAPSYS-HR PVC DWV 25/50 pipe and fittings contain smoke suppressant additives, which reduce both flame spread and smoke development properties. Certified to CAN/ULC-S102.2, NAPSYS-HR PVC DWV 25/50 has a flame spread rating of 0 and smoke development classification of 50.



WHY NAPSYS-HR PVC DWV 25/50?

PVC is virtually corrosion-proof, lightweight and easier to handle, making installation fast and safe, even when working in restricted or awkward spaces. There's no need for special equipment or additional manpower.

VISIT WESTLAKEPIPE.COM FOR ADDITIONAL MARKETING COLLATERAL AS WELL AS OTHER INNOVATIVE AND INDUSTRY LEADING PRODUCTS.

Only Available in Western Canada



NAPSYS-HR PVC DWV 25/50

- **Cost-effective and efficient** – Ease of handling and lighter weight means faster installations without the need for special equipment. Overall that translates into significant project cost savings.
- **Choices to suit every need** – NAPSYS-HR PVC DWV 25/50 pipe and fittings are available in 1½- to 12-inch diameters and pipe is available in 12 foot lengths.
- **Longer product lifecycle** – NAPSYS-HR PVC DWV 25/50 is virtually corrosion-proof, it can easily outperform metal piping systems for longer periods of time.
- **Impact resistant** – The ruggedness of the NAPSYS-HR PVC DWV 25/50 system means less damage and waste on the job site.
- **Safe handling** – The solvent cement application eliminates the need for specialized tools and the risks associated with torches.
- **A system for all seasons** – NAPSYS-HR PVC DWV 25/50 eliminates the need to work with other pipe materials at grade level because it can be used for both above and below grade applications.
- **Low-VOC solvent cements** – Solvent Cements for the NAPSYS-HR PVC DWV 25/50 system have a VOC level of 486 and 508 grams/litre (SCAQMD Test Method 316A) for the 1-Step and 2-Step solvent cements.

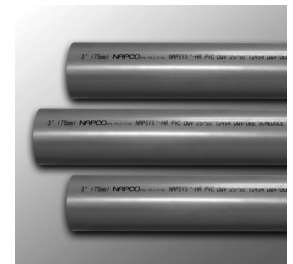
OUR PVC DWV PIPE AND FITTINGS ARE CERTIFIED TO:

- Fittings certified by QAI to ULC S102.2
- Pipe and fabricated fittings certified by Intertek to ULC S102.2
- Fittings and pipe certified by CSA to B181.2



IT ALSO MEETS THE FOLLOWING CODE REQUIREMENTS:

- Air plenums as defined by NBC article 3.6.4.3
- Combustible piping material in non-combustible buildings as defined by NBC article 3.1.5.19



Low Rise PVC DWV 25 Pipe & Fittings

NAPSYS™ -LR (Low Rise) PVC DWV 25 Pipe and Fittings

Westlake Pipe & Fittings' NAPSYS-LR PVC DWV products are certified to ULC S102.2 with a flame spread rating of 20.

NAPSYS-LR PVC DWV 25 Pipe and Fittings The Right Choice for Low-Rise Installations

Until recently, the construction industry has relied on iron and copper pipes for drain, waste and vent (DWV) system needs. As technology evolves, more and more contractors are turning to PVC (Polyvinyl Chloride) pipe systems for residential, commercial and institutional projects. Easy to install, PVC pipe is approved for use in both combustible and non-combustible buildings.

Mechanical contractors and engineers are increasingly turning to Westlake Pipe & Fittings for rugged and durable PVC DWV solutions that deliver on all counts:

- Efficiency
- Lower lifecycle cost
- Compliance with code requirements
- Longer product life
- Reduced environmental impact

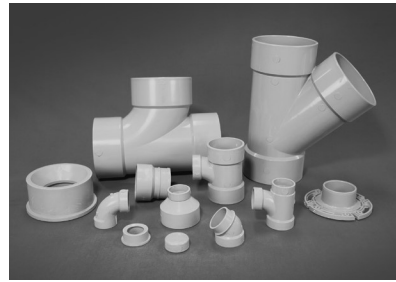


NAPSYS-LR PVC DWV 25 PIPE AND FITTINGS

This cost-effective staple for contractors and engineers is specifically designed for low-rise and light commercial applications where DWV systems do not run through an air space or plenum (see our NAPSYS-HR PVC DWV 25/50 section for air space and plenum applications). Less expensive than conventional iron piping, our tough, impact-resistant NAPSYS-LR PVC DWV 25 can deliver years of uninterrupted service.

PVC is virtually corrosion-proof, lightweight and easy to handle, making installation faster and safer, even when working in restricted or awkward spaces. There is no need for special equipment or additional manpower.

When you do the math, the bottom line is clear: NAPSYS-LR PVC DWV 25 is the smart choice for your current and long-term drain, waste and vent needs.

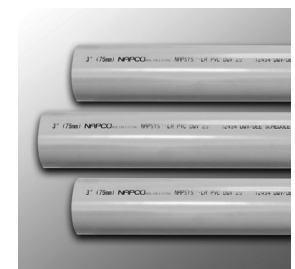


NAPSYS-LR PVC DWV 25

- **Cost-effective and efficient** – Ease of handling and lighter weight means faster installations without the need for special equipment. Overall that translates into significant project cost savings.
- **Choices to suit every need** – NAPSYS-LR PVC DWV 25 pipe and fittings are available in 1½- to 18-inch diameters and pipe is available in 12- and 20-foot lengths.
- **Longer product lifecycle** – NAPSYS-LR PVC DWV 25 is virtually corrosion-proof, it can easily outperform metal piping systems for longer periods of time.
- **Impact resistant** – The ruggedness of the NAPSYS-LR PVC DWV 25 system means less damage and waste on the job site.
- **Safe handling** – The solvent cement application eliminates the need for specialized tools and the risks associated with torches.
- **A system for all seasons** – NAPSYS-LR PVC DWV 25 eliminates the need to work with other pipe materials at grade level because it can be used for both above and below grade applications.
- **Low VOC solvent cements** – Solvent cements for the NAPSYS-LR PVC DWV 25 system have a VOC level of 486 and 508 grams/litre (SCAQMD Test Method 316A) for the 1-Step and 2-Step solvent cements.

RATINGS AND CERTIFICATIONS

According to the National Building Code, (NBC 3.1.5.19), PVC DWV pipe and fittings to be used in non-combustible buildings (up to 18 metres) must have a flame-spread rating of 25 or less. Westlake Pipe & Fittings PVC DWV pipe and fittings are certified to ULC S102.2 with a flame spread rating of 20.



- Fittings and pipe certified by Intertek to ULC S102.2
- Molded fittings and pipe certified by CSA to B181.2
- Fabricated fittings certified by Intertek to B181.2



Only Available in Western Canada

PVC DWV Drain Waste Vent

FABCO PVC DWV LR-25 Pipe

Only Available in Western Canada



PART NUMBER	SIZE		LENGTH (FEET)	FOOTAGE PER CRATE (FEET)
	MM	IN		
PD01512	40	1½	12	2,652
PD02012	50	2	12	2,112
PD03012	75	3	12	936
PD04012	100	4	12	720
PD06012	150	6	12	312
PD04020BE	100	4	20	1,200
PD06020BE	150	6	20	520
PD08020BE	200	8	20	200/360
PD10020BE	250	10	20	160/200
PD12020BE	300	12	20	120/240
PD14020BE	350	14	20	160
PD16020BE	400	16	20	120
PD18020BE	450	18	20	60

PVC DVW LR-25 Low Rise Fittings

Only Available in Western Canada

LINE CLEANOUT



(H X H X GASKET PLUG)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL12901G	1½
DL12902G	2
DL12903G	3
DL12904G	4
DL12904-3G	4x3x4
DL12906G	6
DL12906-4G	6x4
DL12908-4G	8x4
DL12908-6G	8x6
DL12908G*	8
DL12910-4G	10x4
DL12910-6G	10x6
DL12910-8G*	10x8
DL12912-4G	12x4
DL12912-6G	12x6
DL12912-8G*	12x8

FITTING CLEANOUT



(SP X GASKET PLUG)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL9501G	1½
DL9502G	2
DL9503G	3
DL9504G	4
DL9506G	6
DL9508G*	8

TUBE END CLEANOUT



(H X GASKET PLUG)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL9401G	1½
DL9402G	2
DL9403G	3
DL9404G	4
DL9406G	6
DL9408G*	8

DOUBLE SANITARY TEE



(H X H X H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL151D	1½
DL152D	2
DL152-1D	2x1½x1½
DL153D	2x1½x2
DL153-1D	2x1½
DL153-2D	3
DL154D	3x1½
DL154-1D	3x2
DL154-2D	4
DL154-3D	4x1½

*DENOTES NON-LISTED PRODUCT.

PVC DWV Drain Waste Vent

SANITARY TEE



(H X H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
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DL151	1½
DL152	2
DL152-1-1	2x1½x1½
DL152-1-2	2x1½x2
DL152-1	2x1½
DL153	3
DL153-1	3x1½
DL153-2	3x2
DL156	4
DL154-1	4x1½
DL154-2	4x2
DL154-3	4x3
DL157	6
DL157-4	6x4
DL158	8
DL158-4	8x4
DL158-6	8x6
DL16510	10
DL16510-4	10x4
DL16510-6	10x6
DL16510-8	10x8
DL16512	12
DL16512-4	12x4
DL16512-6	12x6
DL16512-8	12x8
DL16512-10	12x10
DL16514	14
DL16514-4	14x4
DL16514-6	14x6
DL16514-8	14x8
DL16514-10	14x10
DL16514-12	14x12
DL16516	16
DL16516-4	16x4
DL16516-6	16x6
DL16516-8	16x8
DL16516-10	16x10
DL16516-12	16x12
DL16516-14	16x14
DL16518	18
DL16518-4	18x4
DL16518-6	18x6
DL16518-8	18x8
DL16518-10	18x10
DL16518-12	18x12
DL16518-14	18x14
DL16518-16	18x16

Only Available in Western Canada

SANITARY TEE SIDE INLET



(LEFT HAND - H X H X H X H SI)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
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DL153-1L	3x1½
DL153-2L	3x2
DL154-2L	4x2

SANITARY TEE SIDE INLET



(RIGHT HAND - H X H X H X H SI)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
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DL153-1R	3x1½
DL153-2R	3x2
DL154-2R	4x4x4x2

45° ELBOW



SHORT TURN (H X H) (CERTIFIED TO
CSA B181.2)

PRODUCT CODE	SIZE (IN)
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DL501SS	1½
DL502SS	2
DL503SS	3
DL504SS	4
DL506SS	6
DL508SS	8
DL5010SS	10
DL5012SS	12
DL5014	14
DL5016	16
DL5018	18

45° ELBOW



SHORT TURN (SP X H) (CERTIFIED TO
CSA B181.2)

PRODUCT CODE	SIZE (IN)
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DL401SS	1½
DL402SS	2
DL403SS	3
DL404SS	4
DL406SS	6
DL408SS	8
DL4010SS	10
DL4012SS	12
DL4014	14
DL4016	16
DL4018	18

PVC DWV Drain Waste Vent

Only Available in Western Canada

90° ELBOW



EXTRA LONG (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL261	1½
DL262	2
DL263	3
DL264	4
DL266	6

90° REDUCING ELBOW



CLOSET BEND REDUCING (H X H)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL254-3CB	4 x 3
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90° ELBOW



*



(H X H) (CERTIFIED TO CSA B181.2)
(*DENOTES: A VENT ELBOW FOR DRAIN,
WASTE AND VENT NON-CSA)

PRODUCT CODE SIZE (IN)

DL251	1½
DL252	2
DL253	3
DL256	4
DL257	6
DL258	8
DL2010*	10
DL2012*	12
DL2514	14
DL2516	16
DL2518	18

90° ELBOW



*



(SP X H) (CERTIFIED TO CSA B181.2)
(*DENOTES: A VENT ELBOW FOR DRAIN,
WASTE AND VENT NON-CSA)

PRODUCT CODE SIZE (IN)

DL271	1½
DL272	2
DL273	3
DL274	4
DL226*	6
DL277	6
DL228*	8
DL278	8
DL2210*	10
DL2710	10
DL2212*	12
DL2712	12
DL2714	14
DL2716	16
DL2718	18

60° ELBOW



(H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL161	1½
DL162	2
DL163	3
DL164	4

22 1/2° ELBOW



(H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL1701	1½
DL1702	2
DL1703	3
DL1704	4
DL1706	6
DL1708	8
DL17010	10
DL17012	12
DL17014	14
DL17016	16
DL17018	18

22 1/2° ELBOW



(SP X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL1711	1½
DL1712	2
DL1713	3
DL1714	4
DL1716	6
DL1718	8
DL17110	10
DL17112	12
DL17114	14
DL17116	16
DL17118	18

11 1/4° ELBOW



(H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL1936	6
DL1938	8
DL19310	10
DL19312	12
DL19314	14
DL19316	16
DL19318	18

11 1/4° ELBOW



(SP X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE SIZE (IN)

DL1836	6
DL1838	8
DL18310	10
DL18312	12
DL18314	14
DL18316	16
DL18318	18

PVC DWV Drain Waste Vent

Only Available in Western Canada

45° WYE



(H X H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL301	1½
DL302	2
DL302-1-1	2x1½x1½
DL302-1	2x1½
DL303	3
DL303-1	3x1½
DL303-2	3x2
DL304	4
DL304-1	4x1½
DL304-2	4x2
DL304-3	4x3
DL306	6
DL306-4	6x4
DL308	8
DL308-4	8x4
DL308-6	8x6
DL3010	10
DL3010-4	10x4
DL3010-6	10x6
DL3010-8	10x8
DL3012	12
DL3012-4	12x4
DL3012-6	12x6
DL3012-8	12x8
DL3012-10	12x10
DL3014	14
DL3014-4	14x4
DL3014-6	14x6
DL3014-8	14x8
DL3014-10	14x10
DL3014-12	14x12
DL3016	16
DL3016-4	16x4
DL3016-6	16x6
DL3016-8	16x8
DL3016-10	16x10
DL3016-12	16x12
DL3016-14	16x14
DL3018	18
DL3018-4	18x4
DL3018-6	18x6
DL3018-8	18x8
DL3018-10	18x10
DL3018-12	18x12
DL3018-14	18x14
DL3018-16	18x16

DOUBLE 45° WYE



(H X H X H X H)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL361	1½
DL362	2
DL362-1	2x1½
DL363	3
DL363-1	3x1½
DL363-2	3x2
DL364	4
DL364-2	4x2
DL364-3	4x3
DL366-6	6
DL366-4	6x4
DL368-8	8
DL368-4	8x4
DL368-6	8x6
DL3610	10
DL3610-4	10x4
DL3610-6	10x6
DL3610-8	10x8
DL3612	12
DL3612-4	12x4
DL3612-6	12x6
DL3612-8	12x8
DL3612-10	12x10
DL3614	14
DL3614-4	14x4
DL3614-6	14x6
DL3614-8	14x8
DL3614-10	14x10
DL3614-12	14x12
DL3616	16
DL3616-4	16x4
DL3616-6	16x6
DL3616-8	16x8
DL3616-10	16x10
DL3616-12	16x12
DL3616-14	16x14
DL3618	18
DL3618-4	18x4
DL3618-6	18x6
DL3618-8	18x8
DL3618-10	18x10
DL3618-12	18x12
DL3618-14	18x14
DL3618-16	18x16

PVC DWV Drain Waste Vent

Only Available in Western Canada

REDUCER COUPLING



(H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL602-1	2x1½
DL603-1	3x1½
DL603-2	3x2
DL604-1	4x1½
DL604-2	4x2
DL604-3	4x3
DL606-4	6x4
DL608-4	8x4
DL608-6	8x6
DL6010-4	10x4
DL6010-6	10x6
DL6010-8	10x8
DL6012-4	12x4
DL6012-6	12x6
DL6012-8	12x8
DL6012-10	12x10
DL6014-4	14x4
DL6014-6	14x6
DL6014-8	14x8
DL6014-10	14x10
DL6014-12	14x12
DL6016-4	16x4
DL6016-6	16x6
DL6016-8	16x8
DL6016-10	16x10
DL6016-12	16x12
DL6016-14	16x14
DL6018-4	18x4
DL6018-6	18x6
DL6018-8	18x8
DL6018-10	18x10
DL6018-12	18x12
DL6018-14	18x14
DL6018-16	18x16

REDUCER BUSHING FLUSH



(SP X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL12501-0	1½x1¼
DL12502-0	2x1¼
DL12502-1	2x1½
DL12503-1	3x1½
DL12503-2	3x2
DL12504-2	4x2
DL12504-3	4x3
DL12506-4	6x4
DL12508-4	8x4
DL12508-6	8x6
DL12510-3	10x3
DL12510-4	10x4
DL12510-6	10x6
DL12510-8	10x8
DL12512-3	12x3
DL12512-4	12x4
DL12512-6	12x6
DL12512-8	12x8
DL12512-10	12x10

ADAPTER SLEEVE FLUSH



ADAPTS PVC DWV TO PVC SEWER (SP X H)
(CERTIFIED TO CSA B182.2)

PRODUCT CODE	SIZE (IN)
DLP1200	2
DLP1207	3
DLP1208	4
DLP1209	6

REDUCER BUSHING



DISHWASHER BUSHING (SP X FPT)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL12501-15T	1½x½
DL12501-75T	1½x¾
DL12502-1T	2x1½

REDUCER BUSHING EXTENDED



(SP X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1201-0	1½x1¼
DL1202-0	2x1¼
DL1202-1	2x1½
DL1203-1	3x1½
DL1203-2	3x2
DL1204-2	4x2
DL1204-3	4x3
DL1216	6x4
DL1217	8x4
DL1218	8x6
DL1210-4	10x4
DL1210-6	10x6
DL1210-8	10x8
DL1212-4	12x4
DL1212-6	12x6
DL1212-8	12x8
DL1212-10	12x10
DL1214-4	14x4
DL1214-6	14x6
DL1214-8	14x8
DL1214-10	14x10
DL1214-12	14x12
DL1216-4	16x4
DL1216-6	16x6
DL1216-8	16x8
DL1216-10	16x10
DL1216-12	16x12
DL1216-14	16x14
DL1218-4	18x4
DL1218-6	18x6
DL1218-8	18x8
DL1218-10	18x10
DL1218-12	18x12
DL1218-14	18x14
DL1218-16	18x16



PVC DWV Drain Waste Vent

Only Available in Western Canada

MALE ADAPTER



(H X MPT) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1301-0	1½x1¼
DL1301	1½
DL1302	2
DL1303	3
DL1304	4
DL1306	6

FEMALE ADAPTER



(H X FPT) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1401	1½
DL1402	2
DL1403	3
DL1404	4
DL1406	6

COUPLING



(H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL601	1½
DL602	2
DL603	3
DL604	4
DL606	6
DL608	8
DL6010	10
DL6012	12
DL6014	14
DL6016	16
DL6018	18

SEWER TO DWV ADAPTER



ADAPTS PVC SEWER TO PVC DWV (H X H) (CERTIFIED TO CSA B182.2 - * DENOTES NOT CERTIFIED)

PRODUCT CODE	SIZE (IN)
DLP651	3x1½
DLP652	3x2
DLP655	4x3
DLP657	4x4
DLP658	6x4
DLP659	6x6
DLP658	8x8
DLP6510-8*	10x8
DLP6510*	10x10
DLP6512*	12x12

"P" TRAP



SOLVENT WELD (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1811P	1½
DL1822P	2
DL1833P	3
DL1844P	4
DL1843P	4x3

"P" TRAP



SOLVENT WELD WITH CLEANOUT (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1811PC	1½

"P" TRAP



UNION CONNECTION (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1811PU	1½
DL1822PU	2

"P" TRAP



UNION CONNECTION WITH CLEANOUT (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1811PUC	1½

U BEND



(H X H) (CERTIFIED TO CSA B181.2 AS PART OF TRAP ASSEMBLY)

PRODUCT CODE	SIZE (IN)
DL1811	1½
DL1822	2
DL1833	3
DL1844	4
DL1866	6

MALE TRAP ADAPTER



PLASTIC NUT AND WASHER (SP X SLIP JOINT) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1351-ON	1½ x 1¼
DL1351N	1½
DL1352N	2

PVC DWV Drain Waste Vent

Only Available in Western Canada

FEMALE TRAP ADAPTER



PLASTIC NUT AND WASHER (H X SLIP JOINT)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1451-ON	1½ x 1¼
DL1451N	1½
DL1452N	2

90° PIPE TRAP ADAPTER



PLASTIC NUT AND WASHER (H X SLIP JOINT)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL251-OTAN	1½ x 1¼
DL251TAN	1½

SANITARY TEE TRAP ADAPTER



PLASTIC NUT AND WASHER (H X H X SLIP JOINT)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL151TAN	1½

CLOSET FLANGE



ONE PIECE WITH MOULDED TEST PLATE (H X FLG)
(CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1803KO**	4x3
DL1804KO	4x4

ADJUSTABLE CLOSET FLANGE



WITH PLASTIC RING AND WITH MOULDED TEST PLATE
(H X FLG) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1803KOPR	4x3

ADJUSTABLE 45° DISCHARGE CLOSET FLANGE



WITH PLASTIC RING (H X FLG) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1803-45PR	4x3

EXPANSION JOINT



VERTICAL USE ONLY (H X H) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL631	1½ Type 1
DL632	2 Type 1
DL633	3 Type 2
DL634	4 Type 2

DISHWASHER WYE



(H X H X HOSE BARB) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DDL301DY	1½ x ½

PVC DWV END CAP HUB



(H X H X SP) (CERTIFIED TO CSA B181.2)

PRODUCT CODE	SIZE (IN)
DL1601	1½
DL1602	2
DL1603	3
DL1604	4
DL1606	6
DL1608	8
DL16010	10
DL16012	12
DL16014	14
DL16016	16
DL16018	18

POLYETHYLENE CAP















SLIP ON STYLE

PRODUCT CODE	SIZE (IN)
DL1601PE	1½
DL1602PE	2
DL1603PE	3
DL1604PE	4

Solvent Cement and Primer

1 Weld-On® Solvent Cements

PVC SOLVENT CEMENTS

			MAX PIPE SIZE (INTERFERENCE FIT)	SET TIME	INDUSTRY LISTING	PERFORMANCE SPECIFICATIONS
HEAVY BODIED	711™ PVC INDUSTRIAL GRADE (Gray)  <ul style="list-style-type: none"> High-strength formula for industrial piping systems. Good gap filling properties Medium set allows for more working time in warm weather. 		12" (315 mm) PVC all classes & schedules	Medium	 PW-G/DWV/SW	ASTM D 2564 NSF/ANSI 14 NSF/ANSI 61 CSA B137.3 CSA B181.2
	719™ PVC INDUSTRIAL GRADE (White or Gray)  <ul style="list-style-type: none"> Premium, high-strength formulation for large size industrial piping systems. Ideal for fabrication of large fittings and applications requiring high gap filling properties. Suitable for irrigation, conduit, other pressure and non-pressure applications. 		30" (800 mm) PVC, all classes & schedules	Slow	 PW-G/DWV/SW  PW-G/DWV/SW (Gray Only)	ASTM D 2564 NSF/ANSI 14 NSF/ANSI 61 CSA B137.3 CSA B181.2
MEDIUM BODIED	705™ PVC INDUSTRIAL GRADE (Clear or Gray)  <ul style="list-style-type: none"> High-strength formula for industrial, irrigation, DWV, electrical conduit, pool & spa and plumbing, including PVC foam core pipe. Can be used without primer on non-pressure systems if local codes permit. 		6" (160 mm) PVC 4" (110 mm) Schedule 80 PVC – PN 10 & 16	Fast	 PW-G/DWV/SW  PW-G/DWV/SW (Gray Only)	ASTM D 2564 NSF/ANSI 14 NSF/ANSI 61 CSA B137.3 CSA B181.2
	725™ WET 'R DRY™* (Aqua Blue)  <ul style="list-style-type: none"> Premium formula for wet conditions and/or quick pressurization. Suitable for irrigation, plumbing, and pool & spa applications. Can be used without primer on non-pressure systems if local codes permit. 		6" (160 mm) PVC 4" (110 mm) Schedule 80 PVC – PN 10 & 16	Extremely Fast	 PW-G/DWV/SW	ASTM D 2564 NSF/ANSI 14 NSF/ANSI 61 CSA B137.3 CSA B181.2
	727™ HOT 'R COLD™* (Clear)  <ul style="list-style-type: none"> Premium formula for all weather conditions (-15°F to 110°F / -26°C to 43°C). Excellent for industrial, irrigation, electrical conduit, pool & spa and plumbing, including PVC foam core pipe. Can be used without primer on non-pressure systems if local codes permit. 		6" (160 mm) PVC 4" (110 mm) Schedule 80 PVC – PN 10 & 16	Very Fast	 PW-G/DWV/SW	ASTM D 2564 NSF/ANSI 14 NSF/ANSI 61

NOTE: * Special Order Only
 -Contact FABCO for Eco Series availability



ECO SERIES



ALL WELD-ON PRODUCTS

INTRODUCING

ECO™ Series












your responsible choice

**The strength you trust,
 now with ultra low VOC**

- Superior joint strength
- Fast setting
- 30% lower solvent emissions
- Less odorous fumes
- Improved working environment



CPVC SOLVENT CEMENTS

HEAVY BODIED	714™ CPVC (Gray or Orange)				
		<ul style="list-style-type: none"> Industrial quality for non-chemical applications up to 180°F (82°C). Approved for use on Corzan® CPVC piping systems. 	12" (315 mm) CPVC, all classes & schedules	Medium	 ASTM D 2846  ASTM F 493  NSF/ANSI 14  NSF/ANSI 61  CSA B137.6 (Orange Only)
HEAVY BODIED	724™ CPVC INDUSTRIAL GRADE (Gray or Orange)				
		<ul style="list-style-type: none"> Premium, high-strength, chemical-resistant solvent cement for use with CPVC and PVC piping systems carrying acids, bases, salts, and hypochlorites. Approved for use on Corzan® CPVC piping systems. 	12" (315 mm) CPVC, all classes & schedules	Medium	 ASTM F 493  NSF/ANSI 14  NSF/ANSI 61 PW-G/DWV/SW
EXTRA HEAVY BODIED	729™ CPVC* INDUSTRIAL GRADE (Gray)				
		<ul style="list-style-type: none"> Extra heavy body industrial quality cement for applications requiring high gap filling properties. Ideal for fabrication of large sized fittings. May be used for chemical applications. 	24" (600 mm) CPVC, all classes & schedules	Slow	- ASTM F 493

NOTE: * Special Order Only
-Contact FABCO for Eco Series availability



ECO SERIES



ALL WELD-ON PRODUCTS



Weld-On® 724™ CPVC and PVC (orange)

One Cement for CPVC and PVC



A Chemical-resistant cement for acids, bases, salts and hypochlorites. For CPVC and PVC industrial piping systems thru 12" (315mm) diameters.

Specifically formulated for joining CPVC and PVC industrial piping systems carrying corrosive chemicals, WELD-ON 724™ is the most chemical resistant CPVC solvent cement in the industry. Laboratory analysis showed no joint failure even after 2,500 hours of pressure tests in numerous chemical solutions.

WELD-ON 724™ is  and  (PW-G / DWV / SW) listed, meets ASTM F 493 standard, and is approved for Corzan® industrial piping systems. For CPVC and PVC pipe and fittings with interference fit up to 12 inches (315 mm) diameter, all classes & schedules. This LOW VOC product meets strict environmental air quality regulations and can qualify for credit under the LEED® Green Building Rating System.

Product Description:

- Heavy bodied, medium setting orange or gray Low VOC cement for all classes and schedules with interference fit through 12" diameter.
- Professional grade, high-strength, chemical-resistant solvent cement for use with CPVC and PVC piping systems carrying acids, bases, salts, and hypochlorites.
- Approved for use on Corzan® CPVC piping systems.
- 2 year shelf life.

Performance Specifications:

Meets and exceeds:

- ASTM F 493
- NSF/ANSI 14
- NSF/ANSI 61

ORDER GUIDELINES

STOCK NUMBER	CAN SIZE	PACKAGING	UNITS PER CASE	LBS PER CASE
12817	Gallon	metal wide-mouth can with screw top	6	56
12818	Quart	metal can with applicator top	12	29
13531	Pint	metal can with applicator top	12	15



Solvent Cement and Primer

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PIPES & FITTINGS

Weld-On® Primers, Adhesives and Accessories

PRIMERS

INDUSTRY LISTING

PERFORMANCE SPECIFICATIONS

P-70™ PRIMER (Clear or Purple)



- Premium industrial strength primer essential for proper softening and preparation of PVC and CPVC pipe and fitting surfaces.
- Specially recommended for use on Schedule 80 (PN 10 and higher) and large size pipe.
- Excellent for cold weather applications.



PW-G/DWV/SW

ASTM F 656
NSF/ANSI 14
NSF/ANSI 61

REPAIR AND FABRICATION ADHESIVES**

APPLICABLE FOR USE WITH

VISCOSITY

SET TIME

SHELF LIFE

810™ (White)



- Thick syrupy, two-component, high strength reactive adhesive.
- Product can withstand very high pressures and is high impact resistant. Great for repairing cracks or leaky pipe valves and fittings.
- Excellent gap-filling properties. Ideal for fabricating fittings and joining saddles to pipe. Good for bonding large diameter PVC and CPVC pipe and fittings.

Non-anodized aluminum, Other metals, Concrete, PVC, CPVC, ABS, Acrylic, Clay, Styrene, FRP

40,000 cps

1 hour

1 year

845™* (White)



- Thick syrupy, two-component, high strength reactive adhesive. Same formula as 810, but different packaging format.
- Product can withstand very high pressures and is high impact resistant. Great for repairing cracks or leaky pipe valves and fittings.
- Excellent gap-filling properties. Ideal for fabricating fittings and joining saddles to pipe. Good for bonding large diameter PVC and CPVC pipe and fittings.
- Conveniently packaged in a dual cylinder cartridge for easy dispensing and application to the bonding surfaces.

Non-anodized aluminum, Other metals, Concrete, PVC, CPVC, ABS, Acrylic, Clay, Styrene, FRP

40,000 cps









1 hour

1 year



NOTE: * Special Order Only

** The following Weld-On adhesives have Low VOC emissions per SCAQMD Rule 1168. Use of these products can qualify for one credit in the LEED® Green Building Rating System – Indoor Environmental Quality.


ROLL-A-WELD ROLLERS, SWABS & BRUSHES

	SuperSwab: See next page SuperSwab for 4-24" pipe		PB-1 Brush: 0000600 Plastic Handle Brush; fits standard pint and quart cans.
	3020MT653 Roll-A-Weld 3" roller for pipe diameters from 3" through 6"; fits MT-653 empty quart triple tight neck can.		4020 4" swab for pipe diameters of 6" or larger; fits MT-648 empty gallon can and cements available in wide mouth cans.
	5020 4" swab for pipe diameters from 3" through 8"; fits standard quart can as well as MT-651 empty quart can.		6020MT651 Roll-A-Weld 4" roller for pipe diameters from 3" through 8"; fits standard quart can as well as MT-651 empty quart can.
	7020MT648 Jumbo Roll-A-Weld 7" roller for pipe diameters of 6" or larger; fits MT-648 gallon can and cements available in wide mouth cans.		8020 4" cotton swab with wire handle for use on pipe diameter 6" or larger.

DAUBERS

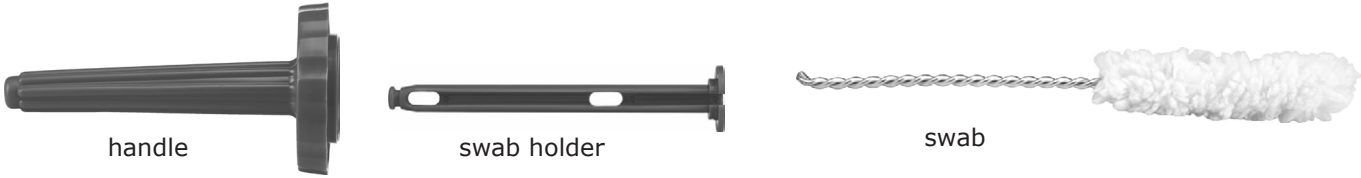
	Can-Mate daubers: CM-75 or CM150 Adjustable plastic applicator with telescoping stem to fit ½ pint, pint, and quart cans. Available in ½", ¾" and 1¼" dauber sizes.		Cap daubers: 000016 DH Daubers fit ¼ pint & ½ pint cans; DP daubers fit ½ pint & pint cans; DQ daubers fit quart cans. Available ¾" dauber sizes.
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ACCESSORIES

	Empty Metal Cans (dauber not included)			
	MT-648	MT-651	MT-653	MT-654
	Gallon can with 2 7/8" neck	Quart can with 1¾" neck	Quart can with triple tight neck (paint style)	Pint can with 1¾" neck

SuperSwab®

A sturdy easy-to-grip 4" swab for pipe diameter from 4" through 24". Adjustable length and dual cap design that fits quart and gallon containers.



*Note: The swab is disposable and replaceable. Swab holder and handle are reusable.

ORDER GUIDELINES

PART NUMBER	DESCRIPTION
14108	Complete assembly
14111	SuperSwab bulk pack contains swabs, swab holders and handles.
14112	Replacement swab bulk pack only contains swabs.

Assembly Instructions

1. Replace used swab by using a tool (e.g. flat screwdriver or key), position it between swab holder and handle, and unsnap. Remove swab from holder.



2. Lay new swab wire end into groove with curved tip downward in desired oval opening.

Position A for gallon container
Position B for quart container



3. Align wire with tooth. Push swab holder into handle and snap into position.



4. The assembled SuperSwab is now ready for use with Weld-On products.



Solvent Cement and Primer

1

Weld-On® Solvent Cement Average Set and Cure Times

AVERAGE JOINT CURE SCHEDULE FOR WELD-ON PVC/CPVC SOLVENT CEMENTS*

RELATIVE HUMIDITY 60% OR LESS	PIPE SIZES							
	1/2" TO 1-1/4" (20-40MM)		1-1/2" TO 2" (50-63MM)		2-1/2" TO 8" (75-200MM)		10" TO 15" (250-380MM)	15"+ (380MM+)
TEMPERATURE RANGE DURING ASSEMBLY AND CURE PERIODS	UP TO 160 PSI (11 BAR)	160 TO 370 PSI (11-26 BAR)	UP TO 160 PSI (11 BAR)	160 TO 315 PSI (11-22 BAR)	UP TO 160 PSI (11 BAR)	160 TO 315 PSI (11-22 BAR)	UP TO 100 PSI (7 BAR)	UP TO 100 PSI (7 BAR)
60°-100°F	15 min.	6 hrs.	30 min.	12 hrs.	1 1/2 hrs.	24 hrs.	48 hrs.	72 hrs.
40°-60°F	20 min.	12 hrs.	45 min.	24 hrs.	4 hrs.	48 hrs.	96 hrs.	6 days
0°-40°F	30 min.	48 hrs.	1 hr.	96 hrs.	72 hrs.	8 days	8 days	14 days

Note: Joint cure schedule is the necessary time to allow before pressurizing system.
In damp or humid weather allow 50% more cure time.

*These figures are estimates based on our laboratory tests. These figures should be used as a general guide only.

AVERAGE INITIAL SET SCHEDULE FOR WELD-ON PVC/CPVC SOLVENT CEMENTS*

TEMPERATURE RANGE	1/2" TO 1 1/4" (20-40MM)	1 1/2" TO 2" (50-63MM)	2 1/2" TO 8" (75-200MM)	10" TO 15" (250-380MM)	15"+ (380MM+)
60-100°F / 16 - 38°C	2 min.	5 min.	30 min.	2 hrs.	4 hrs.
40-60°F / 5 - 16°C	5 min.	10 min.	2 hrs.	8 hrs.	16 hrs.
0-40°F / -18 - 5°C	10 min.	15 min.	12 hrs.	24 hrs.	48 hrs.

Note: Initial set schedule is the necessary time to allow before the joint can be carefully handled.
In damp or humid weather, allow 50% more set time.

*These figures are estimates based on our laboratory tests. These figures should be used as a general guide only.

AVERAGE NUMBER OF JOINTS/QUART (1KG) OF WELD-ON® CEMENT*

PIPE DIAMETER	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	15"	18"
NUMBER OF JOINTS	300	200	125	90	60	40	30	10	5	2-3	1-2	3/4	1/2

For Primer: Double the number of joints shown for cement. Note: 1 Joint = 1 Socket

*These figures are estimates based on our laboratory tests. These figures should be used as a general guide only.

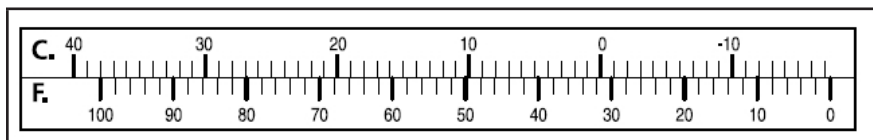
PIPE SIZE EQUIVALENT CHART - INCHES/MILLIMETERS

INCHES	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	14	18	24	30
MILLIMETERS	20	25	32	40	50	63	75	90	110	160	200	250	315	355	450	600	800

PRODUCT SHELF LIFE

WELD-ON PRODUCT	SHELF-LIFE
Primers/Cleaners	3 years
PVC Solvent Cement	3 years
CPVC Solvent Cement	2 years
ABS Solvent Cement	3 years

FAHRENHEIT TO CELSIUS CONVERSION CHART



Natural Polypropylene Pipe



Rigid Natural non-pigmented polypropylene used in the manufacture of industrial piping components conform to the requirements in ASTM D-4101. All components are manufactured from a high purity, unpigmented compound. Fittings are industrial, heavy duty, Schedule 80 hub style. Fitting components that utilize socket type heat fusion welded connections have socket lengths and wall thicknesses conforming to ASTM D-2467 and socket diameters are in accordance with the manufacturer's printed recommendations to provide an interference fit with the pipe. Components utilizing taper pipe threads are to have thread lengths, diameters, and configurations in conformance with ASTM D-2464. Unions are the Viton O-ring seal type.

Features

- Stocked in 20' lengths, plain end
- Extremely corrosion resistant
- Ideal for applications up to 180 °F
- Joined by the thermo-seal fusion process, threading or flanging

Applications

- Semi-conductor
- Pharmaceutical
- Chemical processing
- Pulp and paper
- Electronic
- Biotechnology
- Healthcare
- Universities

MM	NOMINAL PIPE SIZE (IN)	PART NUMBER	OUTSIDE DIAMETER (IN)	MIN. WALL THICKNESS (IN)	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
12	1/2 x 20 ft	69306	0.840	0.147	14	410
20	3/4 x 20 ft	69307	1.050	0.154	18	330
25	1 x 20 ft	69308	1.315	0.179	27	310
40	1 1/2 x 20	69310	1.900	0.200	45	230
50	2 x 20 ft	69311	2.375	0.218	62	200
75	3 x 20 ft	69313	3.500	0.300	126	190
100	4 x 20 ft	69314	4.500	0.337	184	160

Notes:

- Pipe sold in 100 foot bundles to 6".
- Pipe is 20 feet long in plain ends. For other lengths and pipe ends, please consult our customer service department.
- Threading polypropylene schedule 80 pipe reduces working pressure to approximately 20 psi (drainage). Threading polypropylene schedule 40 pipe is not recommended.
- Larger diameter pipe is available on request. Please consult our customer service department.
- These products are not recommended for compressed air or gas systems.
- Black Polypropylene socket and threaded systems available on request. Please consult our customer service department.

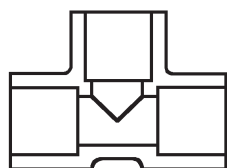
Natural Polypropylene Fittings

Natural Polypropylene Schedule 80 Fittings

Notes:

- Socket valves, flanges, and unions, regardless of size are rated at 150 psi for water service at 73.4°F (23°C).
- Other fittings are available upon request
- All 1/2" - 4" Moulded flanges have a 150 psi Maximum Internal Pressure Rating @ 73°F (23°C).
- No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- Larger sizes available on request.

SOCKET TEES



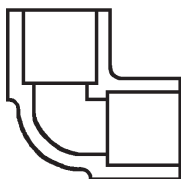
NOMINAL PIPE SIZE	PART NUMBER
1/2	601005
3/4	601007
1	601010
1 1/2	601015
2	601020
3	601030
4	601040

150 LB BLIND FLANGES



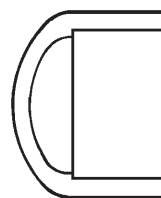
NOMINAL PIPE SIZE	PART NUMBER
1/2	653005
3/4	653007
1	653010
1 1/2	653015
2	653020
3	653030
4	653040

90° SOCKET ELBOWS



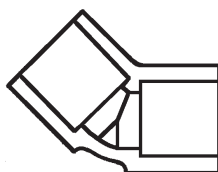
NOMINAL PIPE SIZE	PART NUMBER
1/2	606005
3/4	606007
1	606010
1 1/2	606015
2	606020
3	606030
4	606040

SOCKET CAPS



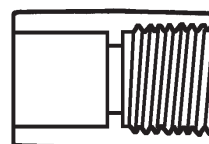
NOMINAL PIPE SIZE	PART NUMBER
1/2	647005
3/4	647007
1	647010
1 1/2	647015
2	647020
3	647030
4	647040

45° SOCKET ELBOWS



NOMINAL PIPE SIZE	PART NUMBER
1/2	617005
3/4	617007
1	617010
1 1/2	617015
2	617020
3	617030
4	617040

FEMALE ADAPTERS



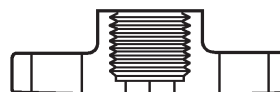
NOMINAL PIPE SIZE	PART NUMBER
1/2	635005
3/4	635007
1	635010
1 1/2	635015
2	635020
3	635030
4	635040

150 LB SOCKET FLANGES



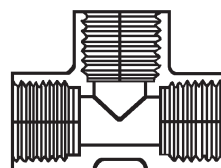
NOMINAL PIPE SIZE	PART NUMBER
1/2	651005
3/4	651007
1	651010
1 1/2	651015
2	651020
3	651030
4	651040

150 LB THREADED FLANGES



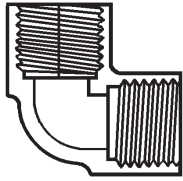
NOMINAL PIPE SIZE	PART NUMBER
1/2	652005
3/4	652007
1	652010
1 1/2	652015
2	652020
3	652030
4	652040

THREADED TEES



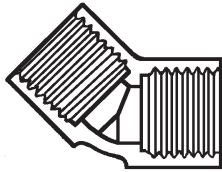
NOMINAL PIPE SIZE	PART NUMBER
1/2	605005
3/4	605007
1	605010
1 1/2	605015
2	605020
3	605030
4	605040

90° THREADED ELBOWS



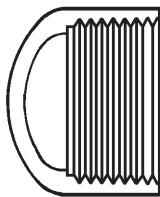
NOMINAL PIPE SIZE	PART NUMBER
1/2	608005
3/4	608007
1	608010
1 1/2	608015
2	608020
3	608030
4	608040

45° THREADED ELBOWS



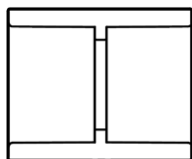
NOMINAL PIPE SIZE	PART NUMBER
1/2	619005
3/4	619007
1	619010
1 1/2	619015
2	619020
3	619030
4	619040

THREADED CAPS



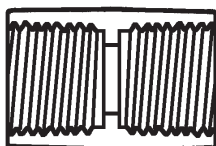
NOMINAL PIPE SIZE	PART NUMBER
1/2	648005
3/4	648007
1	648010
1 1/2	648015
2	648020
3	648030
4	648040

SOCKET COUPLINGS



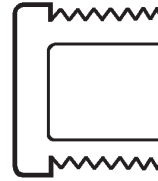
NOMINAL PIPE SIZE	PART NUMBER
1/2	629005
3/4	629007
1	629010
1 1/2	629015
2	629020
3	629030
4	629040

THREADED COUPLINGS



NOMINAL PIPE SIZE	PART NUMBER
1/2	630005
3/4	630007
1	630010
1 1/2	630015
2	630020
3	630030
4	630040

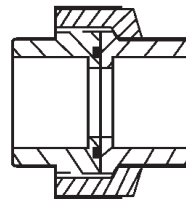
THREADED PLUGS



NOMINAL PIPE SIZE	PART NUMBER
1/2	650005
3/4	650007
1	650010
1 1/2	650015
2	650020
3	650030
4	650040

SOCKET UNIONS

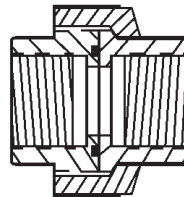
(Viton o-Rings)



NOMINAL PIPE SIZE	PART NUMBER
1/2	697005
3/4	697007
1	697010
1 1/2	697015
2	697020

THREADED UNIONS

(Viton o-Rings)



NOMINAL PIPE SIZE	PART NUMBER
1/2	698005
3/4	698007
1	698010
1 1/2	698015
2	698020

THREADED NIPPLES

(close)



DIAMETER (INCHES)	PART NUMBER
1/2	661063
3/4	661104
1	661133
1 1/2	661213
2	661251
3	661338
4	661422

THREADED NIPPLES

(short)



DIAMETER (INCHES)	PART NUMBER
1/2	661078
3/4	661105
1	661134
1 1/2	661214
2	661252

Natural Polypropylene Fittings

THREADED NIPPLES

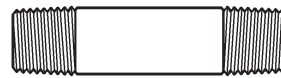
(3 Inches)



DIAMETER (INCHES)	PART NUMBER
1/2	661081
3/4	661106
1	661135
1 1/2	661215
2	661253
3	661339

THREADED NIPPLES

(6 inches)



DIAMETER (INCHES)	PART NUMBER
1/2	661084
3/4	661109
1	661138
1 1/2	661218
2	661256
3	661343
4	661426

THREADED NIPPLES

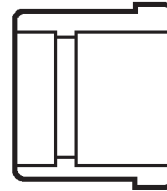
(4 inches)



DIAMETER (INCHES)	PART NUMBER
1/2	661082
3/4	661107
1	661136
1 1/2	661216
2	661254
3	661341
4	661423

REDUCER BUSHINGS

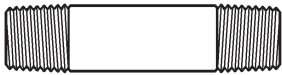
(socket x slip)



NOMINAL PIPE SIZE	PART NUMBER
3/4 x 1/2	637101
1 x 1/2	637130
1 x 3/4	637131
1 1/2 x 1	637211
2 x 1	637249
2 x 1 1/2	637251
3 x 2	637338
4 x 3	637422

THREADED NIPPLES

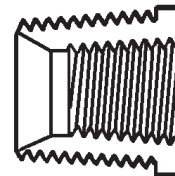
(5 inches)



DIAMETER (INCHES)	PART NUMBER
1/2	661083
3/4	661108
1	661137
1 1/2	661217
2	661255
3	661342
4	661430

REDUCER BUSHINGS

(fpt x mpt)



NOMINAL PIPE SIZE	PART NUMBER
3/4 x 1/2	639101
1 x 1/2	639130
1 x 3/4	639131
1 1/2 x 1	639211
2 x 1	639249
2 x 1 1/2	639251



PVDF Schedule 80 Pipe

(Polyvinylidene Fluoride) PVDF is a strong, tough, and abrasion resistant fluorocarbon material. It resists distortion and retains most of its strength to 280°F. It is chemically resistant to most acids, bases and organic solvents and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other solid thermoplastic piping components can approach the combination of strength, chemical resistance and working temperatures of PVDF. PVDF is joined by the thermo-seal fusion process, threading or flanging.

The great versatility of the material, with its unique combination of physical and chemical properties, as well as the simple installation process of pipe, fittings and valves, make it the piping system of choice for applications in industries like semiconductor, pharmaceutical, chemical processing, metal finishing, pulp and paper.

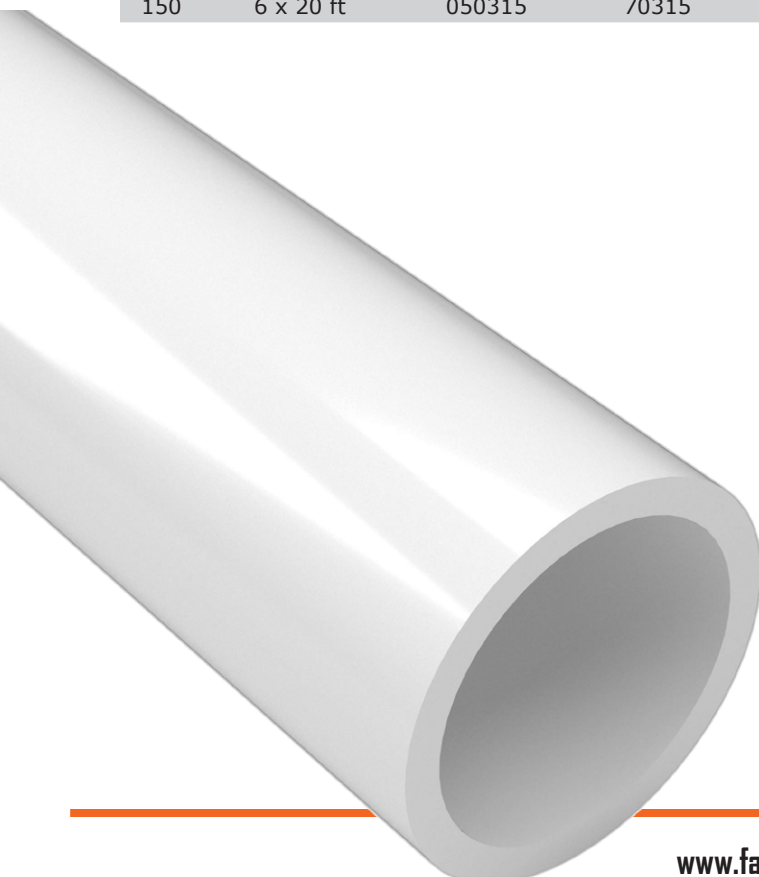
Applications:

- Semi-conductor
- Pharmaceutical
- Chemical processing
- Pulp and paper
- Electronic
- Biotechnology
- Healthcare
- Universities

Features:

- Available in 20' lengths, plain end
- Available in Red Kynar® or natural
- Extremely corrosion resistant
- Ideal for applications up to 280 °F
- Joined by the thermo-seal fusion process, threading or flanging.

MM	NOMINAL PIPE SIZE (INCHES)	PART NUMBER RED	PART NUMBER NATURAL	FEET PER BUNDLE	OUTSIDE DIAMETER (IN)	INSIDE DIAMETER (IN)	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
12	1/2 x 20 ft	050307	70307	140	0.840	0.546	26	580
20	3/4 x 20 ft	050308	70308	100	1.050	0.742	35	470
25	1 x 20 ft	050309	70309	80	1.315	0.957	51	430
40	1 1/2 x 20 ft	050311	70311	80	1.900	1.500	86	320
50	2 x 20 ft	050312	70312	60	2.375	1.939	119	270
75	3 x 20 ft	050313	70313	20	3.500	2.900	246	250
100	4 x 20 ft	050314	70314	20	4.500	3.826	360	250
150	6 x 20 ft	050315	70315	20	6.625	5.761	686	N.R.



Notes:

- Threaded pipe and fittings shall be rated at 50% of the values given for socket.
- Valves, unions and flanges (either socket or threaded) shall be pressure rated at 150 psi service at 73.4°F(23°C), non-shock and have a minimum burst requirement of 3.3 times the rated pressure.
- Pipe is 20 feet long in plain ends. For other lengths and pipe ends, please consult our customer service department.
- Red Kynar® pipe is pigmented to resist ultra-violet attack when handling high concentrations of halogens. The pipe is completely compatible to Fabco's line of Kynar® fittings and valves.
- Larger diameter pipe is available upon request. Please consult customer service.
- These products are not recommended for compressed air or gas systems.
- N.R. = Not recommended for pressure applications.
- Schedule 40 pipe available upon request.

PVDF Fittings

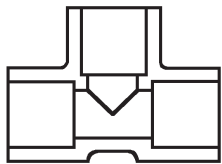
1

PVDF Red and Natural Fittings

Notes:

- Other fittings are available on request.
- All 1/2"-6" Molded flanges have a 150 psi Maximum Internal Pressure Rating @ 73°F (23°C).
- No provisions have been made for pressure surges, water hammer, or other conditions which should be considered.
- Webbed - Honeycomb style flanges/blind flanges/vanstone flanges are available.
- For threaded one end nipples or other length nipples, please call Fabco.

SOCKET TEES



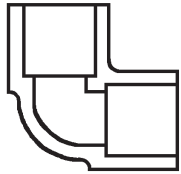
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5801005	701005
3/4	5801007	701007
1	5801010	701010
1 1/2	5801015	701015
2	5801020	701020
3	5801030	701030
4	5801040	701040
6	5801060	701060

150LB BLIND FLANGES



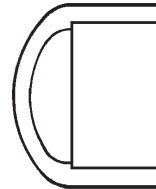
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5853005	753005
3/4	5853007	753007
1	5853010	753010
1 1/2	5853015	753015
2	5853020	753020
3	5853030	753030
4	5853040	753040
6	5853060	753060

90° SOCKET ELBOWS



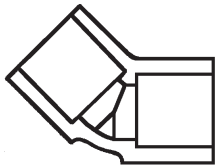
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5806005	706005
3/4	5806007	706007
1	5806010	706010
1 1/2	5806015	706015
2	5806020	706020
3	5806030	706030
4	5806040	706040
6	5806060	706060

SOCKET CAPS



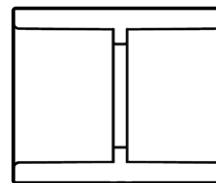
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5847005	747005
3/4	5847007	747007
1	5847010	747010
1 1/2	5847015	747015
2	5847020	747020
3	5847030	747030
4	5847040	747040
6	5847060	747060

45° SOCKET ELBOWS



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5817005	717005
3/4	5817007	717007
1	5817010	717010
1 1/2	5817015	717015
2	5817020	717020
3	5817030	717030
4	5817040	717040
6	5817060	717060

SOCKET COUPLINGS



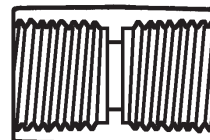
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5829005	729005
3/4	5829007	729007
1	5829010	729010
1 1/2	5829015	729015
2	5829020	729020
3	5829030	729030
4	5829040	729040
6	5829060	729060

150LB SOCKET FLANGES



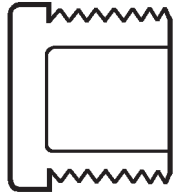
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5851005	751005
3/4	5851007	751007
1	5851010	751010
1 1/2	5851015	751015
2	5851020	751020
3	5851030	751030
4	5851040	751040
6	5851060	751060

THREADED COUPLINGS



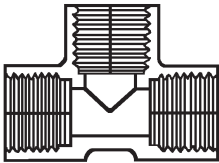
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5830005	730005
3/4	5830007	730007
1	5830010	730010
1 1/2	5830015	730015
2	5830020	730020

THREADED PLUGS



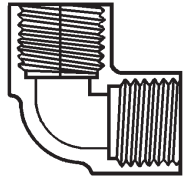
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5850005	750005
3/4	5850007	750007
1	5850010	750010
1 1/2	5850015	750015
2	5850020	750020
3	5850030	750030
4	5850040	750040

THREADED TEES



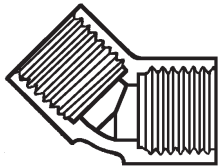
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5805005	705005
3/4	5805007	705007
1	5805010	705010
1 1/2	5805015	705015
2	5805020	705020

90° THREADED ELBOWS



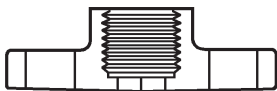
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5808005	708005
3/4	5808007	708007
1	5808010	708010
1 1/2	5808015	708015
2	5808020	708020

45° THREADED ELBOWS



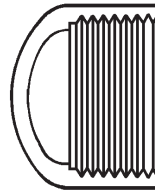
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5819005	719005
3/4	5819007	719007
1	5819010	719010
1 1/2	5819015	719015
2	5819020	719020

150LB THREADED FLANGES



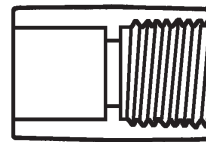
NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5852005	752005
3/4	5852007	752007
1	5852010	752010
1 1/2	5852015	752015
2	5852020	752020

THREADED CAPS



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5848005	748005
3/4	5848007	748007
1	5848010	748010
1 1/2	5848015	748015
2	5848020	748020

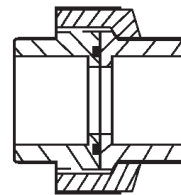
FEMALE ADAPTERS



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5835005	735005
3/4	5835007	735007
1	5835010	735010
1 1/2	5835015	735015
2	5835020	735020

SOCKET UNIONS

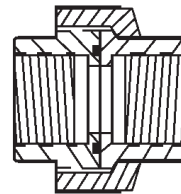
(Viton o-rings)



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5897005	797005
3/4	5897007	797007
1	5897010	797010
1 1/2	5897015	797015
2	5897020	797020

THREADED UNIONS

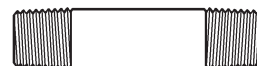
(Viton o-rings)



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5898005	798005
3/4	5898007	798007
1	5898010	798010
1 1/2	5898015	798015
2	5898020	798020

THREADED NIPPLES

(close)



NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
1/2	5861063	761063
3/4	5861104	761104
1	5861133	761133
1 1/2	5861213	761213
2	5861251	761251

PVDF Fittings

THREADED NIPPLES	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(short)	1/2	5861078	761078
	3/4	5861105	761105
	1	5861134	761134
	1 1/2	5861214	761214
	2	5861252	761252

THREADED NIPPLES	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(3 inch)	1/2	5861081	761081
	3/4	5861106	761106
	1	5861135	761135
	1 1/2	5861215	761215
	2	5861253	761253

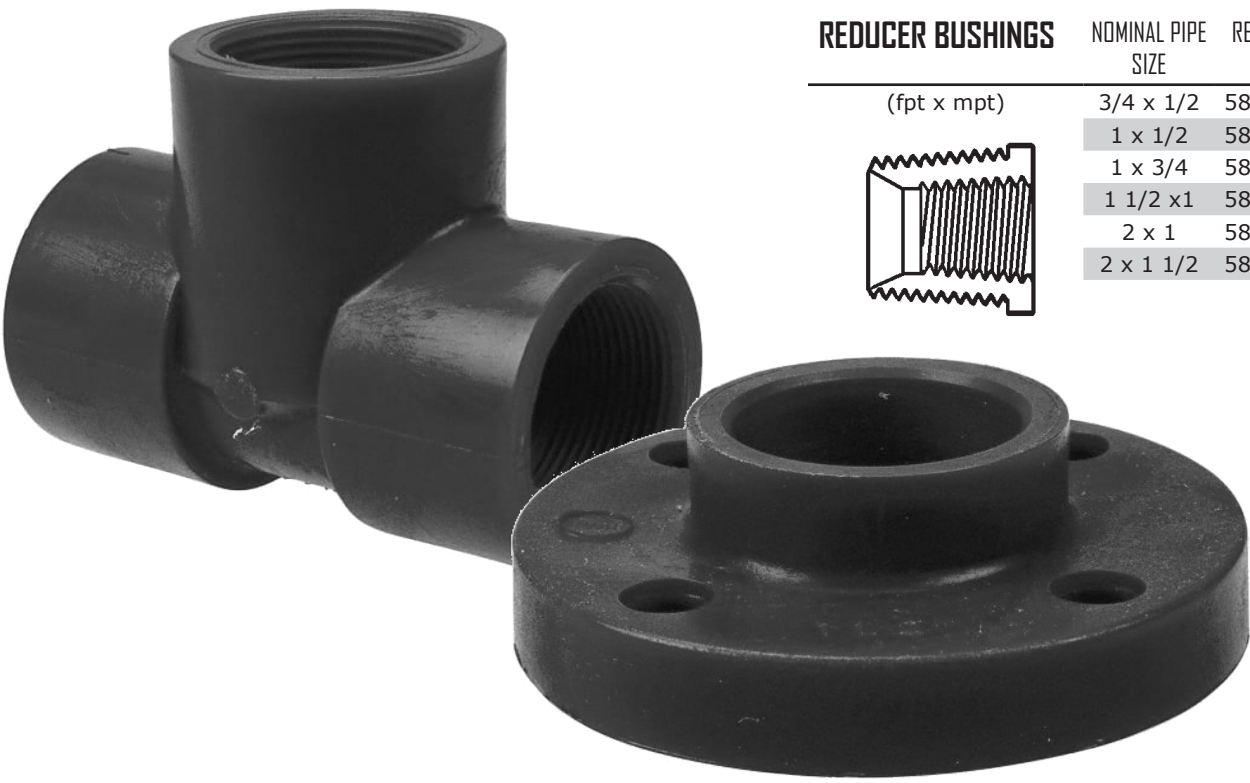
THREADED NIPPLES	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(4 inch)	1/2	5861082	761082
	3/4	5861107	761107
	1	5861136	761136
	1 1/2	5861216	761216
	2	5861254	761254

THREADED NIPPLES	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(5 inch)	1/2	5861083	761083
	3/4	5861108	761108
	1	5861137	761137
	1 1/2	5861217	761217
	2	5861255	761255

THREADED NIPPLES	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(6 inch)	1/2	5861084	761084
	3/4	5861109	761109
	1	5861138	761138
	1 1/2	5861218	761218
	2	5861256	761256

REDUCER BUSHINGS	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(socket x slip)	3/4 x 1/2	5837101	737101
	1 x 1/2	5837130	737130
	1 x 3/4	5837131	737131
	1 1/2 x 1	5837211	737211
	2 x 1	5837249	737249
	2 x 1 1/2	5837251	737251
	3 x 2	5837338	737338
	4 x 3	5837422	737422
	6 x 4	5837532	737532

REDUCER BUSHINGS	NOMINAL PIPE SIZE	RED PART NO.	NATURAL PART NO.
(fpt x mpt)	3/4 x 1/2	5839101	739101
	1 x 1/2	5839130	739130
	1 x 3/4	5839131	739131
	1 1/2 x 1	5839211	739211
	2 x 1	5839249	739249
	2 x 1 1/2	5839251	739251



High Density Polyethylene Pipe



Fabco Plastics is the leading Canadian supplier of industrial plastic pipe including HDPE. Our dedicated and knowledgeable sales staff can provide high quality technical information and accurate project quotations on a timely basis. Fabco provides HDPE pipe to 63", custom fabricated butt fusion fittings, butt fusion equipment and easy to use electrofusion fittings to 12".

The standard length of HDPE pipe is 50 feet, in sizes above 2" in diameter with longer lengths available on request. Coiled pipe is available in diameters up to 3" and is available in 250 and 500 foot lengths. Larger pipe sizes and coil lengths are available on special request.

Features:

HDPE Pipe is Leak Proof: HDPE pipe can be joined by thermal fusion to form a joint that is as strong as the pipe itself and is leak free. Thermal fusion eliminates potential leak points every 8-20 feet commonly found with Concrete, PVC and Ductile Iron pipe. Leak proof joints also eliminate infiltration and exfiltration problems experienced with other pipe joining methods. Since fused joints are self-restraining, costly thrust restraints or thrust blocks are not required.

HDPE Pipe is Corrosion and Chemical Resistant: HDPE pipe will not corrode, tuberculate or support biological growth. It is the material of choice in harsh chemical environments. HDPE pipe has a smooth ID and maintains its flow capability over time - Hazen Williams C Factor remains 150, even after years of use.

HDPE Pipe is Flexible and Fatigue Resistant: HDPE pipe can be bent to a radius 25 times the nominal pipe diameter. This can eliminate many fittings required for directional changes compared to piping systems made from other materials. In addition, the flexibility of HDPE pipe makes it well suited for dynamic soils and areas prone to earthquake. HDPE pipe for pressure applications can accept repetitive pressure surges that exceed the static pressure rating of the pipe.

HDPE Pipe is Lightweight and Impact Resistant: HDPE pipe is much easier to handle and install than heavier, rigid metallic or concrete pipe, allowing for cost advantages in the construction process. It is structurally better able to withstand an impact than other pipe materials, especially in cold weather installations when other pipes like PVC are prone to cracks and breaks.

HDPE Pipe is Easy to Install: Flexibility and leak free joints allow for unique and cost effective methods of installation of HDPE pipe that the rigid Concrete, PVC and Ductile Iron pipes can't use. These alternate installation methods (Horizontal Directional Drilling, Pipe Bursting, Sliplining, Plow and Plant, Submerged or Floating Pipe) can save considerable time and money in most applications.

HDPE Pipe is Cost Effective and Permanent: HDPE pipe is cost effective and has long term cost advantages due to its physical properties, leak free joints and reduced maintenance costs. The Plastics Pipe Institute estimates the service life for HDPE pipe to conservatively be 50-100 years.

Applications:

Water pressure pipes for municipal and industrial transmission systems such as:

- potable water
- sewer
- drain
- mining
- irrigation
- slip lining
- reclaimed water

PE 4710 Resin Specifications

Materials:

HDPE pressure pipe is manufactured with premium, highly engineered PE4710 resin that provides maximum performance benefits to service today's municipal and industrial water needs. The PE4710 material conforms to ASTM D3350 with the cell classification of 445574C/E and is listed with the Plastic Pipe Institute's (PPI) TR4. It is formulated with carbon black and/or ultraviolet stabilizer for maximum protection against UV rays for added assurance.

		DR 7 (333 PSI)			DR 7.3 (318 PSI)			DR9 (250 PSI)			DR11 (200 PSI)		
NOMINAL PIPE SIZE	AVERAGE OUTSIDE DIAMETER	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)
1/2	0.84	0.12	0.59	0.12	0.115	0.6	0.11	0.093	0.64	0.1	0.076	0.68	0.08
3/4	1.05	0.15	0.73	0.19	0.144	0.75	0.18	0.117	0.8	0.15	0.095	0.85	0.12
1	1.315	0.188	0.92	0.29	0.18	0.93	0.28	0.146	1.01	0.23	0.12	1.06	0.2
2	2.375	0.339	1.66	0.95	0.325	1.69	0.91	0.264	1.82	0.77	0.216	1.92	0.64
3	3.5	0.5	2.44	2.06	0.479	2.48	1.98	0.389	2.68	1.66	0.318	2.83	1.39
4	4.5	0.643	3.14	3.4	0.616	3.19	3.28	0.5	3.44	2.75	0.409	3.63	2.3
5 3/8	5.375	0.768	3.75	4.85	0.736	3.81	4.68	0.597	4.11	3.92	0.489	4.34	3.29
5	5.563	0.795	3.88	5.2	0.762	3.95	5.02	0.618	4.25	4.2	0.506	4.49	3.52
6	6.625	0.946	4.62	7.36	0.908	4.7	7.12	0.736	5.06	5.96	0.602	5.35	4.99
7	7.125	0.976	5.06	8.23	0.976	5.06	8.23	0.792	5.45	6.89	0.648	5.75	5.78
8	8.625	1.232	6.01	12.48	1.182	6.12	12.06	0.958	6.59	10.09	0.784	6.96	8.46
10	10.75	1.536	7.49	19.4	1.473	7.63	18.74	1.194	8.22	15.68	0.977	8.68	13.14
12	12.75	1.821	8.89	27.28	1.747	9.05	26.36	1.417	9.75	22.07	1.159	10.29	18.49
14	14	2	9.76	32.9	1.918	9.93	31.78	1.556	10.7	26.61	1.273	11.3	22.3
16	16	2.286	11.15	42.97	2.192	11.35	41.51	1.778	12.23	34.75	1.455	12.92	29.12
18	18	2.571	12.55	54.37	2.466	12.77	52.53	2	13.76	43.97	1.636	14.53	36.84
20	20	2.857	13.94	67.13	2.74	14.19	64.85	2.222	15.29	54.28	1.818	16.15	45.49
24	24	3.429	16.73	96.68	3.288	17.03	93.39	2.667	18.35	78.18	2.182	19.37	65.52
26	26							2.889	19.88	91.75	2.364	20.99	76.89
28	28							3.111	21.4	106.4	2.545	22.6	89.15
30	30							3.333	22.93	122.13	2.727	24.22	102.35
32	32										2.909	25.83	116.46
34	34										3.091	27.45	131.48
36	36										3.273	29.06	147.41

Please refer to the Plastic Pipe Institute at www.plasticpipe.org

Notes

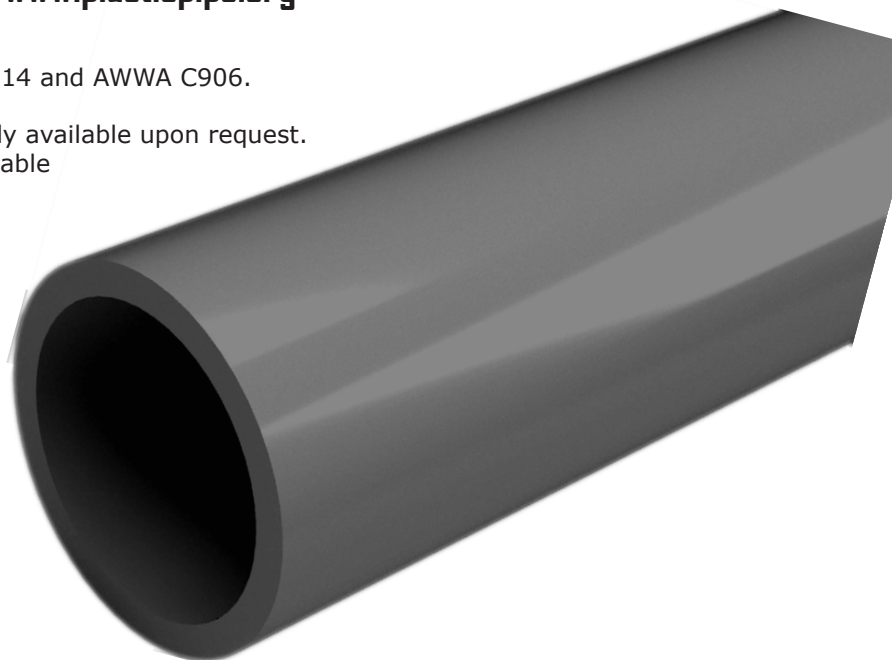
- Pipe dimensions are in accordance with ASTM F714 and AWWA C906.
- Pressure ratings are for water at 73.4 deg F.
- Some of the pipe sizes and/or DRs above are only available upon request.
- Other diameters and DRs not listed may be available upon special request.
- All dimensions are in inches unless otherwise specified.
- Weights are calculated by the methodology established in PPI's TR7.

DR13.5					DR17 (125 PSI)			DR32.5 (64 PSI)		
NOMINAL PIPE SIZE	AVERAGE OUTSIDE DIAMETER	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)	MIN WALL THICKNESS	AVERAGE INSIDE DIAMETER	AVERAGE WEIGHT (LBS/FT)
1/2	0.84	0.062	0.71	0.07	0.062	0.71	0.07	0.062	0.71	0.07
3/4	1.05	0.078	0.88	0.1	0.062	0.92	0.08	0.062	0.92	0.08
1	1.315	0.097	1.11	0.16	0.077	1.15	0.13	0.062	1.18	0.11
2	2.375	0.176	2	0.53	0.14	2.08	0.43	0.073	2.22	0.23
3	3.50	0.259	2.95	1.16	0.206	3.06	0.94	0.108	3.27	0.51
4	4.50	0.333	3.79	1.91	0.265	3.94	1.55	0.138	4.21	0.83
5 3/8	5.375	0.398	4.53	2.73	0.316	4.71	2.21	0.165	5.03	1.19
5	5.563	0.412	4.69	2.92	0.327	4.87	2.36	0.171	5.2	1.27
6	6.625	0.491	5.58	4.15	0.39	5.8	3.35	0.204	6.19	1.81
7	7.125	0.528	6.01	4.8	0.419	6.24	3.88	0.219	6.66	2.09
8	8.625	0.639	7.27	7.03	0.507	7.55	5.68	0.265	8.06	3.06
10	10.75	0.796	9.06	10.92	0.632	9.41	8.82	0.331	10.05	4.77
12	12.75	0.944	10.75	15.36	0.75	11.16	12.41	0.392	11.92	6.69
14	14.00	1.037	11.8	18.52	0.824	12.25	14.97	0.431	13.09	8.08
16	16.00	1.185	13.49	24.19	0.941	14.01	19.55	0.492	14.96	10.54
18	18.00	1.333	15.17	30.61	1.059	15.75	24.75	0.554	16.83	13.36
20	20.00	1.481	16.86	37.79	1.176	17.51	30.53	0.615	18.7	16.47
24	24.00	1.778	20.23	54.44	1.412	21.01	43.99	0.738	22.44	23.72
26	26.00	1.926	21.92	63.89	1.529	22.76	51.61	0.8	24.3	27.86
28	28.00	2.074	23.6	74.09	1.647	24.51	59.87	0.862	26.17	32.33
30	30.00	2.222	25.29	85.04	1.765	26.26	68.74	0.923	28.04	37.09
32	32.00	2.37	26.98	96.76	1.882	28.01	78.18	0.985	29.91	42.22
34	34.00	2.519	28.66	109.26	2	29.76	88.27	1.046	31.78	47.63
36	36.00	2.667	30.35	122.49	2.118	31.51	98.98	1.108	33.65	53.42

Please refer to the Plastic Pipe Institute at www.plasticpipe.org

Notes

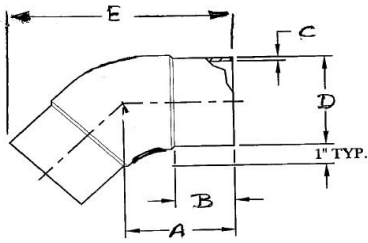
- Pipe dimensions are in accordance with ASTM F714 and AWWA C906.
- Pressure ratings are for water at 73.4 deg F.
- Some of the pipe sizes and/or DRs above are only available upon request.
- Other diameters and DRs not listed may be available upon special request.
- All dimensions are in inches unless otherwise specified.
- Weights are calculated by the methodology established in PPI's TR7.



HDPE Fittings

HDPE Fittings

Butt 45° Elbows (Elongated)



Molded of PE 100/4710/3408 Black

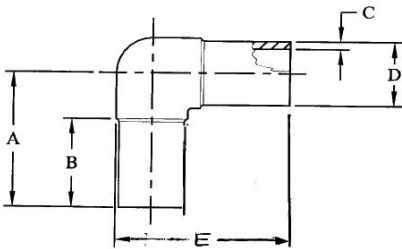
SDR 11 (STANDARD DIMENSION RATIO) 160 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	E (IN)	WEIGHT (LBS)
3/4" IPS	2.28	2.05	0.095	1.05	4.29	0.05
1" IPS	2.48	2.17	0.119	1.315	4.69	0.08
1 1/4" IPS	2.83	2.44	0.151	1.66	5.31	0.14
1 1/2" IPS	3.07	2.64	0.173	1.9	5.91	0.21
2" IPS	3.23	2.64	0.216	2.375	6.38	0.35
3" IPS	4.72	3.86	0.318	3.5	9.33	1.07
4" IPS	5.31	4.21	0.409	4.5	10.63	2
6" IPS	6.89	5.35	0.603	6.625	14.09	5.55
8" IPS	8.46	6.54	0.785	8.625	17.48	11.64
10" IPS	10.04	7.64	0.978	10.75	20.94	21.3
12" IPS	10.63	7.8	1.16	12.75	22.64	31.84

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	E (IN)	WEIGHT (LBS)
2" IPS	3.23	2.64	0.14	2.375	6.38	0.23
3" IPS	4.72	3.86	0.206	3.5	9.33	0.72
4" IPS	5.31	4.21	0.264	4.5	10.63	1.32
6" IPS	6.89	5.35	0.39	6.625	14.09	3.77
8" IPS	8.46	6.54	0.508	8.625	17.48	8.03
10" IPS	10.04	7.64	0.633	10.75	20.94	14.44
12" IPS	10.63	7.8	0.75	12.75	22.64	21.3

Butt 90° Elbows (Elongated)



Molded of PE 100/4710/3408 Black

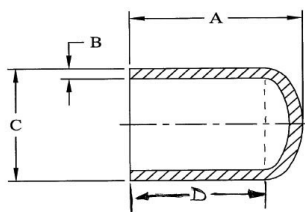
SDR 11 (STANDARD DIMENSION RATIO) 160 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	E (IN)	WEIGHT (LBS)
3/4" IPS	2.68	2.05	0.095	1.05	3.2	0.05
1" IPS	2.91	2.17	0.119	1.315	3.57	0.09
1 1/4" IPS	3.35	2.44	0.151	1.66	4.18	0.16
1 1/2" IPS	3.7	2.64	0.173	1.9	4.65	0.22
2" IPS	4.25	2.95	0.216	2.375	5.44	0.43
3" IPS	5.91	4.06	0.318	3.5	7.66	1.25
4" IPS	6.89	4.53	0.409	4.5	9.14	2.42
6" IPS	9.06	5.63	0.603	6.625	12.37	6.76
8" IPS	11.81	7.2	0.785	8.625	16.13	15.08
10" IPS	13.78	8.27	0.978	10.75	19.15	27.06
12" IPS	14.96	8.46	1.16	12.75	21.33	41.05

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	E (IN)	WEIGHT (LBS)
2" IPS	4.25	2.95	0.14	2.375	5.44	0.28
3" IPS	5.91	4.06	0.206	3.5	7.66	0.8
4" IPS	6.89	4.53	0.264	4.5	9.14	1.64
6" IPS	9.06	5.63	0.39	6.625	12.37	4.8
8" IPS	11.81	7.2	0.508	8.625	16.13	10.05
10" IPS	13.78	8.27	0.633	10.75	19.15	18.33
12" IPS	14.96	8.46	0.75	12.75	21.33	27.47

Butt End Caps (Elongated)



SDR 11 (STANDARD DIMENSION RATIO) 160 PSI (WORKING PRESSURE AT 73.4°F)

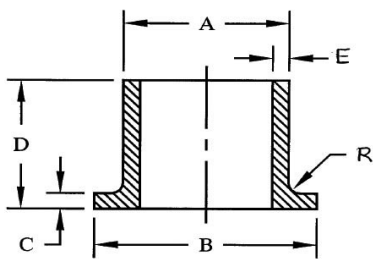
NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	WEIGHT (LBS)
3/4" IPS	2.05	0.095	1.05	1.77	0.02
1" IPS	2.2	0.119	1.315	1.77	0.04
1 1/4" IPS	2.52	0.151	1.66	1.99	0.07
1 1/2" IPS	2.83	0.173	1.9	2.2	0.1
2" IPS	3.23	0.216	2.375	2.52	0.19
3" IPS	4.72	0.318	3.5	3.7	0.59
4" IPS	5.31	0.409	4.5	3.98	1.07
6" IPS	6.89	0.603	6.625	4.84	2.88
8" IPS	8.66	0.785	8.625	5.83	6.32
10" IPS	9.84	0.978	10.75	6.3	10.9
12" IPS	11.77	1.16	12.75	7.52	18.39

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN) WALL	D (IN) OD	WEIGHT (LBS)
2" IPS	3.23	0.14	2.375	2.52	0.12
3" IPS	4.72	0.206	3.5	3.7	0.39
4" IPS	5.31	0.264	4.5	3.98	0.71
6" IPS	6.89	0.39	6.625	4.84	1.98
8" IPS	8.66	0.508	8.625	5.83	4.23
10" IPS	9.84	0.633	10.75	6.3	7.53
12" IPS	11.77	0.75	12.75	7.52	12.4

Molded of PE 100/4710/3408 Black

Butt Flange Adapters (Elongated)



Molded of PE 100/4710/3408 Black

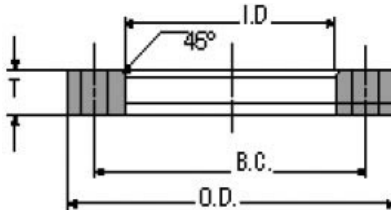
SDR 11 (STANDARD DIMENSION RATIO) 160 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN) OD	B (IN)	C (IN)	D (IN)	E (IN) WALL	WEIGHT (LBS)
3/4" IPS	1.05	1.85	0.39	4.02	0.095	0.07
1" IPS	1.315	2.36	0.39	4.02	0.119	0.11
1 1/4" IPS	1.66	2.8	0.39	4.02	0.151	0.16
1 1/2" IPS	1.9	3.15	0.39	4.02	0.173	0.12
2" IPS	2.375	3.94	0.55	6.1	0.216	0.48
3" IPS	3.5	5	0.67	6.1	0.318	0.93
4" IPS	4.5	6.61	0.79	6.1	0.409	1.66
6" IPS	6.625	8.5	1.02	8.07	0.603	4.07
8" IPS	8.625	10.63	1.26	10.67	0.785	8.73
10" IPS	10.75	12.99	1.38	11.5	0.978	14.11
12" IPS	12.75	15.75	1.5	10.83	1.16	19.88

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN) OD	B (IN)	C (IN)	D (IN)	E (IN) WALL	WEIGHT (LBS)
2" IPS	2.375	3.94	0.55	6.1	0.14	0.37
3" IPS	3.5	5	0.67	6.1	0.206	0.71
4" IPS	4.5	6.61	0.79	6.1	0.264	1.27
6" IPS	6.625	8.5	1.02	8.07	0.39	3.02
8" IPS	8.625	10.63	1.02	10.67	0.508	6.02
10" IPS	10.75	12.99	1.18	11.5	0.633	10.06
12" IPS	12.75	15.75	1.38	10.83	0.75	14.17

Ductile Iron Backing Rings



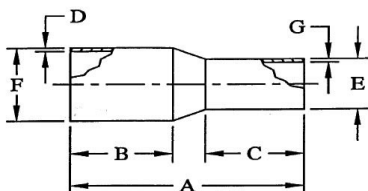
Conventional Cross Section in Ductile Iron



PIPE DIAMETER	OD	FLANGE THICKNESS	ID	BOLT NUMBER	BOLT HOLE DIAMETER	BOLT CIRCLE
1"	3.5	0.44	0.91	4	0.63	2.38
1 1/4"	4.63	0.5	1.72	4	0.63	3.5
1 1/2"	5.0	0.5	1.97	4	0.63	3.88
2"	6.0	0.5	2.75	4	0.75	4.75
3"	7.5	0.5	3.56	4	0.75	6.0
4"	9.0	0.56	4.56	8	0.75	7.50
6"	11.0	0.63	6.75	8	0.88	9.5
8"	13.5	0.63	8.75	8	0.88	11.75
10"	16.0	0.63	10.88	12	1.0	14.25
12"	19.0	0.75	12.88	12	1.0	17.0

- Description: A conventional cross section (reduced section modulus) in ductile iron.
- Utilization: A back-up ring for IPS or APR connections. Butt-welded or integrally flared stub-ends.
- Materials: Cast in ductile iron A536. Tensile strength 80,000 psi, yield 55,000 psi, elongation 6%.
- Dimensions: Vital dimensions AWWA C207, Mates with ANSI B16.5, B16.47; AWWA C207.
- Finish: Red oxide primer, hot dipped galvanized

Butt Reducers (Concentric Elongated)



Molded of PE 100/4710/3408 Black

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

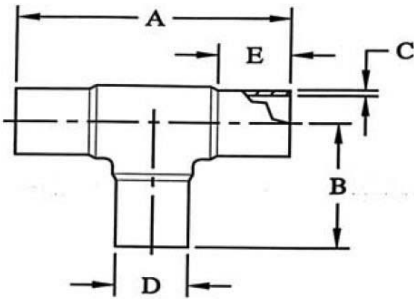
NOMINAL DIAMETER	A (IN)	B (IN)	C (IN)	D (IN) WALL	E (IN) OD	F (IN) OD	G (IN) WALL	WEIGHT (LBS)
3 x 2" IPS	7.87	3.94	2.95	0.206	2.375	3.5	0.14	0.47
4 x 2" IPS	9.06	4.33	2.95	0.264	2.375	4.5	0.14	0.8
4 x 3" IPS	9.06	4.33	3.94	0.264	3.5	4.5	0.206	0.94
6 x 3" IPS	11.42	5.12	3.94	0.39	3.5	6.625	0.206	2.18
6 x 4" IPS	11.42	5.12	4.33	0.39	4.5	6.625	0.264	2.39
8 x 6" IPS	12.8	6.1	5.12	0.508	6.625	8.625	0.39	4.92
10 x 8" IPS	14.37	6.25	5.813	0.75	8.625	10.75	0.508	10.21
12 x 8" IPS	16.54	7.09	6.1	0.75	8.625	12.75	0.508	12.82
12x10" IPS	16.54	7.09	6.69	0.75	10.75	12.75	0.633	14.43

SDR 11 (STANDARD DIMENSION RATIO) 160 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN)	D (IN) WALL	E (IN) OD	F (IN) OD	G (IN) WALL	WEIGHT (LBS)
2 x 1" IPS	6.5	2.95	2.64	0.216	1.9	2.375	0.173	0.29
3 x 2" IPS	7.87	3.94	2.95	0.318	2.375	3.5	0.216	0.7
4 x 2" IPS	9.06	4.33	2.95	0.409	2.375	4.5	0.216	1.21
4 x 3" IPS	9.06	4.33	3.94	0.409	3.5	4.5	0.318	1.41
6 x 3" IPS	11.42	5.12	3.94	0.603	3.5	6.625	0.318	3.21
6 x 4" IPS	11.42	5.12	4.33	0.603	4.5	6.625	0.409	3.54
8 x 6" IPS	12.8	6.1	5.12	0.785	6.625	8.625	0.603	7.31
10 x 8" IPS	14.37	6.25	5.875	1.16	8.625	10.75	0.785	14.45
12 x 8" IPS	16.54	7.09	6.1	1.16	8.625	12.75	0.785	19.11
12 x 10" IPS	16.54	7.09	6.69	1.16	10.75	12.75	0.978	21.66

HDPE Fittings

Butt Tees (Elongated)



Molded of PE 100/4710/3408 Black

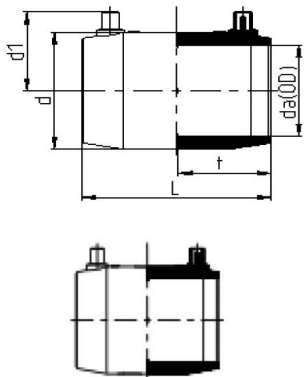
SDR 11 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN)	D (IN)	E (IN)	WEIGHT (LBS)
3/4" IPS	5	2.5	0.095	1.05	1.77	0.09
1" IPS	5.67	2.83	0.119	1.315	1.77	0.17
1 1/4" IPS	6.61	3.31	0.151	1.66	2.01	0.3
1 1/2" IPS	7.99	4	0.173	1.9	2.52	0.47
2" IPS	8.66	4.33	0.216	2.375	2.48	0.82
3" IPS	11.81	5.91	0.318	3.5	3.54	2.18
4" IPS	13.78	6.89	0.409	4.5	3.94	4.02
6" IPS	18.11	9.06	0.603	6.625	4.72	10.91
8" IPS	23.62	11.81	0.785	8.625	5.71	24.61
10" IPS	27.56	13.78	0.978	10.75	6.3	42.6
12" IPS	31.57	15.97	1.16	12.75	7.52	67.85

SDR 17 (STANDARD DIMENSION RATIO) 100 PSI (WORKING PRESSURE AT 73.4°F)

NOMINAL DIAMETER	A (IN)	B (IN)	C (IN)	D (IN)	E (IN)	WEIGHT (LBS)
2" IPS	8.66	4.33	0.14	2.375	2.48	0.53
3" IPS	11.81	5.91	0.206	3.5	3.54	1.45
4" IPS	13.78	6.89	0.264	4.5	3.94	2.58
6" IPS	18.11	9.06	0.39	6.625	4.72	7.24
8" IPS	23.62	11.81	0.508	8.625	5.71	16.6
10" IPS	27.56	13.78	0.633	10.75	6.3	28.9
12" IPS	31.57	15.97	0.75	12.75	7.52	45.32

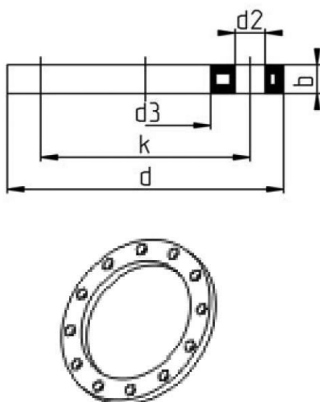
Electro-Fusion Coupler



SDR 17-7.4 PE 100/4710 BLACK. MOP WATER 160PSI / GAS 100PSI INJECTION MOLDED

NOMINAL SIZE DA (OD)	PIPE OD	NOMINAL L	NOMINAL D	NOMINAL DI	NOMINAL T
1/2"	.63"	2.953	1.22	1.398	1.476
3/4"	1.05"	3.189	1.417	1.496	1.594
1"	1.315"	3.504	1.732	1.654	1.752
1 1/4"	1.66"	3.898	2.087	1.811	1.949
1 1/2"	1.9"	4.37	2.638	2.008	2.185
2"	2.375"	5	3.13	2.185	2.5
3"	3.5"	5.551	4.33	2.835	2.736
4"	4.5"	5.98	5.55	3.307	2.95
6"	6.625"	7.126	8.11	4.39	3.52
8"	8.625"	9.094	10.551	5.433	4.469
10"	10.75"				
12"	12.75"				

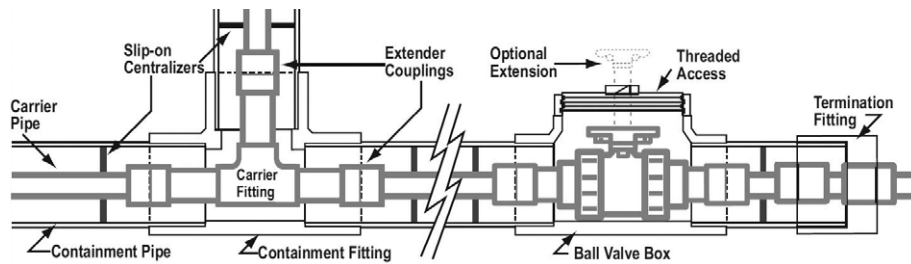
PP Gray Steel Backing Ring ANSI (Fiber Reinforced)



STEEL INSERT, INJECTION MOLDED, HIGH STIFFNESS, DIMENSIONAL AND HEAT STABILITY

PIPE DIAMETER	OD (MM-IN)	D (IN)	D2 (IN)	D3 (IN)	B (IN)	K (IN)
1/2"	20 - 1/2" - MOP 160 psi	3.74	0.63	1.102	0.472	2.38
3/4"	25 - 3/4" - MOP 160 psi	4.016	0.63	1.339	0.472	2.75
1"	32 - 1" - MOP 160 psi	4.488	0.630	1.654	0.630	3.120
1 1/4"	40 - 1 1/4" - MOP 160 psi	5.118	0.630	2.008	0.630	3.500
1 1/2"	50 - 1 1/2" - MOP 160 psi	5.236	0.630	2.441	0.709	3.880
2"	63 - 2" - MOP 160 psi	6.378	0.787	3.071	0.709	4.750
2 1/2"	75-2 1/2"- MOP 160 psi	7.244	0.787	3.622	0.709	5.500
3"	90 - 3" - MOP 160 psi	7.638	0.787	4.370	0.709	6.000
4"	110/125 - 4" - MOP 160 psi	9.015	0.787	5.236	0.709	7.500
6"	160 - 6" - MOP 160 psi	11.141	0.866	7.008	0.945	9.500
8"	200/225 - 8" - MOP 160 psi	13.582	0.866	9.291	0.945	11.750
10"	250 - 10" - MOP 160 psi	16.22	0.984	11.339	1.063	14.250
12"	315 - 12" - MOP 160 psi	19.17	0.984	13.307	1.260	17.000

Spears Double Containment Systems



Double Containment Made Simple! Simplified Design, Easier Installation, Lower Overall Cost

Spears Double Containment Systems are engineered for ease of installation and lower associated installation costs.

Use anywhere secondary containment is required for potential loss of fluid media in main carrier system. Complete systems include all necessary components - carrier pipe, containment pipe, centralizer brackets, valve and valve boxes, plus a full assortment of simplified double containment configurations including elbows, tees, closure and termination fittings. Carrier fittings are equipped with special extender couplings for connection to carrier pipe. Simple, slip-on centralizer brackets used on the carrier pipe support this assembly inside the containment pipe. This design allows the carrier fitting to "float" within the containment fitting, allowing ease of movement for installation while reducing problems associated with thermal expansion and contraction during operation.

Full Size Range for Virtually Any Application

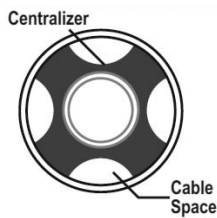
Carrier x Containment Sizes 1/2x2, 3/4x3, 1x3, 1-1/2x4, 2x4, 3x6, 4x8, 6x10, 8x12, plus additional sizes on request.

PVC & CPVC Carrier/Containment Combination Configured to Order

Select any combination of carrier and containment pipe/fittings from PVC Sch 40, PVC Clear Sch 40, PVC Sch 80, CPVC Sch 80.

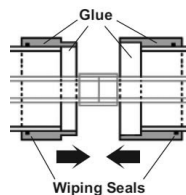
Full Service Pressure Rating

Spears® Double Containment carrier pipe and fittings are suitable for full Sch 40 or Sch 80 pressure applications, except where limited by addition of valves, saddles and other system components with lower pressure ratings. Secondary containment rated at 10 psi unless otherwise specified.



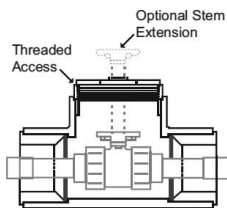
Easy, Slip-on Centralizer Brackets

Simple, slip-on design centralizes carrier pipe and fittings in containment pipe. Allows free movement of components and provides necessary space for routing of leak detection cables.



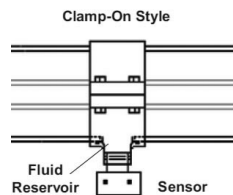
Quick Glue-and-Connect Closure Fittings

Special fittings designed for final closure of containment pipe features gluwiping seal to improve distribution of solvent cement during assembly. After assembly of carrier connection, simply solvent cement pipe and closure fitting and slide assembly together. Wiping seals assures spread of cement for proper bond.



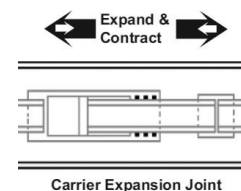
In-Line Valve Boxes

Spears® unique containment enclosure of Valves provides easy access while allowing for addition of valve operation extensions or mechanical actuation. Special "Tee-style" configuration easily connects to containment system, minimizes space requirements and strengthens overall system integrity.



Sensor Saddles

Easy-to-install threaded saddle tees can be easily located anywhere along containment pipe for mounting user-supplied leak detection sensors. Saddle tee forms low-point reservoir for detection of any fluid in the containment system. Select either Clamp-on style (for up to 6" pipe) or Glue-on style (for up to 8" and larger pipe).



Carrier & Containment Expansion Joints

Temperature differentials can produce significant expansion and contraction changes between carrier pipe and containment pipe. These forces can severely damage system integrity. In addition to Spears® floating carrier design, Spears® in-line expansion joints can be used on either carrier or containment runs to compensate for expansion and contraction changes.

Double Containment Systems

+GF+ Double See Vinyl Double Containment Piping System



Applications

- water and wastewater treatment
- chemical processing
- delivery and dosing
- microelectronics
- metal plating and surface finishing
- life sciences applications

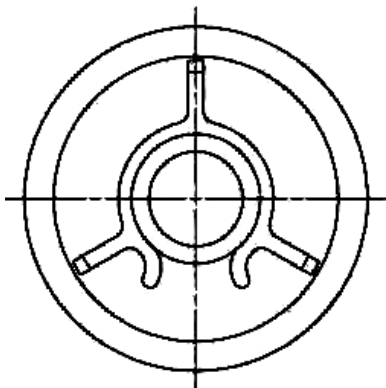
Double-See is fast and easy to install, and is available with a complete selection of pipe, fittings, leak detection and access tees, closure couplings, and termination fittings. Additionally, an innovative "valve-in-valve" design is offered which allows full containment pressure rating.

Double-See is available in PVC and CPVC; either material may be primary or secondary (PVC×PVC, CPVC×PVC, CPVC×CPVC) with Clear PVC always being an option for the containment pipe. System size options range from 1/2"×2" to 6"×10" meeting virtually any application requirement.

Installation versatility allows simultaneous joining throughout a system or in combination with patented closure couplings which enable practical compliance with the ASME B31.3

Benefits

- Installation is fast and easy
- Revolutionary closure coupling design for practical compliance with ASME B31.3
- Innovative centralizer design for thermal expansion compensation
- Flexible choice of PVC, CPVC, and Clear PVC
- Pipe cut-length guidance system for easy installation
- Factory assembled and 100% tested fittings
- Extensive standard part selection
- Customer fabrications and pipe spooling available
- Improves safety by eliminating chemical interaction with employees
- Double-See can be applied above or below ground
- GF quality, field support, and factory engineering



cross section



PRODUCTS AVAILABLE



PIPES



ELBOWS



TEES



SUMP



CLOSURE COUPLINGS



TERMINATIONS



VALVES



LEAK DETECTION



ACCESSORIES

+GF+ Urecon/Fabco Pre-Insulated Plastic Pipe



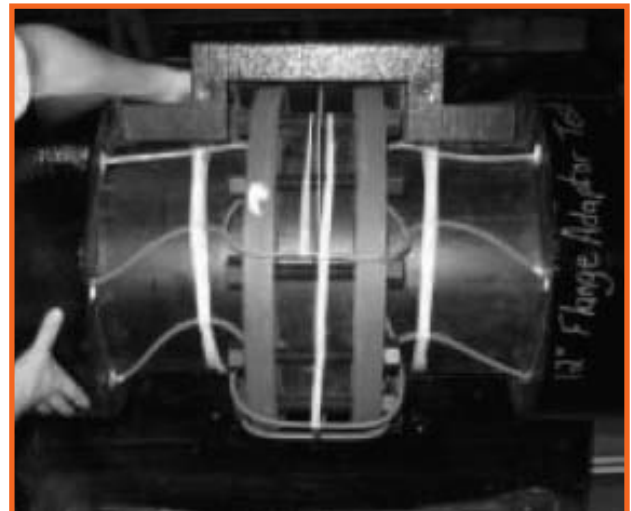
From the Arctic Circle to Antarctica, Urecon is the name synonymous with superior quality and guaranteed void free pre-insulated piping systems. Our systems are manufactured to meet the most rigid quality standards required for projects exposed to the extreme climates of the far north. These identical stringent standards are applied to the piping systems produced for the more benign latitudes of the Caribbean and those in between; thus insuring a level of quality unsurpassed in the industry.

Products and Services:

- System design assistance
- Urecon's U.I.P.® insulation systems to 149 °C (300 F)
- Wide range of outer jackets, including counter wound polyethylene, extruded PE casing, Spiwrap spiral wound galvanized steel or aluminum, extruded white PVC casing, FRP casing and banded aluminum, galvanized or stainless steel
- Custom specialty jackets available
- Insulation kits custom made to suit all fittings for each of our systems
- Heat Tracing Systems, including Urecon's constant watt Thermocable, Series cable, Self-regulating cable, Mineral insulated cable, Electronic and mechanical thermostats
- High temperature composite insulation systems
- Portable foam kits
- Mec-Seal and Slipjoint specialty insulation joint kits
- EN253 District heating systems from Logstor
- Flexible systems from Logstor, PEX-Flex, Cu-Flex and Steel-Flex

Applications:

- Municipal freeze protection including Water and sewer mains, Service connections and Bridge crossings
- District heating and cooling
- Steam and condensate return
- Outdoor wood furnace and solar hydronic heating
- Mine intake, tailings and reclaim
- Snow melt systems
- Cryogenic systems
- Chemical feed and temperature maintenance
- Industrial process



Insulated PVC Pipe

1

Performance Specs

TEMPERATURE GAIN COMPARISON* FOR CHILLED WATER

NOMINAL PIPE DIA. (I.P.S)		FLOW RATE		PIPE AMBIENT TEMPERATURE @ 40.6°C (105°F)								PIPE AMBIENT TEMPERATURE @ 21.1°C (70°F)							
				FINAL TEMPERATURE**				HEAT GAIN				FINAL TEMPERATURE**				HEAT GAIN			
				NO INSULATION		37MM (1.5IN) U.I.P®		NO INSULATION		37MM (1.5IN) U.I.P®		NO INSULATION		37MM (1.5IN) U.I.P®		NO INSULATION		37MM (1.5IN) U.I.P®	
MM	IN	L/ SEC	US GPM	°C	°F	°C	°F	WATTS /M	BTU / HR /FT	WATTS /M	BTU / HR /FT	°C	°F	°C	°F	WATTS /M	BTU / HR /FT	WATTS /M	BTU /HR /FT
25	1	3.9	15	17.8	63.8	5.3	41.4	54.4	56.6	5.2	5.4	10.4	50.6	4.6	40.1	25.4	26.4	2.4	2.5
50	2	6.5	25	13.0	55.0	4.9	40.7	59.3	61.7	6.0	6.3	8.2	46.6	4.4	39.8	27.7	28.8	2.8	2.9
75	3	18	70	7.5	45.3	4.4	39.8	64.6	67.2	7.8	8.1	5.6	41.9	4.2	40.0	30.2	31.4	3.6	3.8
100	4	30.8	120	6.3	43.1	4.3	39.5	71.1	73.9	9.4	9.7	5.1	40.9	4.1	39.3	33.2	34.5	4.4	4.6
150	6	69.5	270	5.2	41.1	4.2	39.3	81.6	84.8	12.5	13.0	4.5	40.0	4.1	39.2	38.1	39.6	5.8	6.1
200	8	115	450	4.8	40.4	4.1	39.2	89.2	92.8	15.3	15.9	4.6	39.6	4.1	39.1	41.7	43.4	7.2	7.5

TIME TO FREEZE AND HEAT LOSS FOR U.I.P® INSULATED PIPE

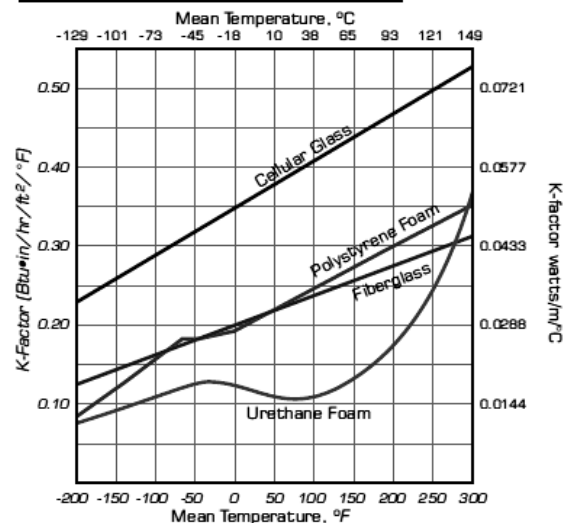
NOMINAL PIPE DIA.		PIPE AMBIENT -18°C (0°F)				PIPE AMBIENT -34°C (30°F)			
		TIME TO FREEZE (HR)***		HEAT LOSS WITH 50MM U.I.P®		TIME TO FREEZE (HR)***		HEAT LOSS WITH 50MM U.I.P®	
		NO INSULATION	50MM (2 IN) U.I.P®	WATTS/M	WATTS/FT	NO INSULATION	50MM (2 IN) U.I.P®	WATTS/M	WATTS/FT
19	3/4	1	15	1.6	0.5	1	8	2.9	0.9
25	1	1	21	1.8	0.5	1	11	3.3	1.0
30	1-1/4	1	38	2.2	0.7	1	20	4.1	1.2
40	1-1/2	1	45	2.4	0.7	1	22	4.4	1.3
50	2	1	62	2.7	0.8	1	33	5.0	1.5
75	3	2	105	3.5	1.1	1	56	6.5	2.0
100	4	4	145	4.2	1.3	2	77	7.7	2.3
150	6	9	235	5.5	1.7	5	125	10.2	3.1
200	8	15	324	6.7	2.0	8	172	12.4	3.8
250	10	23	422	8.0	2.4	12	224	14.7	4.5
300	12	32	516	9.1	2.7	17	273	16.8	5.1
350	14	39	596	9.8	3.0	21	305	18.0	5.5
400	16	51	674	10.9	3.3	27	357	20.0	6.1



Notes:

- * Calculations are based on a 4°C (39°F) inlet, 1000m (3281ft) long pipe run.
- ** At end of pipe run
- *** Assumes initial water temperature of 1.11°C (34°F)
- No safety factor included
- To convert watts to Btu/hr, multiply by 3.414

INSULATION MATERIALS COMPARISON





Section 2:

Pure Water, Institutional and Lab Piping Systems

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Specialty Piping



LOW-EXTRACTABLE™ PIPING FOR ULTRA-PURE WATER SYSTEMS

Spears® Low-Extractable™ Piping Systems provide a cost-effective alternative to other piping materials typically used for ultra-pure water applications in the semiconductor, electronics, biotechnology and other industries. Lower material costs combined with fast, reliable installation greatly reduce installation costs – resulting in significant savings without jeopardizing water quality.

In addition to significant cost savings, these piping systems offer several other advantages for ultra-pure water applications. These include: non-contaminating material with extremely Low-Extractable™ contaminants (particularly Total Oxidizable Carbon and trace metals), ultra-smooth interior walls, strong Schedule 80 dimensions, specialty one-step solvent-cement joining system that cures fast, and unique translucency for visual inspection of joint integrity.



DOUBLE-SEE® DOUBLE CONTAINMENT

This vinyl double containment piping system is fast and easy to install, and is available with a complete selection of pipe, fittings, and valves. Additionally, an innovative “valve-in-valve” design is offered which allows full containment pressure rating. Double-See® is available in PVC and CPVC; either material may be primary or secondary (PVC x PVC, CPVC x PVC, CPVC x CPVC) with Clear PVC always being an option for the containment pipe. System size options range from 1/2” x 2” to 6” x 10”, meeting virtually any application requirement. Installation versatility allows simultaneous joining throughout a system or in combination with patented closure couplings which enable practical compliance with the ASME B31.3 requirement for visual inspection of all primary joint connections during the pressure test before closing the secondary piping joint.



FUSEAL® PP CORROSIVE WASTE

Fuseal® PP is resistant to the corrosive action of alkalis, alcohols, acids, solvents and salt solutions. Dilute mineral acids and aqueous solutions of acid salts, which are so destructive to most metals, have no effect on the Fuseal PP system. In general, Fuseal PP is attacked only by strong oxidizing acids and weakened by certain organic solvents and chlorinated hydrocarbons. Fuseal PP will not rust, pit, scale, corrode or be affected by electrolysis.

Fuseal PP piping systems have excellent chemical resistance and physical properties which make the system ideal for handling corrosive waste mixtures of acids, bases and solvents present in laboratory, industrial or food and beverage processing DWV applications.

+GF+ Fuseal Schedule 40 and 80 Polypro Pipe



Applications

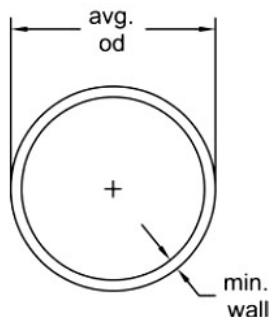
- Corrosive waste drainage system
- Chemical plants
- Industrial plants
- Hospitals
- University laboratories

FLAME RETARDANT, ACID RESISTANT ACID WASTE SYSTEM FOR NON-PRESSURE APPLICATIONS

Fuseal, the proven resistance coil fusion method of joining polypropylene drain piping systems. Used primarily for acid waste drain lines. Fuseal has been utilized in thousands of institutional and industrial projects that demand strong, leak-proof, safe pipe joints.

The Fuseal heat fusion process joins pipe and fitting into one complete homogenous unit. A low voltage Fuseal power unit is connected to an electrical resistance coil imbedded in the Fuseal fitting. When power is applied the coil heat completely fuses the interface between the pipe and fitting socket. The complete line of fittings include all standard DWV configuration in 1 1/2" through 12" pipe sizes.

Pipe is readily available in flame-retardant Schedule 40/80, non-flame retardant Schedule 40/80. The Fuseal heat fusion method should be used in inaccessible places where a completely homogenous structure of pipe and fitting is essential. The mechanical system can be used under bench where speed of installation, future disassembly or modular design is desired. Fittings 1 1/2" through 6" are manufactured of flame retardant material but 8" and above are manufactured of non-flame retardant material. Made of polypropylene and PVDF, the Fuseal II system combines to provide a complete, easy to install corrosive and chemical waste drainage system.



SIZE (IN)	LENGTHS (FT)	PART NUMBER	LIFT QUANTITY (FT)	AVERAGE OD (IN)	MIN. WALL (IN)
SCHEDULE 40 FIRE RETARDANT PIPE**					
1 1/2	10	*37A013015	1800	1.9	0.145
2	10	*37A013020	1050	2.375	0.154
3	10	*37A013030	580	3.5	0.216
4	10	*37A013040	510	4.5	0.237
6	10	*37A013060	220	6.625	0.28
8	20	*37A023080	280	8.625	0.322
10	20	*37A023100	220	10.75	0.365
12	20	*37A023120	100	12.75	0.406
SCHEDULE 40 NON FIRE RETARDANT PIPE					
1 1/2	20	*37B023015	3600	1.9	0.145
2	20	*37B023020	2100	2.375	0.154
3	20	*37B023030	1160	3.5	0.216
4	20	*37B023040	1020	4.5	0.237
6	20	*37B023060	440	6.625	0.28
8	20	*37B023080	280	8.625	0.322
10	20	*37B023100	220	10.75	0.365
12	20	*37B023120	100	12.75	0.406
14	20	*37B023140	100	14	0.437
16	20	*37B023160	100	16	0.5
18	20	*37B023180	60	18	0.562
SCHEDULE 80 NON FIRE RETARDANT PIPE					
1 1/2	20	*37B021015	3600	1.9	0.2
2	20	*37B021020	2100	2.375	0.281
3	20	*37B021030	1160	3.5	0.3
4	20	*37B021040	1020	4.5	0.337
6	20	*37B021060	440	6.625	0.432
8	20	*37B021080	280	8.625	0.5
10	20	*37B021100	220	10.75	0.593
12	20	*37B021120	100	12.75	0.687

** Note: 1 1/2" - 6" Available in 20' lengths upon request

Fuseal II Fittings

+GF+ Fuseal Schedule 40 Fittings

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

COUPLING

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	527001
2	527002
3	527003
4	527004
6	527006

SLEEVE COUPLING

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	527041
2	527042
3	527043
4	527044
6	527046

1/4 (91.2°) BEND LONG SWEEP

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	526276
2	526277
3	526278
4	526279
6	526280F

1/4 (91.2°) BEND SHORT SWEEP

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	526251
2	526252
3	526253
4	526254
6	526256

1/4 (91.2°) BEND STREET

(S X SPG)



SIZE (INCHES)	PART NUMBER
1 1/2	526451
2	526452
3	526453
4	526454
6	526456F

1/4 (90°) BEND VENT

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	526201
2	526202
3	526203

1/6 (60°) BEND

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	526601
2	526602
3	526603
4	526604

1/8 (45°) BEND

(S X S)



SIZE (INCHES)	PART NUMBER
1 1/2	526501
2	526502
3	526503
4	526504
6	526506

1/8 (45°) BEND STREET

(S X SPG)




SIZE (INCHES)	PART NUMBER
1 1/2	526401
2	526402
3	526403
4	526404
6	526406


1/12 (30°) BEND


(S X S)





SIZE (INCHES)	PART NUMBER
1 1/2	526951
2	526952
3	526953
4	526954


1/12 (30°) BEND STREET (S X SPG)	SIZE (INCHES)	PART NUMBER
	1 1/2	526461
	2	526462
	3	526463
	4	526464


1/16 (22.5°) BEND (S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	526551
	2	526552
	3	526553
	4	526554


1/24 (15°) BEND (S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	526971
	2	526972
	3	526973
	4	526974


1/24 (15°) BEND STREET (S X SPG)	SIZE (INCHES)	PART NUMBER
	1 1/2	526961
	2	526962
	3	526963
	4	526964

91.2° 3-WAY ELL (S X S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	526261
	2	526262

45° WYE (S X S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	526301
	2	526302
	3	526303
	4	526304
	6	526306

45° REDUCING WYE (S X S X S)	SIZE (INCHES)	PART NUMBER
	2 x 2 x 1 1/2	526325
	3 x 3 x 1 1/2	526324
	3 x 3 x 2	526326
	4 x 4 x 2	526328
	4 x 4 x 3	526327
	6 x 6 x 2	526342
	6 x 6 x 3	526343
6 x 6 x 4	526344	

45° DOUBLE WYE (S X S X S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	526380
	2	526381
	3	526382
	4	526383
	6	526351F

45° DOUBLE REDUCING WYE	SIZE (INCHES)	PART NUMBER
	(S X S X S X S)	
	2x2x1-1/2x1-1/2	526384
	3x3x1-1/2x1-1/2	526389
	3 x 3 x 2 x 2	526385
	4 x 4 x 2 x 2	526386
	4 x 4 x 3 x 3	526387
	6 x 6 x 3 x 3	526390T
6 x 6 x 4 x 4	526388T	

91.2° LONG TURN TEE WYE (S X S X S)	SIZE (INCHES)	PART NUMBER
	1 1/2	527301
	2	527302
	3	527303
	4	527304

Fuseal II Fittings

2

PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

91.2° LONG TURN TEE REDUCING WYE



SIZE (INCHES)	PART NUMBER
(S X S X S)	
2 x 2 x 1 1/2	527320
3 x 3 x 1 1/2	527326
3 x 3 x 2	527327
4 x 4 x 2	527337
4 x 4 x 3	527338

COMBO WYE & 1/8 BEND (90°)



SIZE (INCHES)	PART NUMBER
(S X S X S)	
6	527306F

REDUCING COMBO WYE & 1/8 BEND (90°)



SIZE (INCHES)	PART NUMBER
(S X S X S)	
6 x 6 x 2	527344F
6 x 6 x 3	527339F
6 x 6 x 4	527340F

90° DOUBLE COMBO WYE



SIZE (INCHES)	PART NUMBER
(S X S X S X S)	
1 1/2	526801
2	526802
3	526803
4	526804
6	526806F

90° DOUBLE REDUCING COMBO WYE



SIZE (INCHES)	PART NUMBER
(S X S X S X S)	
2x2x1-1/2x1-1/2	526825
3x3x1-1/2x1-1/2	526824
3 x 3 x 2 x 2	526826
4 x 4 x 2 x 2	526828
4 x 4 x 3 x 3	526827
6 x 6 x 3 x 3	526843T
6 x 6 x 4 x 4	526844T

91.2° SANITARY TEE



SIZE (INCHES)	PART NUMBER
(S X S X S)	
1 1/2	526151
2	526152
3	526153
4	526154
6	526156F

91.2° SANITARY REDUCING TEE



SIZE (INCHES)	PART NUMBER
(S X S X S)	
2 x 2 x 1 1/2	526126
3 x 3 x 1 1/2	526131
3 x 3 x 2	526130
4 x 4 x 2	526134
4 x 4 x 3	526136
6 x 6 x 2	526137F
6 x 6 x 3	526138F
6 x 6 x 4	526139

91.2° DOUBLE SANITARY TEE



SIZE (INCHES)	PART NUMBER
(S X S X S X S)	
1 1/2	526187
2	526186
3	526183
4	526185

91.2° DOUBLE REDUCING SANITARY TEE



SIZE (INCHES)	PART NUMBER
(S X S X S X S)	
2x2x1-1/2x1-1/2	526188
3x3x1-1/2x1-1/2	526184F
3 x 3 x 2 x 2	526181
4 x 4 x 2 x 2	526190F
4 x 4 x 3 x 3	526191F

PIPE INCREASER



SIZE (INCHES)	PART NUMBER
(S X S)	
1 1/2 x 2	527022
1 1/2 x 3	527023F
2 x 3	527024
2 x 4	527025
3 x 4	527026
3 x 6	527027F
4 x 6	527028F

REDUCER BUSHING

(SPG X S)



SIZE (INCHES)	PART NUMBER
2 x 1 1/2	526752
3 x 1 1/2	526762
3 x 2	526754
4 x 2	526758
4 x 3	526756
6 x 4	526767

CAP

(S)



SIZE (INCHES)	PART NUMBER
1 1/2	527081
2	527082
3	527083
4	527084
6	527087

MALE ADAPTER

(S X MPT)



SIZE (INCHES)	PART NUMBER
1 1/2	526871
2	526872
3	526873
4	526874
6	526876F

FEMALE ADAPTER

(S X FPT)



SIZE (INCHES)	PART NUMBER
1 1/2	526891
2	526892
3	526893
4	526894
6	526896F

GLASS PIPE ADAPTER

(SPG X GLASS PIPE BEAD)



SIZE (INCHES)	PART NUMBER
1 1/2	7411
2	7412
3	7413
4	7414
6	7416

SILICON IRON PIPE ADAPTER

(S X IRON PIPE BEAD)



SIZE (INCHES)	PART NUMBER
1 1/2	527431
2	527432
3	527433
4	527434

CAULKED JOINT ADAPTER

(S X CAULKED JOINT BEAD)



SIZE (INCHES)	PART NUMBER
1 1/2	527441
2	527442
3	527443
4	527444

LEAD PIPE ADAPTER

(S X FLARE)



SIZE (INCHES)	PART NUMBER
1 1/2	527401

POLYETHYLENE ADAPTER

(HDPE S X FEMALE UNION NUT)



SIZE (INCHES)	PART NUMBER
1 1/2	7268A
2	7278A

FEMALE UNION NUT ADAPTER

(S X FEMALE UNION NUT)



SIZE (INCHES)	PART NUMBER
1 1/2	527260A
2	527270A

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

Fuseal II Fittings

2

PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

FEMALE UNION NUT ADAPTER

(SPG X FEMALE UNION NUT)

SIZE (INCHES)	PART NUMBER
1 1/2	7262A



MALE UNION ADAPTER

(S X MALE UNION)

SIZE (INCHES)	PART NUMBER
1 1/2	527264



MALE UNION ADAPTER

(SPG X MALE UNION)

SIZE (INCHES)	PART NUMBER
2	7276



MALE UNION ADAPTER

(MPT X MALE UNION)

SIZE (INCHES)	PART NUMBER
2	7277



MALE UNION ADAPTER

(FPT X MALE UNION)

SIZE (INCHES)	PART NUMBER
2	7275



150LB VAN STONE ANSI FLANGE



SIZE (INCHES)	PART NUMBER
1 1/2	526931
2	526932
3	526933
4	526934
6	526936

FPM UNION

(PPFR X PPFR)



SIZE (INCHES)	PART NUMBER
1 1/2	528291
2	528292
3	528293
4	528294

EPDM UNION

(PPFR X PPFR)



SIZE (INCHES)	PART NUMBER
1 1/2	528271
2	528272
3	528273
4	528274

EXPANSION JOINT

(S X SPG)



SIZE (INCHES)	PART NUMBER
1 1/2	527811A
2	527812A
3	527813A
4	527814A

METAL TRANSITION FITTING

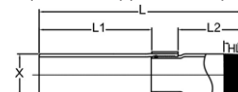
(PPFR X SS)(SPG X SPG)



SIZE (INCHES)	PART NUMBER
2 x 2	528729
3 x 2 1/2	528790
2 x 2	528739
3 x 2 1/2	528740

METAL TRANSITION FITTING

(PPFR X SS)(SPG X MPT)

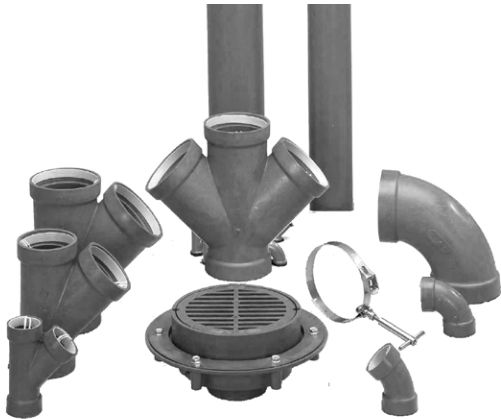


SIZE (INCHES)	PART NUMBER
2 x 2	528907

Fuseal PVDF & Double Containment Pipe

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

+GF+ Fuseal Schedule 40 25/50 PVDF Pipe



FLAME RETARDANT, ACID RESISTANT WASTE SYSTEM FOR NON-PRESSURE APPLICATIONS

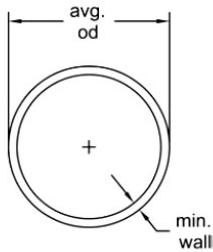
Fuseal, the proven resistance coil fusion method of joining polypropylene drain piping systems. Used primarily for acid waste drain lines. Fuseal has been utilized in thousands of institutional and industrial projects that demand strong, leak-proof, safe pipe joints. It meets the ULC 25/50 flame and smoke spread rating.

The Fuseal heat fusion process joins pipe and fitting into one complete homogenous unit. A low voltage Fuseal power unit is connected to an electrical resistance coil imbedded in the Fuseal fitting. When power is applied the coil imbedded in the Fuseal fitting. When power is applied the coil heat completely fuses the interface between the pipe and fitting socket.

Please contact customer service for a complete list of available fittings.



The complete line of fittings include all standard DWV configuration in 1 1/2" through 12" pipe sizes. Pipe is readily available in flame-retardant Schedule 40. The Fuseal heat fusion method should be used in inaccessible places where a completely homogenous structure of pipe and fitting is essential. The mechanical system can be used under bench where speed of installation, future disassembly or modular design is desired. Fittings 1 1/2" through 6" are manufactured of flame retardant material. Made of polypropylene and PVDF, the Fuseal II system combines to provide a complete, easy to install corrosive and chemical waste drainage system.



SIZE (IN)	LENGTHS (FT)	PART NUMBER	LIFT QUANTITY (FT)	AVERAGE OD (IN)	MIN. WALL (IN)
SCHEDULE 40 25/50 PVDF PIPE					
1 1/2	10	*37C013015	1800	1.9	0.145
2	10	*37C013020	1050	2.375	0.154
3	10	*37C013030	580	3.5	0.216
4	10	*37C013040	510	4.5	0.237
6	10	*37C013060	220	6.625	0.28

20' lengths available upon request

Fuseal Double Containment Pipe

DOUBLE CONTAINMENT POLYPRO CORROSIVE WASTE PIPING SYSTEM



With standard, non-flame Fuseal utilized for both the primary and containment pipe and fittings, the Fuseal Squared system offers the performance and reliability of the Fuseal II drainage system. The standard wall thickness of Fuseal II makes Fuseal Squared ideal for buried applications. Truly a complete acid waste drainage system! Contact customer service for a complete list of available pipe and fittings.

Advantages:

- The pipe and fittings are easily joined with our state of the art fusion technologies
- Fuseal Squared joins to the standard Fuseal II system without the need for special fittings or tools
- Added protection with polypropylene material for both the primary and containment pipe
- Custom fittings and sizes can be quickly designed and manufactured to meet customer needs
- All standard primary fitting joints are butt-welded and factory tested.



CPVC Corrosive Waste System

Spears® LabWaste™ CPVC Corrosive Waste Drainage System



Spears® LabWaste™ is offered as a complete system of pipe, fittings, and solvent cement. A broad assortment of additional accessories are available including Valves, Unions, Flanges and Adapters. Fitting configurations are produced to applicable DWV patterns of ASTM D3311, Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fitting Patterns, and various specialty patterns. All drainage fittings with 90° angles (sanitary tees, elbows, etc.) have socket pitch to maintain approximately 1/4" per foot drainage.

Spears® LabWaste™ products have been developed and designed to be used as a total system consisting of pipe, fittings, accessories, solvent cement and thread sealant. All Spears® LabWaste™ components must be used in order to insure a sound piping system. Substitution of other products for Spears® LabWaste™ pipe, fittings, or solvent cement may be detrimental to system integrity and is not recommended. The Spears® Limited Warranty does not cover problems occurring within the piping system as the direct result of non-

use of Spears® LabWaste™ system products.

Easy transition from PP/PVDF, Glass or Duriron systems to LabWaste™ CPVC using one of these special adapters for sizes 1-1/2" through 4" piping.

Features:

- Complete System of Pipe, Fittings & Adapters
- All CPVC Construction in Full Assortment of Standard DWV Patterns
- Custom Fabricated Accessories-Drains, Neutralization Tanks & Pump Stations
- Specially Formulated One-Step Solvent Cement Provides Chemical Resistance Equal to System Pipe & Fittings – Now in Special Yellow Color
- ULC Flame & Smoke Rated
- Non-Pressure Drainage Service to 220°F

Chemical & Corrosion Resistant CPVC

One of the key advantages of the LabWaste™ CPVC system is its excellent resistance to a broad range of corrosive environments. CPVC is inert to most mineral acids, bases, salts and aliphatic hydrocarbons, and compares favorably to other non-metals in these chemical environments.

GENERAL CHEMICAL RESISTANCE OVERVIEW:

Weak Acids	Excellent	Salts	Excellent
Strong Acids	Excellent	Aliphatic Solutions	Good
Weak Bases	Excellent	Halogens	Good-Fair
Strong Bases	Excellent	Strong Oxidants	Good-Fair

The LabWaste™ CPVC System has been developed for use in academic, research, and institutional laboratory chemical waste drainage applications, which is the routine disposal of a wide variety of hot and cold chemicals accompanied by water for the purpose of dilution and flushing.

Full Assortment of Drainage Pattern Fitting Configurations

Spears® broad line of LabWaste™ CPVC fittings are produced in ASTM D 3311 and other drainage patterns required in corrosive waste system installations. Standard configurations are available in nominal sizes of 1-1/2" through 24" with many specialty fittings.

NSF Certified For Corrosive Waste

Spears® LabWaste™ CPVC Corrosive Waste Drainage System of pipe, fittings, and cement is tested and certified for use in corrosive waste systems by NSF International, tested to IAPMO IGC 210 and ICC-ES AC252 for CPVC Chemical Waste Systems.

Cost Saving Solvent Weld Joining

Eliminates Troublesome Electro-Fusion and Mechanical Connections

A proven joining method reliably used for over 50 years, Solvent Cement Welding requires no special tools, no costly fusion equipment, and provides a solid, chemically bonded joint for easy installation, repairs or alterations. Most importantly, solvent cement joints end problems typical of polypropylene system installation, such as mechanical connector pullout, maintenance on elastomer sealed joints, internal fusion wire corrosion, and cumbersome fusion joining methods. Saves time, saves cost, saves worry!

ULC Flame & Smoke Rated Components

Spears® LabWaste™ system components have been evaluated as finished products for surface burning characteristics of flame spread and smoke density by Underwriters Laboratories of Canada under standard test method CAN/ULC S102.2-M88.

Product Certification (3rd Party Approval Standards)

Spears® LabWaste™ CPVC Corrosive Waste Drainage System is a complete system of pipe, fittings and solvent cement. Since specific ASTM Standards have not been developed for CPVC corrosive waste systems, Spears® LabWaste™ CPVC pipe and fittings are tested and certified for use in corrosive waste systems by NSF International as a Special Engineered (SE) product. Spears® LabWaste™ CPVC system meets the requirements of IAPMO IGC 210 and ICC-ES AC252 for CPVC Corrosive Waste Drainage Systems.

LXT[®] Schedule 80 Piping System

LXT[®] Schedule 80 Pipe and Fittings



Non-Contaminating PVC Material
Exceptionally Smooth Surface Characteristics
Low TOC & Chemical Extraction
Fast Particle Rinse Up

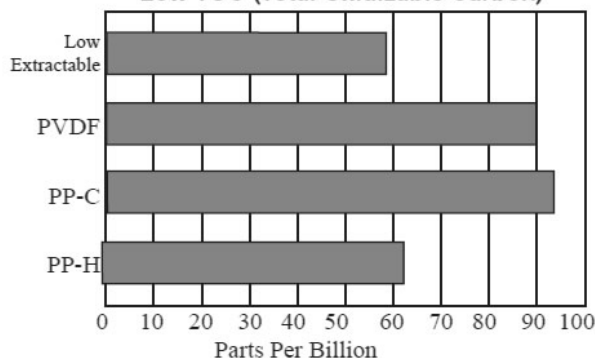
Spears[®] Low Extractable PVC provides a superior, cost effective alternative to conventional high purity piping system materials while providing ease of installation without jeopardizing water quality. Specially developed for ultra-pure water systems in semiconductor, electronics, university research laboratories, hospital dialysis, industrial laboratories, Federal and state police forensic laboratories and biotechnology applications, Spears[®] Low Extractable PVC material has been subjected to independent laboratory leach studies during both static and dynamic exposure to 18.2 meg-ohm deionized water. Tests have shown relatively low TOC, Anion/Cation and trace metal contamination levels in comparison to conventional high purity piping system materials including PVDF and Natural Polypropylenes.

Advantages:

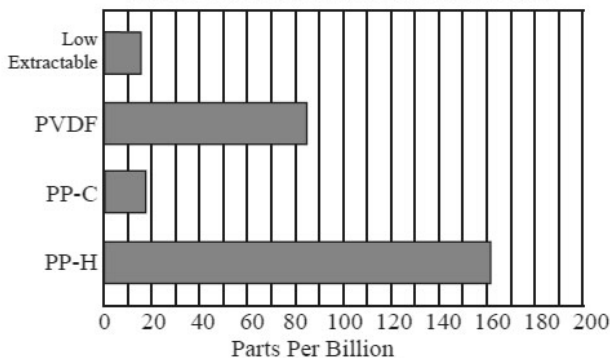
- Complete line of pipe, fittings and valves IPS Sizes 1/2" - 6" diameters
- Strong Schedule 80 dimensions for pressure service
- Advanced Low-Extractable™ material significantly reduces leachable contamination compared to conventional PVC and other piping materials.
- Exceptionally smooth interior walls reduce particle contaminants
- Fast, reliable installation with simple, inexpensive joining methods
- Proprietary one-step fast setting joining method reduces TOC contamination and rinses up quickly
- Good chemical/corrosion resistance, high-impact strength, low thermal conductivity
- Bagged, sealed and boxed on-line for use in high-purity environments
- High Quality
- Low Maintenance
- Cost Effective



Low TOC (Total Oxidizable Carbon)



Low Ion & Trace Metal Contaminates



Material test graphic comparisons from 7-day static leach analysis at ambient temperature, 18.2 meg-ohm ultra pure water on Low Extractable, PVDF, PP Copolymer and PP Homopolymer pipe samples by ICP Mass Spectroscopy. Ion & Trace Metal contaminates reflect cumulative totals.

2

PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS



LXT[®] Schedule 80 Piping System

Material:

Spears[®] Low-Extractable™ Piping is produced from an innovative PVC compound that has been specifically formulated to reduce leachable contamination when exposed to ultra-pure water environments. Minor ingredients necessary for processing have been scrupulously selected to address their potential for contamination, and are then carefully blended in precise ratios. This results in a much cleaner material than conventional PVC compounds, and compares favorably to alternate materials typically used for UPW piping applications. This has been validated with extensive static and dynamic leach studies during exposure to 18.2 megohm ultra-pure water conducted by a reputable third party.

Spears[®] Low-Extractable™ material meets the toxicological requirements of NSF International Standard 61 as being safe for use in potable water applications, and also complies with the provisions of Title 21 of the United States FDA Code of Federal Regulations as being safe for use in food contact applications.

Processing:

Processing conditions for converting this material into component form are as critical as the selection of the material itself to ensure that the physical properties of the finished product are optimized. Correct processing techniques ensure proper dispersion and fusion of the compound, resulting in a homogenous melt with uniform properties. Great care is also taken during this process using proprietary techniques to address surface finish characteristics. Optimizing processing conditions and providing smooth internal surfaces greatly reduce the potential for extractable and particle contaminant. Spears[®] Low-Extractable™ pipe is cut square, purged to remove shavings, sealed in polybags and boxed on-line at time of manufacture to minimize contamination.



Joining:

Spears[®] Low-Extractable™ system utilizes a one-step solvent-cementing process specifically formulated for use with this product. Unlike conventional PVC solvent cements, this product contains fewer contaminants and cures quickly, reducing the potential for TOC contamination. Joining is accomplished quickly and efficiently utilizing inexpensive tools, thereby greatly reducing labor and installation costs.

Physical Properties:

Although the extractable contaminants of this Spears[®] system are much lower than those of conventional PVC piping, the physical properties are very similar. As a result, these products exhibit the well-known physical characteristics and other benefits of conventional PVC piping, such as good chemical and corrosion resistance, low thermal conductivity, high strength-to-weight ratio, good impact resistance, and ease of installation.

MM	NOMINAL PIPE SIZE (IN)	PART NUMBER	CARTON QTY FEET	OUTSIDE DIAMETER	INSIDE DIAMETER	MIN. WALL THICKNESS	WEIGHT PER 100 FEET	PRESSURE RATING AT 73.4°F
12	1/2 x 15 ft	LXT-005	330	0.840	0.528	0.147	0.202	420
20	3/4 x 15 ft	LXT-007	330	1.050	0.724	0.154	0.273	340
25	1 x 15 ft	LXT-010	270	1.315	0.935	0.179	0.402	320
32	1 1/4 x 15 ft	LXT-012	210	1.660	1.256	0.191	0.554	260
40	1 1/2 x 15 ft	LXT-015	165	1.900	1.476	0.200	0.673	240
50	2 x 15 ft	LXT-020	120	2.375	1.913	0.218	0.932	200
75	3 x 15 ft	LXT-030	75	3.500	2.864	0.300	1.903	190
100	4 x 15 ft	LXT-040	30	4.500	3.786	0.337	2.782	160
150	6 x 15 ft	LXT-060	15	6.625	5.709	0.432	5.313	140

Notes:

- PSI water, non-shock @ 73.4°F(23°C) with Solvent Welded Connections.
- All pipe is double bagged and boxed on-line for high purity environments.
- Spears LXT[®] piping is produced to Schedule 80 dimensions in strict accordance with ASTM D1785, and exhibits a Type II pressure rating.
- Spears LXT[®] fittings are produced to Schedule 80 dimensions per ASTM D2467.
- Spears LXT[®] is joined using the one step solvent cement (part # 07LXT200). The pint size comes complete with a dauber which is suitable for pipe size 1/2" to 3". For pipe sizes 4" thru 6" use a roller equal in size to 1/2 the pipe diameter.
- 7.5 ft lengths available upon request.

LXT® Schedule 80 Fittings

TRUE UNION 2000 IND. BALL VALVE

WITH HANDLE LOCKOUT & SAFE T-BLOCK™ DESIGN



NOMINAL PIPE SIZE	EPDM O-RING PART NUMBER	FKM O-RING PART NUMBER
1/2	1829-005BL	1839-005BL
3/4	1829-007BL	1839-007BL
1	1829-010BL	1839-010BL
1 1/4	1829-012BL	1839-012BL
1 1/2	1829-015BL	1839-015BL
2	1829-020BL	1839-020BL
3	1822-030BL	1832-030BL
4	1822-040BL	1832-040BL

INCLUDES PLUGGED END WITH ADDITIONAL SOCKET AND THREADED END CONNECTORS.

TRUE UNION 2000 IND. BALL VALVE

T-STYLE



NOMINAL PIPE SIZE	EPDM (TEE X SOCKET/SPIGOT) PART NUMBER	FKM (TEE X SOCKET/FIPT) PART NUMBER
1/2	182901-005BL	183901-005BL
3/4	182901-007BL	183901-007BL
1	182901-010BL	183901-010BL
1-1/4	182901-012BL	
1-1/2	182901-015BL	183901-015BL
2	182901-020BL	183901-020BL
3/4X1/2	182901-101BL	183901-101BL
1X1/2	182901-130BL	183901-130BL
1X3/4	182901-131BL	183901-131BL
1-1/4X1/2	182901-166BL	183901-166BL
1-1/4X3/4	182901-167BL	183901-167BL
1-1/4X1	182901-168BL	183901-168BL
1-1/2X1/2	182901-209BL	183901-209BL
1-1/2X3/4	182901-210BL	183901-210BL
1-1/2X1	182901-211BL	183901-211BL
2X1/2	182901-247BL	183901-247BL
2X3/4	182901-248BL	183901-248BL
2X1	182901-249BL	183901-249BL
2X1-1/2	182901-251BL	183901-251BL
3X1/2	182901-333BL	183901-333BL
3X1	182901-335BL	183901-335BL
3X1-1/2	182901-337BL	183901-337BL
3X2	182901-338BL	183901-338BL
4X1	182901-417BL	183901-417BL
4X1-1/2	182901-419BL	183901-419BL
4X2	182901-420BL	183901-420BL
6X2	182901-528BL	183901-528BL
8X2	182901-578BL	183901-578BL

INCLUDES PLUGGED END WITH ADDITIONAL SOCKET AND THREADED END CONNECTORS.

TRUE UNION 2000 IND. BALL CHECK VALVE



NOMINAL PIPE SIZE	EPDM O-RINGS PART NUMBER	FKM O-RINGS PART NUMBER
1/2	4529-005BL	4539-005BL
3/4	4529-007BL	4539-007BL
1	4529-010BL	4539-010BL
1-1/4	4529-012BL	4539-012BL
1-1/2	4529-015BL	4539-015BL
2	4529-020BL	4539-020BL
3	4522-030BL	4532-030BL
4	4522-040BL	4532-040BL

DIAPHRAGM VALVE

EPDM O-RING SEALS
EPDM BACKED PTFE DIAPHRAGM



NOMINAL PIPE SIZE	PART NUMBER
1/2	2729T-005BL
3/4	2729T-007BL
1	2729T-010BL
1-1/4	2729T-012BL
1-1/2	2729T-015BL
2	2729T-020BL

NOTE: BOTH SOCKET AND THREADED END CONNECTORS ARE PROVIDED WITH VALVE SIZES 1/2"- 2" DIAPHRAGM VALVES. VALVES CARRY A MAXIMUM PRESSURE RATING OF 150 PSI FOR WATER, NON-SHOCK, @ 73°F (23°C).

T-STYLE "ZERO DEAD LEG" DIAPHRAGM VALVE

MAINLINE TEE X SPIGOT
EPDM BACKED PTFE DIAPHRAGM



NOMINAL PIPE SIZE	PART NUMBER
1/2	2797TZD-005BL
3/4	2797TZD-007BL
1X1	2797TZD-010BL
1-1/2	2797TZD-015BL
2X2	2797TZD-020BL
1X1/2	2797TZD-130BL
1X3/4	2797TZD-131BL
1-1/2X1/2	2797TZD-209BL
1-1/2X3/4	2797TZD-210BL
2X1/2	2797TZD-247BL
2X1	2797TZD-249BL
2X1-1/2	2797TZD-251BL

NEEDLE VALVE ANGLE PATTERN



NOMINAL PIPE SIZE	FIPT ENDS PART NUMBER	SOCKET ENDS PART NUMBER
1/4	5691-002BL	5692-002BL
3/8	5691-003BL	5692-003BL
1/2	5691-005BLSR*	5692-005BL

REPLACEABLE PTFE STEM SEAL - NO ELASTOMER OR LUBRICANTS USED. NEEDLE VALVES CARRY A MAXIMUM INTERNAL PRESSURE RATING OF 235 PSI AT 73°F (23°C).

* - SR FIPT

NEEDLE VALVE GLOBE PATTERN



NOMINAL PIPE SIZE	FIPT ENDS PART NUMBER	SOCKET ENDS PART NUMBER
1/4	5591-002BL	5592-002BL
3/8	5591-003BL	5592-003BL
1/2	5591-005BLSR*	5592-005BL

REPLACEABLE PTFE STEM SEAL - NO ELASTOMER OR LUBRICANTS USED. NEEDLE VALVES CARRY A MAXIMUM INTERNAL PRESSURE RATING OF 235 PSI AT 73°F (23°C).

* - SR FIPT

LXT[®] Schedule 80 Fittings

2
PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

GAUGE GUARD DIAPHRAGM



NOMINAL PIPE SIZE	FKM PART NUMBER	PTFE PART NUMBER	EPDM PART NUMBER
NO GAUGE	G0003*	G0004*	G0002*
0-15 PSI	G0153*	G0154*	G0152*
0-30 PSI	G0303*	G0304*	G0302*
0-60 PSI	G0603*	G0604*	G0602*
0-100 PSI	G1003*	G1004*	G1002*
0-160 PSI	G1603*	G1604*	G1602*
0-200 PSI	G2003*	G2004*	G2002*
0-300 PSI	G3003*	G3004*	G3002*
0-30 IN-HG	G30V3*	G30V4*	G30V2*

* - For 1/4" inlet connection replace with -002BL
For 1/2" inlet connection replace with -005BL

"NO GAUGE" DESIGNATES GAUGE GUARD ONLY, UNFILLED. OTHER UNITS ARE PRE-FILLED AND FACTORY ASSEMBLED WITH GAUGE SPECIFIED IN SIZE COLUMN. GAUGE GUARDS CARRY A MAXIMUM PRESSURE RATING TO 235 PSI @ 73°F (23°C) AND FULL VACUUM @ SERVICE ON VACUUM GAUGES. ALL INLET CONNECTIONS ARE SPEARS PATENTED SPECIAL REINFORCED (SR) FEMALE PLASTIC NPT THREAD.

TEE

SOCKET X SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	801-005BL
3/4	801-007BL
1	801-010BL
1 1/4	801-012BL
1 1/2	801-015BL
2	801-020BL
3	801-030BL
4	801-040BL
6	801-060BL

REDUCING TEE

SOCKET X SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1x1x3/4	801-131BL
1-1/2x1-1/2x1	801-211BL
2x2x1	801-249BL
2x2x1-1/2	801-251BL
3x3x2	801-338BL
4x4x3	801-422BL
6x6x3	801-530BL
6x6x4	801-532BL

90° ELBOW

SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	806-005BL
3/4	806-007BL
1	806-010BL
1 1/4	806-012BL
1 1/2	806-015BL
2	806-020BL
3	806-030BL
4	806-040BL
6	806-060BL

90° SWEEP ELBOW

SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	806-005SBL
3/4	806-007SBL
1	806-010SBL
1-1/4	806-012SBL
1-1/2	806-015SBL
2	806-020SBL

45° ELBOW

SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	817-005BL
3/4	817-007BL
1	817-010BL
1-1/4	817-012BL
1-1/2	817-015BL
2	817-020BL
3	817-030BL
4	817-040BL
6	817-060BL

COUPLING

SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	829-005BL
3/4	829-007BL
1	829-010BL
1-1/4	829-012BL
1-1/2	829-015BL
2	829-020BL
3	829-030BL
4	829-040BL
6	829-060BL

REDUCER COUPLING

SOCKET X SOCKET



NOMINAL PIPE SIZE	PART NUMBER
3/4x1/2	829-101BL
1x3/4	829-131BL
1-1/4x1	829-168BL
1-1/2x1	829-211BL
1-1/2x1-1/4	829-212BL
2x1	829-249BL
2x1-1/2	829-251BL
3x2	829-338BL
4x2	829-420BL
4x3	829-422BL
6x4	829-532BL

GRIPLOC™ TRANSITION COUPLING

SOCKET X GRIPLOC™ COMPRESSION
WARNING: DO NOT INSERT FINGERS
EPDM GASKET



NOMINAL PIPE SIZE	PART NUMBER
1/2	P092-005BL
3/4	P092-007BL
1	P092-010BL
1-1/4	P092-012BL
1-1/2	P092-015BL
2	P092-020BL

LXT[®] Schedule 80 Fittings

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

SPECIAL REINFORCED FEMALE ADAPTER



NOMINAL PIPE SIZE	PART NUMBER
1/2	835-005SRBL
3/4	835-007SRBL
1	835-010SRBL
1-1/4	835-012SRBL
1-1/2	835-015SRBL
2	835-020SRBL
3	835-030SRBL
4	835-040SRBL

CAP



NOMINAL PIPE SIZE	PART NUMBER
1/2	847-005BL
3/4	847-007BL
1	847-010BL
1 1/4	847-012BL
1 1/2	847-015BL
2	847-020BL
3	847-030BL
4	847-040BL
6	847-060BL

SPECIAL REINFORCED REDUCING SPIGOT FEMALE ADAPTER



NOMINAL PIPE SIZE	PART NUMBER
1/2X1/4	878-072SRBL
3/4X1/4	878-098SRBL
1X1/4	878-128SRBL

UNION



NOMINAL PIPE SIZE	EPDM O-RINGS PART NUMBER	FKM O-RINGS PART NUMBER
1/2	897-005BL	857-005BL
3/4	897-007BL	857-007BL
1	897-010BL	857-010BL
1-1/4	897-012BL	857-012BL
1-1/2	897-015BL	857-015BL
2	897-020BL	857-020BL
3	8097-030BL	8057-030BL
4	8097-040BL	8057-040BL

235 PSI MAXIMUM INTERNAL PRESSURE RATING @ 73°F (23°C)

MALE ADAPTER



NOMINAL PIPE SIZE	PART NUMBER
1/2	836-005BL
3/4	836-007BL
1	836-010BL
1-1/4	836-012BL
1-1/2	836-015BL
2	836-020BL
3	836-030BL
4	836-040BL

FLANGE SOCKET VAN STONE STYLE



NOMINAL PIPE SIZE	PART NUMBER
1/2	854-005BL
3/4	854-007BL
1	854-010BL
1 1/4	854-012BL
1 1/2	854-015BL
2	854-020BL
3	854-030BL
4	854-040BL
6	854-060BL

RATED @ 150 PSI WORKING PRESSURE @ 73°F (23°C)

REDUCER BUSHING FLUSH STYLE



NOMINAL PIPE SIZE	SPIGOT X SOCKET PART NUMBER	SPIGOT X FPT PART NUMBER
1/2x1/4		838-072BL
1/2x3/8		838-073BL
3/4x1/4		838-098BL
3/4x1/2	837-101BL	838-101BL
1x3/8		838-129BL
1x1/2	837-130BL	838-130BL
1x3/4	837-131BL	838-131BL
1-1/4x1/2	837-166BL	
1-1/4x1	837-168BL	
1-1/2x3/4	837-210BL	838-210BL
1-1/2x1	837-211BL	838-211BL
1-1/2x1-1/4	837-212BL	
2x1	837-249BL	
2x1-1/2	837-251BL	
3x2	837-338BL	
4x3	837-422BL	
6x4	837-532BL	

PVC NEW STYLE STANDARD TANK ADAPTER



NOMINAL PIPE SIZE	EPDM GASKETS PART NUMBER	FKM GASKETS PART NUMBER
1/2	8170E-005BL	8170V-005BL
3/4	8170E-007BL	8170V-007BL
1	8170E-010BL	8170V-010BL
1-1/4	8170E-012BL	8170V-012BL
1-1/2	8170E-015BL	8170V-015BL
2	8170E-020BL	8170V-020BL
3	8170E-030BL	8170V-030BL
4	8170E-040BL	8170V-040BL


150 PSI MAXIMUM INTERNAL WORKING PRESSURE RATING @ 73°F (23°C)



LXT[®] Schedule 80 Fittings

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

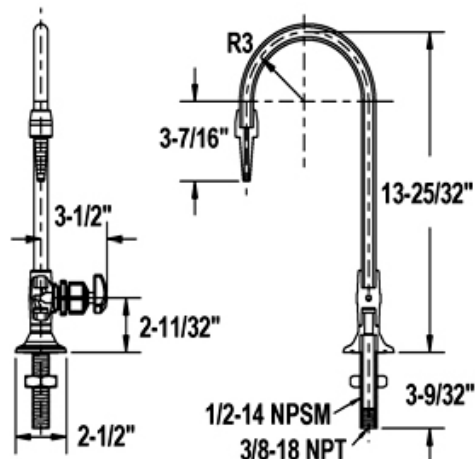
WRENCH SETS

	NOMINAL PIPE SIZE	PART NUMBER
	1/2	TAW-005
	3/4	TAW-007
	1	TAW-010
	1-1/4	TAW-012
	1-1/2	TAW-015
	2	TAW-020
	3	TAW-030
	4	TAW-040

NOTE: FOR INDIVIDUAL BODY WRENCH ADD 1 AFTER TAW, FOR INDIVIDUAL NUT WRENCH ADD 2 AFTER TAW. (TAW1-005 ETC.)

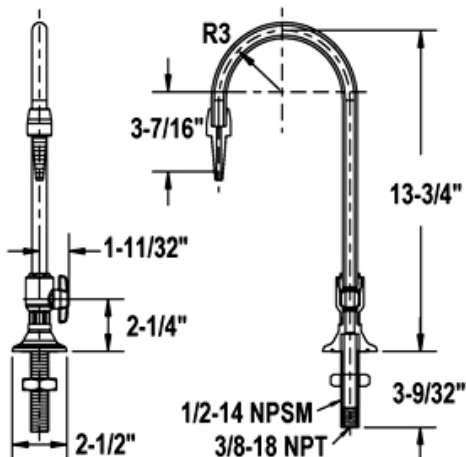
GOOSENECK UNITS - DECK MOUNT LAB FIXTURE

	DETAILS	PART NUMBER
WITH NEEDLE VALVE	LE, PTFE SEAL	LF1000-BLN
BASE, GOOSENECK & SERRATED TIP WITH NEEDLE VALVE-METERED FLOW		



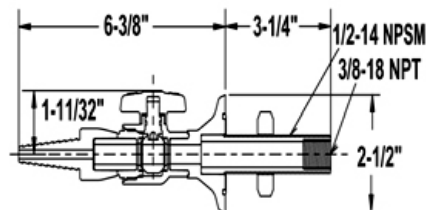
GOOSENECK UNITS - DECK MOUNT LAB FIXTURE

	DETAILS	PART NUMBER
WITH BALL VALVE	LE, EPDM SEAL	LF1002-BL
	LE, FKM SEAL	LF1003-BL
BASE, GOOSENECK & SERRATED TIP WITH BALL VALVE-DIRECT FLOW		



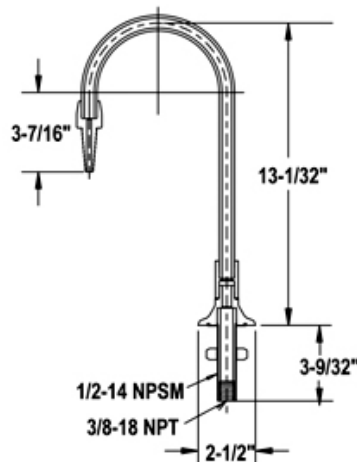
TURRET UNITS - PANEL MOUNT LAB FIXTURE

	DETAILS	PART NUMBER
WITH BALL VALVE	LE, EPDM SEAL	LF3002-BL
	LE, FKM SEAL	LF3003-BL
TURRET BASE & SERRATED TIP WITH BALL VALVE-DIRECT FLOW		



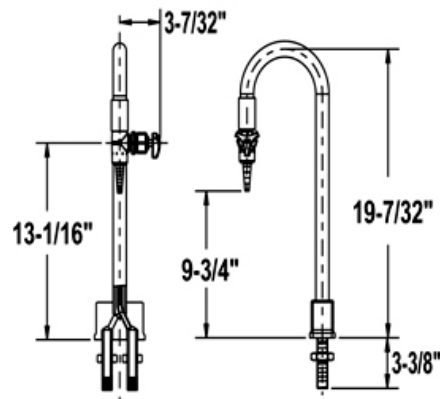
REMOTE VALVE UNITS - DECK MOUNT GOOSENECK

	DETAILS	PART NUMBER
NO VALVE	LE	LF100-BL
BASE, GOOSENECK & SERRATED TIP - FOR USE WITH REMOTE VALVE		



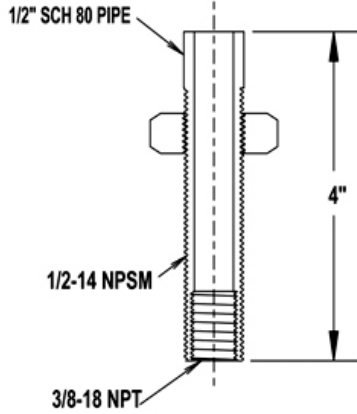
GOOSENECK RECIRCULATING UNITS - DECK MOUNT LAB FIXTURE

	DETAILS	PART NUMBER
WITH NEEDLE VALVE	LE, PTFE SEAL	LF1000-BLN
BASE, GOOSENECK & SERRATED TIP WITH NEEDLE VALVE-METERED FLOW		



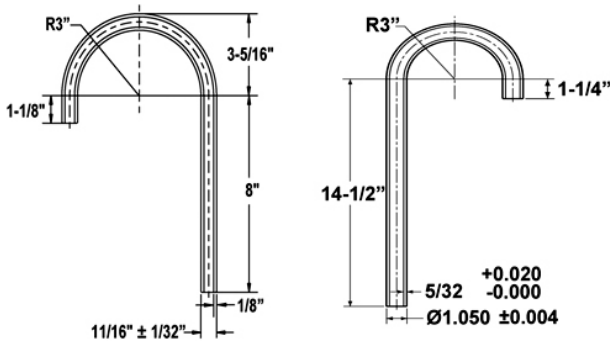
ACCESSORY/REPLACEMENT FIXTURE CONNECTION NIPPLE

	DETAILS	PART NUMBER
WITH LOCKNUT (INCLUDED ON ALL FIXTURES LISTED ABOVE)	LE	LF500-BL



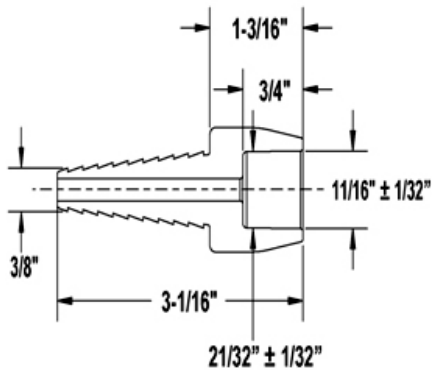
ACCESSORY/REPLACEMENT GOOSENECK (3/8")

	DETAILS	PART NUMBER
	LF	LFGN-BL
	LE	LFRGN-BL



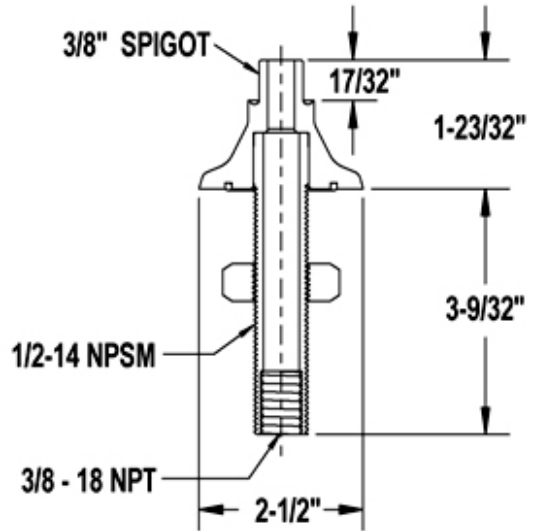
ACCESSORY/REPLACEMENT STRAIGHT SERRATED TIP ONLY

	DETAILS	PART NUMBER
	LE	LF400-BL



ACCESSORY/REPLACEMENT BASE ONLY

	DETAILS	PART NUMBER
DECK MOUNT	LE	LFB-BL



2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

+GF+ Progef[®] Standard PP Piping System

for a wide range of industrial applications

The highly resistant system offers numerous fields of application in industries. High stress fracture, pressure, abrasion, corrosion and temperature resistance are only some of the advantageous characteristic properties for the durable polypropylene system. Its fine, homogeneous material structure furthermore offers outstanding weldability and low heat distortion.

Applications:

- Low-grade DI water
- Process cooling water (PCW)
- Chemical distribution
- Vacuum
- High impact strength
- Excellent chemical resistance
- High stress crack resistance

Fields of Application:

- RO/DI Water Conveyance
- Process Cooling Water
- Chemical Process Industry
- Food Processing

Technical Data:

- Size Range: d16 - d500 mm (3/8" - 20")
- Pressure Rating: d16 - d225 mm, SDR11: PN10 (150 PSI); d50 - d225 mm, SDR17.6: PN6 (90 PSI); d250 - d500 mm, SDR11: PN10 (150 PSI); d250 - d500mm, SDR17.6: PN6 (90 PSI)
- Operating Temperature: 0°C - 80°C (32°F - 176°F)
- Joining Technology: IR Plus Fusion: d20 - d225 mm; Butt Fusion: d20 - d500 mm; Socket Fusion: d16 - d110 mm
- Standard Ratings: FDA CFR 21 177.1520; USP 25 Class VI; ASME-BPE; NSF 61
- Materials: Beta Polypropylene Homopolymer (Beta PP-H)

+GF+ Progef[®] Natural PP Piping System

for laboratories and pharmaceutical applications

Wherever pure solutions are needed, especially for applications in chemical or life science industries, PROGEF Natural is predestined. Beneficial properties of the transparent, pigment free polypropylene such as excellent clean, smooth surface, high chemical and temperature resistance, and additionally the bead and crevice free joining technologies, ensure highest system quality.

Applications:

- Purified Water (PW)
- De-Ionized Water (DIW)
- Slurry distribution

Features:

- Translucent appearance
- No corrosion or rouging
- Outstanding surface quality
- Excellent chemical resistance
- High impact strength

Fields of Application:

- Pharmaceutical Grade water
- Purified water for Life Science applications
- Cost effective, pure distribution of Lab Grade DI water and critical biological fluids
- Specified water applications in microelectronics
- Chemical processes (i.e. Chemical Mechanical Polishing or Planarization)

Technical Data:

- Size Range: d20 - d90 mm (1/2" - 3")
- Pressure Rating: d20 - d63, SDR11: PN10 (150 PSI); d75 - d110, SDR17.6: PN6 (90 PSI)
- Operating Temperature: 0°C - 80°C (32°F - 176°F)
- Joining Technology: BCF Plus Fusion; IR Plus Fusion
- Standard Ratings: FDA CFR 21 177.1520; USP 25 Class VI; ASME-BPE
- Material: Polypropylene Random Copolymer (PP-R)

+GF+ SYGEF® Standard PVDF Piping System



For the industrial water and chemical market, SYGEF Standard provides a premier piping system solution because of its purity characteristics, chemical resistance and extensive product and fusion offerings. It is joined using BCF Plus (20mm - 110mm), Socket Fusion (16mm - 110mm), or IR Plus Fusion (20mm - 315mm).

Applications:

- Ultra-Pure Water (UPW) Return
- Purified Water (PW)
- Chemical distribution

Fields of Application:

- Pharmaceutical Grade DI Water
- Chemical applications within the Chemical Processing Industry (CPI)
- Acid Distribution
- UPW and HUPW (Hot) Ultrapure Water return loops in microelectronics
- Life Science applications for sanitization with ozone, steam, or hot water

Features:

- Virgin Kynar® 700 Series Resin
- Surface finish Ra < μm
- Ozone resistant
- 100% traceability to the raw material
- Durable packaging to ensure product integrity

Technical Data:

- Size Range: d20 - d315 mm (1/2" - 12")
- Pressure Rating: d20 - d110 mm: PN16 (232 PSI); d160 - d315 mm: PN10 (150 PSI)
- Operating Temperature: -20°C - 140°C (-4°F - 284°F)
- Joining Technology: Socket Fusion: d20 - d110 mm; BCF Plus Fusion: d20 - d110 mm;
- IR Plus Fusion: d20 - d315 mm
- Standard Ratings: ASME BPE; FDA CFR 21 177.1520; USP 25 Class VI; FM4910; UL 723; ASTM E84
- Material: Polyvinylidene Fluoride (PVDF)

+GF+ SYGEF® Plus PVDF Piping System



SYGEF Plus is the most recognized brand in the high purity water market because of its industry leading purity characteristics, manufacturing excellence, vast product range, and proven performance with foremost semiconductor and life science corporations. Please contact customer service for a complete list of available fittings.

Applications:

- Ultra-pure Water (UPW)
- High purity acid distribution

Fields of Application:

- Semiconductor UPW/HUPW
- USP Pharmaceutical
- Water for injection (WFI)
- High purity acid distribution

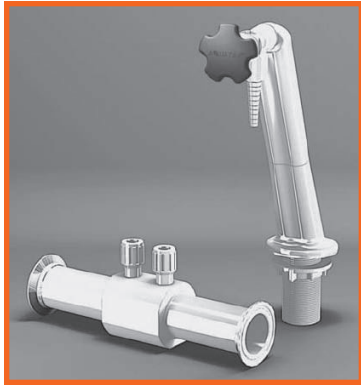
Features:

- Virgin Kynar® 700 Series Resin
- Technologically advanced cleanroom manufacturing
- Surface finish < 225mm Ra < 0.2μm; >225mm Ra < 0.3 μm
- Ozone resistant
- Extensive industry validated QA/QC protocol
- 100% traceability to the raw material
- Durable packaging to ensure product integrity

Technical Data:

- Size Range: d20 - d450 mm (1/2" - 18")
- Pressure Rating: d20 - d225 mm: PN16 (232 PSI); d90 - d450 mm: PN10 (150 PSI)
- Operating Temperature: -20°C - 140°C (-4°F - 284°F)
- Joining Technology: BCF Plus Fusion; IR Plus Fusion; Butt Fusion
- Standard Ratings: ASME BPE; FDA CFR 21 177.1520; USP 25 Class VI; SEMI F57; FM4910
- Material: Polyvinylidene Fluoride (PVDF)

+GF+ Type 530 AquaTap Recirculating Laboratory Faucet



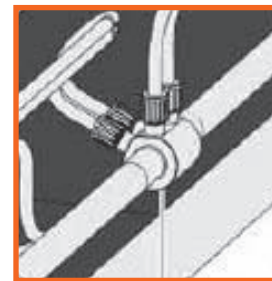
Featuring GF's Inline Flow Diverter (IFD) Technology (Patent Pending)

The Georg Fischer Type 530 recirculating laboratory faucet is designed to provide constant DI fluid flow to point of use when used with the new Inline Flow Diverter (IFD). The unique design of the IFD provides high flow from the distribution main through the faucet for constant water movement. The IFD uses a slight orifice reduction to create a differential pressure imbalance which forces water through the faucet with minimal pressure loss. The system is further enhanced by using smooth bore interconnecting tubing for design flexibility and simplified piping installations. Up to three faucets can be served from a single IFD.

The faucet is made from high purity PVDF, and the IFD is available in SYGEF® PVDF or PROGEF® natural PP in either weld or sanitary clamp connections. Simple heat flaring tools make leak-proof, minimum crevice connections between components.

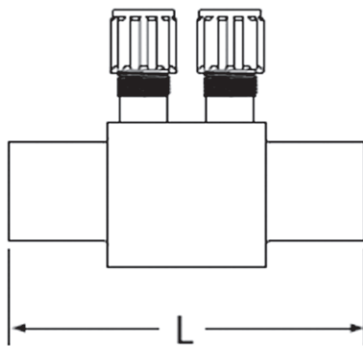
Technical Features

- Ideal flow characteristics
- Sleek robust design
- Continuous flow up to valve eliminating dead-legs
- Easy flare-style connection method
- Deck or wall mounting options
- Needle-type flow control for precise metering

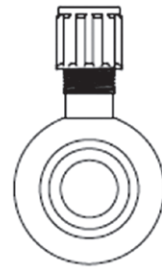


Example: Single IFD (Inline Flow Diverter): Serving Multiple (3) AquaTap Faucets

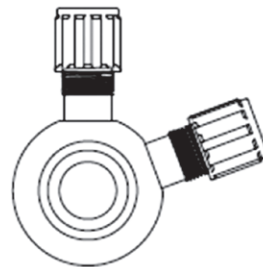
Tie-In Components



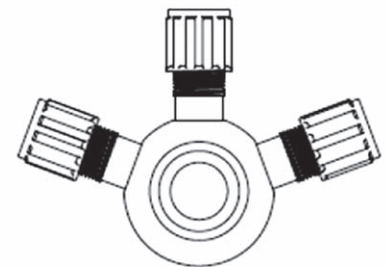
Inline Flow Diverter with IR Butt/BCF® Plus Connection



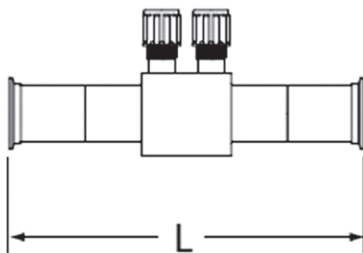
1/1 Port (Inlet/Outlet)



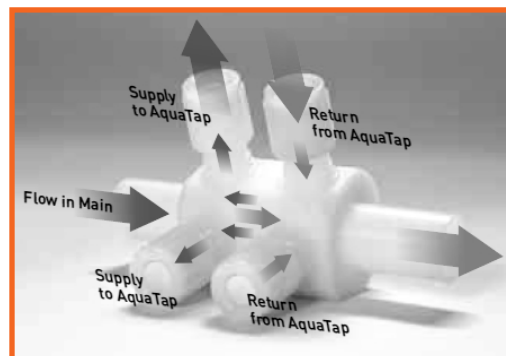
2/2 Port (Inlet/Outlet)



3/3 Port (Inlet/Outlet)

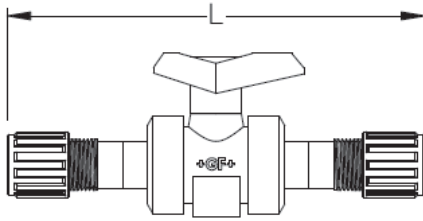


Inline with sanitary Tri-Clamp Connections Flow Diverter

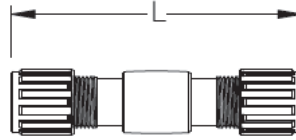


NOTE: ALSO AVAILABLE WITH SANITARY CLAMP ENDS

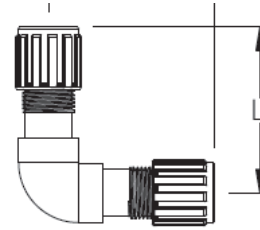
Tubing Interconnect Components



Isolation Ball Valve
Capable of direct connection as isolator to the faucet



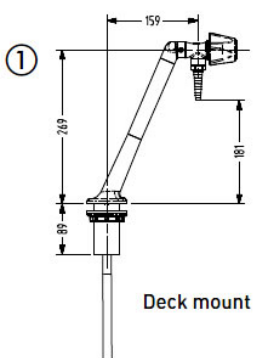
Straight Coupler
For direct connection to faucet tubing



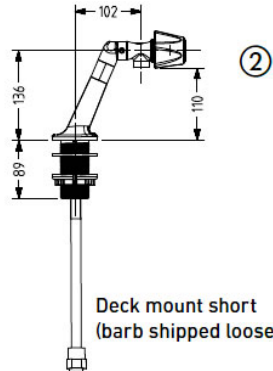
90° Elbow
For tight space constraints

Ordering Details

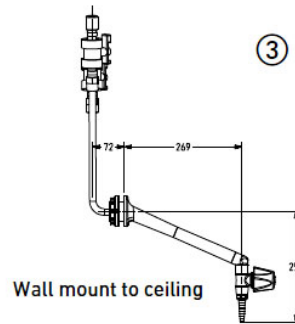
PICTURE	MOUNTING STYLE	PN	PART NUMBER
1	Deck Mount Hose Barb	6	175530101
2	Deck Mount Short Version Female 3/8" NPT	6	175530105
3	Wall Mount to Ceiling Hose Barb	6	175530102
4	Wall Mount to Floor Hose Barb	6	175300103
5	Wall Mount with Hose Barb to floor short	6	175530107
6	Deck Mount Dual Head	6	175530104
7	Wall Mount Short to Ceiling	6	175530106
8	Wall Mount with Hose Barb at Mounting Elevation	6	175530118



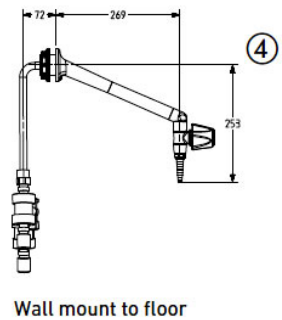
Deck mount



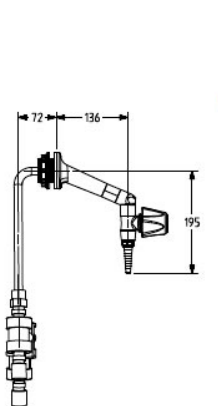
Deck mount short (barb shipped loose)



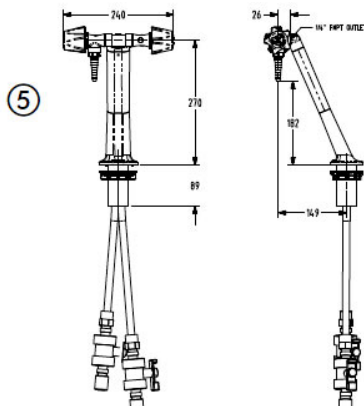
Wall mount to ceiling



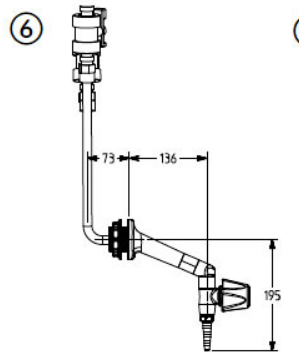
Wall mount to floor



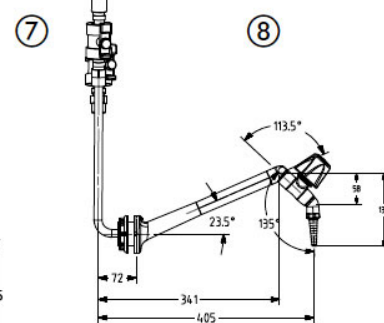
Wall mount to floor short



Deck mount dual head



Wall mount to ceiling short



Wall mount with hose barb at mounting level

Notes:

Mounting Hole Diameter 2"-2 1/8"

Male-to-male coupler included (not shown in illustration)

Gauge Isolators & Throttle Master Needle Valves

Marquest Scientific Tuff Guard Gauge Isolators



Standard Gauge(SB) Installed in a Wika 213.53 Stainless Case, Brass Connection, Glycerin Filled. All Stainless Gauges(SS), Process Gauges(PG), & Pressure Switches are available.

Marquest Scientific's new line of gauge and instrument isolators are engineered to provide total protection and isolation of corrosive & ultra pure fluids while offering a design with the most rugged features in the industry. Stainless steel reinforcement of the instrument connection to prevent fracturing associated with metal to plastic threads. This stainless steel reinforcing component is integrally molded into the Upper Chamber to completely surround the full length of the female thread and is for all practical purposes "unbreakable".

- Available in PVC, CPVC, Polypropylene, & PVDF.
- Diaphragms in PTFE, Teflon, Viton and EPDM
- Connection Sizes: 1/4" x 1/2", 1/4" x 1/4", 1/2" x 1/2"
- Instrument x Process Female, NPT/BSP Connections
- Solvent Cement Socket Process Joint

GAUGE RANGE	PVC, TEFLON DIAPHRAGM		CPVC, TEFLON DIAPHRAGM		POLYPROPYLENE, TEFLON DIAPHRAGM		PVDF, TEFLON DIAPHRAGM	
	1/4" FEMALE NPT INLET	1/2" FEMALE NPT INLET	1/4" FEMALE NPT INLET	1/2" FEMALE NPT INLET	1/4" FEMALE NPT INLET	1/2" FEMALE NPT INLET	1/4" FEMALE NPT INLET	1/2" FEMALE NPT INLET
No Gauge	TG-22T-PVC	TG-25T-PVC	TG-22T-CPV	TG-25T-CPV	TG-22T-PPR	TG-25T-PPR	TG-22T-PVD	TG-25T-PVD
0-15psi	TG-22T015SB-PVC	TG-25T015SB-PVC	TG-22T015SB-CPV	TG-25T015SB-CPV	TG-22T015SB-PPR	TG-25T015SB-PPR	TG-22T015SB-PVD	TG-25T015SB-PVD
0-30psi	TG-22T030SB-PVC	TG-25T030SB-PVC	TG-22T030SB-CPV	TG-25T030SB-CPV	TG-22T030SB-PPR	TG-25T030SB-PPR	TG-22T030SB-PVD	TG-25T030SB-PVD
0-60psi	TG-22T060SB-PVC	TG-25T060SB-PVC	TG-22T060SB-CPV	TG-25T060SB-CPV	TG-22T060SB-PPR	TG-25T060SB-PPR	TG-22T060SB-PVD	TG-25T060SB-PVD
0-100psi	TG-22T100SB-PVC	TG-25T100SB-PVC	TG-22T100SB-CPV	TG-25T100SB-CPV	TG-22T100SB-PPR	TG-25T100SB-PPR	TG-22T100SB-PVD	TG-25T100SB-PVD
0-160psi	TG-22T160SB-PVC	TG-25T160SB-PVC	TG-22T160SB-CPV	TG-25T160SB-CPV	TG-22T160SB-PPR	TG-25T160SB-PPR	TG-22T160SB-PVD	TG-25T160SB-PVD
0-200psi	TG-22T200SB-PVC	TG-25T200SB-PVC	TG-22T200SB-CPV	TG-25T200SB-CPV	TG-22T200SB-PPR	TG-25T200SB-PPR	TG-22T200SB-PVD	TG-25T200SB-PVD
0-300psi	TG-22T300SB-PVC	TG-25T300SB-PVC	TG-22T300SB-CPV	TG-25T300SB-CPV	TG-22T300SB-PPR	TG-25T300SB-PPR	TG-22T300SB-PVD	TG-25T300SB-PVD

Notes:

- 250 psi rating for PVC & CPVC, 170 psi for PP, and 250 psi for PVDF
- PVC, CPVC available with Solvent Socket Connection, PVDF available with metric fusion sockets.
- Standard Instrument Connection is 1/4" Female NPT. 1/2" Female NPT available "TG-55"

Marquest Scientific Throttle Master Needle Valves



Standard port connection is Female NPT. Tubing, Solvent, & Fusion connections available upon request.

Notes:

- 200 psi rating for PVC, CPVC, PVDF. 150 psi rating for PP
- Cv Factors: .310 thru .780 at Full Open

Marquest Scientific's line of Throttle Master Needle Valves provide precise flow control with fine adjustment of corrosive and high purity fluids. Available in two styles, both straight pattern (straight 180°) and Angle pattern (90°). Three standard end connections: 1/4", 3/8" and 1/2" Female NPT. Tubing, solvent, & fusion connections are available. A PTFE, Teflon sealed metering chamber offers excellent chemical resistance & high purity. There are no metals, elastomers, or lubricants used in their construction.

SIZE	PVC		CPVC		POLYPROPYLENE		PVDF	
	STRAIGHT	ANGLE	STRAIGHT	ANGLE	STRAIGHT	ANGLE	STRAIGHT	ANGLE
1/4" NPT	NG-250-PVC	NA-250-PVC	NG-250-CPV	NA-250-CPV	NG-250-PPR	NA-250-PPR	NG-250-PVD	NA-250-PVD
3/8" NPT	NG-375-PVC	NA-375-PVC	NG-375-CPV	NA-375-CPV	NG-375-PPR	NA-375-PPR	NG-375-PVD	NA-375-PVD
1/2" NPT	NG-500-PVC	NA-500-PVC	NG-500-CPV	NA-500-CPV	NG-500-PPR	NA-500-PPR	NG-500-PVD	NA-500-PVD

Laboratory Faucets & Turrets

2 PURE WATER, INSTITUTIONAL & LAB PIPING SYSTEMS

Marquest Scientific Laboratory Faucets



Marquest Scientific Laboratory Faucets provide point of use access of Type I, II & III water as well as corrosive chemicals. FDA, USDA, & USP standards are either met or exceeded. All injection molded, rugged design and construction. Outlet options include a molded serrated barb fitting for tubing, a male or female NPT thread, a .2 Micron capsule filter, and many more. Control Valve options include a zero deadleg needle valve, a compact 1/4 turn on/off lab valve, and standard 1/4 turn ball valve.

- Available in PVC, Natural Polypropylene, & PVDF.
- Gooseneck component is heavy wall, custom extruded for increased rigidity.
- L Series Needle Control Valve option offers all New PTFE sealing for extended life. Exceptional Low torque on/off.

From Left to Right: (1) Wall Mount PVC Lab Faucet w/ L Series Needle Valve (2) Deck Mount Natural Polypro Lab Faucet w/ Standard Ball Valve (3) Deck Mount PVC Lab Faucet w/ L Series Needle Valve & Atmospheric Vacuum Breaker (4) Deck Mount PVC Lab Faucet w/ Lab Valve

CONTROL VALVE	PVC, TYPE II, III WATER		NATURAL POLYPRO, TYPE II, I WATER		HIGH PURITY PVDF, TYPE I WATER		PVDF (TYPE I) RECIRCULATING FAUCETS	
	DECK MOUNT	WALL MOUNT	DECK MOUNT	WALL MOUNT	DECK MOUNT	WALL MOUNT	DECK MOUNT	WALL MOUNT
Needle Valve	LG-DN-X1	LG-WN-X1	LG-DN-X2	LG-WN-X2	LG-DN-X3	LG-WN-X3	LG-DNR-X3	LG-WNR-X3
Ball Valve	LG-DB-X1	LG-WB-X1	LG-DB-X2	LG-WB-X2	LG-DB-X3	LG-WB-X3	-	-
Lab Valve	LG-DL-X1	LG-WL-X1	-	-	-	-	-	-
Remote, No Valve	LG-DR-X1	LG-WR-X1	LG-DR-X2	LG-WR-X2	LG-DR-X3	LG-WR-X3	-	-

*Fill in the (X) in the above part numbers with "R"-Right Handed, "L"-Left Handed, "F"-Handle in Front, "B"-Handle in Back. Remote, (X) remains.



An Atmospheric Vacuum Breaker for Backflow Prevention is available on most Lab Faucet configurations. An example: Part No. LGV-DN-R1

Description: Lab Faucet, Deck Mount, L Series Needle Valve, Right Handed, PVC, w/ Atmospheric Vacuum Breaker installed. Meets ASME A112.18.1M.



A Water Quality Light with Resistivity thresholds ranging from 5k ohm/cm through 2 meg Ohm/cm are available on most Lab Faucet configurations. Please contact us for a part number that meets your specification. An example: Part No. LG-DN1MEG-R1 Description: Lab Faucet, Deck Mount, L Series

Needle Valve, Right Handed, PVC, w/ 1 Meg Ohm/cm Quality Light installed. The monitoring is simple; the green light indicates the water purity is above the threshold value; the red light warns that it is below.



A .2 Micron Capsule Filter option is available on all Lab Faucet configurations. An example: Part No. LG-DNCF-R1 Description: Lab Faucet, Deck Mount, L Series Needle Valve, Right Handed, PVC, w/ .2 Micron Capsule Filter. Standard Outlet on Capsule Filter is 3/8" Male NPT. Other connections available include Hose Barb, & Female NPT.

Notes:

- All deck mount assemblies include a 3" Thru-Deck Nipple (Wall Mount 1.5"), Ring Nut, casual water gasket.
- Standard Inlet connection is 3/8" Female NPT. Tube & Fusion Socket connections available.
- All assemblies require a 1" diameter hole for mounting.

Marquest Scientific Laboratory Turrets



Picture shown is LT-V-R1

Marquest Scientific's line of Laboratory Turrets provide compact and convenient point of use access of Type I II & III water as well as corrosive chemicals. FDA, USDA, & USP standards are either met or exceeded. All injection molded, rugged design and construction. Outlet options include a molded serrated barb fitting for tubing, as well as a male or female NPT Thread, Control Valve options include a zero deadleg needle valve and a standard 1/4 turn ball valve. Available in PVC, Natural Polypropylene, & High Purity PVDF.

CONTROL VALVE	PVC			NATURAL POLYPROPYLENE			HIGH PURITY PVDF		
	RIGHT HAND	LEFT HAND	HANDLE ON TOP	RIGHT HAND	LEFT HAND	HANDLE ON TOP	RIGHT HAND	LEFT HAND	HANDLE ON TOP
Needle Valve	LT-V-R1	LT-V-L1	LT-V-T1	LT-V-R2	LT-V-L2	LT-V-T2	LT-V-R3	LT-V-L3	LT-V-T3
Ball Valve	LT-B-R1	LT-B-L1	LT-B-T1	LT-B-R2	LT-B-L2	LT-B-T2	LT-B-R3	LT-B-L3	LT-B-T3
Remote, No Valve	LT-X-1			LT-X-2			LT-X-3		

Notes:

- Cv Factor: .310 at Full Open
- 200 psi rating for PVC & PVDF. 150 psi rating for Natural Polypro



FLUOR-O-FLO® PTFE Piping Systems

Micromold FLUOR-O-FLO® Virgin PTFE NPT Piping System

Schedule 80

2



The FLUOR-O-FLO® PTFE piping system is well suited for low pressure laboratory and process industry applications demanding:

- Extreme Corrosion Resistance
- High Temperature Capability
- High Purity

It is less expensive than PTFE lined piping systems, and has several application advantages:

- it is easier to cut to length and install
- it is easier to reuse
- it is available in small pipe sizes



Compared to systems made of nickel alloy, such as stainless steel or Hastelloy®, or of exotic metals, such as tantalum or zirconium, the FLUOR-O-FLO® system is often a more cost effective solution to handling difficult fluids.

Also Available: FLUOR-O-FLO® PTFE Threaded Piping System

All pipe and fittings are solid virgin PTFE. To maximize creep resistance, FNPT fittings are made from special virgin PTFE: Micromold's MICROFLON™.

Available in pipe sizes ranging from 1/8" through 4". Pipe schedule is 80. Standard length is 8 feet. Other lengths available.

Standard NPT threaded fittings available include the following:

- Nipples
- 45° & 90° Elbows
- Street Elbows
- Straight Couplings
- Reducing Couplings
- Bushings
- Adapters: NPT to Hose Barbs; NPT to Tri-Clamp
- Plugs
- Unions
- Tees
- Caps
- Threaded Flanges
- Tank Adapters
- Manifolds
- Cam-Lock, Quick-Connect Coupling

Other fittings available on request

Strainers Dip Pipes Piping Systems

FLUOR-O-FLO®
PTFE and PVDF systems
for your most corrosive
applications

M **MICROMOLD PRODUCTS, INC.**
Made in USA since 1950
www.micromold.com

Micromold FLUOR-O-FLO[®] Dip Pipes & Spargers

PTFE Lined and Jacketed Steel



MATERIALS

LINERS, JACKETS AND SEALS	Virgin PTFE
PIPES AND FLANGES	Carbon steel is standard. Stainless steel, Monel, or other special materials are available.

SIZES

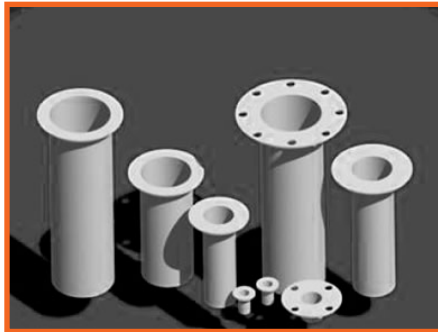
FLANGES	Up to 10" 150 lb. is standard. 300 lb. or special flanges are available.
PIPE SIZES	1/2" through 6" are standard. Larger sizes and specials available.
LENGTHS	Lengths to 15 feet are standard. Longer lengths available.

STYLES

STANDARD UNITS	Double, single, and reducing flanged styles available.
CURVED UNITS	Sizes up to 3" are standard.
REINFORCED UNITS	Double-walled steel pipe for extra strength.

Micromold FLUOR-O-FLO[®] Nozzle Liners

Solid Virgin PTFE



NOZZLE SIZE

Standard liners fit nozzles from 1/2" to 18" pipe size. Special sizes available on request.

LENGTH

Up to 4" nominal pipe size, lengths available to 15 feet. Over 4" nominal size, lengths available to 30".

FLANGE DIAMETER

Minimum diameter of flange of standard liners corresponds to the raised face of ANSI Class 150 flanges. Full face or other special flange diameters available on request.

THICKNESS

Wall thickness of standard liners increases with liner size, from a minimum of 1/16" wall up to 1/4" wall. Nonstandard wall thickness available on request. Seal thickness equal to wall thickness standard, other seal thicknesses available on request.

END

Square cut end is standard. Diagonal cut available on request.
--

Micromold FLUOR-O-FLO[®] Spacers and Flanges

PTFE, PVDF, PPL or CPVC



MATERIALS

Virgin PTFE, PVDF. Also PPL or CPVC. Other materials on request.
--

STYLES

Ring, Full Face, Reducing, Blind, Orifice, Tapered, Conical Bore, Armored, Filler Flanges, Spectacle Line-Blinds
--

PIPE SIZES

1/2" through 12", larger on request.

FLANGE SIZES

Class 150, 300 and ISO metric sizes

LENGTHS

To 12", longer on request.

ChemFlare™ Flexible Leak-Free Solutions

Single Wall Systems

- Chemline's ChemFlare™ system is the long term leak-free alternative to standard PVC solvent welded piping on sodium hypochlorite chemical feed systems. Valves, controls and pumps with ChemFlare™ ends connect to ChemFlare™ fittings and PFA tubing.
- 25 years life expectancy for leak-free and maintenance-free service on sodium hypochlorite
- Systems are easy to install
- Mechanical connections
- No welding or curing waiting time, may be pressure tested immediately
- True Union valve sizes: 1/2", 3/4" & 1"
- Tubing sizes: 1/4", 3/8", 1/2", 3/4" & 1"

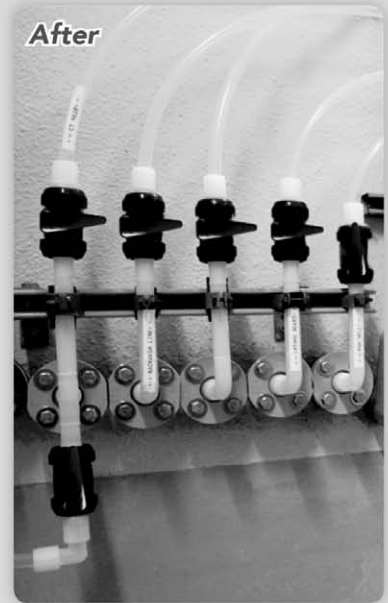
Do you have leaking chemicals? Consider a retrofit. Call Chemline to arrange a site visit.



All Chemline valves 1/2" to 1" with True Union ends are available with ChemFlare™ ends



Leaking sodium hypochlorite in a welded PVC system



ChemFlare™ tubing system and ECTFE piping on sodium hypochlorite service

Dual Containment Systems

For maximum safety level of chemical containment

Tubing

- The carrier (inner) tube of PFA is the primary chemical line. The containment (outer) tube of FEP is translucent, permitting good visibility of the carrier tube.

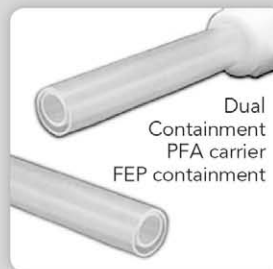
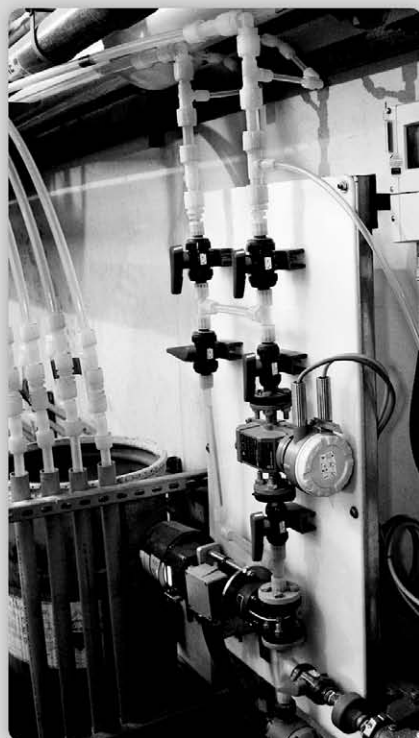
Specialty Fittings

- Dripleg Fittings
- Dual containment tubing assemblies
- Dual containment splitter boxes
- Junction Boxes

Tubing Sizes O.D.

PFA Primary/FEP Containment

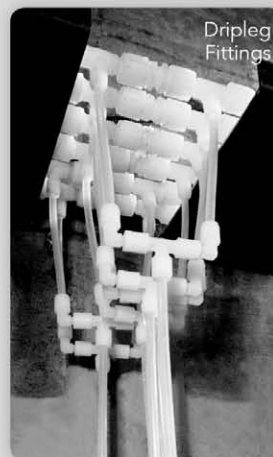
- 1/4" / 1/2"
- 3/8" / 3/4"
- 1/2" / 3/4"
- 3/4" / 1"



Dual Containment PFA carrier FEP containment



Junction Box



Dripleg Fittings

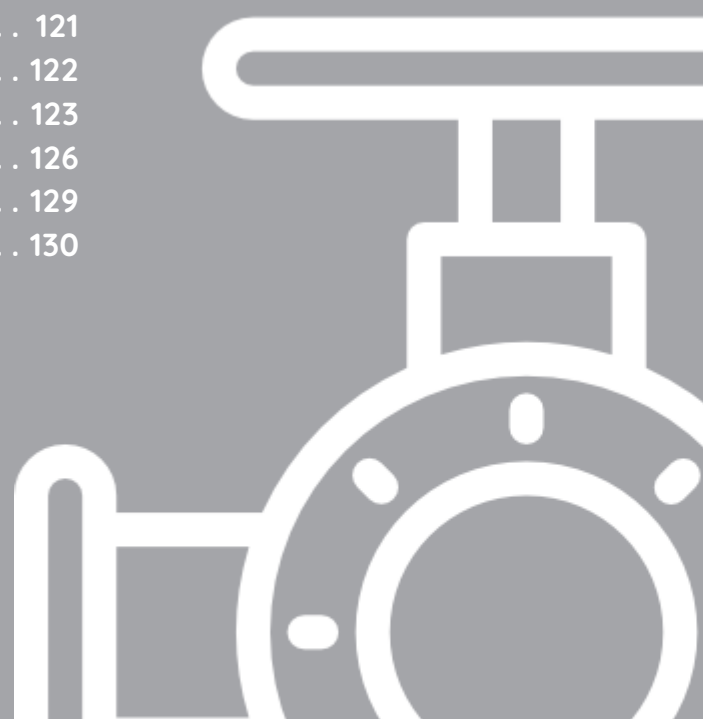


Dripleg Fittings



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Valves and Valve Automation

Fabco Plastics is Canada's leading Plastic Valve distributor with access to all of the major Valve brands. We are able to provide you with almost any Valve product for your project. Our distribution network has inventory and access to Thermoplastic - Ball Valves, Butterfly valves, Diaphragm valves, Gate & Globe Valves as well as Pressure Control Valves. Potentially offered with a full complement of Electric or Pneumatic Actuation and Accessory packages, Fabco Plastics can bring full sophistication to your fluid control demands.



Chemkor True Union Ball Valves

Chemkor Super Bloc True Union Ball Valves



The Chemkor Super Bloc true union ball valve features a unique double union/double block design for easier maintenance. It contains blocks in both the upstream and downstream directions. These valves are available in PVC, CPVC, and Polypropylene construction. All ball valves are available with either a Viton or EPDM O-ring, Teflon seats, and double stem O-rings. The full-port design ensures minimal flow restriction. These valves have an external adjustment for seat wear.

CHEMKOR TRUE UNION BALL VALVES WITH EPDM SEALS

SIZE	PVC			CPVC		
	SOC/THD	THD	FLANGE	SOC/THD	THD	FLANGE
1/2	31913007	N/A	31916007	32913007	N/A	32916007
3/4	31913008	N/A	31916008	32913008	N/A	32916008
1	31913009	N/A	31916009	32913009	N/A	32916009
1 1/4	31913010	N/A	31916010	32913010	N/A	32916010
1 1/2	31913011	N/A	31916011	32913011	N/A	32916011
2	31913012	N/A	31916012	32913012	N/A	32916012
2 1/2	31913013	31914013	31916013	32913013	32914013	32916013
3	31913014	31914014	31916014	32913014	32914014	32916014
4	31913016	31914016	31916016	32913016	32914016	32916016

CHEMKOR TRUE UNION BALL VALVES WITH VITON SEALS

SIZE	PVC			CPVC			POLYPROPYLENE		
	SOC/THD	THD	FLANGE	SOC/THD	THD	FLANGE	SOC/THD	THD	FLANGE
1/2	31909007	N/A	31912007	32909007	N/A	32912007	34909007	N/A	34912007
3/4	31909008	N/A	31912008	32909008	N/A	32912008	34909008	N/A	34912008
1	31909009	N/A	31912009	32909009	N/A	32912009	34909009	N/A	34912009
1 1/4	31909010	N/A	31912010	32909010	N/A	32912010	34909010	N/A	34912010
1 1/2	31909011	N/A	31912011	32909011	N/A	32912011	34909011	N/A	34912011
2	31909012	N/A	31912012	32909012	N/A	32912012	34909012	N/A	34912012
2 1/2	31909013	31910013	31912013	32909013	32910013	32912013	34909013	34910013	34912013
3	31909014	31910014	31912014	32909014	32910014	32912014	34909014	34910014	34912014
4	31909016	31910016	31912016	32909016	32910016	N/A	N/A	N/A	34912016

Notes:

- 150 psi rating for PVC and CPVC.
- 2 1/2" valves are fabricated with 3" valves and bushings.
- 2 1/2" flanged valves are nonstock.
- In PVC, CPVC, and PP, 1/2" to 2" are supplied with both socket and threaded ends.
- Threaded part numbers apply to 3" and 4" valves only.
- Vacuum resistant to 29.9" of mercury.
- PVDF valves are available upon request.

Chemkor Single Union Ball Valves



The Chemkor single union ball valve is manufactured from white PVC with EPDM O-rings and is available in 1 1/2" and 2" with socket ends. It is ideal for pool and spa applications and is rated to 140°F.

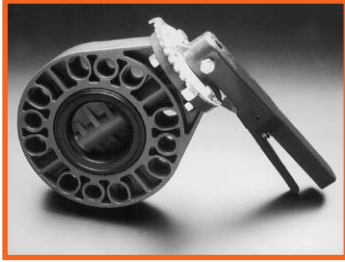
SIZE	PART NUMBER
1 1/2"	WPSUB015
2"	WPSUB020

Notes:

- 150 psi rating for PVC and CPVC.
- PVC rated to 140°F, CPVC rated to 210°F.
- Vacuum resistant to 29.9" of mercury.

Chemkor Butterfly and Compact Ball Valves

Chemkor Butterfly Valves



Chemkor Butterfly valves have a unique "Triple Seal" design for maximum reliability. They have a full face design assuring positive flange sealing. These valves are up to 50% lighter than metal valves and have a PVC disk for optimized strength and reduced pressure drop. Chemkor butterfly valves have a ten position index plate for precise flow control and are pressure rated to 150 psi and service temperatures of up to 140°F. 8", 10", and 12" come complete with a gear box handle.

PVC HAND LEVER

SIZE	EPDM	VITON
3"	31350014	31351014
4"	31350016	31351016
6"	31350018	31351018
8"	31350019	31351019
10"	31350020	31351020
12"	31350022	31351022

Notes:

- 150 psi rating at 73.4 °F.
- Temperature rated to 140 °F.

Chemkor Gear Box Butterfly Valves



Chemkor Gear Box Butterfly Valves are corrosion resistant and exhibit excellent flow characteristics. They require lower torque and have greater sealing capacity with a clear indication of the disc opening. The standard stem is made from 304, 316 or 316L stainless steel. They are available in sizes from 3" to 24" upon request.

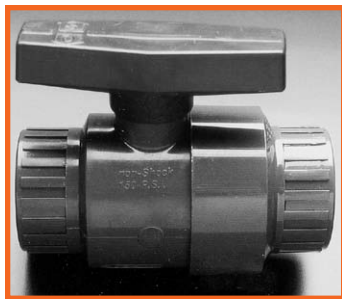
PVC GEAR BOX

SIZE	EPDM	VITON
8"	31350019G	31351019G
10"	31350020G	31351020G
12"	31350022G	31351022G

Notes:

- 150 psi rating at 73.4°F(23°C)
- Temperature rated to 140 °F.
- Pressure rating for 2"~10" is 150 PSI.
- Pressure rating for 12" is 100 PSI.

Chemkor Super C Compact Ball Valves



The Super C Compact Ball Valve features double O-rings, self-lubricating Teflon seats, full flow design. It is available in schedule 80 socket or npt thread and is pressure rated to 150 psi @ 73.4°F(23°C).

SIZE	GRAY PVC EPDM SOCKET	GRAY PVC EPDM	WHITE PVC EPDM SOCKET	WHITE PVC EPDM SOCKET
1/2	3011005	3012005	3011005W	3012005W
3/4	3011007	3012007	3011007W	3012007W
1	3011010	3012010	3011010W	3012010W
1 1/4	3011012	3012012	3011012W	3012012W
1 1/2	3011015	3012015	3011015W	3012015W
2	3011020	3012020	3011020W	3012020W

Chemkor Compact Econo Ball Valves



The Chemkor Econo Ball Valve is cost effective and features a white PVC body, santoprene seats, EPDM rings, and a short overall length. This is a full bore, 150 PSI rated (non shock) valve.

SIZE	PVC EPDM THREADED	PVC EPDM SOCKET
1/2	3014005W	3013005W
3/4	3014007W	3013007W
1	3014010W	3013010W
1 1/4	3014012W	3013012W
1 1/2	3014015W	3013015W
2	3014020W	3013020W

Hayward True Union and Butterfly Valves

Hayward TBH Series - True Union Ball Valves

1/2" to 6" PVC, CPVC



Features and Benefits:

- System2™ Sealing Technology provides longer cycle life
- 250 PSI / 16 Bar, non-shock at 70°F / 23°C full pressure rating
- Consistent operating torque with adjustment-free design
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Ergonomic handle for improved grip and comfort
- ISO mounting flange simplifies actuation
- Permanent markings, eliminates labels
- Integral footpad for skid or panel mount
- FPM or EPDM seals
- Double O-Ring stem seals
- Reversible PTFE seats – Standard
- Easy replacement for existing Hayward TB Series
- NSF / ANSI 61 and NSF / ANSI 372 Listed

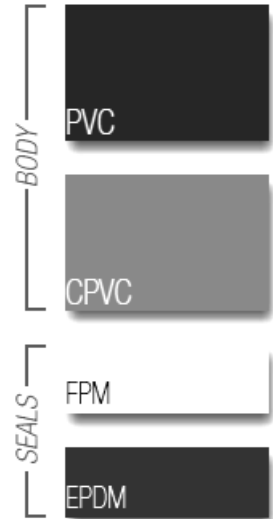
Options:

- Stem Extensions
- Manual Limit Switch
- Z-Ball - Drilled Ball for Sodium Hypochlorite applications with identifiable black handle.
- Pneumatic or Electric Actuators



Certified to NSF/ANSI 61 & 372

MATERIALS



Hayward BYV Series - Butterfly Valves

2" -12"
PVC, CPVC, GFPP



Features and Benefits:

- One Piece Injection Molding PVC, CPVC or GFPP Body
- PVC, CPVC or GFPP Disc Materials
- Hand Lever with 19 Lockable Stop Positions & 360° Interlocking Splines
- External Disc Position and Flow Indication
- Hydro-dynamic Centric Disc for Increased Flow Performance
- Over-Sized Liner Face Maximizes Surface Contact with Flanges
- 1-Piece 316 Stainless Steel Stem with Threaded Retaining Gland
- Stem Bearing and Seal Retainer for Absolute Stem Position and Seal
- ISO 5211 Top Flange and Stem Drive
- All Sizes Meet ANSI B16.10 / ISO 5752 Narrow Face-to-Face Dimensions
- Pressure Rated at 150 PSI/10 Bar in All Sizes @ 70°F Non-Shock
- NSF / ANSI 61 and NSF / ANSI 372 Listed

Options:

- Lock Out Caps
- Stem Extensions
- Over-Molded 316 Stainless Steel Lugs
- Titanium or Hastelloy™ Stem Materials
- Gear Operators
- Complete Range of Pneumatic or Electric Actuators
- 2" Square Operating Nut
- Chain Operator for Gear Box



Certified to NSF/ANSI 61 & 372 PVC/EPDM 2" - 12" CPVC/EPDM 4" - 12"

3

VALVES & VALVE AUTOMATION

Hayward BYB Series - Large Diameter Butterfly Valves

14" TO 24"
PVC, CPVC, PP AND PVDF



Features and Benefits:

- PVC, CPVC, PP and PVDF Bodies
- PVC, CPVC, PP and PVDF Discs
- Heavy Duty Gear Operator
- 410 Grade Stainless Steel Stem
- Choice of FPM, EPDM or Nitrile Liners

Options:

- Pneumatic and Electric Actuation
- Stem Extensions

SIZE	BODY MATERIAL	DISC MATERIAL	LINERS	PRESSURE RATING (NON-SHOCK)
14-16" (DN350-DN400)	PVC, CPVC, PP or PVDF	PVC, CPVC, PP or PVDF	FPM, EPDM or Nitrile	86 PSI @70°F (6 BAR @ 21°C)
18" (DN450)				72 PSI @70°F (5 BAR @ 21°C)
20-24" (DN500-DN600)				51 PSI @70°F (3 BAR @ 21°C)



Hayward Electric and Pneumatic Actuators

Electric and Pneumatic Actuator Series



Options:

- HR Series 120VAC Electric On/Off Actuator
- ECP Series 24-265VAC/VDC Electronic Actuator
- PMD/PMS Double Acting or Spring Return Pneumatic Actuator
- PCD/PCS Industrial Grade Double Acting or Spring Return Pneumatic Actuator
- TBH Series True Union Ball Valve in PVC and CPCV, 1/2" TO 2"
- BYV Series Butterfly Valve in PVC with PVC disc, 2" TO 8"
- Direct Mounted Assembly
- One Part Number



Hayward HR Series - Electric Actuators

266-177,000 Torque in-lbs



Features and Benefits:

- Units are equipped with two (2) volt-free Form A Auxiliary switches
- ISO5211 compliant mounting with a double square female drive socket
- Raised visual position indicator
- NEMA 4X/IP67 compliant
- EMT entry ports with sealed cable glands

Options:

- Power Supply Flexibility
- On/Off and Proportional Control
- Manual Override Handwheel
- Local Control Stations
- IP68 Submersion
- Battery Backup
- Supercapacitor Backup
- Interchangeable ISO5211 Flange & Drives

Hayward True Union Ball Valves

Hayward TB Series True Union Ball Valves

1/2" TO 6" PVC AND CPVC



Features:

- PVC and CPVC
- Full Port Design Through 4"
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- Easily Actuated
- NSF/ANSI 61 & 372 Listed
- Actuator-Ready Design

Options:

- Pneumatic and Electric Actuation
- Lockouts Available
- Gear Operator
- 2" Square Operating Nut
- Stem Extensions
- Spring Return Handle



SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING (NON-SHOCK)
1/2"-4"	PVC or CPVC	Socket, Threaded or Flanged**	FPM or EPDM	235 PSI @70°F (16 BAR @ 21°C)
6"		Flanged		150 PSI @70°F (10 BAR @ 21°C)

* 4" valve venturied to 6"

**All Flanged valves are rated to 150 PSI @ 70°F Non-Shock

***PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. Flanged ends available in DIN/EN PN10.

Hayward TBH Series with "Z-Ball" True Union Ball Valves

1/2" TO 2" PVC AND CPVC



Features:

- Drilled Ball for Sodium Hypochlorite applications
- Ergonomic black identifiable handle for improved grip and comfort
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Reversible PTFE Seats
- Double O-Ring Stem Seals

Options:

- Pneumatic and Electric Actuation
- Stem Extensions
- Manual Limit Switch
- Coupling for Actuator



SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING (NON-SHOCK)
1-1/2"-2" (DN15-DN50)	PVC or CPVC	Socket or Threaded	FPM	250 PSI @70°F (16 BAR @ 21°C)
		Flanged		150 PSI @70°F (10 BAR @ 21°C)

**PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. PP socket fusion ends per ASTM F2389 and threaded ends per BS21. Flanged ends available in DIN/EN PN10.

EAU1 Series Automated True Union Ball Valves

1/2" TO 2" PVC AND CPVC



Valve Features:

- PVC and CPVC
- FPM or EPDM Seals
- PTFE Seats
- Full Port Design
- Fully Serviceable
- Double O-Ring Stem Seals

*PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

SIZE*	MATERIAL	END CONNECTION	SEALS	VALVE PRESSURE RATING
1/2"-2" (DN15-DN50)	PVC or CPVC	Socket and Threaded	FPM or EPDM	250 PSI @70°F (17 BAR @ 21°C) Non-Shock

Actuator Features:

- UL/CSA Listed Motor
- Thermoplastic NEMA 4/4X Enclosure
- 2.5 Second, 90° Cycle Time
- Permanently Lubricated Gear Train
- Actuator Brake
- 90 or 180° Operation
- Unidirectional, Not Reversing
- Terminal Block Connections
- Standard 120 VAC
- End of Travel Dry Contact Limit Switch
- Thermal Overload Protection
- Lightweight, Compact and Inexpensive

3

VALVES & VALVE AUTOMATION



Hayward True Union Ball Valves

TW Series Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC



Features:

- PVC and CPVC
- Position Indicator
- Easily Actuated
- PTFE Seats
- FPM or EPDM O-Rings
- Double O-Ring Stem Seal

Options:

- Lockouts Available
- Pneumatic and Electric Actuation
- Cross-Flow Ball
- NT Ball
- TP Ball

SIZE**	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2"-4" (DN15-DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
6"* (DN150)		Flanged		

* 4" valve venturied to 6"

**PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. Flanged ends available in DIN/EN PN10.

Options:

- Lockouts Available
- Pneumatic and Electric Actuation

LA Series Three-Way True Union Ball Valves

1/2" TO 6" PVC AND CPVC



Features:

- PVC and CPVC
- PTFE Seats
- FPM or EPDM O-Rings
- Double O-Ring Stem Seal
- Simplifies Lateral Connections
- Replaces Valve/Tee Connection Combinations
- Quick, Easy to Install
- Replacement for Zero Dead-Leg Valves

Series TW and LA Multiport Valves

Multi-Port Valve Flow Plans - Series TW Body

Flow At	TW Ball		Flow At	NT Ball		Flow At	TP Ball				
0°	Port A		Port B	0°	Port A		Port B	0°	Port A		Port B
90° Center-Off	Port A		Port B	45° No Deadhead	Port A		Port B	90°	Port A		Port B
180°	Port A		Port B	90°	Port A		Port B				

Lateral Valve Flow Plans Series LA Body

Flow At	NT Ball - Standard		
0°	Port A		Port B
90°	Port A		Port B
180°	Port A		Port B

Ordering Information:

Series TW Valve – Choose NT Ball for automated valve applications. Center-off applications use electric actuator with 'Center-off' option. Series LA Valve – NT Ball ONLY

CrossFlo Multi-port Valves

Use Hayward CrossFlo™ True Union Multi-port Ball Valves for isolated straight through and diverting flow requirements. CrossFlo™ multi-port ball valves provide isolated flow patterns in 0°-90° & 0°-90°-180° valve positions. Reduced flow can occur in certain sizes. Review flow requirements with sales associate prior to ordering.

Ordering Information:

Substitute 'CF' (manual) or 'HCCF' (automated) for 'TW' prefix of standard Valve Part No. above. CrossFlo valves are available in 1/2" – 6" size range. Actuators specified separately.

0°, PORT C to PORT A



90°, PORT B to PORT A



180°, PORT C to PORT B



TC Series True Union Ball Check Valves

1/4" TO 3/8" PVC, 1/2" TO 2" PVC, CPVC, PP
2-1/2" TO 6" PVC AND CPVC, 1/4" TO 1" PVDF



Features:

- PVC, CPVC, PP and PVDF
- For Horizontal or Vertical Installation
- 1/2" to 6" are Sure Block Design
- Square Cut Seat for Positive Sealing
- Seats with Minimum Back Pressure
- 1/4" and 3/8" are Trim Check Design

Options:

- Foot Valve Screens



Certified to
NSF/ANSI 61 & 372
1/4" - 4"

SIZE*****	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING (NON-SHOCK)
1/4"-3/8"* (DN8-DN10)	PVC	Socket or Threaded	FPM	150 PSI @70°F (10 BAR @ 21°C)
1/2"-2" (DN15-DN50)	PVC or CPVC	Socket and Threaded or Flanged*****	FPM or EPDM	235 PSI @70°F (16 BAR @ 21°C)
	PP**	Threaded or Socket Fusion	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C)
2-1/2"-4" (DN63-DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C)
	6"*** (DN150)	PVC or CPVC	Flanged	150 PSI @70°F (10 BAR @ 21°C)
1/4"-1" (DN8-DN28)	PVDF	Threaded or Socket Fusion	FPM	150 PSI @70°F (10 BAR @ 21°C)

* Trim Checks

** 2" PP is rated to 100 PSI @70°F Non-Shock

*** 4" valve venturied to 6"

****All Flanged valves are rated to 150 PSI @ 70°F Non-Shock

*****PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21. PP socket fusion ends per ASTM F2389 and threaded ends per BS21. Flanged ends available in DIN/EN PN10.

YC Series Y-Check Valves

1/2" TO 4" PVC AND CPVC AND 1/2" TO 1" PVDF

Features:

- PVC, CPVC and PVDF
- Full Flow Design
- Minimum Pressure Drop
- PVC Coil to Guide Piston to a Positive Seat
- Minimal Back Pressure Required to Seat Piston

Options:

- Drilled Cap for Easy Drainage
- True Union End Connections

SIZE*	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2"-4" (DN15-DN100)	PVC or CPVC	Socket, Threaded, Flanged or True Union	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
1/2"-1" (DN15-DN28)	PVDF	Flanged	FPM	

*PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.



SLC Series Spring-Loaded Y-Check Valves

1/2" TO 4" PVC



Features:

- PVC
- Full Flow Design
- Closes with No Back Pressure
- Adjustable - Opens From 2 to 15 PSI
- Easy Maintenance
- Opens in Any Position

Options:

- True Union End Connections

SIZE*	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2"-4" (DN15-DN100)	PVC	Socket, Threaded, or True Union	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

*PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.



Hayward Check Valves

SW Series Swing Check Valves

3" TO 6" PVC, CPVC AND GFPP AND 8" PVC AND GFPP



Features:

- PVC, CPVC and GFPP
- High Temperature/Pressure Ratings
- Two-In-One Seal Design
- Built-In Flange Seals
- Two Drain Ports
- Self-Aligning Clapper Seals
- High Cv Rating and Full Flow Design

SIZE*	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
3"-6" (DN80-DN150)	PVC, CPVC or GFPP	Flanged	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
8" (DN200)	PVC or GFPP			

*Flanged ends available in DIN/EN PN10.

WCV Series Full Pattern Wafer Check Valves

2" TO 8" PVC AND CPVC

Features:

- Robust Full Pattern Body
- PVC and CPVC
- No Special Spacers or Flanges Required
- High Cv Rating Equal to Metal Check Valves, Saves on Energy and Pump Wear
- FPM or EPDM Gasket and Face Seal
- One-Piece Disc and Shaft Design
- Designed for ANSI150 and PN10 Flanges
- Patent No. 8,887,757

Options:

- 316 Stainless Steel or Hastelloy® Disc Spring



SIZE*	MATERIAL	END CONNECTION	O-RING	SPRING	PRESSURE RATING
2"-8" (DN50-DN200)	PVC and CPVC	Wafer	FPM or EPDM	316 SS, Hastelloy®	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

* Consult Factory on DN100 size

WC Series Wafer Check Valves

10" TO 14" PVC AND PP

Features:

- PVC and PP Body and Disc
- FPM, EPDM or PTFE O-Ring Seats
- Compact and Lightweight
- Easy Installation
- Vertical or Horizontal Operation

Options:

- Stainless Steel or Hastelloy® Disc Springs*



SIZE	MATERIAL	END CONNECTION	O-RING	SPRING	PRESSURE RATING
10"-12" (DN250-DN300)	PVC, PP	Wafer	FPM or EPDM	316 SS, Hastelloy®	90 PSI @70°F (6 BAR @ 21°C) Non-Shock
14" (DN350)					Consult Factory

* Valve shown with spring option

**All sizes require a spacer

Hayward Control, Diaphragm and Solenoid Valves

Hayward CVH Series Profile2™ Proportional Control Ball Valves



Features:

- Profile2™ Characterized Ball
- System2™ Sealing Technology provided longer cycle life
- Lockout/Tagout mechanism that secures directly to valve body for enhanced safety
- Reversible PTFE Seats
- Double O-Ring Stem Seals
- NSF/ANSI 61 & 372 Listed
- Actuator-Ready Design

*Does not include sizes 1-1/2"

1/2" TO 2" PVC AND CPVC

Options:

- Pneumatic and Electric Actuation
- Stem Extensions
- Manual Limit Switch
- Coupling for Actuator

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING (NON-SHOCK)
1-1/2"-2" (DN15-DN50)	PVC or CPVC	Socket or Threaded	FPM	250 PSI @70°F (16 BAR @ 21°C)
		Flanged		150 PSI @70°F (10 BAR @ 21°C)

DAB Series True Union or Flanged Diaphragm Valves



Features:

- PVC and CPVC
- Position Indicator
- Sure-Grip Handwheel
- Choice of FPM, EPDM or PTFE Diaphragms*

True Union: 1/2" TO 2" PVC AND CPVC
Flanged: 1/2"- 6" PVC AND 1/2" - 4" CPVC

Options:

- Pneumatic Actuation to 4"
- Over 4" Actuation, Consult Factory
- PVDF Vapor Barrier**

SIZE	MATERIAL	END CONNECTION	DIAPHRAGM	SEALS	PRESSURE RATING
1/2"-2" (DN15-DN50)	PVC or CPVC	Socket and Threaded	FPM, EPDM or PTFE**	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
1/2"-4" (DN15-DN100)	PVC			-	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
6" (DN150)	PVC	Flanged	FPM, EPDM or PTFE**	-	75 PSI @70°F (5 BAR @ 21°C) Non-Shock
1/2"-4" (DN15-DN100)	CPVC			-	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

*All PTFE diaphragms are EPDM backed

** PVDF Vapor Barrier available with EPDM and PTFE diaphragm only

SV Series True Union Solenoid Valves

1/4" TO 1" PVC AND CPVC



Features:

- PVC and CPVC
- Corrosion-Resistant Polyester Coil
- No Pressure Differential Required for Operation
- Both 1/2" Conduit or SJ-Type Cord Electrical Connection
- 110 VAC Standard

Options:

- 12 VAC, 24 VAC, 220 VAC, 12 VDC, 24 VDC

Operating Parameters:

For optimum valve performance, inlet pressure must not exceed 120 PSI. Flow velocity must not exceed 5 ft. per second.

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4", 1/2", 3/4", 1" (DN8-DN25)	PVC or CPVC	Socket and Flanged	FPM or EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

*PVC and CPVC socket ends available to ISO 727-1 and threaded ends to BS21.

Hayward Globe Valves, Needle Valves & Stopcock

AV Series Angle Globe Valves

1/4" TO 2" PVC, 1/4" TO 1" CPVC



Features:

- PVC & CPVC
- Space Saving 90° Body
- Panel Mount Lugs on 1/4" Size
- Fine Pitch Stem Threads for Precision Adjustment
- Reliable Globe Valve Design
- Perfect for Throttling and Changing Flow Direction

SIZE*	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4"-2" (DN8-DN50)	PVC	Threaded or Flanged	FPM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock
1/4"-1" (DN8-DN25)	CPVC			

*Available with threaded ends to BS21

NVA Series Needle Valves

1/4" TO 1/2" PVC, CPVC, GFPP AND PVDF

Features:

- Available in PVC, CPVC, GFPP and PVDF
- Integrated Stem/PTFE Seat Design
- Flanges for Panel Mounting
- NPT Threaded Ends
- Accurate Flow Control
- Fine Pitch Stem Threads for Precise Adjustment
- Adjust Flow Rates Down to Drops per Minute
- Ideal for Metering Flow
- Patented: U.S. Patent No. 9,506,569



SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4"-1/2" (DN8-DN15)	PVC, CPVC, GFPP or PVDF	Threaded	FPM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

LC Series Universal Stopcock™

1/4" PVC























Features:












- PVC
- Six End Connections in One Package
- EPDM Seat and Seals
- Hex Wrench Included for End Connection Installation
- NSF/ANSI 61 Listed

SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/4" (DN8)	PVC	FPT x FPT FPT x MPT FPT x Hose MPT x MPT MPT x Hose Hose x Hose	EPDM	150 PSI @70°F (10 BAR @ 21°C) Non-Shock

FPT= female pipe thread, MPT= male pipe thread

Ball Valves						
	Type 546 Industrial Ball Valve	Type 375 Midrange Ball Valve	Type 355 COLORO Economy Ball Valve	Type 523 Metering Ball Valve	Type 543 3-Way Ball Valve	
	Material	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, PPN	PVC	PVC, CPVC, PP, PVDF (ABS, on request)	PVC, CPVC, PP, PVDF, ABS
	Seal Material	EPDM, FPM	EPDM, FPM	EPDM	EPDM, FPM	EPDM, FPM
	Size Range	3/8"-4"	1/2"-6"	1/2"-2"	3/8", 1/2"	3/8"-2"
Diaphragm Valves						
	Type 514 Union Diaphragm Valve	Type 515 Spigot Diaphragm Valve	Type 517 Flanged Diaphragm Valve	Type 317 Flanged Diaphragm Valve	Type 519 Zero Static Diaphragm Valve	
	Material	PVC, CPVC, PP, PVDF, ABS	PP, PPN, PVDF, ABS	PVC, CPVC, PP, PP-n, PVDF	PVC, CPVC, PP, PVDF	PP, PPN, PVDF
	Seal Material	EPDM, FPM, PTFE	EPDM, FPM, PTFE	EPDM, FPM, PTFE	EPDM, FPM, PTFE	EPDM, FPM, PTFE
	Size Range	1/2"-2"	1/2"-2"	1/2"-2"	2 1/2"-6"	d20xd20-d100xd63
Butterfly Valves						
	Type 038/039 Metallic Butterfly Valve	Type 578 Butterfly Valve	Type 365 High Purity Butterfly Valve	Type 565 Butterfly Valve	Type 567 Butterfly Valve	
	Material	Ductile Iron	PVC, CPVC, PP, PVDF, ABS	Coated ductile iron	PVC/PVDF	PVC, CPVC, PP, PVDF, ABS
	Seal Material	EPDM, FPM	EPDM, FPM, PTFE	PTFE/PFA	EPDM	EPDM, FPM, PTFE
	Size Range	14"-24"	2"-12"	2"-12"	2"-12"	2"-24"
Check and Angle Seat Valves						
	Type 591/595 Vent and Vacuum Breaker Valve	Type 304 Y-Check Valve	Type 561/562 Cone Check Valve	Type 369 Wafer Check Valve	Type 306 Line Strainer Valve	
	Material	PVC, CPVC, PP, PVDF, ABS	PVC (transparent)	PVC, CPVC, PP, PVDF, ABS	PVC (PP & PVDF optional)	PVC (transparent)
	Seal Material	EPDM, FPM	EPDM, FPM	EPDM, FPM	EPDM, FPM	EPDM, FPM
	Size Range	3/8"-4"	1/2"-3"	3/8"-4"	1 1/2"-12"	1/2"-3"

+GF+ Actuated Valves

Ball Valves				
				
	Type 179-184 Industrial Electric Ball Valve	Type 127 Midrange Electric Ball Valve	Type 104 Economy Electric Ball Valve	Type 231-233 Pneumatic Ball Valve
Actuator Type	EA25-EA120	EA15	EA04	PA11-PA45
Function	Open/Close Modulating	Open/Close	Open/Close	FC, FO, DA Modulating
Cycle Time	5sec./90°	5sec./90°	9sec./90°	1-2 sec.
Material	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, ABS	PVC, CPVC, ABS	PVC, CPVC, PP, PVDF, ABS
Seal Material	EPDM, FPM	EPDM, FPM	EPDM, FPM	EPDM, FPM
Size Range	3/8"-4"	3/8"-2"	3/8"-2"	3/8"-4"
3-way Ball Valves				
				
	3-way Ball Valve with Pneumatic Actuator Type 285-288	3-way Ball Valve with Electric Actuator Type 167-170	3-way Ball Valve with Electric Actuator Type 125-128	
Actuator Type	PA11/21	EA25	EA15	
Function	FC, FO, DA Modulating	On/Off, Modulating	On/Off	
Cycle Time	1-2 sec.	5sec./90°	5sec./90°	
Material	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, PP, PVDF, ABS	PVC	
Seal Material	EPDM, FPM	EPDM, FPM	EPDM, FPM	
Size Range	3/8"-2"	3/8"-2"	3/8"-2"	
Butterfly Valves				
				
	Type 145 Electric Wafer Butterfly Valve	Type 147 Electric Lug Butterfly Valve	Type 240 Pneumatic Wafer Butterfly Valve	Type 244 Pneumatic Lug Butterfly Valve
Actuator Type	EA45/EA120/EA250	EA45/EA120/EA250	PA30-PA70	PA30-PA70
Function	Open/Close Modulating	Open/Close Modulating	FC, FO, DA Modulating	FC, FO, DA Modulating
Cycle Time	15-25 sec.	15-25 sec.	1-2 sec.	1-2 sec.
Material	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, PP, PVDF, ABS	PVC, CPVC, PP, PVDF, ABS
Seal Material	EPDM, FPM, PTFE/FPM	EPDM, FPM, PTFE/FPM	EPDM, FPM, PTFE/FPM	EPDM, FPM, PTFE/FPM
Size Range	2"-24"	2"-12"	2"-24"	2"-12"

Diaphragm Valves



DIASTAR Ten Pneumatic Diaphragm Valve



DIASTAR TenPlus Pneumatic Diaphragm Valve



DIASTAR Ten Pneumatically Actuated Zero Static Valve



DIASTAR TenPlus Pneumatically Actuated Zero Static Valve

Functions	FC, FO, DA Modulating	FC Modulating	FC Modulating	FC Modulating
Pressure Rating	150psi combined	150psi	150psi combined	150psi
Control Time	3 sec.	3 sec.	3 sec.	3 sec.
Material	PVC, CPVC, PP, PPn, PVDF, ABS	PVC, CPVC, PP, PVDF	PPn	PP, PVDF
Seal Material	EPDM, FPM, PTFE/ EPDM, PTFE/FPM	EPDM, FPM, PTFE/EPDM, PTFE/FPM	EPDM, PTFE/EPDM	EPDM, PTFE/EPDM, PTFE/FPM
Size Range	½"-2"	½"-2"	d20×d20-d63×d32	d20×d20-d110×d63

Diaphragm Valves



DIASTAR Six Pneumatic Diaphragm Valve



DIASTAR 025 Pneumatic Diaphragm Valve



DIASTAR 604/605 Pneumatic Dosing Valve

Functions	FC	FC, FO, DA Modulating	FC, FO, DA
Pressure Rating	90psi combined	150psi	90psi combined
Control Time	3 sec.	3 sec.	<1 sec.
Material	PVC, CPVC, ABS	PVC, CPVC, PP, PVDF	PVC, CPVC, PP, PVDF
Seal Material	EPDM	EPDM, FPM, PTFE/ EPDM, PTFE/FPM	EPDM, FPM, PTFE/ EPDM, PTFE/FPM
Size Range	¾"-2"	2½"-6"	½"

PRVs

PRVs

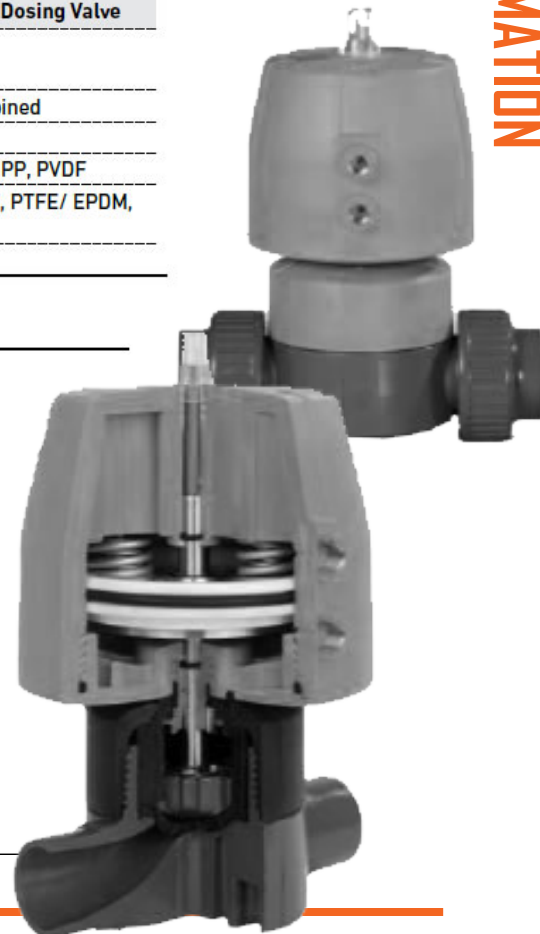


Type 582 Pressure Reducing Valve



Type 586 Pressure Retaining Valve

Material	PVC, CPVC, PP, PVDF	PVC, CPVC, PP, PVDF
Seal Material	PTFE with FPM or EPDM	PTFE with FPM or EPDM
Size Range	½"-2"	½"-2"



Spears True Union 2000, Gate & Globe Valves

Spears True Union 2000 Industrial Valves

Ball Valves



Features:

- Multi-featured Industrial Grade
- Built-in Handle Lockout
- Fully Serviceable, Replaceable Components
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- ISO Pattern Actuation Mounting Option
- Spears® Dual O-ring Safe-T-Shear® Stem
- Self Adjusting PTFE Floating Seat Design
- Sizes 1/2" - 4" pressure rated to 235 psi @ 73°F, sizes 6" - 8" and all flanged to 150 psi @ 73°F
- NSF Certified for Potable Water Use
- Produced in IPS sizes 1/2" - 6" with Socket, Flanged, Spigot or SR Threaded End Connectors
- 8" with Socket and Flanged End Connectors

3-Way Valves



Features:

- Industrial Grade, Multiport, Diverter, L-Pattern & T-Pattern configurations Vertical 3-Way or Horizontal Diverter (shown)
- Built-in Handle Lockout
- Fully Serviceable, Replaceable Components
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- ISO Pattern Actuation Mounting Option
- Spears® Dual O-ring Safe-T-Shear® Stem
- Self Adjusting PTFE Floating Seat Design
- Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F, sizes 2-1/2" - 4" and all flanged to 150 psi @ 73°F
- NSF Certified for Potable Water Use
- Produced in IPS sizes 1/2" - 4" with Socket, Flanged, Spigot or SR Threaded End Connectors

Ball Check Valves



Features:

- Industrial Grade
- Flow-Tested for Minimum Turbulence
- Fully Serviceable, Replaceable Components, uses Standard O-ring Seat
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- Easily Converted to Foot Valve
- NSF Certified for Potable Water Use
- Sizes 1/2" - 4" pressure rated to 235 psi @ 73°F, sizes 6" - 8" and all flanged to 150 psi @ 73°F
- Produced in IPS sizes 1/2" - 6" with Socket, Flanged, Spigot or optional SR Threaded End Connectors
- Produced in size 8" with Socket and Flanged End Connectors
- Also available in PVC White

CHECK VALVE SIZE	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8*
Cv	6.3	17	25	65	86	130	200	275	500	800	-

*8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

PVC and CPVC Gate Valves



Performance Engineered

This solid, proven design is well suited for a variety of chemical, industrial and irrigation applications. Spears® Gate Valves are feature-packed with multiple end connector options. Individual special features are found in each size range 1/2" through 2", 2-1/2" & 3" and in the full featured Heavy Industrial 4" valve.

See Spears® Plug Gate Valves for 6" & 8" size.

PVC Globe Valves



Notes:

- Maximum pressure rating of 150 psi for PVC and CPVC.
- Temperature rated to 140 °F for PVC and 200 °F for CPVC.

This PVC Globe Valve is heavy duty, extra strong, and is ideal for throttling applications. They are slow closing reducing the likelihood of water hammer. They are available in sizes ranging from 2 1/2" to 6" in PVC and CPVC with flanged ends. All valves are assembled with silicone-free, water soluble lubricant and are suitable for vacuum service.

Swing Check Valves



Swing check valves are used in irrigation systems, waste water lines, sump pump disposal lines, and sewage lift stations or ejector systems. They are also used where minimum heat loss or flow resistance is required, as well as in swimming pools, hot tubs, or spa applications. The PVC weighted and shielded flapper will retain backpressure up to 125 PSI. They have an angled seat and weighted flapper design for low pressure seal. They also feature no metallic parts, full flow design, solvent weld or compression ends. These valves are ideal for close working areas, easy pipe alignment.

Notes:

- Designed for both horizontal or vertical usage.
- Pressure rated 125 PSI @ 73.4°F(23°C).
- Clear PVC Swing Check Valves available on request.

1/2	3/4	1	1 1/4	1 1/2	2	3	4
PVC SOCKET CONNECTION							
152007	152007	152010	152012	152015	152020	152030	152040
PVC COMPRESSION CONNECTION							
150007	150007	150010	150012	150015	150020	150030	150040

Swing/Wafer Check Valves



Wafer check valves are economical and lightweight. They are of a space saving design. They are available in PVC, PP, and PVDF in sizes from 2" to 20" with Buna N, EPDM, Viton or Teflon O-rings. The spring is available in 316 S.S. standard and in HASTELLOY C upon request. Spacers are required for installation.

SIZE	PVC				PP			
	EPDM	EPDM/SPRING	VITON	VITON/SPRING	EPDM	EPDM/SPRING	VITON	VITON/SPRING
2"	460-20-E	470-20-E	460-20-V	470-20-V	461-20-E	471-20-E	461-20-V	471-20-V
2 1/2"	460-25-E	470-25-E	460-25-V	470-25-V	461-25-E	471-25-E	461-25-V	471-25-V
3"	460-30-E	470-30-E	460-30-V	470-30-V	461-30-E	471-30-E	461-30-V	471-30-V
4"	460-40-E	470-40-E	460-40-V	470-40-V	461-40-E	471-40-E	461-40-V	471-40-V
5"	460-50-E	470-50-E	460-50-V	470-50-V	461-50-E	471-50-E	461-50-V	471.50-V
6"	460-60-E	470-60-E	460-60-V	470-60-V	461-60-E	471-60-E	461-60-V	471-60-V
8"	460-80-E	470-80-E	460-80-V	470-80-V	461-80-E	471-80-E	461-80-V	471-80-V
10"	460-100-E	470-100-E	460-100-V	470-100-V	461-100-E	471-100-E	461-100-V	471-100-V
12"	460-120-E	470-120-E	460-120-V	470-120-V	461-120-E	471-120-E	461-120-V	471-120-V
14"	460-140-E	470-140-E	460-140-V	470-140-V	461-140-E	471-140-E	461-140-V	471-140-V
16"	460-160-E	470-160-E	460-160-V	470-160-V	461-160-E	471-160-E	461-160-V	471-160-V
20"	460-200-E	470-200-E	460-200-V	470-200-V	461-200-E	471-200-E	461-200-V	471-200-V

K4 Swing Check Valves

K4 Swing Check Valve

3" TO 10" PVC, PP, PPGR (glass reinforced) AND PVDF
EPDM or VITON SEALS

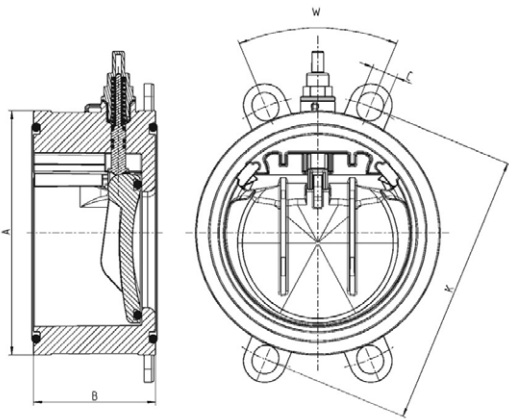
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VALVES & VALVE AUTOMATION



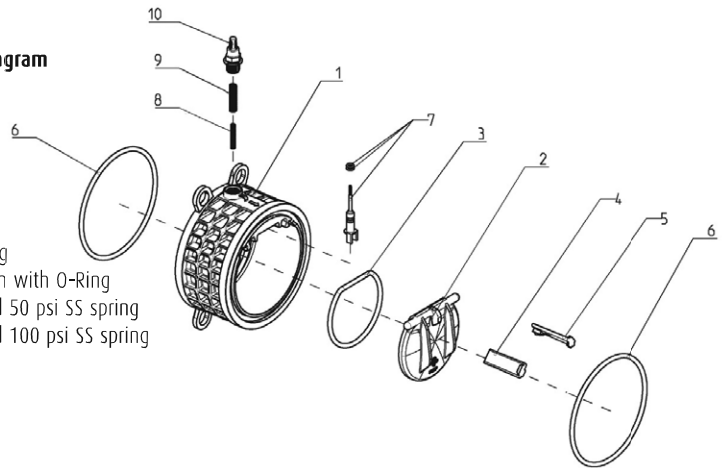
Features:

- Higher flow rates and lower pressure drops compared to 'thin wafer' design
- Energy efficient (less head loss)
- Quad O-Ring ensures tight seal on all types of flanges
- Non-wetted SS spring
- No spacer or flange gaskets required
- Can be mounted vertically or horizontally
- Nested springs included allow field settings for 50 psi, 100 psi or 150 psi
- Mounting link guide holes allow easy installation between ANSI 150# or equivalent size DIN flanges
- Materials are NSF listed



Parts List/Diagram

1. Body
2. Disc
3. Disc O-Ring
4. Left post
5. Right post
6. Body O-Ring
7. Indicator pin with O-Ring
8. Non-wetted 50 psi SS spring
9. Non-wetted 100 psi SS spring
10. Cap, clear



SIZE	DN BORE	A	B	C	K	W°	WEIGHT			
							PVC	PP	PVDF	CV
3"	80	5.04	2.8	0.79	5.91-6.30	45	1.6	1.35	1.8	180
4"	100	6.1	3.15	0.79	6.89-7.52	45	2.25	2	2.65	400
6"	150	8.35	4.17	0.94	9.21-9.53	45	5.6	4.55	6.4	1000
8"	200	10.39	5.51	0.94	11.42-11.77	45	9.95	6.75	12.3	1500
10"	250	12.8	5.51	1.06	13.78-14.25	30	16.61	N/A	N/A	2000

Plast-O-Matic Valves & Controls

CHECK VALVES



Series CKM
Patented design closes automatically, requires no reverse pressure 1/2", 3/4", 1" PVC, CPVC, GPP, PVDF, PTFE



Series CKS
Isolated spring closes valve automatically, requires no reverse pressure 1 1/2", 2", 3", 4" PVC, CPVC, PP, PVDF



Series CKD
Specialty diaphragm design opens with virtually no forward pressure 1/4", 1/2" PVC, PP, PVDF, PTFE

VACUUM BREAKERS



Series VBM
Patented design closes automatically, requires no reverse pressure 1/2", 3/4", 1" PVC, CPVC, GPP, PVDF, PTFE



Series VBS
Isolated spring closes valve automatically, requires no reverse pressure 1-1/2", 2", 3", 4" PVC, CPVC, PP, PVDF

RELIEF, BY-PASS & BACKPRESSURE VALVES



Series RVDT/RVDTM
PTFE diaphragm design has no wetted elastomers; 1st State-approved thermoplastic anti-siphon valve; superior performance and cycle life. Inline flow pattern 1/4", 1/2", 3/4", 1", 1 1/2", 2", 3", 4" PVC, CPVC, PP, PVDF, PTFE, SS



Series TRVDT
3-port valve, PTFE diaphragm design has no wetted elastomers; simplifies piping 1/2", 3/4", 1" PVC, CPVC, PP, PVDF, PTFE,



Series RVT/RVTX
Angle flow pattern with PTFE shaft. High flow rates in a design proven for over 50 years 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3" PVC, CPVC, PP, PVDF, PTFE



Series RVD
Angle flow pattern with PTFE spring guides. Compact, rugged design 1/4", 1/2" PVC, CPVC, PP, PVDF, PTFE



Series RVDM
Inline pattern with ultra smooth flow performance, light weight 1/2", 3/4", 1" PVC, CPVC, GPP, PVDF

HIGH PERFORMANCE PRESSURE REGULATORS



Series PRH/PRHM
Rolling diaphragm, extended shaft and multiple spring design is the industry standard for thermoplastic pressure regulators. Set pressure range from 5 to 125 PSI on most models. 1/4", 1/2", 3/4", 1", 1 1/2", 2", 3", 4" PVC, CPVC, PP, PVDF, PTFE



Series PRA
Air-piloted design provides superior flow with industry's lowest drop-off from set pressure (droop). Set pressure range from 5 to 125 PSI. 1/4", 1/2", 3/4", 1", 1 1/2", 2", 3" PVC, PP, PVDF



Series PRS
Optional patented Stabilizer is used with Series PRA. The Stabilizer reacts to downstream liquid pressure and provides continuous feedback control to the compressed air supply, for the ultimate regulator sensitivity and performance. PVC, PP, PVDF, PTFE

PLASTOMATIC



Series PRD/PRDM
Differential pressure regulator eliminates overpressure across a bank of filters, etc. via tubing connected downstream. Set range to 50 PSI. 1/4", 1/2", 3/4", 1", 1 1/2", 2", 3" PVC, PP

ULTRA PURE PRESSURE REGULATORS



Series PRHU
Kynar machined body with metal ion-free EPDM rolling diaphragm, IPS or metric spigot connections. Highest flow performance in ultra-pure valve with 10 to 125 PSI set range. 1/2" - 3" or 20 mm - 90 mm Kynar 740 PVDF



Series UPR
Kynar machined body with no wetted elastomers; variable area PTFE diaphragm provides excellent pressure response. UPR is a non-shutoff design with 5 to 100 PSI set range. 1/4" NPT or Flare; PVDF or PTFE 20, 25, 32, 50, 63mm spigot; PVDF

PROCESS COOLING WATER STICK



Series PCWS
Supply side stick strengthens piping and reduces installation costs. Configurations include options with or without ball valve, diaphragm valve, y-strainer, pressure regulator, pressure gauge, Tridicator, and a variety of connection types. 1/2", 3/4", 1", 1 1/2", 2" PVC, CPVC



Series PCWR
Return stick strengthens piping and reduces installation costs. Configurations include options with or without ball valve, diaphragm valve, flow meter, pressure gauge, Tridicator, and a variety of connection types. 1/2", 3/4", 1", 1 1/2", 2" PVC, CPVC

3 VALVES & VALVE AUTOMATION



Plast-O-Matic Valves & Controls

3

VALVES & VALVE AUTOMATION

SOLENOID VALVES



Series EASYMT/EASMT
Normally-closed design/energize to open. Million-cycle design featuring PTFE bellows; direct acting. Available with choice of rectified coil or rectified "Z-Cool" energy saving 24 watt coil. 120/60, 24/60, 240/60 AC or 24V DC 1/4", 1/2", 3/4", 1" sizes with 3/8" - 1 1/16" main orifice
PVC, CPVC, GPP, PVDF



Series EAST
Compact, normally-closed design/energize to open. Multimillion-cycle design featuring PTFE bellows; direct acting. Available with 11 watt, NEMA 4X coil.
120/60, 24/60, 240/60, 230/50 AC or 24V DC 1/4", 1/2" sizes with 3/16" or 1/4" main orifice
PVC, PP, PVDF



PS
Pilot-operated, normally-closed design/energize to open. Million-cycle high flow rate valve features PTFE bellows; require pressure differential to function. Available with 11 watt, NEMA 4X coil.
120/60, 24/60, 240/60, 230/50 AC or 24V DC 1/4", 1/2", 3/4", 1", 1 1/2", 2", 3"
PVC, CPVC, PP, PVDF

SIGHT GLASSES & LEVEL INDICATORS



Series GX
Single-wall sight glass for liquids compatible with acrylic. Fluttering streamers optional.
1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3"
PVC, PP



Series GYW
Double-wall sight glass for liquids compatible with Pyrex inner wall. Flange connections; fluttering device optional.
1 1/2", 2", 3", 4", 6", 8"
PVC, CPVC, PP, PVDF, PTFE

PLASTOMATIC

AIR RELEASE & DEGASSING VALVES



Series ARV
Provides rapid expulsion of air at start-up; seals bubble-tight while system operates. Dust cap optional.
1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3", 4"
PVC, CPVC, PP, PVDF



Series DGV
Provides continuous venting of trace amounts of air/gas as it occurs during system operations.
1/2"
PVC, CPVC, PP, PVDF, Clear Acrylic



Series CARD
Combines ARV initial volume venting & DGV continuous trace venting in one unit.
1", 2", 4"
PVC, CPVC

PULSATION DAMPENER/SUPPRESSOR



Series PDS
Performs six functions to improve system performance: Pulsation Dampener smooths pump flow, Surge Suppressor absorbs vibrations, Water Hammer Arrestor, Inlet Stabilizer enhances pump operation, Accumulator releases stored fluid during unwanted pressure drops, Expansion Tank protects system from thermal volume increases.
10, 50 and 180 cubic inch capacity in 1", 2", 3" connection, respectively.
PVC, CPVC, PP, PVDF

SHUTOFF VALVES



Series BSDA/BSHAM
Air operated, compact PTFE diaphragm valve for drain applications and pressures to 100 PSI.
1/4", 1/2", 3/4", 1", 1 1/2"
PVC, CPVC, PP, PVDF, PTFE



Series BSR/BSRM
Air operated, balanced shaft design assures bubble tight shutoff with automatic spring return.
1/2", 3/4", 1", 1 1/2", 2"
PVC, PP



Series MFR
Hand or foot operated manual valve. Press to open, automatic spring return closure.
1/2", 3/4"
PVC



Series HSA
Air operated pinch valve ideal for slurries or particulate. EPDM sleeve closes bubble-tight around media.
1/2", 3/4", 1"
PVC, CPVC, PP, PVDF

FLOW CONTROL VALVES



Series FC
Internal diaphragm and orifice plate maintains constant, pre-set flow despite pressure fluctuations. Flow rate is tamper-proof and available from 1/4 GPM to 120 GPM.
1/4", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3"
PVC

GAUGE GUARDS & INSTRUMENTATION



Series GGS
Heavy duty instrument isolator; 1/2" process connection with steel reinforced 1/4" instrument connection. Available with or without pressure or vacuum gauges. Standard instrument has 2 1/2" gauge face with stainless steel case. Options include center back mount, acrylic shield for harsh environments, snubber, liquid filled face.
PVC, CPVC, GPP, PP, PVDF



Series SWT
PTFE diaphragm pressure switch features no wetted metals or elastomers. 16, 25, or 3 Amp models.
PVC, CPVC, PP, PVDF

MANUAL BALL VALVE OPTIONS



Series MBVL
Lock out/tag out option. Available factory complete or as kit for retrofit.
All sizes/materials for Series MBV.



Series MBVM
Metering indicator shows degrees open. For use with regular or characterized ball valve, factory complete or as kit for retrofit. Series MBV sizes to 2" in all materials.



Series MBVSE
Stem extension from 2" to 12". Factory complete or as kit for retrofit.
Series MBV sizes to 2" in all materials.

ACTUATED BALL VALVES



Series ABVA/ABVS
Air x air or fail-safe air x spring actuator for Series MBV, 3/8"-1" sizes. Thermoplastic construction, includes direct manual override. Options include limit stop and limit switch.



Series ABRA/ABRS
3" & 4" designs features stainless actuator. Options include limit stop and limit switch.



Series EPP
Electro-Pneumatic Positioner turns any air actuated True Blue valve into an electronic control valve. Requires ABRA/ABRS actuator for all sizes.



Series TABVA/TABRA/S
3-way air actuated valves, air x air or fail-safe air x spring versions for Series TMBV.

MANUAL BALL VALVES



Series MBV
The engineered ball valve features trunnion ball design, dual shaft seals, large diameter shaft, mounting lugs, PTFE seats, and perfectly spherical ball. Will outlive any competitive ball valve. NPT, socket, BSP or metric socket.
3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 3", 4" or 20 - 110 mm
PVC, CPVC, PP, PVDF



Series TMBV
Three-way version of Series MBV with same trunnion design and features. 2-hole or 3-hole option.
1/2", 3/4", 1", 1 1/2", 2", 3", 4"
PVC, CPVC



Series LMBV
Lateral reducing ball valve based on Series MBV; simplifies and strengthens lateral drops. Includes tee.
1/2", 3/4", 1", 1 1/2", 2" valve
3/4", 1", 1 1/2", 2", 3" tee
PVC, CPVC, PP, PVDF

MANUAL & ACTUATED BALL VALVE OPTIONS



Flange Connections
Available for most sizes and materials, 2-way and 3-way.



Sanitary Connections
Available for 2-way valves, 1/2" through 2" in PP, PVDF.



Z-Vent Balls
Designed for sodium hypochlorite and other applications prone to dangerous outgassing. Vent allows trapped liquid and resulting gas to escape harmlessly downstream.



ZC Control Balls
Specific angles or special linear cut enables precise control of flow rates for manual valves, or for actuated valves with electronic positioning. All 2-way sizes and materials.

BÁSIS PRODUCT LINE



Value line of commodity products, manufactured to Plast-O-Matic specifications, with complete technical support. One year warranty. Most products offered with NPT, socket, metric socket, BSP or JIS.

PVC & CPVC standard; most items also available in PP, GPP & PVDF.

- Manual & Actuated Butterfly Valves and Ball Valves
- Ball Checks
- Weir Style Diaphragm Valves
- PTFE Diaphragm Backpressure Valves
- Wye Strainers
- Mini Gauge Guards
- Flow & Level Switches
- Solenoid Valves



Series GGME
Compact, low-cost diaphragm seal in polypropylene. Buna-N or Viton seals. Available with or without pressure gauges; suitable for use with virtually any pressure

instrument that requires protection from ultrapure or corrosive liquid. Accuracy to within $\pm 4\%$



Series S-RV
PTFE diaphragm valve serves as relief valve, pump backpressure valve, backpressure regulator, bypass valve, or anti-siphon valve. Excellent corrosion resistance and well suited to ultrapure

processes. Regulates backpressure from 5 to 150 PSI set. 1/4", 1/2", 3/4" and 1" in PVC, CPVC, GPP, PVDF.



Series S-SV
PTFE bellows design with no wetted metals is suitable for inlet pressure to 140 PSI, backpressure to 80 PSI. 24, 120 or 240V coil. 1/4" or 1/2" with 1/4"

orifice in PVC, CPVC, GPP, PVDF.

PLASTO MATIC

ChemLine Valves & Actuation

Ball Valves

- Chemline ball valves come in a wide selection of body materials, end connections and actuation options
- Sizes are up to 6" full port
- Metering and Proportional valves offer linear flow control
- Cavity Free model is designed for handling solids
- New HYBRID ball valve has composite metal reinforced body, PFA or PVDF lined for severe chemical services at temperatures up to 160°C (320°F)



**Type 24
True Union**
PVC: 1/2" to 4"



**Type 25
True Union**
PVC, PP, PVDF:
1/2" to 2"



**Type 21
True Union**
PVC, CPVC, PP, PVDF:
1/2" to 4"



**Type XLT
True Union**
PVC: 1/2" to 4"



Type 27 Compact
PVC, CPVC:
3/8" to 3"



**Type 33
Horizontal
Multi Port**
PVC, PP, PVDF: 1/2" to 2"



**Type 23 Vertical
Multi Port**
PVC, CPVC, PP, PVDF:
1/2" to 4"



**SL Series
Cavity Free**
PVC, PP: 1/2" to 2"



**SM Series
Metering**
PVC, PP: 1/2" to 1"



**SP Series
Proportional**
PVC, PP, PVDF: 1/2" to 2"



**HC Series
High Capacity**
PVC, PP, PVDF:
2-1/2" to 6"



**HB Series HYBRID
PFA or PVDF Lined**
PPG, PPSG: 1" to 1-1/2"

Butterfly Valves

- New Type 61 features a streamlined disc designed for more linear flow control
- New Type 71 double eccentric features low stem torques. Actuation is less expensive
- Giant butterflies 28" to 48" have a full seat for tight sealing
- ChemValve butterflies are fluoropolymer-lined for severe chemical services
- New HYBRID butterfly valve has composite metal reinforced body, PFA lined for severe chemical services at temperatures up to 160°C (320°F)
- FRP dampers are for large diameter ducting systems



**Type 61
Elastomer
Seated**
PVC, PP: 2-1/2" to 8"



**Type 58
Elastomer
Seated**
PP, PVDF: 1-1/2" to 24"



**Type 57P
Elastomer
Seated**
1-1/2" to 24"



**Type 71
Double
Eccentric**
PVC, PP: 2" to 12"



**GY Series
Giant**
PP: 28" to 48"



**ChemValve
Fluoropolymer
Lined, Composite
Body**
2" to 12"



**ChemValve
Fluoropolymer
Lined, Ductile
Iron Body**
2" to 40"



**HY Series
HYBRID
PFA Lined, Lever**
PPG, PPSG: 3"



**HY Series
HYBRID
PFA Lined, Gear**
PPG, PPSG: 3" to 12"



**Low Leakage
Damper**
FRP: 12" to 96"

Diaphragm Valves

- New HYBRID diaphragm valve has composite metal reinforced body, PFA or PVDF lined for severe chemical service temperatures up to 160°C (320°F)
- 700 Series – 1/2" to 4", either manual or pneumatically actuated, normally closed, normally open or double acting
 - modular design
 - compact dimensions
 - designed for water treatment and original equipment manufacturers (OEM's)



Type 14 Flanged
PVC, CPVC, PP, PVDF:
1/2" to 10"



Type 16 Flanged
PVC, CPVC, PP, PVDF:
1/2" to 10"



DV Series True Union
PVC, CPVC, PP, PVDF:
1/2" to 2"



HD Series HYBRID PFA or PVDF Lined
PPG, PPSG: 1/2" to 6"



Type 760/761 Manual
PVC, CPVC, PP, PVDF:
1/2" to 4"



Type 720 Manual
PVC, CPVC, PP, PVDF:
3/8" & 1/2"



Type 710 Pneumatic
PVC, CPVC, PP, PVDF:
3/8" & 1/2"



Type 731 Pneumatic
PVC, CPVC, PP, PVDF:
1/2" & 3/4"



Type 750 Pneumatic
PVC, CPVC, PP, PVDF:
1" to 2"



Type 730 Pneumatic
PVC, CPVC, PP, PVDF:
1" to 4"

Check Valves

- New spring check valves will close in any position within the piping system
- Wafer checks are a cost effective solution



Ball Check/Foot
PVC, CPVC, PP, PVDF:
1/2" to 4"



ES Spring Check
PVC: 1/2" to 2"



SW Swing Check
PVC, CPVC, PP, PVDF:
1/2" to 8"



WE Wafer Check
PVC: 2-1/2" to 8"



WP Wafer Check
PVC, PP, PVDF:
10" to 24"

Gate & Globe Valves



CGA Series Gate
PVC: 1-1/2" to 14"



GT Series Gate
PP: 1-1/2" to 10"



Globe Valves
PVC, PP, PVDF: 1/2" to 2"

Lab Valves



PVC Lab Cocks
1/4"



PVDF Lab Cocks
1/4"



Needle Valves
PVC, CPVC, PPG:
1/4" to 1/2"



Goosenecks
3/8"

Strainers & Gaskets

- Flange gaskets are recommended for all plastic flanges. Required bolt torques to seal are a fraction of those for flat face gaskets.



Y-Sediment Strainers
Clear PVC, PP, PVDF:
1/2" to 4"



Low Torque Flange Gaskets
EPDM, PTFE:
1/2" to 12"

Regulating Valves

- Leakproof True Union ends
- Reliable and repeatable operation
- Low hysteresis
- SB Series Back Pressure/Relief valves are designed for long maintenance-free life in chemical dosing systems.
- SR50 Series Pressure Regulating (Reducing) Valves are sensitive and provides precise control. Valves protect equipment from damaging pressure surges.



SB17 Mini Back Pressure/Relief

- Compact, fits tight spaces
- PVC, PP or PVDF
- 1/4" & 3/8"



SB18 Back Pressure/Relief

- Recommended for dosing applications
- PVC, PP or 316SS
- 3/8" to 2"
- Certified under NSF 61



SB11 Back Pressure/Relief

- Proven superior performance on sodium hypochlorite
- PVC
- 1/2" to 1"
- Shown with ChemFlare™ end connections



SB12 Back Pressure/Relief

- Built-in check function for dosing applications
- PVC, PP or PVDF
- 3/8" to 4"
- Certified under NSF 61



SR50 Pressure Regulating (Reducing)

- Maintains a set downstream pressure independent of higher upstream pressures
- PVC, PP or PVDF
- 3/8" to 4"
- Certified under NSF 61

Electric Actuation

- Corrosion Resistant, lightweight plastic housings
- NEMA 4X/IP65 enclosure
- CSA Approved or Special Inspection labelled
- Multi-Voltage operation
- Adjustable Travel through full range
- Irreversible Gearing, backlash impossible
- Heater/Thermostats are supplied standard
- 2 Extra Switches for valve position feedback are supplied standard



E Series
on a Type 24



V Series
on a Type 24



E Series
on a Type 33



V Series
on a Type 58



V Series
on a Type 61

Other Electric Actuator Features

E Series – Prewired inside with DIN Plug wiring connections

V Series – Hand wheel manual override

– Adjustable mechanical travel stops

Pneumatic Actuation

- Epoxy/Rilsan coated for high corrosion resistance and durability
- Aluminum rack and pinion construction
- Rated for over one million cycles
- Mechanical travel stops



PA & PG Series
Coated Aluminum
on a Type 25



PA & PG Series
Coated Aluminum
on a Type 24



PA & PG Series
Coated Aluminum
on a Type 33



PA Series
Coated Aluminum
on a Type 61



P3 Series 316
Stainless Steel
on a Type 61

Accessories for Pneumatic Actuators



Limit Switches
• Standard Mechanical Switches or Explosion-Proof



Positioners
• 3-15 psi pneumatic
• 4-20 mA Electro-Pneumatic
• 4-20 mA Smart



Declutchable
Gear Overrides



Solenoid Valves
• Bolt flush onto the actuator

ChemFlare™ Flexible Leak-Free Solutions

Single Wall Systems

- Chemline's ChemFlare™ system is the long term leak-free alternative to standard PVC solvent welded piping on sodium hypochlorite chemical feed systems. Valves, controls and pumps with ChemFlare™ ends connect to ChemFlare™ fittings and PFA tubing.
- 25 years life expectancy for leak-free and maintenance-free service on sodium hypochlorite
- Systems are easy to install
- Mechanical connections
- No welding or curing waiting time, may be pressure tested immediately
- True Union valve sizes: 1/2", 3/4" & 1"
- Tubing sizes: 1/4", 3/8", 1/2", 3/4" & 1"

Do you have leaking chemicals? Consider a retrofit. Call Chemline to arrange a site visit.



Dual Containment Systems

For maximum safety level of chemical containment Tubing

- The carrier (inner) tube of PFA is the primary chemical line. The containment (outer) tube of FEP is translucent, permitting good visibility of the carrier tube.

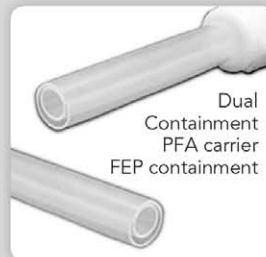
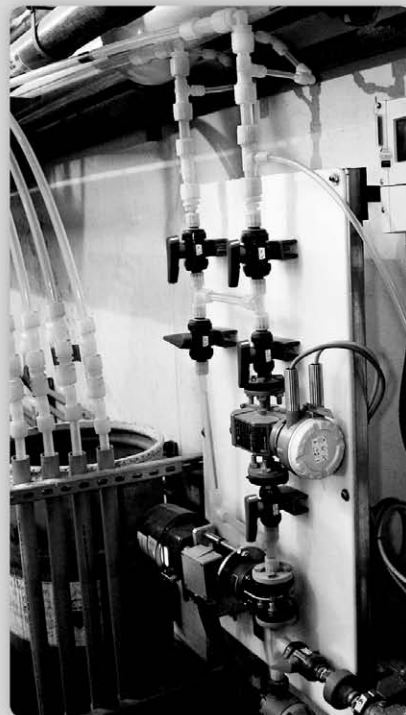
Specialty Fittings

- Dripleg Fittings
- Dual containment tubing assemblies
- Dual containment splitter boxes
- Junction Boxes

Tubing Sizes O.D.

PFA Primary/FEP Containment

- 1/4"/1/2"
- 3/8"/3/4"
- 1/2"/3/4"
- 3/4"/1"



3 VALVES & VALVE AUTOMATION



ChemFlare™ Fluoropolymer Tubing Systems

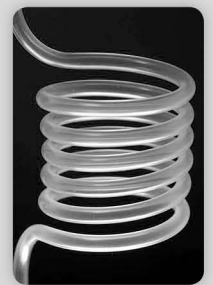
PFA Tube & Fittings

Tubing

- PFA (perfluoroalkoxy) tubing is the choice for applications involving extreme chemical resistance at higher temperatures
- PFA is the highest grade of fluoropolymer tubing and has excellent mechanical properties
- Tubing sizes are 1/8" to 1"

Fittings

- Fittings are moulded from virgin high purity PFA or PVDF resin providing chemical resistance and ultra-high purity
- Fitting sizes are 1/4" to 1-1/4" in all popular configurations



Connectors



Unions



Union Reducers



Adaptors



Elbows



Sweeps



Union Tees



Reducing Tees



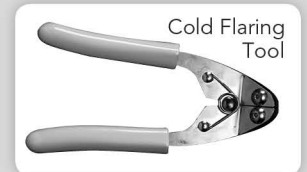
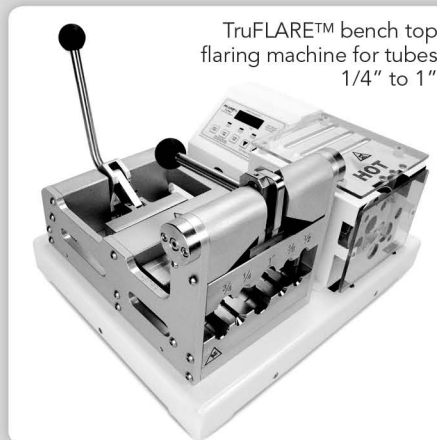
Branch Tees



Transitions

Flaring Machines & Tools

- Manual flare tools
- Torque wrenches
- Semi automatic bench top Flaring Machines



3

VALVES & VALVE AUTOMATION



Section 4: Plastic Sheet and Rod

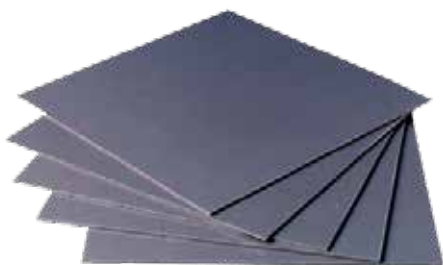
PVC Type I Sheet	.133
PVC Type II Sheet	.134
PVC Clear Sheet	.135
Perforated Sheet	.136
PVDF Sheet	.136
CPVC Sheet	.137
Homopolymer PP Sheet	.138
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Round Welding Rod	.149
Rod, Nuts, Bolts & Washers	.150



Fabco Plastics carries the Largest Inventory of Industrial Plastic Sheets, Rods and Shapes in Canada. Fabco's cross nation warehouse locations can provide product availability and technical assistance for all your needs. Call us or view our product selections on line. We carry PVC and CPVC, PVDF and Polypropylene materials for manufacturing components used in high corrosion applications – Polyethylene for rugged wear resistant applications in Marine, Forestry and Food - Copolymers for Medical and Orthotics - Polycarbonates and Acrylics for Commercial and Glazing.

PVC sheet has excellent corrosion resistance and weather resistance. The working temp is 33°F - 160°F. and the forming temperatures of 245°F. PVC is the most widely used member of the vinyl family and it is excellent when used for corrosion-resistant tanks, ducts, fume hoods and pipe. PVC is ideal for self-supporting tanks, fabricated parts, tank linings and spacers. PVC is not UV stabilized and has a tolerance of +/- 10%.

	Acrylic	CPVC	
Plastic Rod	<p style="margin: 0;">Rigid Sheet ROD Shapes</p> <p style="margin: 0;">available in 4x8, 5x10 and others</p>		Perforated
Polycarbonate			Polypropylene
Welding Rod			Clear PVC
PVDF			UHMW
	PVC	HDPE	



Simona® PVC Type I Sheet



SIMONA® PVC Type I sheet is extruded to exacting specification for normal impact applications. This type of sheet has excellent corrosion resistance, very good dielectric properties, low moisture absorption, high rigidity, good abrasion resistance and excellent weathering properties. The material is also self-extinguishing.

Applications:

- Chemical processing
- Semiconductor processing equipment
- Pollution control equipment
- Machined and fabricated parts
- Etching and plating tanks
- Scrubbers, hoods, ducts and other protective equipment

Features:

- Normal Impact
- Excellent chemical and corrosion resistance
- Easily to fabricate, weld or machine
- Showcase quality surface
- Stress relieved, square, flat sheets
- Accurate to dimensional tolerances
- Color consistent

SIMONA® PVC TYPE I SHEET TECHNICAL DATA

SIMONA® VERSADUR® PVC TYPE I	TEST METHOD	UNIT	TYPICAL VALUE
PHYSICAL			
Density	ASTM D-792	g/cc	1.41
Water Absorption (24 hrs @ 73 °F)	ASTM D-570	%	<0.02
MECHANICAL			
Tensile Strength @ Yield	ASTM D-638	PSI	9000
Tensile Modulus	ASTM D-638	PSI	486,000
Izod Impact	ASTM D-256	ft. lbs./in.	0.8
Hardness, Shore D	ASTM D-2240		84
THERMAL			
Heat Distortion Temperature at 264 psi	ASTM D-648	°F	154
Coefficient of Thermal Expansion	ASTM D-696	in./in., °F mm/mm, °C	4.4 x 10 ⁻⁵ (8.0 x 10 ⁻⁵)
Temperature Range		°F	+32 to +140
FLAMMABILITY			
Flammability	D-635		self-extinguishing
	UL 94		V-0, 5V

Notes:

- Meets ASTM D-1784-81 Type I Grade I Class 12454.
- Meets Federal Specification L-P 535e.
- Meets UL 94V-0,94-5V Flammability rating.
- Meets ASTM E 84 Flame Spread Rate 15, Fuel Contribution 0. (White Only)
- Maximum application temperature +140°F.
- Custom lengths, sizes, colors and special requirements available upon request.
- Gray PVC Sheet has no protective foil.
- White PVC Sheet has one side protective foil.
- * refers to items that are non-stock. Minimum orders and long leadtimes may be encountered.

PART # THICKNESS (MM) WT PER SHEET (LBS)

CAW - 2000MM X 1000MM

S110012*	1	6.17
S110112*	1.5	9.48
S112012*	2	12.57
S110212*	3	18.74
S112212*	4	25.13
S112512*	5	31.31
S110412*	6	37.48
S114812*	7	43.87
S114612*	8	50.04
S114912*	9	-
S113012*	10	62.61
S110612*	12	75.18
S113112*	15	93.92
S113212*	20	125.22
S110812*	25	156.53
S110912*	30	187.83
S113412*	35	219.14
S111012*	40	250.44
S111212	50	313.06

CAW - 3000MM X 1500MM

S112013*	2	28.22
S110213*	3	42.33
S112213*	4	56.44
S112513*	5	70.55
S110413*	6	84.43
S114813*	7	98.55
S114613*	8	112.66
S114913*	9	126.74
S113013*	10	140.87
S110613*	12	169.09
S113113*	15	211.42
S113213*	20	281.75
S110813*	25	352.30
S110913*	30	422.62

GREY - 2440MM X 1220MM

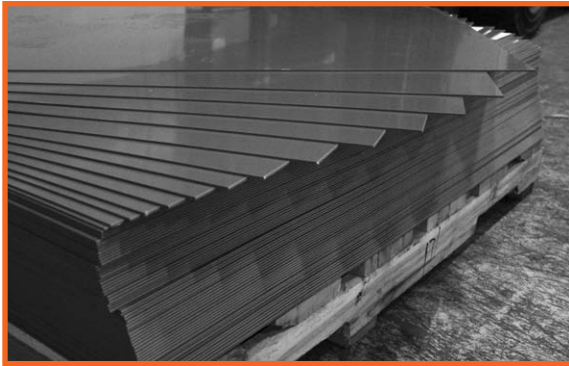
S110011*	1/16	15.36
S110111*	3/32	23.04
S110211	1/8	30.72
S110311	3/16	46.08
S110411	1/4	61.44
S110511	3/8	92.16
S110611	1/2	122.88
S110711	3/4	184.32
S110811	1	245.76

WHITE

*	1/16	15.36
*	3/32	23.04
*	1/8	30.72
*	3/16	46.08
*	1/4	61.44
*	3/8	92.16
*	1/2	122.88
*	3/4	184.32
*	1	245.76

PVC Type II Sheet

Simona® PVC Type II Sheet



SIMONA® PVC Type II sheet is extruded to exacting specification for high impact applications. This type of sheet has excellent corrosion resistance, very good dielectric properties, low moisture absorption, high rigidity, good abrasion resistance and excellent weathering properties. The material is also self-extinguishing. It is also available in 4' x 8' sheets in light grey, dark grey and white.

Features:

- High Impact
- Minimal shrinkage
- Good corrosion and chemical resistance
- Easy to fabricate, weld or machine, hot and cold formable
- Showcase quality surface
- Stress relieved, square, flat sheets
- Accurate to dimensional tolerances
- Color consistent

Applications:

- Pollution control equipment
- Machined and fabricated parts
- Etching and plating tanks
- Scrubbers, hoods, ducts and other protective equipment

Notes:

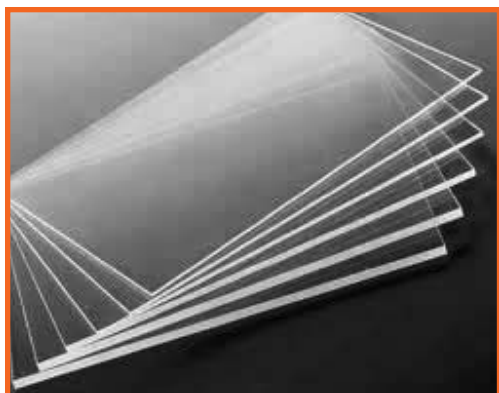
- Meets ASTM D-1784-81 Type II Grade I Class 15333-D.
- Meets UL 94V Standards.
- Meets Federal Specification L-P 535e.
- Maximum application temperature 140°F.
- Custom lengths, sizes, colors and special requirements available upon request.
- Light Grey and white PVC Sheet have no protective foil.

THICKNESS (MM)	WT PER SHEET (LBS)
VERSADUR 250 - 4' X 8'	
1/16"	15
1/8"	30
3/16"	45
1/4"	60
3/8"	90
1/2"	120

SIMONA® PVC TYPE II SHEET TECHNICAL DATA

ASTM TEST METHOD	UNIT	TYPICAL VALUE
PHYSICAL		
Density	D-792 g/cc	1.38
Water Absorption (24 hrs @ 73 °F)	D-570 %	
MECHANICAL		
Tensile Strength	D-638 PSI	7400
Tensile Modulus	D-638 PSI	435,000
Izod Impact	D-256 ft. lbs/in	14
Hardness, Shore D	D-2240	82
THERMAL		
Heat Distortion Temperature at 264 psi	D-648 °F	154
Coefficient of Thermal Expansion	D-696 in./in. °C	80 x 10-6
Temperature Range	°F	+32 to +140
FLAMMABILITY		
Flammability		self-extinguishing 94V-0 low flammability

Simona® PVC GLAS Sheet



SIMONA® PVC GLAS sheets are extruded to exacting specification for normal impact applications requiring transparency. This type of sheet has excellent corrosion resistance, very good dielectric properties, low moisture absorption, high rigidity, good abrasion resistance and excellent weathering properties. The material is also self-extinguishing.

Features:

- Normal Impact
- Excellent chemical and corrosion resistance
- Easy to fabricate, welded and machined
- Showcase quality surface
- Single- or double-side protective masking
- Stress relieved, square, flat sheet
- Accurate to dimensional tolerances
- Color consistent

Applications:

- Chemical processing
- Semiconductor processing equipment
- Machined and fabricated parts
- Work Stations

Notes:

- Meets UL 94V-0 Standards.
- Meets Federal Specification L-P 535e.
- Maximum application temperature +140°F.
- offered with two sided protective foil.

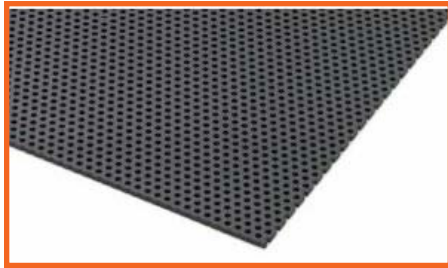
PART NO.	THICKNESS (MM)	WT. PER SHEET (LBS)
GLAS - 2000 X 1000 MM		
S114222	1	5.95
S114322	2	12.13
S110222	3	18.08
S112222	4	24.25
S112522	5	30.20
S110422	6	36.16
S114622	8	48.28
S110522	10	60.41
S110622	12	72.53
S113122	15	90.61
GLAS - 3000 X 1500 MM		
S114323	2	27.12
S110223	3	40.79
S112223	4	54.45
S112523	5	67.90
S110423	6	81.57
VERSADUR - 4' X 8' SHEET		
S110221	1/8	26.90
S110321	3/16	40.57
S110421	1/4	54.01
S110521	3/8	89.72
S110621	1/2	107.66

SIMONA® CLEAR PVC SHEET TECHNICAL DATA

ASTM TEST METHOD	UNIT	TYPICAL VALUE
PHYSICAL		
Density	D-792 g/cc	1.37
Water Absorption (24 hrs @ 73 °F)	D-570 %	
MECHANICAL		
Tensile Strength	D-638 PSI	10,600
Tensile Modulus	D-638 PSI	479,000
Izod Impact	D-256 ft. lbs./in.	0.52
Hardness, Shore D		86
THERMAL		
Coefficient of Thermal Expansion	D-696 in./in. °C	44 x 10 ⁻⁶
Temperature Range	°F	+32 to +140
FLAMMABILITY		
Flammability		self-extinguishing 94V-0 low flammability DIN 4102 B1 up to 4 mm

Perforated Sheet & PVDF Sheet

Perforated Sheet

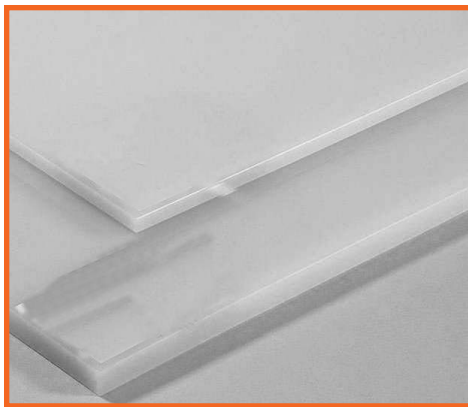


Perforated sheet is available in Natural Homopolymer Polypropylene and PVC. It is ideal for tumbling barrels, distributor plates, plating baskets, overflow weirs, odd size filters, scrubber packing, mesh screens, and support plates. The standard sheet size is 1/8" x 4' x 8' with 1/8" diameter holes on 3/16" staggered centers. These sheets have 40% open area.

PART NO.	MATERIAL	THICKNESS (IN)
PERFORATED SHEET, 4' X 8'		
S140211	PVC Gray	1/8
S240231	Polypro Nat.	1/8

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PVDF Natural Sheet



Simona PVDF Sheet exhibits excellent chemical and corrosion resistance to virtually all organic and inorganic media at high temperatures. The service temperature ranges from -22°F(-30°C) to +284°F(+140°C). They are flame retardant and self-extinguishing. This sheet is easy to fabricate, weld, machine or thermoform. PVDF is ideal for applications including tanks, vessels, chemical industry, machined and fabricated parts, laboratory equipment, chemical processing, semiconductor and electroplating industry.

PART #	THICKNESS (MM)	WT KG/SHEET
PVDF NATURAL PRESSED SHEET		
2000 MM X 1000 MM		
S260632	12	94.14
S262032	15	117.73
S263232	20	156.97
S260832	25	196.21
S263332	30	235.45
S263432	35	274.69
S263532	40	313.94
S261232	50	392.42
S262132	60	470.90
S262332	70	549.39
S262632	80	627.87

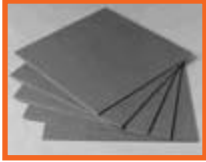
PART #	THICKNESS (MM)	WT KG/SHEET
RED KYNAR PVDF SHEET, 4' X 8'		
S260431	1/4"	33.36
S260531	3/8"	52.82
S260631	1/2"	66.72
S260731	3/4"	105.60
S260831	1"	138.96
S260931	1 1/4"	177.92
S261031	1 1/2"	211.28
S261231	2"	278.00

PART #	THICKNESS (MM)	WT KG/SHEET
PVDF NATURAL EXTRUDED SHEET		
2000 MM X 1000 MM		
S264332	2	15.65
S260232	3	23.59
S262232	4	31.31
S262532	5	39.24
S260432	6	47.18

TECHNICAL DATA

PHYSICAL PROPERTIES	METRIC	UNIT	TYPICAL VALUES
PHYSICAL			
Density	D-792	g/cm ³	1.78
Water Absorption (24 hrs @ 73°F)	D-570	%	0.02
MECHANICAL			
Tensile Strength	D-638	PSI	8,000
Tensile Modulus	D-638	PSI	283,000
Elongation at break	D-638	%	30
Izod Impact	D-256	ft. lbs./in.	NA
Rockwell Hardness	D-785	"R" scale	NA
THERMAL			
Heat Distortion Temperature at 66 psi	D-648	°F	NA
Heat Distortion Temperature at 264 psi	D-648	°F	NA
Vicat Softening Temperature	D-1525	°F	295
Coefficient of Thermal Expansion	D-696	in./in. °C	130 x 10 ⁻⁶
Temperature Range		°F	-22 to +284
FLAMMABILITY RATINGS			
Flammability	FM-4910		FM-4910 listed

CPVC Corzan® Sheet



PVC-C CORZAN® Industrial Grade sheet is a high heat, corrosion resistant chlorinated polyvinyl chloride sheet (CPVC). Because of its excellent corrosion resistance at elevated temperatures, it is ideally suited for self-supporting constructions where high temperatures are a concern. It can be used (depending on chemistry) up to 210° F. It is available in 4' x 8' sheets in thickness up to 3".



Applications:

- Chemical processing temperatures up to 200°F
- Machine flanges
- Valves
- Acid tanks
- Linings

Features:

- Easily to fabricate, weld or machine
- Color consistent
- Excellent impact strength, high temperature
- Excellent chemical and corrosion resistance

PART NUMBER	THICKNESS (IN.)	WEIGHT PER SHEET (LBS)
CPVC - 4' X 8'		
S180211	1/8	32.50
S180311	3/16	48.75
S180411	1/4	65.00
S180511	3/8	97.50
S180611	1/2	130.0
S180711	3/4	195.0
S180811	1	260.0
S180911	1 1/4	325.0
S181011	1 1/2	390.0
S181111	2	520.0
S181211	3	780.0

Notes:

- Meets ASTM D-1784-99 Type IV Grade II Class 24446-B.
- Meets ASTM E 84 Flame Spread Rate 20.
- Maximum application temperature 200°F.
- Custom lengths, sizes, and special requirements available upon request.

CPVC SHEET TECHNICAL DATA

	ASTM TEST METHOD	UNIT	TYPICAL VALUE
PHYSICAL			
Density	D-792	g/cm ³	1.47
Water Absorption (24 hrs @ 73 °F)	D-570	%	0.03
MECHANICAL			
Tensile Strength	D-638	PSI	7,300
Flexural Modulus	D-638	PSI	361,000
Flexural Strength	D-790	psi	14,300
Compressive Strength	D-695	psi	10,100
Compressive Modulus	D-695	psi	196,000
Izod Impact	D-256	ft. lbs./in.	9
Rockwell Hardness	D-785	"R" scale	116
THERMAL			
Heat Distortion Temperature at 264 psi	D-648	°F	198
Coefficient of Thermal Expansion	D-696	in./in. °F	3.86 x 10 ⁻⁵
ELECTRICAL			
Volume Resistivity	D-257	ohm·cm	3.4 X 10 ¹⁵
FLAMMABILITY			
Flammability	UL94	V-O, 5VB, 5VA	0.062"

Homopolymer PP Sheet

Simona® PP-H Extruded Sheet



Polypropylene is a member of the polyolefin family of the thermoplastics, polypropylene exhibits properties that make it an excellent choice for corrosion resistant applications. Homopolymer Polypropylene is the most widely utilized.

Homopolymer Polypropylene is a crystalline material offering a broad range of good physical, mechanical, thermal, chemical, and electrical properties. The high degree of crystallinity and low density of Homopolymer Polypropylene offers a high strength to weight ratio. Combining the high strength to weight ratio with good chemical resistance and weldability of Homopolymer, Polypropylene allows the material to be used in many corrosion resistant structures.

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Application:

- Semiconductor processing equipment
- Machined and fabricated parts
- Laboratory equipment
- Wet benches
- Food grade applications
- Prosthetics
- Etching and plating tanks
- Acid tanks
- Ducts, fume hoods and other protective equipment

Features:

- Excellent chemical and corrosion resistance
- Easily to fabricate, weld or machine
- Accurate to dimensional tolerances
- Stress relieved, square, flat sheets
- Color consistent
- Showcase quality surface
- Meets established ASTM specifications

DESCRIPTION	SIZE	FEATURE	PROTECTION	SIZE RANGE
500 Natural	48" x 96"	Stress Relieved	without protective foil	3/4" and 1"
500 Natural	48" x 96"	Stress Relieved	2 side protective foil	1/16 - 2"
515 Euro grey	48" x 96"	High Gloss/Stress Relieved	1 side protective foil	1/8" to 1"
520 White	48" x 96"	High Gloss/Stress Relieved	2 side protective foil	1/8" to 1"
520 White	48" x 96"	High Gloss/Stress Relieved	without protective foil	1/16'
530 Black	48" x 96"	High Gloss/Stress Relieved	2 side protective foil	1/8" to 1/2"
500 Natural	48" x 120"	Stress Relieved	without protective foil	1/4" to 1/2"
500 Natural	48" x 120"	Stress Relieved	2 side protective foil	3/4" to 1"
520 White	48" x 120"	High Gloss/Stress Relieved	2 side protective foil	1/4" to 1'
500 Natural	48" x 144"	Stress Relieved	without protective foil	1/4" to 1/2"
500 Natural	48" x 144"	Stress Relieved	2 side protective foil	3/4" to 1"
520 White	48" x 144"	High Gloss/Stress Relieved	2 side protective foil	1/4" to 1'
500 Natural	60" x 120"	Stress Relieved	without protective foil	1/4" to 1/2"
500 Natural	60" x 120"	Stress Relieved	2 side protective foil	3/4" to 1"
520 White	60" x 120"	High Gloss/Stress Relieved	2 side protective foil	1/4" to 1'

Notes:

- ASTM D-4101 Group I Class I Grade I.
- FDA Regulation Title 21 CFR 177.1520 (C1.1).
- Federal Specification LP-394B Type I (GP) Type III Grade IIIA Class III.
- California Proposition 65 – Safe Drinking Water and Toxic Enforcement Act – Passes.
- UV Radiation Exposure 500 hours no visible change (515 European grey).
- For technical data, please contact customer service.

Simona® PPC Sheet



Polypropylene is a member of the polyolefin family of the thermoplastics, polypropylene exhibits properties that make it an excellent choice for corrosion resistant applications. Homopolymer Polypropylene is the most widely utilized.

Copolymer Polypropylene involves the introduction of a second monomer to the propylene monomer during the polymerization process. The resin manufacture will introduce a small percentage of ethylene monomer to the propylene monomer resulting in a product that exhibits better impact strength than Homopolymer Polypropylene. When compared to Homopolymer Polypropylene rigidity, chemical resistance and temperature resistance properties of Copolymer Polypropylene are slightly lower.

Applications:

- Tanks and linings
- Lab equipment
- Etching equipment
- Fume hoods, duct work
- Battery cases
- Machined parts
- Industrial doors

Features:

- High impact resistance
- Excellent chemical and corrosion resistance
- Excellent impact strength at low temperatures
- Lightweight
- Excellent formability
- Good abrasion resistance
- Good electrical properties

DESCRIPTION	SIZE	PROTECTION	SIZE RANGE
570 Natural	48" x 96"	without protective foil	1/8" to 1 1/2"
590 Black	48" x 96"	2 side protective foil	1/4" to 1 1/2"
570 Natural	48" x 120"	without protective foil	1/4" to 1"
590 Black	48" x 120"	2 side protective foil	1/4" to 1"
570 Natural	60" x 120"	without protective foil	1/4" to 1 1/2"
590 Black	60" x 120"	2 side protective foil	1/2" to 1 1/2"

TECHNICAL DATA

	TEST METHOD	UNIT	TYPICAL VALUE
PHYSICAL			
Density	ASTM D-792	g/cc	0.905
Water Absorption (24 hrs @ 73 °F)	ASTM D-570	%	<0.01
MECHANICAL			
Tensile Strength	ASTM D-638	PSI	3,600
Tensile Modulus	ASTM D-638	PSI	150,000
Elongation	ASTM D-638	%	7500
Izod Impact	ASTM D-256	ft. lbs./in.	No Break
Hardness, Shore D	ASTM D-2240		80
THERMAL			
Heat Distortion Temperature at 66 psi	ASTM D-648	°F	180
Heat Distortion Temperature at 264 psi	ASTM D-648	°F	133
Coefficient of Thermal Expansion	ASTM D-696	in./in. °C	8.88 x 10 ⁻⁵
Temperature Range		°F	-4 to +180
FLAMMABILITY			
Flammability			normal flammability

Notes:

- Call for custom lengths, other sizes, colors or special requirements.
- Also available in metric sizes in white grey, euro grey, and black.

High Density PE Sheet

Simona® HDPE Extruded Sheet



Simona HDPE Sheet 600 series high density polyethylene has excellent chemical corrosion resistance and has abrasion resistance, impact resistance, and is easy for fabrication. It can be used (depending on chemistry) up to 180° F and is available in 4' x 8' sheets in thickness up to 4". This sheet is also available in black upon request.

Applications:

- Food processing
- Tanks and vessels
- Machined and fabricated parts
- Laboratory equipment
- Chemical processing
- Corrosion-resistant wall coverings
- Wear, skid and deflector plates
- Ducts, hoods, chute liners and other protective equipment

Features:

- Excellent chemical and corrosion resistance
- Excellent impact and abrasion resistance
- Easily to fabricate, weld, machine or thermoforming
- High-density, slippery surface, UV-resistant (Black only)
- Stress relieved
- Accurate to dimensional tolerances
- Color consistent

TECHNICAL DATA

	ASTM* TEST METHOD	UNIT	TYPICAL VALUE
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PHYSICAL

Density	D-792	g/cc	0.96
Water Absorption (24 hrs @ 73 °F)	D-570	%	<0.01

MECHANICAL

Tensile Strength	D-638	PSI	4,400
Tensile Modulus	D-638	PSI	19,000
Elongation	D-638	%	7,300
Izod Impact	D-256	ft. lbs./in.	2.75
Hardness, Shore D			65

THERMAL

Heat Distortion Temperature at 66 psi	D-648	°F	167
Heat Distortion Temperature at 264 psi	D-648	°F	110
Coefficient of Thermal Expansion	D-696	in./in. °F	10 x 10 ⁻⁵
Temperature Range		°F	-58 to +170

FLAMMABILITY

Flammability	normal flammability
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Notes:

- Meets FDA Regulation Title 21 CFR 177.1520 (Natural only).
- Maximum application temperature +170°F.
- Also available in 48" x 120", 60" x 120" and 54" x 96".
- NSF Certified Cutting Board material also available in Size 48" x 96", 48" x 120", and 60" x 120".
- Custom lengths, sizes, and special requirements available upon request.

4

PLASTIC SHEET & ROD

PART NO.	THICKNESS (IN.)	WT. PER SHEET (LBS)
HDPE NATURAL - 4' X 8'		
S340231	1/8	20.2
S340331	3/16	30.3
S340431	1/4	40.4
S340531	3/8	60.6
S340631	1/2	80.8
S340731	3/4	121.2
S340831	1	161.6
S340931	1 1/4	202
S341031	1 1/2	242.4
S341131	1 3/4	282.8
S341231	2	323.3
S341331	2 1/4	363.7
S341431	2 1/2	404.1
S341531	2 3/4	444.5
S341631	3	484.9
S341731	3 1/4	525.3
S341831	3 1/2	565.7
S341931	4	646.5

Ultra High Molecular Weight Sheet



Features:

- Meets FDA/USDA guidelines; 3-A Dairy-approved (natural)
- Reduces noise
- Self-lubricating
- Chemical-, corrosion- and wear-resistant
- No moisture absorption
- Non-toxic, low-friction surface

UHMW Sheet is resistant to chemical attack and moisture absorption, and retains key physical properties to -30° C. UHMW is an excellent general-purpose material and is a cost-effective solution for food handling problems, and meets FDA, USDA and 3-A Dairy guidelines for food processing and handling. It is also available in custom colours which also meet FDA and USDA guidelines for food processing and handling. It is available in 4' x 8', 4' x 10' and 5' x 12' sheets in thicknesses up to 6".

PART NUMBER	THICKNESS (INCHES)	WEIGHT PER SHEET (LBS)
UHMW NATURAL - 4' X 8'		
S370231	1/8	20
S370331	3/16	30
S370431	1/4	40
S370531	3/8	60
S370631	1/2	80
S370731	3/4	120
S370831	1	160
S370931	1 1/4	200
S371031	1 1/2	240
S371131	1 3/4	280
S371231	2	320
S371331	2 1/4	360
S371431	2 1/2	400
S371531	2 3/4	440
S371631	3	480
S371731	3 1/4	520
S371831	3 1/2	560
S371931	4	640

Applications:

- Agriculture
- Bottling
- Canning
- Conveyor manufacturers
- Food processing
- Packaging
- Material handling
- Waste water treatment

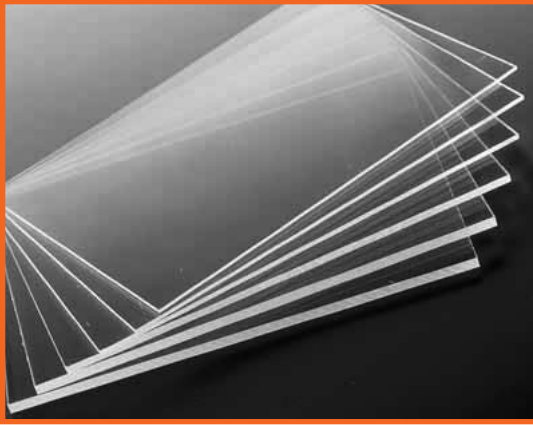
Notes:

- Meets ASTM-D-4020-81 of 4.0 to 5.4-million molecular weight.
- Maximum application temperature $+180^{\circ}$ F.
- Custom lengths, sizes, and special requirements available upon request.
- UHMW sheet is offered with no protective foil.
- Also available in 4' x 10' and 5' x 10'.



Acrylic/Lexan Sheet

Acrylic Sheet



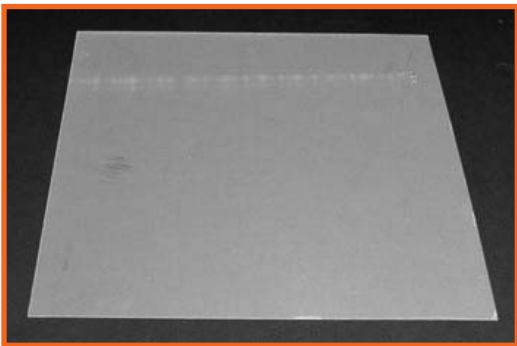
Acrylic sheet has been considered the standard of the industry since it was first introduced more than 50 years ago because of its unsurpassed quality, ease of use and wide range of colors, patterns, thickness and sizes. It is paper masked on both sides.

Applications:

- Sanitary wear
- Machine guards
- Prototypes
- Furniture
- Office machines
- Decorative lighting
- Displays
- Glazing

PART NUMBER	THICKNESS (IN.)	THICKNESS (MM)	SIZE
S410221	0.118"	3.0 mm	49" x 97"
S410321	0.177"	4.5 mm	49" x 97"
S410421	0.236"	6.0 mm	49" x 97"
S410521	0.375"	9.5 mm	49" x 97"
S410421	0.472"	12.0 mm	49" x 97"

Lexan/Polycarbonate Sheet



The major advantages of polycarbonate plastic are breakage resistance, clarity, class I approval (under all three major model building codes), light weight, high temperature, weather resistance and ease of fabrication. It is the only glazing material that is guaranteed unbreakable and is listed by U.L. as burglar resistant. In addition to clear, Lexan is also available in film and sheet form as transparent, opaque and translucent colours, pattern surface textures, mar-resistant surface coated, glass reinforced and U.L. listed bullet resistant. Lexan also has good electrical insulation properties and low moisture absorption. Resistant to both heat and flame, polycarbonates are dimensionally stable and are generally unaffected by greases, oils and acids. Weatherability is good, but not as good as acrylics. Ultraviolet rays cause slight discolouring and embrittlement. Polyfilm masked on both sides.

Applications:

- Machine guards
- Medical equipment
- Electrical components
- Light fittings
- Aircraft parts
- Safety devices
- Food equipment

PART NUMBER	THICKNESS (IN.)	THICKNESS (MM)	SIZE
S430421	0.118"	3.00 mm	48" x 96"
S430521	0.177"	4.50 mm	48" x 96"
S430621	0.236"	6.00 mm	48" x 96"
S430721	0.375"	9.50 mm	48" x 96"
S430821	0.500"	12.50 mm	48" x 96"

Fabric Backed Sheet



Fabric backed polypropylene is a unique material, produced by a unique process, which enables polypropylene sheet to be strengthened with glass-reinforced polyester resins. This material combines interior surfaces having the outstanding anti-corrosion, non-stick and hygienic properties of polypropylene with the external rigidity and lightweight strength of resin/glass mixtures. Polypropylene is well known for its chemical inertness and low coefficient of friction which are so useful in the fabrication of storage and process equipment for critical environments. These properties, however, also make it virtually impossible to bond polypropylene sheet to any of the standard resin/glass mixtures that are used for structural reinforcements. On the other hand there is a limit to the size of fabrication economically and physically practicable with polypropylene, alone.

The key for bonding between polypropylene and FRP is provided by a special fabric backing from polyester fibers / polypropylene fibers. This backing is calendered into the sheet at the extrusion stage and the backing is therefore locked into the extruded sheet, giving a mechanical bond between the sheet and the fabric. The backing of the fabric stands out and becomes in effect the first layer of the resin/glass reinforcement.

Fabco PVDF Fabric Backed Sheeting has a unique stretchable fabric backing calendered into the sheet at the extrusion stage. This stretchable backing allows the most difficult thermoforming operations to be performed with great ease – even compound curves such as vacuum formed dished heads.

PART NUMBER	THICKNESS (MM)	THICKNESS (IN)	SIZE	WT
PP-DWU-SK WITH STRETCH BACKING, GREY RAL 7032				
S210211	2	0.0787	1M x 2M	7.94
S210212	3	0.118	1M x 2M	12.13
S210213	3	0.118	1.5M x 3M	27.12
S212212	4	0.157	1M x 2M	16.98
S210313	4	0.157	1.5M x 3M	36.16
S212512	5	0.197	1M x 2M	20.06
S212513	5	0.197	1.5M x 3M	45.19
S210412	6	0.236	1M x 2M	24.03
S210413	6	0.236	1.5M x 3M	54.23
PP-C-PK (COPOLYMER) WITH PP BACKING, GREY				
S224312	2	0.0787	1M x 2M	7.94
S220212	3	0.118	1M x 2M	12.13
S220213	3	0.118	1.5M x 3M	27.12
S222212	4	0.157	1M x 2M	16.98
S222213	4	0.157	1.5M x 3M	36.16
S222512	5	0.197	1M x 2M	20.06
S222513	5	0.197	1.5M x 3M	45.19
S220412	6	0.236	1M x 2M	24.03
S220413	6	0.236	1.5M x 3M	54.23
PVDF-SK WITH STRETCH FABRIC BACKING, NATURAL COLOUR				
S280232	3	0.118	1M x 2M	23.59
S280233	3	0.118	1.5M x 3M	52.91
S282232	4	0.157	1M x 2M	31.31
S282233	4	0.157	1.5M x 3M	70.55
S282532	5	0.197	1M x 2M	39.24
S280432	6	0.236	1M x 2M	47.18

PART NUMBER	THICKNESS (MM)	THICKNESS (IN)	SIZE	WT
E-CTFE-GK (HALAR), GLASS AND FABRIC BACKING, NATURAL COLOUR				
S540132	1.5	.060	1M x 2M	14.11
S540131	1.5	.060	4' x 8'	20.97
S545032	2.3	.090	1M x 2M	20.06
S545031	2.3	.090	4' x 8'	29.82
S540232	3.0	.188	1M x 2M	25.13
S540231	3.0	.118	4' x 8'	37.35
S540332	4.5	3/16	4' x 8'	59.26
PFA (TEFLON®) LINING LAMINATE, WITH GLASS FABRIC BACKING				
S560134	1.5	.060	1.25m x 15m (49.21" x 49.2 ft.)	160.80
S565034	2.3	.090	1.25m x 10m (49.21" x 32.8 ft.)	160.52
FEP (TEFLON®) WITH FABRIC BACKING				
S820134	1.5	.060		39.37 50 ft.
S820234	2.3	.090		39.37 50 ft.

PVC Strips and Sheet

Flexible PVC Strips and Sheet



WHAT IS FLEXIBLE PVC?

PVC (polyvinyl chloride) is one of the oldest (1930) and most commonly used plastics. No other plastic offers so many different qualities and possibilities, it is very economic and can be recycled many times. No other plastic has been studied so intensively to guarantee its safety. Granulates of PVC compound are obtained by blending PVC resin, plasticizers and specific additives to combine flexibility and other required qualities.

Granules are extruded and formed into strips and sheets with a large choice of dimensions.

Since 1960, EXTRUFLEX (EXTRUtion & FLEXibility) have mastered the complete process of PVC: compounding and extrusion, that give them the ability to provide a very broad range of products that are adaptable to the particular needs of its customers.

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Fabco offers the highest quality flexible PVC products on the market today.

WHERE TO USE SOFT PVC STRIPS AND SHEETS?

- Industrial flexible doors
- Partitions, protective screens, machine covers
- Tanks, basins, tunnels, galleries
- Carpets, fitted carpets, furnishing protection
- Terraces, flexible windows, tarpaulin, hoods
- Art realization, decoration, light and colour games
- Shooting range impact deadener
- Seals, accessories, shoes, bags, covers

SHEET ROLLS

WIDTH (IN)	48"		54"		66"		86"		
THICKNESS (IN)	.060"	.080"	.120"	.160"	.157"	.256"	.276"	.354"	.256"
Standard Clear	*	*	*	*	*	*	*	*	*
Low Temp Clear				*		*	*		
Screenflex Bronze	*								
Standard Reinforced						*			
Standard Clear/Blue									*

STRIP ROLLS

WIDTH (IN)	4"	6"	8"	12"	16"	
THICKNESS (IN)	.060"	.060"	.080"	.080"	.120"	.160"
Standard Smooth	*	*	*	*	*	*
Standard DuraRib™			*	*	*	
Low Temp Non-Reinforced	*	*	*	*	*	*
Low Temp Reinforced		*	*	*		
Low Temp Durarib™			*	*	*	
Anti-Static			*			
Anti-Insect Yellow			*	*		
Opaque Black			*			
Safety Orange			*	*	*	
Screenflex Red			*			
Screenflex Green			*			
Screenflex Bronze			*			
Super Low Temp						

THE **QuickMount** STRIP DOOR HARDWARE SYSTEM IS THE LATEST INNOVATION IN PVC STRIP CURTAINS, DEVELOPED WITH THE INSTALLER IN MIND. THREE SIMPLE INSTALLATION STEPS ALLOW YOU TO QUICKLY GET THE JOB DONE.

1 MOUNT THE QUICKMOUNT INTO THE WALL OR UNDER THE LINTEL



2 TEAR THE PERFORATED PVC STRIP FROM THE ROLL

3 HOOK THE STRIPS ONTO THE QUICKMOUNT



Simona® Plastic Rod



SIMONA® plastic rod is available in a variety of sizes and material. Sizes range from 1/4" diameter to 14". This rod is available in PVC, CPVC, Homopolymer Polypropylene and High Density Polyethylene. Technical data is available upon request. Other materials and sizes may be available upon request. Please contact customer service for more information.

DIAMETER (MM)	NATURAL HOMOPOLYMER POLYPROPYLENE PP-DWU LENGTH	PVDF LENGTH
8	2M	
10	2M	2M
12	2M	
15	2M	2M
18	2M	
20	2M	2M
25	2M	2M
30	2M	2M
35	2M	2M
40	2M	2M
45	2M	
50	2M	2M
55	2M	
60	2M	2M
65	2M	
70	2M	2M
75	2M	
80	2M	2M
90	2M	2M
100	2M	2M
110	1M	2M
120	1M	
125	1M	2M
130	1M	
140	1M	
150	1M	2M
160	1M	2M
165	1M	
170	1M	
180	1M	2M
200	1M	2M
225	1M	
250	1M	2M
300	1M	2M
350	1M	2M
400	1M	2M
500	1M	2M
600	1M	
700	1M	
800	1M	

DIAMETER (INCHES)	PVC-CAW 150 SERIES (DARK GRAY) TYPE I LENGTH	CPVC CORZAN® 450 SERIES INDUSTRIAL GRADE GRAY LENGTH	PP-DWST 500 SERIES NATURAL HOMOPOLYMER LENGTH	600 SERIES NATURAL HDPE-HWST LENGTH
1/4	10'	10'	-	8'
3/8	10'	10'	8'	8'
1/2	10'	10'	8'	8'
5/8	10'	10'	8'	8'
3/4	10'	10'	8'	8'
1	10'	10'	8'	8'
1 1/8	10'	10'	8'	8'
1 1/4	10'	10'	8'	8'
1 3/8	10'	10'	8'	8'
1 1/2	10'	10'	8'	8'
1 5/8	10'	10'	N/A	N/A
1 3/4	10'	10'	8'	8'
1 7/8	10'	10'	N/A	N/A
2	10'	10'	8'	8'
2 1/4	5'	5'	6'	6'
2 3/8	5'	5'	N/A	N/A
2 1/2	5'	5'	6'	6'
2 3/4	N/A	5'	6'	6'
3	5'	5'	6'	6'
3 1/4	N/A	5'	6'	6'
3 1/2	5'	5'	6'	6'
4	5'	5'	6'	6'
4 1/2	5'	N/A	6'	6'
5	5'	N/A	6'	6'
5 1/2	5'	N/A	6'	6'
6	5'	N/A	4'	4'
6 1/2	N/A	N/A	4'	4'
7	5'	N/A	4'	4'
8	5'	N/A	4'	4'
9	N/A	N/A	4'	4'
10	N/A	N/A	4'	4'
12	N/A	N/A	4'	4'
13	N/A	N/A	4'	4'
14	N/A	N/A	4'	4'

Plastic Rod

UHMW-PE Rod



UHMW-PE is a tough, wear resistant plastic that combines an incredibly low coefficient of friction with outstanding impact strength. This self-lubricating polymer has excellent chemical resistance and a broad temperature range making it the perfect choice for engineers in a variety of industries such as conveyor and bulk material handling.

Applications:

- Chute, hopper and truck bed liners
- Wear strips and guide rails
- Star wheels, sprockets and conveyor tracks
- Bumpers and dock fenders
- Bushings, bearings and rollers

DIAMETER	UHMW ROD
1/2	10'
3/4	10'
1	10'
1 1/4	10'
1 1/2	10'
2	10'
2 1/4	10'
2 1/2	10'
2 3/4	10'
3	10'
3 1/2	10'
4	10'
4 1/2	10'
5	10'
6	10'

4

PLASTIC SHEET & ROD

Rod - Engineered Materials



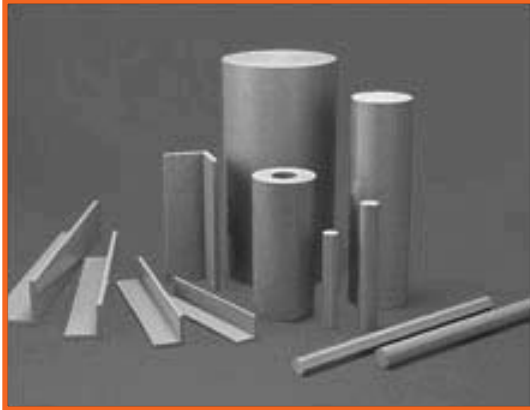
Plastic rod is available in a variety of specialty plastics including:

- Halar (E-CTFE)
- Moulded and Extruded Teflon
- Glass filled Moulded and Extruded Teflon
- Nylon 6/6
- Delrin (Acetal)
- ABS
- Polycarbonate
- ULTEM®ROD (polyetherimide)
- NORYL®ROD (polyphenylene oxide, modified)
- PSU ROD (polysulfone)
- PEEK ROD (polyetheretherketone)
- 6PAL CAST NYLON ROD (Oil-impregnated cast nylon)
- PET ROD (polyethylene terephthalate)

Please contact customer service for further information on these specialty plastic rod products.



PVC and CPVC Shapes



This product is provided porosity-free, stress-reduced with optimum physical properties and exacting tolerances, products that consistently machine with ease, part after part. Available products include angle, solid bar, hollow bar, square and hexagonal bar in Clear PVC, PVC, and CPVC. These materials offer excellent chemical and corrosion resistance, mechanical strength, and good thermal and electrical properties. They are noncontaminating for purity applications, and have excellent flammability characteristics. Other specialty materials such as static dissipative PVC, custom colors, additional sizes and special lengths are available upon request. Please contact customer service for more details.

O.D. (IN.)	I.D. (IN.)	MATERIAL (WEIGHT LBS./FT.)	
		PVC	CPVC
HOLLOW PVC AND CPVC			
1.625	0.562	1.154	1.288
1.9	0.562	1.647	N/A
1.9	0.906	1.41	N/A
2	1.25	1.285	N/A
2.125	0.75	2.01	2.243
2.25	1.125	2.025	2.26
2.25	1.5	1.625	N/A
2.375	1	2.393	2.671
2.5	1	2.68	N/A
2.5	1.5	2.209	N/A
2.625	1.5	2.511	2.802
2.75	1	3.299	3.682
2.875	1.5	N/A	3.525
3	1	3.976	N/A
3	1.25	3.77	4.207
3	1.5	3.375	N/A
3	2	2.798	N/A
3.25	1.25	4.506	N/A
3.5	1.5	5.037	N/A
3.563	1.5	5.245	5.853
4	2.5	5.153	5.751
4	3	3.845	N/A
4.25	1.75	7.452	8.316
4.25	3	4.948	N/A
4.5	2	8.099	N/A
4.75	3	7.069	7.889
5	3	8.217	9.17
5.563	4	7.954	N/A
6	2.437	15.2	N/A
6	4	11.19	N/A
6.625	2.875	18.03	20.121
6.625	4	14.91	16.64
8.625	5.75	21.4	N/A

SIZE (IN.)	TOL. ACROSS FLATS (IN.)	MATERIAL (WEIGHT LBS./FT.)	
		GRAY PVC	CPVC

HEXAGONAL ROD

7/16	±.030	0.108	0.121
1/2	±.030	0.142	0.159
9/16	±.030	0.18	0.202
5/8	±.030	0.222	0.249
3/4	±.030	0.32	0.359
13/16	±.030	0.375	0.421
7/8	±.030	0.435	0.489
1	±.030	0.569	0.639
1 1/8	±.030	0.721	0.81
1 1/4	±.0625 - 0	0.89	0.999
1 3/8	±.0625 - 0	1.08	1.213
1 1/2	±.0625 - 0	1.283	1.441
1 3/4	±.0625 - 0	1.746	N/A
2	±.0125 - 0	2.28	2.56

SIZE (IN.)	TOL. ACROSS FLATS (IN.)	MATERIAL (WEIGHT LBS./FT.)	
		GRAY PVC	CPVC

SQUARE ROD

1/2	±.030	0.157	N/A
5/8	±.030	0.238	N/A
3/4	±.030	0.36	N/A
1	±.030	0.629	N/A
1 1/4	±.0625	1.033	N/A
1 1/2	±.0625	1.464	N/A
2	0.055	2.452	N/A

SIZE (IN.)	MATERIAL (WEIGHT LBS./FT.)			
	GRAY PVC	WHITE PVC	CPVC	CLEAR

PVC AND CPVC ANGLE

1" x 1" x 1/8"	0.141	0.141	0.18	0.141
1-1/4" x 1-1/4" x 3/16"	0.262	0.262	0.325	0.262
1-1/2" x 1-1/2" x 3/16"	0.316	0.316	0.395	0.316
1-1/2" x 1-1/2" x 1/4"	0.415	N/A	N/A	0.415
2" x 2" x 1/4"	0.563	0.563	0.645	0.563








Orthotics and Prosthetics Sheet

SIMOLIFE Orthotics and Prosthetics Sheet



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PLASTIC SHEET & ROD

APPLICATION	SIMOLIFE MATERIAL
Diagnostic/Test Sockets 	PETG
Final Prosthetic Sockets 	HDPE PP-Homopolymer PP-Copolymer
Flexible Interior Prosthetic Sockets 	LDPE EVA
Foot/Leg Orthotics 	HDPE LDPE PP-Homopolymer PP-Copolymer
Functional Foot Orthotics 	HDPE LDPE PP-Homopolymer PP-Copolymer EVA
Hand/Arm Orthotics 	HDPE LDPE PP-Copolymer
Corsets 	HDPE LDPE PP-Homopolymer PP-Copolymer

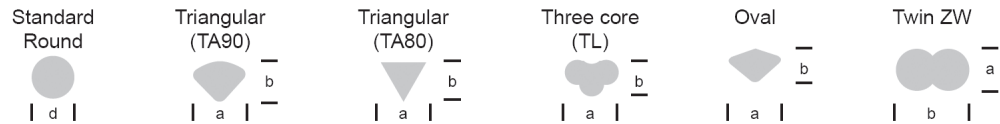
The SIMOLIFE line of sheet materials represents the most extensive range of products tailored to the specific requirements of the orthopedics industry. Using certified orthotic grade raw materials and rigid manufacturing controls, we manufacture premium-quality products that meet the highest standards applicable within the health care sector.



Round Welding Rod



Rod is available in the configurations shown below. Minimum quantities may be required. Welding rod may be available in coils. Add "C" to end of part number. Contact Fabco to check for availability.



PART NO.	MATERIAL DESIGNATION	DIA. MM	DIA. IN	COLOUR	PART NO.	MATERIAL DESIGNATION	DIA. MM	DIA. IN	COLOUR
W01203	PVC-CAW	3	1/8	Gray	W06203	CPVC	3	1/8	Lt. Gray
W01204	PVC-CAW	4	5/32	Gray	W06204	CPVC	4	5/32	Lt. Gray
W01205	PVC-CAW	5	3/16	Gray	W06205	CPVC	5	3/16	Lt. Gray
W03206	PVC-CAW	5	Triangular TA90	Gray	W18603	HDPE - HWST	3	0.118	Natural
W03206T	PVC-CAW	5	3-Core	Gray	W18604	HDPE - HWST	4	0.157	Natural
W25403	PVC - MZ	3	0.118	Lt. Gray	W18605	HDPE - HWST	5	0.197	Natural
W25404	PVC - MZ	4	0.157	Lt. Gray	W21603	HDPE - SR-IND	3.175	1/8	Natural
W25405	PVC - MZ	5	0.197	Lt. Gray	W21604	HDPE - SR-IND	3.969	5/32	Natural
W07303	PVC - KD7300	3	0.118	Green	W21605	HDPE - SR-IND	4.763	3/16	Natural
W07604	PVC - KD7300	4	0.157	Clear	W18903	HDPE - HWU	3	0.118	Black
W01603	PVC - GLAS	3	0.118	Clear	W18904	HDPE - HWU	4	0.157	Black
W01604	PVC - GLAS	4	0.157	Clear	W18905	HDPE - HWU	5	0.197	Black
W04603	PVC - FLEXIBLE	3	1/8	Natural	W22603	HDPE - HML500	3	0.118	Natural
W08603	PP -DWST	3	1/8	Natural	W22604	HDPE - HML500	4	0.157	Natural
W08604	PP - DWST	4	5/32	Natural	W14603	LDPE	3.175	1/8	Natural
W08605	PP - DWST	5	3/16	Natural	W14604	LDPE	3.969	5/32	Natural
W11603	PP - SR-IND	3	1/8	Natural	W14605	LDPE	4.763	3/16	Natural
W11604	PP - SR-IND	4	5/32	Natural	W50602	ECTFE	3	0.118	Natural
W11605	PP - SR-IND	5	3/16	Natural	W50603	ECTFE	3.18	0.125	Natural
W08203	PP - DWU	3	1/8	Tan/Gray	W50604	ECTFE	3.96	0.156	Natural
W08204	PP - DWU	4	5/32	Tan/Gray	W50605	ECTFE	4	0.157	Natural
W05205	PP - DWU	5	3/16	Tan/Gray	W30603	PVDF	3	0.118	Natural
W12603	PP - PPS	3	1/8	Gray	W30604	PVDF	4	0.157	Natural
W12604	PP - PPS	4	5/32	Gray	W40603	FEP	3.5	0.138	Natural
					W42603	PFA	3.5	0.138	Natural

Rod, Nuts, Bolts & Washers

Plastic Bolts, Nuts and Washers



Thermoplastic fasteners can be used in a variety of applications that require resistance to chemicals and corrosive environments. When used to join dissimilar metal parts, they help eliminate cathodic corrosion problems. Caution should be exercised during assembly since thermoplastic bolts can break by over-tightening. These fasteners are stocked in PVC and CPVC but are also available in polypropylene, Teflon, nylon, Kynar, Lexan, Kel-f and Polyethylene.

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PLASTIC SHEET & ROD

SIZE (IN)	PVC PART NUMBER	CPVC PART NUMBER	PP PART NUMBER	NYLON PART NUMBER
PVC THREADED ROD				
1/4-20	3001020	3002020	3003020	3004020
5/16-18	3001018	3002018	3003018	3004018
3/8-16	3001016	3002016	3003016	3004016
1/2-13	3001013	3002013	3003013	3004013
5/8-11	3001011	3002011	3003011	3004011
3/4-10	3001010	3002010	3003010	3004010

SIZE (IN)	NUT PART NUMBER	WASHER PART NUMBER
PVC MACHINE HEX NUTS AND WASHERS		
1/4 -20	211401	211301
5/16 -18	211402	211302
3/8 -16	211403	211303
1/2 -13	211404	211304
5/8 -11	211405	211305
3/4 -10	211406	211306

Notes:

- Technical information available upon request.
- Bolts, Nuts and Washers also available in sizes 7/8" and 1" in lengths from 1/2" to 6".
- PVC and CPVC Rod available in 5 foot lengths, PP and Nylon available in 4 foot lengths. Threaded rods also available in sizes 7/8" and 1".



DIA. AND LENGTH (IN)	PVC PART NUMBER
MACHINED HEX HEAD BOLTS	
1/4-20 x 1/2	211100
1/4-20 x 3/4	211101
1/4-20 x 1	211102
1/4-20 x 1-1/4	2111021
1/4-20 x 1-1/2	211103
1/4-20 x 2	211104
1/4-20 x 2-1/2	2111041
1/4-20 x 3	211105
5/16-18 x 1/2	211108
5/16-18 x 3/4	211109
5/16-18 x 1	211110
5/16-18 x 1-1/4	2111101
5/16-18 x 1-1/2	2111102
5/16-18 x 2	211111
5/16-18 x 2-1/2	2111111
5/16-18 x 3	211112
3/8-16 x 1/2	2111121
3/8-16 x 3/4	2111122
3/8-16 x 1	2111123
3/8-16 x 1-1/4	2111124
3/8-16 x 1-1/2	211113
3/8-16 x 2	211114
3/8-16 x 2-1/2	211114A
3/8-16 x 3	211115
1/2-13 x 1	211119
1/2-13 x 1-1/2	211120
1/2-13 x 2	211121
1/2-13 x 2-1/2	211122
1/2-13 x 3	211123
1/2-13 x 3-1/2	211124
1/2-13 x 4	2111241
5/8-11 x 1-1/2	211126B
5/8-11 x 2	211127
5/8-11 x 2-1/2	211128
5/8-11 x 3	211129
5/8-11 x 3-1/2	2111291
5/8-11 x 4	211130
3/4-10 x 1-1/2	211132A
3/4-10 x 2	211133
3/4-10 x 2-1/2	2111331
3/4-10 x 3	211134
3/4-10 x 3-1/2	2111341
3/4-10 x 4	211135
3/4-10 x 4-1/2	2111351
3/4-10 x 5	2111352



Section 5: Liquid Monitoring

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Liquid Monitoring

Quality Analytical and Flow Instrumentation for Industries such as Industrial and Municipal Water / Waste Water, Chemical and Metals Processing, Aquaculture, Food and Beverage. Our lines consist of GF Signet//Blue White/Icon Process.



The F-400 SERIES of In-Line Units

F-400N

F-400N BENEFITS

- Tough machined acrylic meter body, highly polished to a clear finish. Annealed for added strength.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade FKM o-ring seals.
- Standard models #316 stainless steel float guide rods.
- Standard models #316 stainless steel, PVDF, PTFE float.
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Models available for use with liquids.

F-400N SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70° F (21° C)
 Max. Fluid Temperature Polypropylene adapters: 150° F (65° C) @ 0 PSI
 Full scale accuracy +/- 5%
 Meter body material Machined acrylic
 O-ring seals..... FKM
 Approximate shipping wt. . 1/2 lb. (.23 kg)
 NIST certificates optional

PIPE SIZES

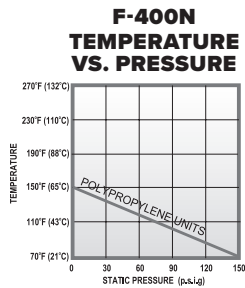
1/2" F/NPT

FLOW RATES

0.025 to 5 GPM
 0.1 to 20 LPM

DIMENSIONS

Height: 8-3/16" (20.8cm)
 Width: 1-1/4" (3.2cm)



F-400N

F-410N

F-410N BENEFITS

- Tough machined acrylic meter body, highly polished to a clear finish. Annealed for added strength.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade FKM o-ring seals.
- Standard models #316 stainless steel float guide rods.
- Standard models #316 stainless steel or PVC float.
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Models available for use with liquids.

F-410N SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70° F (21° C)
 Max. Fluid Temperature 316 SS and Hastelloy Floats: 150° F (65° C) @ 0 PSI
 PVC floats: 120° F (49° C) @ 0 PSI
 Full scale accuracy +/- 5%
 Meter body material Machined acrylic
 O-ring seals..... FKM
 Approximate shipping wt. . 2 lb. (.91 kg)
 NIST certificates optional

PIPE SIZES

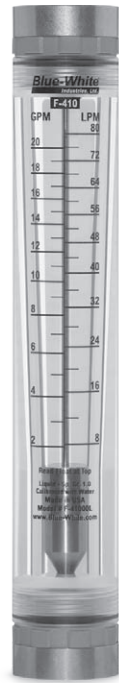
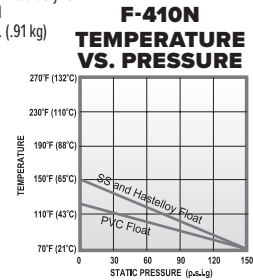
3/4" and 1" F/NPT

FLOW RATES

1 to 20 GPM
 4 to 80 LPM

DIMENSIONS

Height: 11" (27.9cm)
 Width: 1-3/4" (3.2cm)



F-410N
F-430N

F-420N

F-420N BENEFITS

- Tough machined acrylic meter body, highly polished to a clear finish. Annealed for added strength.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade FKM o-ring seals.
- Standard models #316 stainless steel float guide rods.
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.

F-420N SPECIFICATIONS

Max. Working Pressure..... 130 psig (8.9 bar) @ 70° F (21° C)
 Max. Fluid Temperature 130° F (54° C) @ 0 PSI
 Full scale accuracy +/- 5%
 Meter body material Machined acrylic
 O-ring seals..... FKM
 Approximate shipping wt. . 2 lb. (.91 kg)
 NIST certificates optional

PIPE SIZES

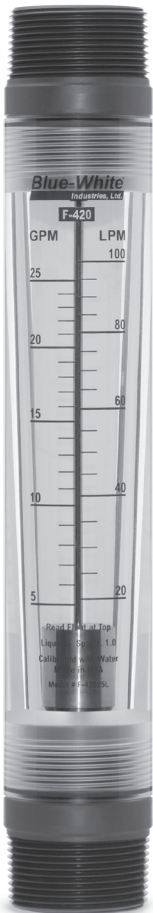
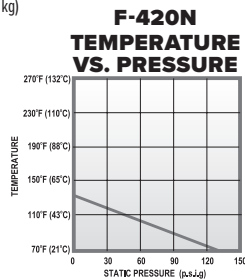
1" F/NPT and 1-1/2" M/NPT

FLOW RATES

5 to 50 GPM
 20 to 200 LPM

DIMENSIONS

Height: 12" (30.5cm)
 Width: 2" (5.1cm)



F-420N

F-430N

F-430N BENEFITS

- Tough machined acrylic meter body, highly polished to a clear finish. Annealed for added strength.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade FKM o-ring seals.
- Standard models #316 stainless steel float guide rods.
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Optional Polypropylene Adapters available.

F-430N SPECIFICATIONS

Max. Working Pressure..... 130 psig (8.9 bar) @ 70° F (21° C)
 Max. Fluid Temperature 130° F (54° C) @ 0 PSI
 Full scale accuracy +/- 5%
 Meter body material Machined acrylic
 O-ring seals..... FKM
 Approximate shipping wt. . 6 lb. (2.7 kg)
 NIST certificates optional

PIPE SIZES

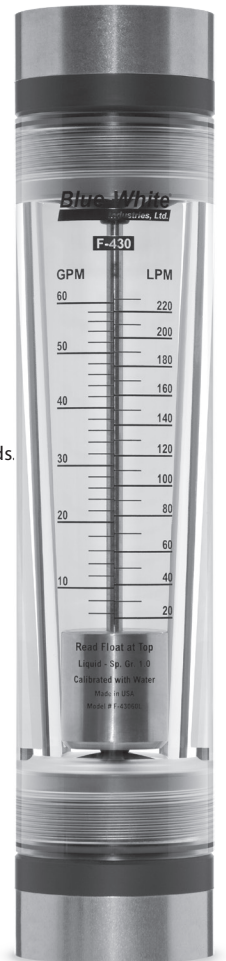
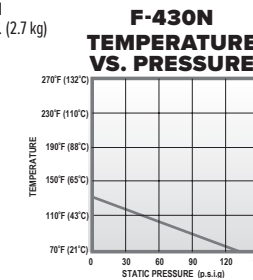
1-1/2" and 2" F/NPT

FLOW RATES

4 to 100 GPM
 15 to 375 LPM

DIMENSIONS

Height: 14" (35.6cm)
 Width: 3" (7.6cm)



5 LIQUID MONITORING



Acrylic Variable Area Flow Meters

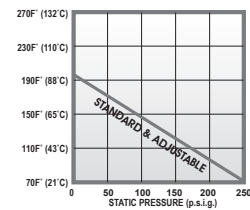
F-550 SERIES Machined Panel Mount Meter



F-550

F-550A WITH INTEGRAL FLOW ADJUSTMENT VALVE

F-550 OUTPUT VS. PRESSURE



F-550 BENEFITS

- Durable, highly polished, one piece machined meter body. Annealed for added strength.
- #316 Stainless Steel floats and float guides.
- Sturdy adapters with FKM O-ring seals.
- Bulkhead nuts attach directly to inside panel.
- Separate mounting screws are not required.
- Optional Adjustable Flow Control Valve (F-550A only) easy to disassemble. No special tool required, ALL FIELD REPLACEMENTABLE.
- Acceptable in direct sunlight applications.
- Models available for use with liquids.

F-550 SPECIFICATIONS

Pressure 250 psig (17.2 Bar) @70°F (21°C)
 Temperature 200°F (93°C) @ 0 pressure
 Full Scale Accuracy ± 5%
 Meter Body Material Machined acrylic
 Adapter Material Polypropylene
 O-rings FKM
 Float Material #316 SS
 Approximate Shipping Wt. 2 lbs. (.907 kg.)

PIPE SIZES

1/4", 3/8, 1/2", 3/4" and
 1" M/NPT.
 1/2" Barb

FLOW RATES

0.025 to 20 GPM
 0.1 to 75 LPM

F-550 ORDERING GUIDELINES

MODEL NUMBER	CALIBRATION GPM	LPM	ADAPTER SIZE	FLOAT MATERIAL
F-55250L(*)	0.025 to 0.250	0.1 to 1	1/4" M/NPT	#316 SS
F-55375L(*)	0.1 to 1	0.4 to 4	3/8" M/NPT	#316 SS
F-55376L(*)	0.2 to 2	0.75 to 7.5	3/8" M/NPT	#316 SS
F-55500L(*)	0.5 to 5	2 to 20	1/2" M/NPT	#316 SS
F-55750L(*)	1 to 10	4 to 40	3/4" M/NPT	#316 SS
F-55005L	1 to 5	3 to 18	1" M/NPT	PTFE
F-55010L(*)	1 to 10	4 to 40	1" M/NPT	#316 SS
F-55015L(*)	1 to 15	5 to 60	1" M/NPT	#316 SS
F-55200L(*)	2 to 20	7.5 to 75	1" M/NPT	#316 SS

MODEL OPTIONS

(*) To order with Flow Adjustment Valve add the letter "A" after the "L" in the model number. Model #F-55005L is not available with Adjustment Valve.

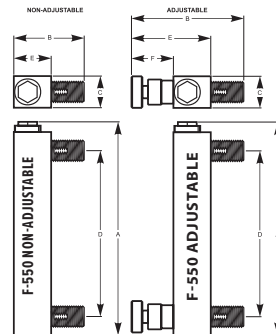
F-550 NON-ADJUSTABLE DIMENSIONS

Model Number	A	B	C	D	E	Mount Hole
F-55250L (1/4")	7-1/4"(18.4cm)	2-1/2"(6.4cm)	1-1/16"(2.4cm)	5-5/8"(14.3cm)	1-1/4"(cm)	9/16"(1.4cm)
F-55375L (3/8")	8-3/8"(21.3cm)	2-3/4"(7.0cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	1-1/2"(cm)	1-1/16"(2.7cm)
F-55376L (3/8")	8-3/8"(21.3cm)	2-3/4"(7.0cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	1-1/2"(cm)	1-1/16"(2.7cm)
F-55500L (1/2")	8-3/8"(21.3cm)	2-3/4"(7.0cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	1-1/2"(cm)	7/8"(2.2cm)
F-55750L (3/4")	9"(22.9cm)	3-3/4"(9.5cm)	1-1/2"(3.8cm)	6-1/2"(16.5cm)	1-3/4"(cm)	1-1/16"(2.7cm)
F-55200L (1")	10-5/8"(27.0cm)	4"(10.2cm)	1-3/4"(4.4cm)	8"(20.3cm)	2"(cm)	12-1/64"(30.5cm)

F-550 ADJUSTABLE DIMENSIONS

Model Number	A	B	C	D	E	F
F-55250LA (1/4")	7-1/4"(18.4cm)	3-7/16"(8.7cm)	1"(2.5cm)	5-5/8"(14.3cm)	2-7/16"(6.2cm)	1-11/32"(3.4cm)
F-55375LA (3/8")	8-3/8"(21.3cm)	4-1/2"(11.4cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	3-1/4"(8.3cm)	1-3/4"(4.4cm)
F-55376LA (3/8")	8-3/8"(21.3cm)	4-1/2"(11.4cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	3-1/4"(8.3cm)	1-3/4"(4.4cm)
F-55500LA (1/2")	8-3/8"(21.3cm)	4-1/2"(11.4cm)	1-1/32"(3.4cm)	6-1/2"(16.5cm)	3-1/4"(8.3cm)	1-3/4"(4.4cm)
F-55750LA (3/4")	9"(22.9cm)	5-1/2"(14.0cm)	1-1/2"(3.8cm)	6-1/2"(16.5cm)	3-1/4"(8.3cm)	1-5/16"(3.3cm)
F-55200LA (1")	10-5/8"(27.0cm)	5-1/4"(13.3cm)	1-3/4"(4.4cm)	8"(20.3cm)	3-1/2"(8.9cm)	1-7/16"(3.7cm)

Note: Mount Hole Dimensions are the same as the Model Non-Adjustable



5

LIQUID MONITORING

F-300 SERIES Machined Acrylic Flowmeters

F-300 BENEFITS

- NSF listed.
- No metal in the fluid.
- Horizontal or Vertical pipe installation.
- One piece machined acrylic meter body.
- Corrosion resistant internal parts.
- Smooth flow means no float bounce.
- Ships with gasket seal and mounting clamps.
- Calibrated for use on PVC or Copper Pipe.

F-300 SPECIFICATIONS

Max. Working Pressure 75 psig (5.1 bar) @ 70°F (21°C)
 Max. Fluid Temperature 190°F (88°C) @ 0 pressure
 Accuracy ± 5% for 1", 1-1/2", 1-1/4" and 2" ± 10% for 2-1/2", 3", 4", 6"

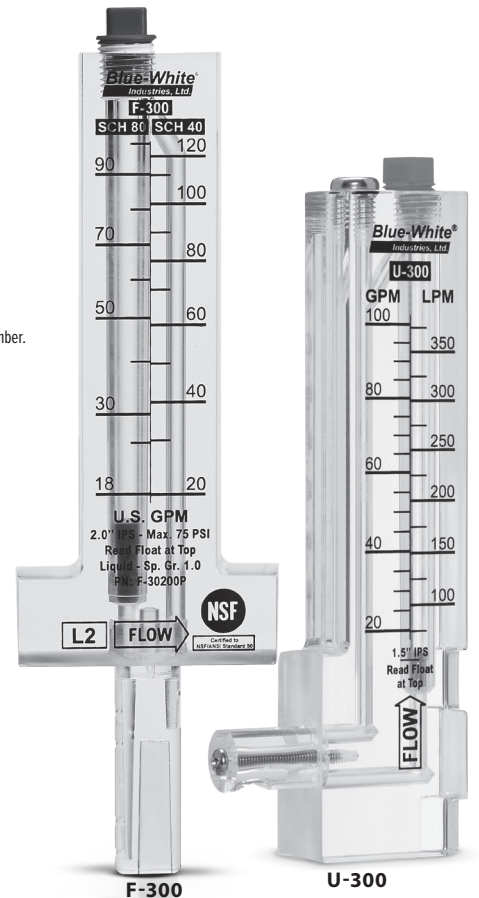
Meter Body Material Acrylic
 Connection Type Saddle
 Float Material PVDF
 Gasket Material Neoprene
 Max. Pressure Drop 0 psi
 Approx. Shipping Weight... 1" to 4" Pipe: 1 lbs. (.454 kg.)
 6" to 8" Pipe: 2 lbs. (.907 kg.)

I.P.S. PIPE SIZES

1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 8"

FLOW RATES

5 to 2200 U.S. GPM
 20 to 8328 LPM



F-300

U-300

Polysulfone Variable Area Flow Meters

F-440 SERIES Compact Size. Big Performance.

F-440 BENEFITS

- Adjustable Flow Indicating Marker.
- Engineered with large half union connections.
- Oversized o-rings for Superior seal.
- All wetted parts are PVDF or Polypropylene.
- Tough Polysulfone meter body resists high temperatures and pressures.*
- Compact size for tight installation spaces.
- 2" scale length (approximate).
- Direct reading permanent scale.
- In-line or Panel mount configurations available.
- Optional Integral Flow Adjustment Valve.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Standard models have #316 Stainless Steel, PTFE or PVC float.
- Not recommended for direct sunlight.

F-440 SPECIFICATIONS

Max. Working Pressure..... 175 psig (10.3 bar) @ 70°F (21°C)
 Max. Fluid Temperature
 Standard Models 212°F (100°C) @ 0 PSI
 Full Scale Accuracy +/- 4%
 Meter Body Material Polysulfone
 Adapter Material Polysulfone
 O-Ring Material FKM
 Approx. Shipping Weight... 1/2lb. (.23 kg)

F-440 ORDERING GUIDELINES

STANDARD LIQUID MODELS

MODEL NUMBER	Pipe Size M/NPT	DUAL SCALE RANGE		Float Material
		GPM	LPM	
F-44250(*)-6	3/8"	.025 to .250	0.1 to 1.0	PVDF
F-44250(*)-8	1/2"	.025 to .250	0.1 to 1.0	PVDF
F-44375(*)-6	3/8"	0.1 to 1.0	0.4 to 4.0	316 SS
F-44375(*)-8	1/2"	0.1 to 1.0	0.4 to 4.0	316 SS
F-44376(*)-6	3/8"	0.2 to 2.0	0.8 to 8.0	316 SS
F-44376(*)-8	1/2"	0.2 to 2.0	0.8 to 8.0	316 SS
F-44500(*)-6	3/8"	0.5 to 5.0	1.8 to 18.0	316 SS
F-44500(*)-8	1/2"	0.5 to 5.0	1.8 to 18.0	316 SS
F-44750(*)-6	3/4"	1.0 to 10.0	5.0 to 37.5	316 SS
F-44750(*)-8	1/2"	1.0 to 10.0	5.0 to 37.5	316 SS
F-44330(*)-6	3/8"	3.0 to 30.0	10 to 110	PTFE
F-44330(*)-8	1/2"	3.0 to 30.0	10 to 110	PTFE

MODEL Variations

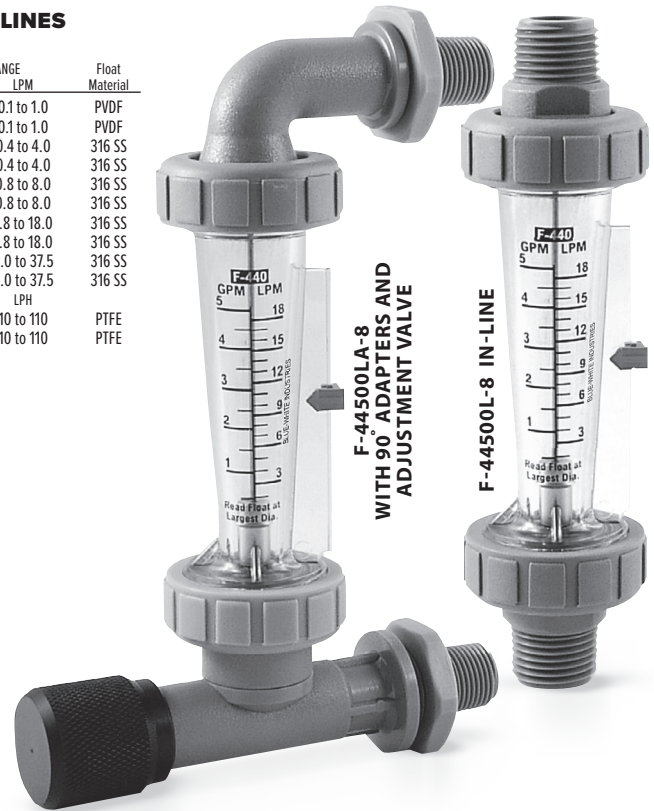
*L = In-Line Model is listed
 *LE = Panel Mount Model
 *LA = Adjustable Model

PIPE SIZES

Standard Models: 3/8" F/NPT; 1/2", 3/4" M/NPT

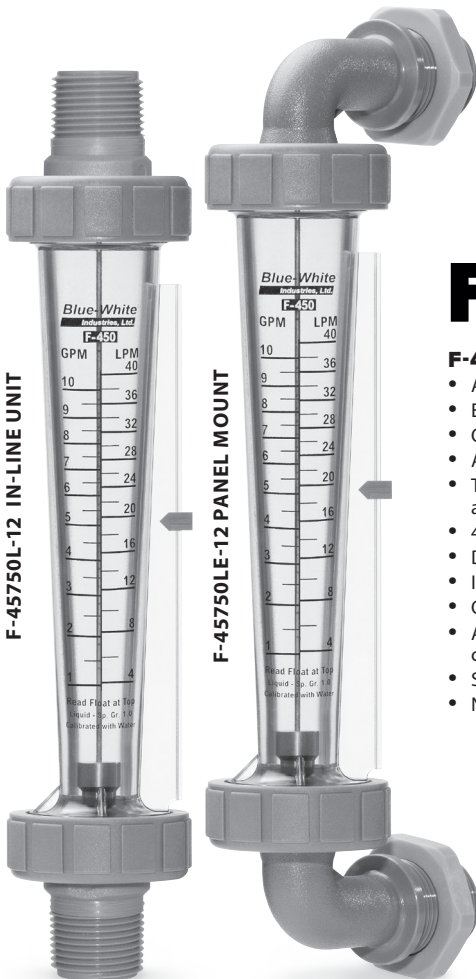
FLOW RATES

0.025 to 10 U.S. GPM
 0.1 to 37.5 LPM
 3 to 60 GPH
 10 to 220 LPH



F-44500LA-8 WITH 90° ADAPTERS AND ADJUSTMENT VALVE

F-44500L-8 IN-LINE



F-45750L-12 IN-LINE UNIT

F-45750LE-12 PANEL MOUNT

F-450N SERIES Performance and Versatility

F-450N BENEFITS

- Adjustable Flow Indicating Marker.
- Engineered with large half union connections.
- Oversized o-rings for Superior seal.
- All wetted parts are PVDF or Polypropylene.
- Tough Polysulfone meter body resists high temperatures and pressures.*
- 4" approximate scale length for easy reading.
- Direct reading permanent scale.
- In-line or Panel mount configurations available.
- Optional integral flow adjustment valve.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Standard models have #316 Stainless Steel or PTFE float.
- Not recommended for direct sunlight.

F-450N SPECIFICATIONS

Max. Working Pressure..... 175 psig (10.3 bar) @ 70°F (21°C)
 Max. Fluid Temperature
 Standard Models 212°F (100°C) @ 0 PSI
 Full Scale Accuracy +/- 4%
 Meter Body Material Polysulfone
 Adapter Material Polysulfone
 O-Ring Material FKM
 Max. Pressure Drop 2 psi
 Approx. Shipping Weight... 1/2lb. (.23 kg)

F-450N ORDERING GUIDELINES

STANDARD LIQUID MODELS

MODEL NUMBER	Pipe Size	DUAL SCALE RANGE		Float Material
		GPM	LPM	
F-45375(*)-6	3/8" F/NPT	.1 to 1	.4 to 4	PTFE
F-45375(*)-8	1/2" M/NPT	.1 to 1	.4 to 4	PTFE
F-45376(*)-6	3/8" F/NPT	.2 to 2	1 to 7.5	316 SS
F-45376(*)-8	1/2" M/NPT	.2 to 2	1 to 7.5	316 SS
F-45500(*)-6	3/8" F/NPT	.5 to 5	2 to 20	316 SS
F-45500(*)-8	1/2" M/NPT	.5 to 5	2 to 20	316 SS
F-45500(*)-12	3/4" M/NPT	.5 to 5	2 to 20	316 SS
F-45750(*)-12	3/4" M/NPT	1 to 10	4 to 40	316 SS

MODEL Variations

*L = In-Line Model is listed
 *LE = Panel Mount Model
 *LA = Adjustable Model

PIPE SIZES

Standard Models: 3/8" F/NPT; 1/2", 3/4" M/NPT

FLOW RATES

0.1 to 10 GPM
 4 to 40 LPM

*The factory does not guarantee their flowmeters for use with liquids other than water. Customers are required to do their own compatibility testing.



Polysulfone Variable Area Flow Meters

F-460 & F-461 SERIES For Ultra Pure & Corrosive Environments



**NO METALS
IN THE
FLUID PATH**

F-460 & F-461 BENEFITS

- Polysulfone meter body with precisely engineered float guide ribs.
- No metal in the fluid path.
- Direct reading permanent scale.
- Ideal for corrosive environments* such as Deionized Water or other applications where an all plastic meter is desirable.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Not recommended for direct sunlight.

F-460 & F-461 SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70°F (21°C)
 Max. Fluid Temperature..... PVDF adapters: 210°F (98°C) @ 0 PSI, PVC adapters: 130°F (54°C) @ 0 PSI
 Full Scale Accuracy..... +/- 2-1/2%
 Meter Body Material..... Polysulfone
 Float Material..... PTFE
 O-ring Seals..... FKM
 Max. Pressure Drop..... 2 psi
 Approx. Shipping Weight... F-460 = 1 lb. (.45 kg), F-461 = 3 lb. (1.4 kg)

F-460 PIPE SIZES

1/2" and 3/4" F/NPT

F-460 FLOW RATES

0.1 to 5.0 U.S. GPM
 0.4 to 20 LPM

F-460 DIMENSIONS

Height: 10" (25.4cm)
 Width: 1-3/4" (4.4cm)

F-461 PIPE SIZES

1" F/NPT

F-461 FLOW RATES

1 to 35 GPM
 4 to 130 LPM

F-461 DIMENSIONS

Height: 15"
 Width: 2-3/4"

F-460 & F-461 ORDERING GUIDELINES

STANDARD F-460 LIQUID MODELS with F/NPT Adapters	MODEL NUMBER	Pipe Size	DUAL SCALE RANGE	
			GPM	LPM
F-46010LX-08(*)	1/2"	0.1 to 1.2	0.4 to 4.4	
F-46010LX-12(*)	3/4"	0.1 to 1.2	0.4 to 4.4	
F-46020LX-08(*)	1/2"	0.2 to 2.0	0.8 to 8.0	
F-46020LX-12(*)	3/4"	0.2 to 2.0	0.8 to 8.0	
F-46030LX-08(*)	1/2"	0.3 to 3.0	1.0 to 11	
F-46030LX-12(*)	3/4"	0.3 to 3.0	1.0 to 11	
F-46050LX-08(*)	1/2"	0.5 to 5.0	2.0 to 20	
F-46050LX-12(*)	3/4"	0.5 to 5.0	2.0 to 20	

STANDARD F-461 LIQUID MODELS with F/NPT Adapters

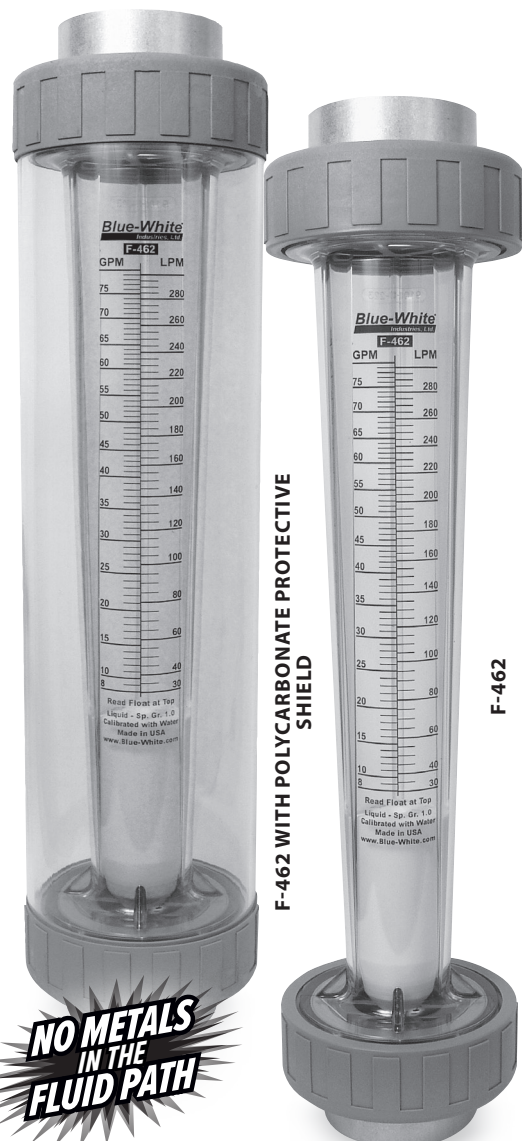
MODEL NUMBER	Pipe Size	DUAL SCALE RANGE	
		GPM	LPM
F-461100LX-16(*)	1"	1 to 10	4 to 40
F-461200LX-16(*)	1"	2 to 20	5 to 75
F-461300LX-16(*)	1"	3 to 35	12 to 130

MODEL Variations

*P = PVC Adapter

*K = PVDF Adapter

PVC Union Nuts = replace "X" with "P"



**NO METALS
IN THE
FLUID PATH**

F-462 WITH POLYCARBONATE PROTECTIVE SHIELD

F-462

F-462 WITH RIB GUIDED FLOAT High Capacity. Top Performance.

F-462 BENEFITS

- Polysulfone meter body with precisely engineered float guide ribs.
- No metal in the fluid path.
- Direct reading permanent scale.
- Ideal for corrosive environments* such as Deionized Water or other applications where an all plastic meter is desirable.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Not recommended for direct sunlight.

F-462 SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70°F (21°C)
 Max. Fluid Temperature..... 200°F (93°C) @ 0 PSI
 Full Scale Accuracy..... +/- 2-1/2%
 Meter Body Material..... Polysulfone
 Float Material..... PTFE
 O-ring Seals..... FKM (Optional EP)
 Max. Pressure Drop..... 2 psi
 Approx. Shipping Weight... 5 lb. (2.27 kg)

F-462 ORDERING GUIDELINES

STANDARD F-462 LIQUID MODELS with 2" F/NPT Adapters	MODEL NUMBER	Pipe Size	DUAL SCALE RANGE		Adapter Material	Float Material
			GPM	LPM		
F-462200LX-32H	2" F/NPT	2 to 20	8 to 80	Polysulfone	PTFE	
F-462500LX-32H	2" F/NPT	5 to 50	20 to 200	Polysulfone	PTFE	
F-462800LX-32H	2" F/NPT	8 to 80	30 to 300	Polysulfone	PTFE	

MODEL Variations

Polycarbonate Shield may be ordered as an accessory.
 PVC Union Nuts = replace "X" with "P"

PIPE SIZES

2" F/NPT, 2" Socket Fusion, 63mm Butt Fusion

FLOW RATES

2 to 80 GPM
 8 to 300 LPM

DIMENSIONS

Height: 18-7/8" (47.9cm)
 Width: 4-5/8" (11.7cm)

* The factory does not guarantee their flowmeters for use with liquids other than water. Customers are required to do their own compatibility testing.

5

LIQUID MONITORING

Polysulfone Variable Area Flow Meters

F-451 SERIES **Quality. Versatility.**

F-451 BENEFITS

- A Heat and Chemical resistant meter body of injection molded Polysulfone.*
- Floats are #316 S.S. or PTFE, depending on calibration.
- Permanent, easy to read screen printed scales.
- 1" F/NPT Polysulfone adapters, or 1-1/2" PVC adapters (depending on model ordered).
- FKM O-ring Seals.
- Accuracy \pm 3%.
- May be ordered with 90° elbow adapters.
- Polycarbonate Protective Shield may be ordered as an accessory.
- Not recommended for direct sunlight applications.
- Models available for use with liquids.

F-451 ORDERING GUIDELINES

MODEL NUMBER	CALIBRATION		ADAPTER SIZE
	GPM	LPM	
F-451006LHN	0.5 to 6	to 22	1" F/NPT
F-451001LHN	1.0 to 10	4 to 40	1" F/NPT
F-451002LHN	2.0 to 20	7.5 to 75	1" F/NPT
F-451003LHN	3.0 to 30	12 to 115	1" F/NPT
F-451004LHN	4.0 to 40	15 to 155	1" F/NPT

1-1/2" F/NPT PVC Adapters

MODEL NUMBER	CALIBRATION		ADAPTER SIZE
	GPM	LPM	
F-451006LHN-24	0.5 to 6	to 22	1-1/2" F/NPT
F-451001LHN-24	1.0 to 10	4 to 40	1-1/2" F/NPT
F-451002LHN-24	2.0 to 20	7.5 to 75	1-1/2" F/NPT
F-451003LHN-24	3.0 to 30	12 to 115	1-1/2" F/NPT
F-451004LHN-24	4.0 to 40	15 to 155	1-1/2" F/NPT

PIPE SIZES

1", 1-1/2" F/NPT

FLOW RATES

0.5 to 40 GPM
2 to 155 LPM

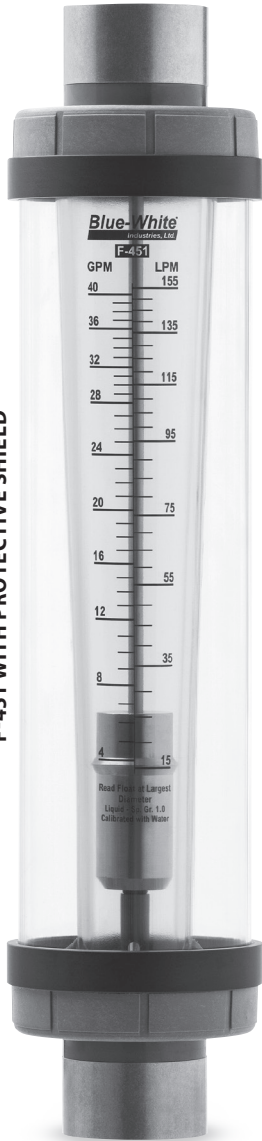
DIMENSIONS

Height: 14-1/2" (36.8cm)
Width: 3-5/16" (8.4cm)

F-451 SPECIFICATIONS

Max. Working Pressure..... 150 psi (10 Bar) @ 70°F (21°C)
Max. Fluid Temperature Polysulfone adapters: 212°F (100°C) @ 0 PSI.
PVC adapters: 130°F (54°C) @ 0 PSI
Full Scale Accuracy..... \pm 3%
Meter Body Material Polysulfone
Adapter Material 1" Polysulfone & 1 1/2" PVC
O-Rings FKM
Float Material #316 SS, or PTFE, depending on calibration.
Max. Pressure Drop 2 psi
Approx. Shipping Weight... 3 lbs. (1.36 kg.)

F-451 WITH PROTECTIVE SHIELD



F-452N SERIES **High Capacity.**

F-452N BENEFITS

- One piece Polysulfone meter body resists high temperatures and pressures.*
- 316 Stainless Steel rod guided float.
- Direct reading permanent scale.
- Adapters and unions engineered for maximum protection from misalignment and vibration.
- Polycarbonate Protective Shield may be ordered as an accessory.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Not recommended for direct sunlight.
- Models available for use with liquids.

F-452N SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70°F (21°C)
Max. Fluid Temperature 212°F (100°C) @ 0 PSI
Full Scale Accuracy..... \pm 2%
Meter Body Material Polysulfone
Union Nuts..... Glass fiber reinforced Nylon
Guide Rod Material..... 316 Stainless Steel
O-Ring Material..... FKM
Max. Pressure Drop..... 2 psi
Approx. Shipping Weight... 5 lb. (2.27 kg)

PIPE SIZES

2" F/NPT

FLOW RATES

2 to 175 GPM
8 to 675 LPM

DIMENSIONS

Height: 18-7/8" (47.9cm)
Width: 4-5/8" (11.7cm)

F-452 ORDERING GUIDELINES

MODEL NUMBER	DUAL SCALE RANGE		ADAPTER SIZE
	GPM	LPM	
F-452020LHN	2 to 20	8 to 78	2" F/NPT
F-452060LHN	6 to 60	30 to 230	2" F/NPT
F-452080LHN	8 to 80	40 to 300	2" F/NPT
F-452100LHN	6 to 100	20 to 380	2" F/NPT
F-452130LHN	20 to 130	80 to 500	2" F/NPT
F-452175LHN	25 to 175	100 to 675	2" F/NPT

5

LIQUID MONITORING

F-452N



* The factory does not guarantee their flowmeters for use with liquids other than water. Customers are required to do their own compatibility testing. Request Kit #70000-718, at no charge.



Paddlewheel Area Flow Meters

BW DIGI-METER F-1000 Paddlewheel Flow Meter

BLUE-WHITE'S CAREFULLY ENGINEERED BW DIGI-METER® F-1000 SERIES INCLUDE PREMIER FEATURES AND PROVIDE OUTSTANDING PERFORMANCE.

Three versions of the BW DIGI-METER® F-1000 are offered. The F-1000RB Unit is a rate meter only; the F-1000TB Unit is a flow totalizer; and the F-1000RT Unit is both a Rate Meter and Flow Totalizer. BW DIGI-METERS are available with a number of configuration and mounting style options. If you don't see the unit that meets your requirements here, please contact our courteous and knowledgeable staff for assistance.

F-1000 BENEFITS

- Easy to read six digit LCD, up to four decimal positions.
- Tamper proof.
- Battery operated (2 AAA batteries included).
- Three model variations: **RB** = RATE ONLY; **TB** = TOTAL ONLY; **RT** = RATE & TOTALIZER
- Total reset function can be disabled.
- Display update time: Rate 1.5 sec., Total 0.5 sec.
- Factory calibrated - nothing to program.
- Custom calibration units available. Contact the factory.
- Weather resistant ABS enclosure. NEMA 4X
- Calibration Units: GPM, LPM, M3/H, oz/min, GPH, LPH.
- LCD is not recommended for direct sunlight applications.

BW DIGI-METER® F-1000 WITH SADDLE MOUNT PIPE SIZES

1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12"



F-1000 SPECIFICATIONS

WITH SADDLE MOUNT BODY

Max. Working Pressure.....300 psig (20 bar) @ 70° F (21° C)
 Max. Fluid Temperature200° F (93° C) @ 0 PSI (all PVDF saddle fittings)
 140° F (60° C) @ 0 PSI (all PVC saddle fittings)
 Note: Temperature rating of F-1000 only. Actual pipe rating may vary.
 Full scale accuracy+/- 2%
 Saddle material.....PVDF (1-1/2", 2", 3", 50mm, 63mm, 90mm sizes)
PVC (all other sizes)
 Sensor/Paddle/Axle material ... PVDF
 O-ring seals.....FKM
 Max. pressure drop0 psi (no significant drop)
 Approximate shipping wt.2 lb. (.91 kg)

BW DIGI-METER® F-1000 WITH SOLVENT TEE BODY PIPE SIZES

1", 1-1/2", 2", 3"



WITH SOLVENT WELD OR STAINLESS STEEL TEE BODY

Max. Working Pressure
 316 SS Tee fittings300 psig (20 bar) @ 70° F (21° C)
 PVC Tee fittings200 psig (13.8 bar) @ 70° F (21° C)
 Max. Fluid Temperature
 316 SS Tee fittings200° F (93° C) @ 0 PSI
 PVC Tee fittings140° F (60° C) @ 0 PSI
 Full scale accuracy+/- 2%
 Tee material options316 Stainless Steel, PVC
 Body, Paddle, Axle material ... PVDF
 O-ring sealsFKM
 Max. pressure drop0 psi (no significant drop)
 Approximate shipping wt.2 lb. (.91 kg)

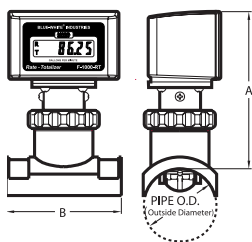
BW DIGI-METER® F-1000 WITH MOLDED IN-LINE BODY PIPE SIZES

1/4", 3/8", 1/2", 3/4", 1", 2" M/NPT



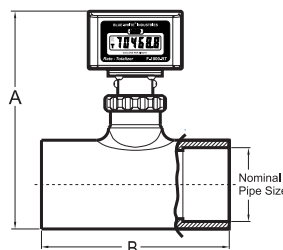
WITH MOLDED IN-LINE BODY

Max. Working Pressure.....300 psig (20 bar) @ 70° F (21° C)
 Max. Fluid Temperature200° F (93° C) @ 0 PSI
 Full scale accuracy+/- 2%
 Meter body materialPolysulfone
 Sensor/Paddle/Axle material ... PVDF
 O-ring seals.....FKM
 Max. pressure drop8 psi (varies per model)
 Approximate shipping wt.2 lb. (.91 kg)



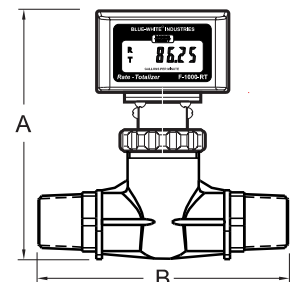
F-1000 with SADDLE MOUNT Body

PIPE SIZE (mm)	A	B
150(050)	4-5/16" (11.0cm)	3-3/16" (8.1cm)
200(063)	4-5/16" (11.0cm)	3-3/16" (8.1cm)
300(090)	4-5/16" (11.0cm)	3-3/16" (8.1cm)
400(110)	4-5/16" (11.0cm)	3-3/16" (8.1cm)
600(160)	4-1/4" (10.8cm)	3-3/16" (8.1cm)
800(200)	4-1/4" (10.8cm)	3-3/16" (8.1cm)
1000(250)	4-1/4" (10.8cm)	4-1/2" (11.4cm)
1200(315)	4-1/4" (10.8cm)	4-1/2" (11.4cm)



F-1000 with SOLVENT TEE Body

PIPE SIZE	A	B
1"	6" (15.2cm)	4" (10.2cm)
1-1/2"	6-5/8" (16.8cm)	4-1/2" (11.4cm)
2"	7-1/8" (18.1cm)	4-3/4" (12.1cm)
3"	8" (20.3cm)	5-1/2" (14.0cm)



F-1000 with MOLDED In-Line Body

PIPE SIZE	A	B
3/8" MPT	5-3/8" (13.7cm)	4-3/4" (12.1cm)
1/2" MPT	5-3/8" (13.7cm)	5-1/8" (13.0cm)
3/4" MPT	5-3/8" (13.7cm)	5-1/4" (13.3cm)
1" MPT	5-3/8" (13.7cm)	5-5/8" (14.3cm)
1-1/2" MPT	6-1/8" (15.6cm)	6-1/2" (16.5cm)
2" MPT	6-3/8" (16.2cm)	6-3/4" (17.1cm)

5

LIQUID MONITORING

BW DIGIMETER F-2000 Paddlewheel Flowmeter

THE THOUGHTFULLY ENGINEERED BW DIGI-METER® F-2000 COMBINE INNOVATIVE FEATURES AND BENEFITS, AND THE FINEST MATERIALS OF CONSTRUCTION TO PROVIDE AN ACCURATE AND VERSATILE DIGITAL FLOWMETER.

FOUR MODEL VARIATIONS

- RT** = Rate and Totalizer. Transformer or battery operated.
- AO** = 4-20mA, 0-10 VDC analog output, flow rate & totalizer. Transformer operated.
- PC** = Batch processing, flow rate alarm, proportional chemical metering, flow rate and totalizer. Transformer operated.
- AP** = Analog output, batch processing, flow rate alarm, proportional chemical metering, flow rate and totalizer. Transformer operated.

F-2000 BENEFITS

- Easy to read 8 digit LCD, up to 4 decimal positions.
- Flow rate and Total flow display.
- AC/DC transformer or battery operated (RT models only). 4 AA batteries.
- Factory programmed with calibration certificate.
- Field programmable via front panel touch pad.
- Front panel security lockout.
- Total reset function can be disabled.
- Weather resistant ABS enclosure. NEMA 4X.
- Note: LCD is not recommended for direct sunlight applications.
- Panel mounting option available.
- Custom calibration units available.

BW DIGI-METER® F-2000 PANEL MOUNT



BW DIGIMETER® F-2000 WITH SADDLE MOUNT
PIPE SIZES: 1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12"



BW DIGI-METER® F-2000 WITH SOLVENT TEE BODY
PIPE SIZES: 1", 1-1/2", 2", 3"



BW DIGI-METER® F-2000 WITH MOLDED IN-LINE BODY
PIPE SIZES: 3/8", 1/2", 3/4", 1", 1-1/2", 2"

F-2000 SPECIFICATIONS

WITH SADDLE MOUNT BODY

Max. Working Pressure.....300 psig (20 bar) @ 70°F (21°C)
Max. Fluid Temperature.....200°F (93°C) @ 0 PSI
(all PVDF saddle fittings)
.....140°F (60°C) @ 0 PSI
(all PVC saddle fittings)

Note: Temperatures rating of F-2000 only. Actual pipe rating may vary.

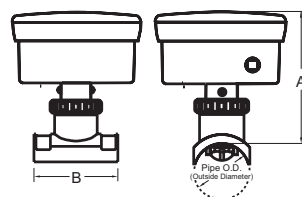
Full Scale Accuracy.....±1-1%
Sensor/Paddle/Axle Material...PVDF
O-ring Seals.....FKM
Max. Pressure Drop.....0 psi (no significant pressure drop)
Approx. Shipping Weight.....4lb. (1.8 kg)

WITH SOLVENT WELD OR STAINLESS STEEL TEE BODY

Max. Working Pressure
316 SS Tee fittings.....300 psig (20 bar) @ 70°F (21°C)
PVC Tee fittings.....200 psig (13.8 bar) @ 70°F (21°C)
Max. Fluid Temperature
316 SS Tee fittings.....200°F (93°C) @ 0 PSI
PVC Tee fittings.....140°F (60°C) @ 0 PSI
Full scale accuracy.....±1-1%
Tee material options.....316 Stainless Steel, PVC
Body, Paddle, Axle material.....PVDF
O-ring seals.....FKM (Optional EP)
Max. pressure drop.....0 psi (no significant drop)
Approximate shipping wt.....4 lb. (.91 kg)

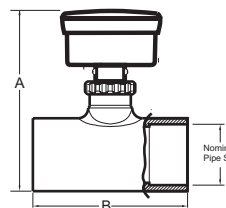
WITH MOLDED IN-LINE BODY

Max. Working Pressure.....300 psig (20 bar) @ 70°F (21°C)
Max. Fluid Temperature.....200°F (93°C) @ 0 PSI
Full Scale Accuracy.....±1-1%
Sensor/Paddle/Axle Material...PVDF
O-ring Seals.....FKM
Max. Pressure Drop.....8 psi (varies per model)
Approx. Shipping Weight.....4lb. (1.8 kg)



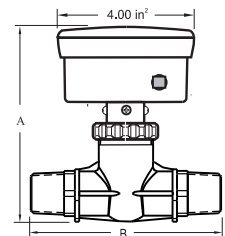
F-2000 with SADDLE MOUNT Body

PIPE SIZE (mm)	A	B
150(050)	4-1/2"(11.4cm)	3-3/16"(8.1cm)
200(063)	4-1/2"(11.4cm)	3-3/16"(8.1cm)
300(090)	4-1/2"(11.4cm)	3-3/16"(8.1cm)
400(110)	4-1/2"(11.4cm)	3-3/16"(8.1cm)
600(160)	4-3/8"(11.1cm)	3-3/16"(8.1cm)
800(200)	4-3/8"(11.1cm)	3-3/16"(8.1cm)
1000(250)	4-3/8"(11.1cm)	4-1/2"(11.4cm)
1200(315)	4-1/2"(11.4cm)	4-1/2"(11.4cm)



F-2000 with SOLVENT TEE Body

PIPE SIZE	A	B
1"	6"(15.2cm)	4"(10.2cm)
1-1/2"	6-5/8"(16.8cm)	4-1/2"(11.4cm)
2"	7-1/8"(18.1cm)	4-3/4"(12.1cm)



F-2000 with MOLDED In-Line Body

PIPE SIZE	A	B
3/8" MPT	5-7/8"(14.9cm)	4-3/4"(12.1cm)
1/2" MPT	5-7/8"(14.9cm)	5-1/8"(13.0cm)
3/4" MPT	6"(15.2cm)	5-1/4"(13.3cm)
1" MPT	6"(15.2cm)	5-5/8"(14.3cm)
1-1/2" MPT	6-1/2"(16.5cm)	7"(17.8cm)
2" MPT	6-3/4"(17.1cm)	7"(17.8cm)

5 LIQUID MONITORING



Paddlewheel Area Flow Meters

BW DIGIMETER F-2000 Flow Monitoring System

BW DIGI-METER® F-2000 SERIES ELECTRONIC INSERTION STYLE FLOWMETERS, ARE WELL SUITED FOR MONITORING FLOW IN MUNICIPAL WATER AND WASTEWATER APPLICATIONS.

The clamp on saddle fitting and insertion sensor is quickly installed on IPS (ASTM-D-1785) pipe sizes from 1-1/2" through 12" and metric (DIN 8062) pipe sizes from 50mm through 315mm. The electronic display and communication enclosure can be mounted directly to the sensor, or remotely mounted to a pipe or panel.

Standard F-2000 models display flow rate and accumulated total flow, and include an NPN open collector output for communication with data loggers, SCADA systems, and other external devices.



BW DIGIMETER® F-2000 FLOW MONITORING SYSTEM

BW DIGIMETER F-2000 with Digital Hall Effect Output Signal

F-2000 BENEFITS

- TTL/CMOS compatible, current sinking output signal.
- Optional AC sine wave output sensor available.
- One mile signal range without boosters.
- NEMA 4X rated.

F-2000 SPECIFICATIONS

Max. Working Pressure..... 300 psig (20 bar) @ 70°F (21°C)
 Max. Fluid Temperature 200°F (93°C) @ 0 PSI
 (Polypro and PVDF saddles)
 140°F (60°C) @ 0 PSI
 (PVC saddles and TEE fittings)

Note: Temperatures rating of F-2000 only.

Actual pipe rating may vary.

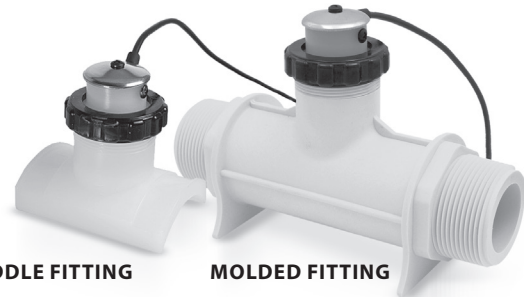
Power Requirements FH: 6-24 VDC, AC/DC transformer sold separately.
 FC: None

Full Scale Accuracy..... +/- 1%

Sensor/Paddle/Axle Material PVDF

O-ring Seals FKM

Approx. Shipping Weight... 2 lb. (0.9 kg)



SADDLE FITTING

MOLDED FITTING

BW DIGIMETER F-1000 & F-2000 Installation Options

BLUE-WHITE F-1000 AND F-2000 FLOWMETER model numbers include a pipe fitting as part of the complete model number. Although it is possible to purchase the pipe fittings separately, it is not necessary.



MOLDED IN-LINE

- One piece injection molded construction.
- Male pipe thread In-line installation.
- Polypropylene fittings for standard applications.

MOLDED IN-LINE SPECIFICATIONS

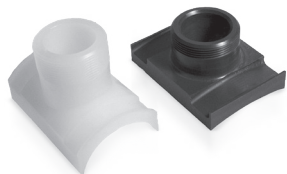
Max. PSI 300 psig (20 bar) @ 70° F (21° C)

Max. Temp 200° F (93° C) @ 0 PSI

Note: Temperature rating of pipe fitting only. Actual pipe rating may vary.

PIPE SIZES:

3/8", 1/2", 3/4", 1", 1-1/2", 2" M/NPT



SADDLE FEATURES

- 1-1/2" thru 3" (50mm thru 90mm) injection molded PVDF.
- 4" thru 12" (110mm thru 315mm) machined from solid PVC sheet stock.
- Installs on existing pipe – no other fittings are required.
- No added pressure drop to system.
- Ships with metal clamps to secure fitting to pipe.

SADDLE SPECIFICATIONS

Max. PSI 300 psig (20 bar) @ 70° F (21° C)

Max. Temp 200° F (93° C) @ 0 PSI (PVDF)

140° F (60° C) @ 0 PSI (PVC)

Note: Temperature rating of pipe fitting only. Actual pipe rating may vary.

I.P.S. PIPE SIZES:

1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12"

METRIC PIPE SIZES:

50, 63, 90, 110, 160, 200, 250, 315MM



TEE FEATURES

- Easy to install.
- No added pressure drop to system.

TEE SPECIFICATIONS

Max. PSI PVC TEE..... 200 psig (13.8 bar) @ 70° F (21° C)

Max. Temp PVC TEE .. 140° F (60° C) @ 0 PSI

PIPE SIZES: 1", 1-1/2", 2", 3"

5

LIQUID MONITORING

Signet Multi-Parameter Instruments

+GF+ Signet 9900



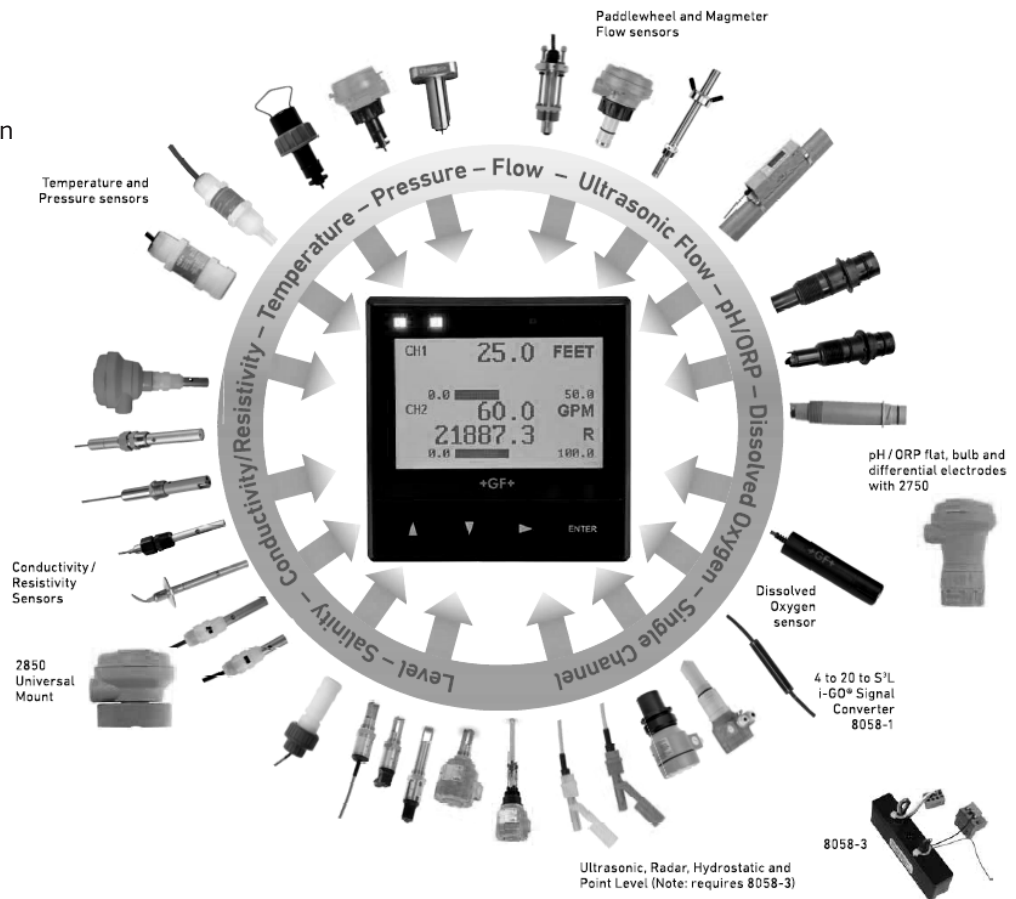
- Multi-Parameter input selection
- Large auto-sensing backlit display
- "Dial-type" digital bar graph
- Optional field upgradable relays
- Selectable error mode for current outputs, 3.6 mA or 22 mA
- Warning LED indicator
- Custom 13-character label capabilities for the channel type
- CE, UL, RoHS, China RoHS

+GF+ Signet 9950

The 9950 SmartPro Transmitter takes a simple approach to modularity. Choose from DC powered only or AC/DC powered system. The 9950 is ready to run out of the box with its standard two 4 to 20 mA passive outputs. Add optional relay modules and binary inputs, and transform your SmartPro in to a two channel controller. With onboard clock/calendar, derived functions, and advanced relay operation, you have seemingly countless configurations to meet your process control needs.

Applications:

- Water Treatment
- Wastewater Treatment
- Reverse Osmosis
- Deionization
- Media Filtration
- Chemical Manufacturing/Addition
- Metal Finishing
- Fume Scrubber
- Odor Control
- Cooling Tower
- Chemical Dosing/ Injection
- Aquatic Life Support
- Pools & Fountains
- Rinse Tanks
- Chemical Neutralization



5
LIQUID MONITORING



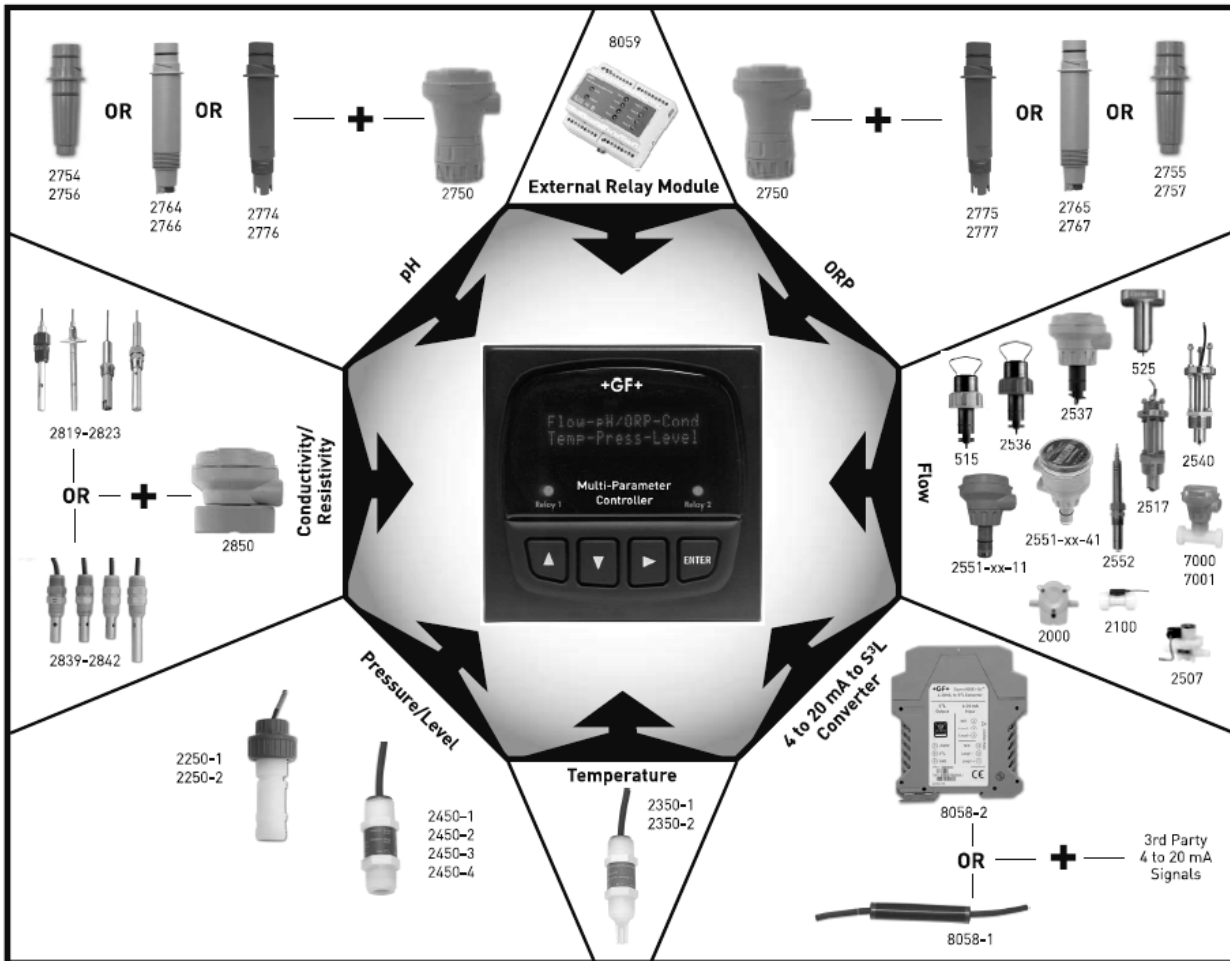
Signet Multi-Parameter Instruments

+GF+ Signet 8900 Multi-parameter/Multi-channel controller



- AC or DC power option
- Up to 6 sensor inputs (2 frequency inputs max)
- Up to 4 current outputs
- Up to 8 relays
- Use with all digital (S3L) sensors
- CE, UL, RoHS, China RoHS

Below is an overview of the Signet sensor offering that is compatible with the 8900 Multi-Parameter Controller.



5

LIQUID MONITORING

Icon Process P14 Series pH Sensors



The ProCon® P14 Series pH Sensors (featuring SimplCal®) include advanced electronic circuitry that stores pH data for automatic sensor recognition and trouble-free calibration when connected to the ProCon® Controller. P14 Series pH sensors incorporate Nexus®, a solid reference material that eliminates poisoning or leaching of the reference electrolyte that occurs in standard sensors. Nexus® also eliminates the need for ongoing maintenance or cleaning requirement due to fouling or film build up removal which occurs with traditional pH sensors. They are available in multiple configurations including flying lead and blind/local display j-box for maximum versatility. The universal NPT^{3/4}" connections are designed for mounting on pipe, wall, or tank. J-box versions are equipped standard with quick grip wire connection making installation easy — no tools required. Connect with any ProCon® controller for seamlessly easy calibration. Direct sensor to controller — no preamp required. Manufactured by Icon Process Controls.

Features:

- 4-20mA Output
- Temperature Compensated
- No Preamp Required
- High Accuracy
- Quick Response Time
- ^{3/4}" NPT Connection
- PP or PPS Body Materials
- RS 485 Modbus Communication
- Double junction reference extends sensor life and protects against poisoning ions
- Durable crack resistant low ionic glass enhances performance and increased reliability
- Operates in sub-zero temperatures down to 14°F (-10°C)
- Advanced electronic diagnostics provides excellent repeatability and reliability

MODEL	PI4E	PI4G	PI4C	PI4H	PI4F	PI4S	PI4D	PI4P
APPLICABLE ENVIRONMENT	Chemical Process		Complex Environment	HF Acid < 1000ppm	HF Acid > 1000ppm	Seawater	Desulfurization Environment	Pure water/ low ion concentration
MEASURING RANGE	0 – 14pH			0 – 12pH		0 – 14pH	0 – 12pH	
ZERO POTENTIAL	7.00 ± 0.25							
TEMPERATURE RANGE	0 – 90°C							
PRESSURE	0 – 90 Psi							
TEMPERATURE SENSOR	Pt1000 (std)							
SHELL MATERIAL	PP							
MEMBRANE RESISTANCE	<600M		<500M	<600M			<800M	
REFERENCE SYSTEM	Ag / AgCl / KCl		NEXUS® Ag / AgCl / KCl					
LIQUID JUNCTION	Porous Ceramics	PTFE Teflon®	NEXUS®					
ELECTROLYTE SOLUTION	3.3M KCl Gel		3.3M KCl					
DOUBLE SALT BRIDGE SYSTEM	Yes							
CONNECTION THREAD	NPT ^{3/4} "							
CABLE LENGTH	10m							
CABLE CONNECTION	J-Box Flying Lead							
OUTPUT	4-20mA 4-20mA + RS485							
PH ELECTRODE	Blue Glass Flat Bulb			Glass Bulb Flat	Antimony	Blue Glass Flat Bulb	Glass Bulb Flat	Blue Glass

Icon Process ORB Sensors



The ProCon® ORP Sensors (featuring SimplCal®) include advanced electronic circuitry that stores ORP data for automatic sensor recognition and trouble-free calibration when connected to the ProCon® Controller. ORP sensors incorporate Nexus®, a solid reference material that eliminates poisoning or leaching of the reference electrolyte that occurs in standard sensors. Nexus® also eliminates the need for ongoing maintenance or cleaning requirement due to fouling or film build up removal which occurs with traditional ORP sensors. They are available in multiple configurations including flying lead and blind/local display j-box for maximum versatility. The universal NPT^{3/4}" connections are designed for mounting on pipe, wall, or tank. J-box versions are equipped standard with quick grip wire connection making installation easy — no tools required. Connect with any ProCon® controller for seamlessly easy calibration. Direct sensor to controller —no preamp required. Manufactured by Icon Process Controls

Features

- Ag / AgCl / KCl Nexus® Reference System
- Nexus® (Replaces Liquid Junction)
- Factory Calibrated and Programmed
- SimplCal® Calibration
- Easy Installation
- Integral Mount Systems
- Temperature Compensation
- J-box or Flying Lead
- 4 – 20mA + RS485 Output
- Connect with any ProCon® Controller
- Quick Grip Wire Connection
- Compact Design

Applications

- Water Quality
- Water Treatment
- Neutralization Systems
- Effluent Monitoring
- Sanitization Systems
- Pool & Spa Control
- Aquatic Animal Life Support Systems
- Process Control
- Cooling Towers

MODEL	R7G	R7C
APPLICABLE ENVIRONMENT	General Environment	Complex Environment
MEASURING RANGE	±1000mV	
ZERO POTENTIAL	-	
TEMPERATURE RANGE	0 – 90°C	
PRESSURE	0 – 90 Psi	
TEMPERATURE SENSOR	None (customizable)	
SHELL MATERIAL	PP	
MEMBRANE RESISTANCE	-	
REFERENCE SYSTEM	NEXUS®	
LIQUID JUNCTION	Porous Ceramics	NEXUS®
ELECTROLYTE SOLUTION	3.3M KCl Gel	
DOUBLE SALT BRIDGE SYSTEM	Yes	
CONNECTION THREAD	NPT 3/4"	
CABLE LENGTH	10m	
CABLE CONNECTION	J-Box Flying Lead	
OUTPUT	4-20mA 4-20mA + RS485	
PH ELECTRODE	Platinum	Gold

Icon Process pH/ORP Controllers

The ProCon® D series is an extremely robust corrosion resistant pH/ORP controller. The modular design is both easy to install and operate providing first measurement values in under one minute. It is packed with all the extra features included. No need to pay extra for relay, 4-20mA or RS485 outputs. The SimpliCal® feature makes calibrating your sensor easier and quicker than ever before. The cost-saving quick and simple setup is done through our user-friendly step-by step on-screen menu. Active display of red alarm LED provides notification of out of bounds sensor readings and indication for sensor cleaning/recalibration or replacement.

D300 Series



D400 Series



D500 Series



D700 Series



MODEL	D300	D400	D500	D700
RANGE	pH: -2-16, ORP: ±2000mV			
RESOLUTION	pH: 0.001, ORP 1mV			
ERROR OF INDICATION	pH: ±0.01, ORP: ±1mV			
STABILITY	pH: ≤ 0.01pH/24h, ORP: ≤ 1mV/24h			
TEMPERATURE	0 – 150.0°C (Electrode Specific)			
TEMPERATURE RESOLUTION	0.1°C			
TEMPERATURE	±0.3°C			
TEMPERATURE COMPENSATION RANGE	0 – 150°C			
TEMPERATURE COMPENSATION	Automatic or Manual			
OUTPUT CURRENT	Two (2) x 4 – 20mA Outputs			
COMMUNICATION	RS485 Modbus			
DATA RECORDING	-		Data Recording/Trend Chart Display	
RELAY CONTROL CONTACT	Two (2) Relays: 3A Outputs		Three (3) Relays: 5A Outputs	
OPTIONAL POWER SUPPLY	85 – 265VAC or 9 – 36VDC			
WORK ENVIRONMENT	Avoid magnetic field interference			
ENVIRONMENT TEMPERATURE	14 – 140°F -10 – 60°C			
RELATIVE HUMIDITY	≤ 90%			
PROTECTION GRADE	IP65			NEMA 4X, IP66
MOUNTING HOLE SIZE	92.5 × 92.5mm		138 × 138mm	235 × 185 × 120mm
INSTALLATION	Panel Wall Pipe Mount			Wall Mount

Conductivity Sensors

Icon Process Conductivity Sensors



MODEL	C250	C350	C450	C550
MEASURING RANGE	0 - 2 μ S 0 - 10 μ S	0 - 20 μ S 0 - 200 μ S 0 - 2,000 μ S	0 - 100 μ S 0 - 1,000 μ S 0 - 10,000 μ S 0 - 200,000 μ S	0 - 10,000 μ S/cm
MEASUREMENT METHOD	Bipolar			
ELECTRODE CONSTANT	K = 0.01		K = 0.01 0.1 1.0 10	K = 1.0
MATERIAL	Titanium Alloy	316L Stainless Steel	Titanium Alloy	Graphite + PMMA
TEMPERATURE	32 - 176°F	32 - 266°F	14 - 176°F	
PRESSURE	0 - 150Ps	0 - 80Psi	0 - 150Psi	0 - 100Psi
TEMPERATURE SENSOR	Pt1000 (std)			
CONNECTION	NPT 3/4"	Sanitary Tri-Clamp	NPT 3/4"	
STANDARD CABLE LENGTH	5m			
CABLE CONNECTION	J-Box Flying Lead	Flying Lead	J-Box Flying Lead	



MODEL	C554	C650	C750	C850	C950
MEASURING RANGE	0-500,000 μ S/cm	0 - 100 μ S 0 - 1,000 μ S 0 - 10,000 μ S 0 - 200,000 μ S	0 - 2,000mS	0 - 500,000 μ S/cm	0 - 100 μ S 0 - 1,000 μ S 0 - 10,000 μ S 0 - 200,000 μ S
MEASUREMENT METHOD	Quadrupole	Bipolar			
ELECTRODE CONSTANT	K = 0.4	K = 0.01 0.1 1.0 10	Toroidal	K = 0.4	K = 0.01 0.1 1.0 10
MATERIAL		Titanium Alloy	PFA Teflon® PP	Graphite + PMMA	Stainless Steel
TEMPERATURE		32 - 176°F	14 - 266°F	14 - 176°F	14 - 250°F
PRESSURE		0 - 90Psi	0 - 150Psi		
TEMPERATURE SENSOR	NPT 3/4"				
CONNECTION					
STANDARD CABLE LENGTH	5m				
CABLE CONNECTION	J-Box Flying Lead		Flying Lead	J-Box Flying Lead	Flying Lead

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LIQUID MONITORING

Conductivity Controllers

Icon Process Conductivity Controllers

C300 Series



C400 Series



C500 Series



C700 Series



U900 Series



MODEL	C300	C400	C500	C700	U900
RANGE	0 – 500ms/cm				
RESOLUTION	0.01µS/cm; 0.01mS/cm				
ERROR OF INDICATION	±0.5%F.S				
STABILITY	±0.2%F.S/24h				
TEMPERATURE	0 – 150.0°C (Electrode Specific)				
TEMPERATURE RESOLUTION	0.1°C				
TEMPERATURE	±0.3°C				
TEMPERATURE COMPENSATION RANGE	0 – 150°C				
TEMPERATURE COMPENSATION	Automatic or Manual				
OUTPUT CURRENT	Two (2) x 4 – 20mA Outputs				
COMMUNICATION	RS485 Modbus				
DATA RECORDING	-		Data Recording/Trend Chart Display		
RELAY CONTROL CONTACT	Two (2) Relays: 3A Outputs		Three (3) Relays: 5A Outputs		
OPTIONAL POWER SUPPLY	85 – 265VAC or 9 – 36VDC				
WORK ENVIRONMENT	Avoid magnetic field interference				
ENVIRONMENT TEMPERATURE	14 – 140°F -10 – 60°C				
RELATIVE HUMIDITY	≤ 90%				
PROTECTION GRADE	IP65			NEMA 4X, IP66	
MOUNTING HOLE SIZE	92.5 × 92.5mm		138 × 138mm	235 × 185 × 120mm	
INSTALLATION	Panel Wall Pipe Mount			Wall Mount	



In-Line Paddle Wheel Flow Meter

Icon Process In-Line Paddle Wheel Flow Meter TK Series

- Blind | Pulse | 4-20 | 0-5V
- Battery Operated
- Flow + Pulse + Relay
- Flow + Total | Pulse + RS485*
- Flow + Total | Pulse + 4-20mA



TKW

- Pulse Output
- 4-20mA
- 0-5V

TKP

- Flow & Total
- Pulse Output
- RS485 Modbus*



TKB

- Battery Powered
- Flow & Total
- High | Low Visual Alarms



TKS

- Flow Rate
- Pulse Output
- IA Programmable Relay



TKM

- Flow & Total
- 4-20mA
- Pulse Output

TK3 Series

- 316 SS Body + Rotor Housing
- Zirconium Ceramic Pin & Bushings
- ETFE Tefzel® Rotor
- Industry's Most Accurate 0.5%



TK3B

- Battery Operated
- Rate & Total



TK3S

- Flow Rate
- Pulse & Relay Output



TK3W

- Pulse Output
- 4-20mA + Pulse
- 0-5VDC



TK3P

- Rate & Total
- Pulse Output
- RS485* Modbus



TK3M

- Rate & Total
- Pulse Output
- 4-20mA

5

LIQUID MONITORING

Insertion Paddle Wheel Flow Meter

TCB Series



The TCB Series digital paddle wheel flow meter has been designed for industrial applications. The TCB series paddle wheel flow meter has been engineered to provide long-term accurate flow measurement. The plastic in-line flow sensor is equipped with a bright LCD display showing both Flow Rate & Flow Total. The paddle wheel liquid flow sensor provides optional frequency output signals. The re-engineered low-drag, fluid-dynamic design of the paddle wheel allows it to stand alone as one of the industry's most accurate flow meter.

- Battery Operated with Pulse Output
- Bright LCD Digital Display
- Flow Rate + Flow Total
- Local Display : Blind : Pulse Output
- True Union Design 1/2 - 3"

Icon Process Insertion Paddle Wheel Flow Meter

TI Series



TIW

- Pulse Output
- Quick Connect
- Flying Lead

TIR

- Pulse Output
- 4-20mA
- LED Display



4 Year Battery



7.5 Year Battery



DIN Quick Disconnect

TIB-H

- Battery Powered
- Flow & Total
- High | Low Visual Alarms

TIB-V

- Battery Powered
- Flow & Total
- High | Low Visual Alarms

TIP-H

- Flow & Total
- Pulse Output
- RS485 Modbus*

TIM-H

- Flow & Total
- 4-20mA + Pulse
- 0-5V*

TIM-V

- Flow & Total
- 4-20mA + Pulse
- 0-5V*

TIP-V

- Flow & Total
- Pulse Output
- RS485 Modbus*

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LIQUID MONITORING



Insertion Paddle Wheel Flow Meter & Displays/Controllers

T13 Series

316 Stainless Steel



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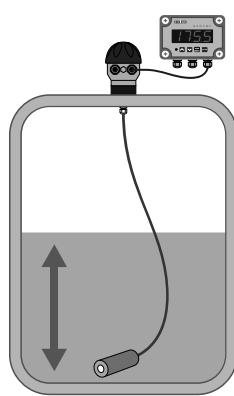
LIQUID MONITORING

Icon Process Tank Level Display & Controller TVL Series

TVL

Liquid Level LED Display

- > All in One Controller
- > NEMA 4X Enclosure + Cord Grips
- > Input : 4-20mA
- > 1 x 5A Relay Output + 4-20mA
2 x 5A Relay Outputs | Latching
- > 24DC Power Supply Output to
Sensor
- > RS-485 Modbus RTU Standard
- > 8 Levels of LED Brightness



Universal Remote Controller

Screwdriver included

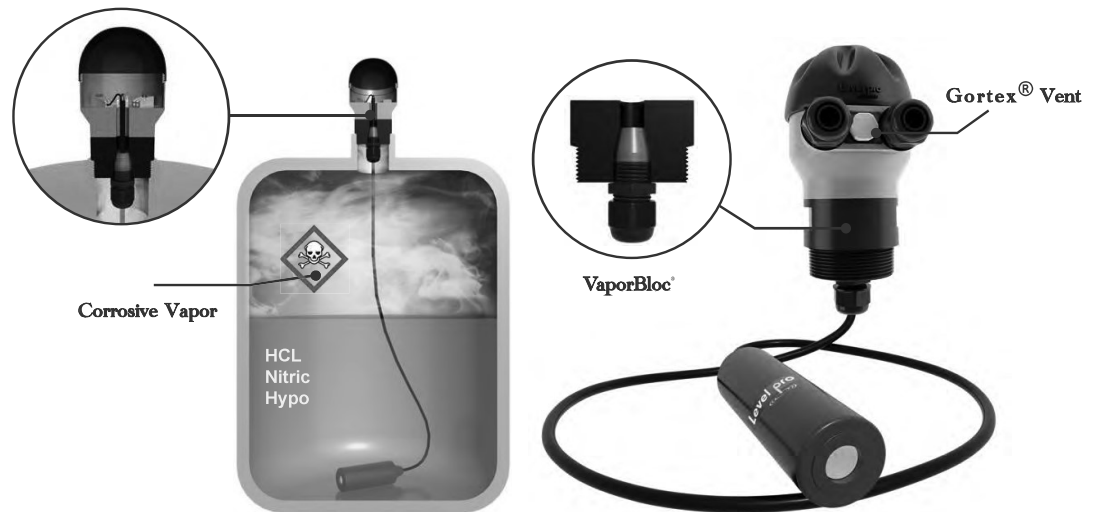
Captive

Icon Process Junction Box

LP100

Junction Box

- All Plastic NEMA 4X Enclosure
- 2" NPT Tank Connection
- Self-Draining | Tethered Lid
- Gortex® Breather
- PP Sensor Cable Grips
- No Tools Required to Wire
- VaporBloc® Sealing System



Icon Process Submersible Level Sensor



100 Series

- PVC | PP | PVDF | 316SS | PTFE Teflon®
- Excellent for Foam | Vapor | Condensate | Turbulence
- Gortex® Atmospheric Reference Tube
- Kalrez® O-Ring Seal
- Integral Weight | No Floating
- High Accuracy $\pm 0.5\%$
- Flush Sensor | Non-Clogging Design
- Teflon® Jacketed Cable
- Ceramic Sensing Diaphragm



200C Series

- PVC | PP | PVDF | PTFE Teflon®
- Excellent for Foam | Vapor | Condensate | Turbulence
- Capacitive Ceramic Sensing Diaphragm
- Gortex® Atmospheric Reference Tube
- Kalrez® O-Ring Seal
- Integral Weight | No Floating
- High Accuracy $\pm 0.35\%$ | $\pm 0.25\%$
- Flush Sensor | Non-Clogging Design
- Teflon® Jacketed Cable



300S Series

- 316SS | Titanium | Hastalloy Body
- Excellent for Foam | Vapor | Condensate | Turbulence
- Viton® O-Ring Seal
- High Accuracy $\pm 0.5\%$
- Non-Clogging Design
- Teflon® Jacketed Cable
- Gortex® Atmospheric Reference Tube

Icon Process Installation Fittings



CPVC

PT | PPT | CT

- PVC | PP | CPVC
- 1/2" - 4"
- True-Union Sch 80 | Flanged | Butt | Soc | NPT



PVC | PP | PVDF



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LIQUID MONITORING



PVC Saddle Clamps

- 2" - 8"
- Wedge Clamping Design



SDR Piping Saddle Clamps

- Designed for SDR Piping Systems
- 2" - 16" | DN50 - DN 400
- PE100 | PP | PVDF | ETFE
- 316 SS Bolts
- FPM Sealing
- Asahi America® Proline® | Super-Proline®
- Chem-Proline® | AIR-Proline®
- GF Piping Systems SYGEF® | PRO SYGEF®



Weld-o-let Insertion Fitting

- Weld Fitting
- PVC | PP | PVDF | PE | 316SS
- 4" - 24"



Contoured Profile Reduces Turbulence

Ultrasonic Flow Meter

Icon Process Ultrasonic Flow Meter UltraFlo® Series



UltraFlo® 1000

- High Purity Flared Tubing Connections
- PFA Teflon® Body
- 4-20mA + Pulse + RS485 Modbus



UltraFlo® 2000

- 2" NPT | G Connections
- PE Body
- 4-20mA + Pulse + RS485

UFM-500 Clamp-On Ultrasonic Flow Meter

The Truflo UFM-500 series Clamp-on Ultrasonic flow meters require no pipe cutting, eliminating flow restrictions, and are extremely easy to install with exceptionally long-life performance. These flow meters are highly repeatable, rugged sensors that offer exceptional value with virtually no maintenance.

Features

- Simple to Install-No Cutting of Pipe
- Large Blue OLED Low Light Display
- High Accuracy | $\pm 2.0\%$ of Full Scale
- Pipe Sizes $\frac{1}{2}$ – 4"
- Flow Rate + Total | Resettable
- Flow Velocity Range | 0.3 – 15 ft/s | 0.1 – 5 m/s
- Works on PVC | PP | PVDF | PE | SS | Copper Pipe

Applications

- Chemical Processes
- Water Usage
- Scrubber | Gas Stacks
- Sodium Hypochlorite
- Visual Flow Indication
- Totalizer – Batching Applications



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LIQUID MONITORING



Pressure Gauge & Gauge Guard

Icon Process OBS Plastic Gauge & Integral Guard

OBS Series

- Available in PVC | PP | PVDF
- Teflon® Diaphragm
- Designed to Act as Visual Pressure Alert
- Pressure Range Markers - Red | Yellow | Green
- Highest Accuracy: ±1.5%
- Factory Pre-Filled
- One-Piece Molded Design | No Assembly
- 2½ - 3" Dial Size
- MNPT | FNPT | Flange



OBS
Single side



2VU
Double Sided Display



BAG
Extra Large 3" Dial



OBS-R
360° Rotator



OBS-LC
LCD Battery Operated



OBS-B
Center Mount



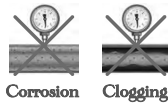
OBS-A
Panel Mount

OBS LE Series

OBS-LE Series

Pressure Transmitter + Switch All Plastic Gauge + Guard Red - Green LED Display

- 4-20mA Output
- 2 Pulse Relay Outputs
- LED Display-Changes from Green to Red when Relays are Active
- Teflon® Diaphragm
- PVC | PP | PVDF



OBS-C
Center Mount



OBS-P
Panel Mount

OBS GO SERIES

Plastic Gauge 316SS NPT Connection

- Available in Corrosion Resistant PP Housing
- Designed to Act as Visual Pressure Alert
- Pressure Range Markers - Red | Yellow | Green
- High Accuracy: ±0.75%
- Factory Pre-Filled
- 2½" Dial Size
- ¼" 316SS NPT | G Connection

316SS ¼" NPT | G Thread



OBS-GO



OBS-DGO
Double Sided



OBS-GO-C
Center Mount



OBS-V
Compound Vacuum
-30 + 30 PSI Range

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LIQUID MONITORING



Section 6: Pumps and Filtration

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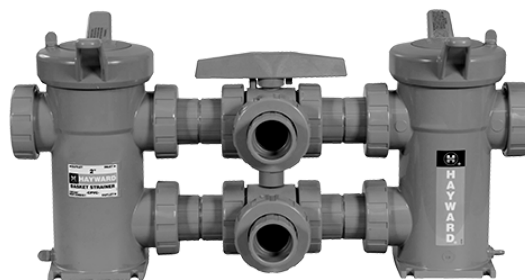
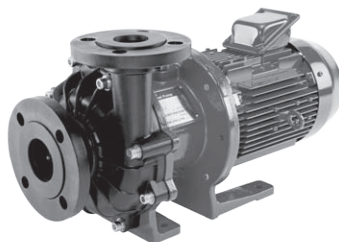
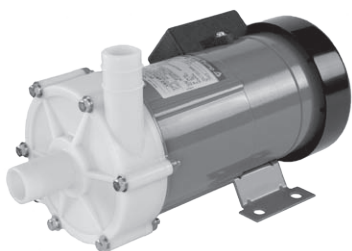
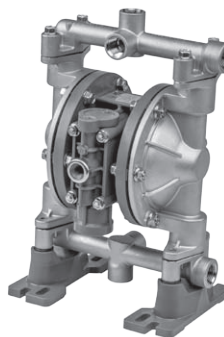


Pumps and Filtration

Fabco Plastics Carries the widest range of Pumps and Filters in Canada, We supply Magnetic Drive Centrifugal, Vertical Centrifugal, Air Operated Double Diaphragm [AODD], Peristaltic & Diaphragm style Metering Pumps.

Our Filters, Basket and Y-Strainers are designed to protect pumps, pipeline systems and components from debris while allowing process media to flow freely. Available in both Simplex and Duplex configurations, our Filters and Strainers can be ordered in PVC, CPVC, GFPP, and clear EASTAR Materials. Baskets and Screens are available in thermoplastics as well as optional 316 SS with a variety of perforations and mesh sizes.

Fabco Plastics carries Canada's widest range of Pumps, Filters and Strainers used in Corrosive and High purity applications for industry.



Finish Thompson - Drum and Tote/IBC Pumps

Finish Thompson offers engineered drum pump solutions based on specific classes of chemicals, container types and flow ranges.



BENEFITS OF POWERED PUMPS:

- Risk reduction - Keep chemicals safely contained during transfers.
- Versatility - Models available for high or low transfer rates, with diverse chemical handling capabilities.
- Portability - Easily transported for various tasks throughout a facility.
- Speed - Able to transfer fluids quickly to improve productivity.
- Durability - Offer longevity and low maintenance with an extended life span, reducing costs.
- Container Size to Pump Length - 30/55 gallon = 40"/102cm; 275 gallon tote/IBC = 48"/122cm

Medium Performance Pumps

EF Series pumps offer an outstanding combination of performance and value and are an ideal upgrade from hand pumps.

PERFORMANCE DATA

Maximum Flow ¹			Maximum Head ¹			Max. Specific Gravity ²	Maximum Viscosity		
Elec. gpm (lpm)	Air gpm (lpm)	12V gpm (lpm)	Elec. ft (m)	Air ft (m)	12V ft (m)		Elec. cP	Air cP	12V cP
17 (64.4)	15 (56.8)	14 (53.0)	20 (6.1)	17 (5.2)	13 (4.0)	1.6	300 cP	300 cP	100 cP

¹All testing performed with water at 68° (20°C). Actual performance can vary by +/- 10%. Actual performance will decrease with increased fluid viscosity and specific gravity.

VISCOSITY DATA

	Electric/Air Motor			12V Motor			
	Viscosity (cP)	100	200	300	Viscosity (cP)	50	100
Max Flow gpm (lpm)	7 (26)	5 (19)	4 (14)		Max Flow gpm (lpm)	7 (26)	3 (11)
Max Head ft (m)	16 (5)	16 (5)	16 (5)		Max Head ft (m)	11 (3)	14 (4)

Note: Viscosity data is based on motors operating at high speed.

Tube Models for Medium Performance Pumps

EFP: Mild acids, chemicals & corrosives, max temperature 150 °F (66 C °)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
EFP-40	DEF003	40" (102 cm)	3/4" hose barb	1.25" Ø polypropylene	FKM	316 S/S
EFP-48	DEF004	48" (122 cm)	3/4" hose barb	1.25" Ø polypropylene	FKM	316 S/S

EFV: Harsh acids, chemicals & corrosives, sodium hypochlorite max temperature 160°F (71°C)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
EFV-40	DEFV003	40" (102 cm)	3/4" hose barb	1.32" Ø pure PVDF/PP	FKM	Alloy 625
EFV-48	DEFV004	48" (122 cm)	3/4" hose barb	1.32" Ø pure PVDF/PP	FKM	Alloy 625

EFS: Strong chemicals, light oils, solvents, & flammables, max temp 212°F (100°C)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
EFS-40	DEFS003	40" (102 cm)	3/4" hose barb	1.25" Ø 316 S/S	FKM	316 S/S
EFS-48	DEFS004	48" (122 cm)	3/4" hose barb	1.25" Ø 316 S/S	FKM	316 S/S

Motors for Medium Performance Pump Tubes

ODP (Open Drip Proof), IP24 Motor

Model	P/N	Electrical Specifications	Max Viscosity	Certification
S1	107341-1	115 volts, 1 phase, 60 Hz, 230 watts, 2.0 FLA	300 cP	

ODP (Open Drip Proof), IP24 Lithium-Ion Battery Motor Kit (motor, charger and wall hanger)

Model	P/N	Electrical Specifications	Max Viscosity	Certification
S6 Kit	108017-3	12 volts, 150 watts	100 cP	N/A

Air Motor

Model	P/N	Air Requirements	Max Viscosity	Certification
S4	107325	40 psi @ 27 cfm	300 cP	CE

Drum Pumps

High Performance Pumps

features like a built-in suction strainer to prevent damage from foreign objects, radial O-ring seal on the discharge spout to prevent leakage when the discharge hose is rotated and rugged industrial construction.

PERFORMANCE DATA - Standard High Flow Impeller Models

Maximum Flow ¹		Maximum Head ¹		Maximum Specific Gravity ²		Maximum Viscosity	
Elec. gpm (lpm)	Air gpm (lpm)	Elec. ft (m)	Air ft (m)	Elec.	Air	Elec.	Air
37 (140)	31 (117)	50 (15)	32 (10)	1.84	2.0	1,000 cP	1,200 cP

VISCOSITY DATA

Viscosity (cP)	Electric/Air Motor			
	100	500	1,000	1,200
Max Flow gpm (lpm)	23 (87)	8 (30)	4 (15)	2 (8)
Max Head ft (m)	48 (15)	44 (13)	44 (13)	37 (11)

Note: Electric motors up to 1,000 cP.
Air Motors up to 1,200 cP.

Tube Models for High Performance Pumps

SFM: Non- or mildly corrosive fluids, max temp 150°F (66°C)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
SFM-40	DSFM003	40" (102 cm)	1" hose barb	1.6" Ø polypropylene	FKM	316 S/S
SFM-48	DSFM005	48" (122 cm)	1" hose barb	1.6" Ø polypropylene	FKM	316 S/S

SFP: Corrosive fluids (caustics, acids, salts), max temp 150°F (66°C)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
SFP-40	DSFP003	40" (102 cm)	1" hose barb	1.6" Ø polypropylene	FKM	Alloy 625
SFP-48	DSFP005	48" (122 cm)	1" hose barb	1.6" Ø polypropylene	FKM	Alloy 625

SFV: Harsh acids, chemicals & corrosives, max temp 175°F (79°C)

Model	P/N	Length	Discharge	Tube	O-ring	Shaft
SFV-40	DSFV003	40" (102 cm)	1" hose barb	1.6" Ø pure PVDF/PP	FKM	Alloy 625
SFV-48	DSFV005	48" (122 cm)	1" hose barb	1.6" Ø pure PVDF/PP	FKM	Alloy 625

SFVV: Extremely corrosive, chromic, nitric and hydrofluoric, max temp 140°F (60°C)


Model	P/N	Length	Discharge	Tube	O-ring	Shaft
SFVV-40	DSFVV003	40" (102 cm)	1" hose barb	1.6" Ø pure PVDF	FKM	Alloy 625
SFVV-48	DSFVV005	48" (122 cm)	1" hose barb	1.6" Ø pure PVDF	FKM	Alloy 625

SFS: Flammables, solvents, mild corrosives, & organic acids, max temp 212°F (100°C)


Model	P/N	Length	Discharge	Tube	O-ring	Shaft
SFS-40	DSFS003	40" (102 cm)	1" hose barb	1.6" Ø 316 S/S	FKM	316 S/S
SFS-48	DSFS005	48" (122 cm)	1" hose barb	1.6" Ø 316 S/S	FKM	316 S/S

Motors for High Performance Pump Tubes


ODP (Open Drip Proof), variable speed, IP24 Motor

Model	P/N	Electrical Specifications	Max Viscosity	Certification
M3V	106655	115 volts, 1 phase, 60 Hz, 650 watts, 5.6 FLA	1,000 cP	

TEFC (Totally Enclosed Fan Cooled), variable speed, IP55 Motor

Model	P/N	Electrical Specifications	Max Viscosity	Certification
M3TV	110018	115 volts, 1 phase, 60 Hz, 1,000 watts, 9.1 FLA	1,000 cP	

Explosionproof, variable speed, IP55 Motor

Model	P/N	Electrical Specifications	Max Viscosity	Certification
M3XV	110024	115 volts, 1 phase, 60 Hz, 1,000 watts, 9.1 FLA	1,000 cP	

Air Motor - variable speed

Model	P/N	Electrical Specifications	Max Viscosity	Certification
M6	A100007	80-100 psi @ 15-32 cfm	1,200 cP	CE

Caution: When pumping flammables use stainless steel tube w/air or explosionproof electric motor & static protection kit.

6 PUMPS & FILTRATION

Drum Pump Kits & Accessories

Pump Kits



Finish Thompson offers engineered drum pump solutions based on specific classes of chemicals, container types and flow ranges. Kits include everything in one convenient carton. Includes drum pump tube, motor, discharge tubing, nozzle, wall bracket and additional accessories depending upon model. 40" (102cm) tube length is for 30/55 gallon drums; 48" (122cm) is for 275 gallon tote/IBC. Many other kit options available, contact Fabco.

Kits for Non-corrosive to Mildly Corrosive Liquids (cleaners, detergents, coolants and more)

Transfer Rate	Kit P/N	Tube Length	Motor Type
Medium, up to 17 gpm (64.4 lpm)	111615	40" (102cm)	2 speed, 115V/60 Hz, ODP
Medium, up to 15 gpm (56.8 lpm)	111620	40" (102cm)	Variable speed air motor
High, up to 40 gpm (151 lpm)	111639	40" (102cm)	Variable speed, 115V/60 Hz, ODP
High, up to 40 gpm (151 lpm)	111640	48" (122cm)	Variable speed, 115V/60 Hz, ODP
High, up to 22 gpm (83 lpm)	111643	40" (102cm)	Variable speed air motor
High, up to 22 gpm (83 lpm)	111644	48" (122cm)	Variable speed air motor


Kits for Corrosive Liquids (Acids, bases, plating solutions and more)

Transfer Rate	Kit P/N	Tube Length	Motor Type
High, up to 40 gpm (151 lpm)	111645	40" (102cm)	Variable speed, 115V/60 Hz, ODP
High, up to 40 gpm (151 lpm)	111646	48" (122cm)	Variable speed, 115V/60 Hz, ODP
High, up to 22 gpm (83 lpm)	111649	40" (102cm)	Variable speed air motor
High, up to 22 gpm (83 lpm)	111650	48" (122cm)	Variable speed air motor

Kits for Water Treatment Chemicals (Aluminum sulfate, HFSA, PAC, sodium hypochlorite and more)

Transfer Rate	Kit P/N	Tube Length	Motor Type
High, up to 37 gpm (140 lpm)	111666	40" (102cm)	Variable speed, 115V/60 Hz, TEFC
High, up to 37 gpm (140 lpm)	111667	48" (122cm)	Variable speed, 115V/60 Hz, TEFC
High, up to 31 gpm (117 lpm)	111670	40" (102cm)	Variable speed air motor
High, up to 31 gpm (117 lpm)	111671	48" (122cm)	Variable speed air motor

Kits for Flammable and Combustible Liquids (Acetone, MEK, lacquer thinner, naphtha and more)

Transfer Rate	Kit P/N	Tube Length	Motor Type
High, up to 40 gpm (151 lpm)	111657	40" (102cm)	Variable speed, Explosion proof, IP55, Class 1, Div. 1, Gr D, T4, 
High, up to 22 gpm (83 lpm)	111661	40" (102cm)	Variable speed air motor

Accessories

A wide variety of accessories are available including various specialized discharge hose to handle virtually any liquid, discharge nozzles for precise control of fluid flow, bung adapters to help keep pump/motor upright in the container, wall hangers for convenient storage when pump is not in use and flow meters to allow precise dispensing. Contact Fabco for more information.

Nozzle



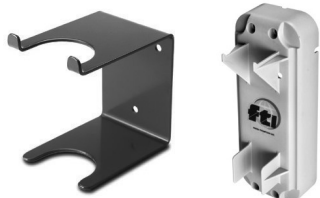
Flow Meter



Air Motor Accessories



Wall Hangers



Bung Adapters



6 PUMPS & FILTRATION

Centrifugal Pumps

Finish Thompson - DB Series Magnetic Drive Pumps

FTI's DB Series magnetic drive pumps are the product of advanced engineering CFD design software and superior magnetic flux technology. Using powerful neodymium magnetic technology, the DB sealless mag drive pumps are an ideal replacement for mechanical sealed pumps in corrosive duty applications.

Features:

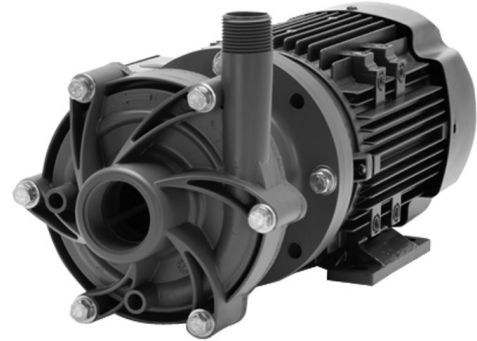
- Engineered for performance with state of the art software
 - Runs dry for hours without damage
 - Best efficiency double of any pump in its class
 - Sealless design improves reliability with no seal maintenance to perform or seal leaks
 - Magnetic drive pump
 - Polypropylene or PVDF corrosion resistant construction
 - Horizontal or vertical (with IEC motor only) installation
 - High specific gravity handling - over 1.8
- *Threaded (NPT or BSP), flanged or union connections

DB Specifications

- Up to 70% operating efficiency
- High working pressure up to 90 psi/6.2 bar
- Maximum viscosity:
 - Up to 150 cP
- Maximum temperature:
 - Polypropylene - 180 ° F (82 ° C)
 - PVDF - 220 ° F (104 ° C)

DB Applications

- Chemical processes
- Wastewater treatment
- OEM equipment supply
- Fume scrubbing
- Paper mills
- Pharmaceutical
- Metal plating/working
- Electronics manufacturing
- DI & high purity water
- Mining
- Printing
- Chillers



Model	Max Flow (GPM)	Max Head (ft)	Suction/Discharge	Impeller Diameter	RPM (60Hz)	HP Requirement*
DB3	15	21	1 x 1/2	2.3	3450	1/8
DB4	18	29	1 x 1/2	2.7	3450	1/4
DB5	19.5	35	1 x 1/2	3	3450	1/4
DB5.5	30	31	1 x 3/4	3	3450	1/2
DB6	31-40	21-32	1 x 1	2.5-3	3450	1/4-1/3
DB6H	31-42	31-54	1 x 1	3.12-3.88	3450	1/4-1/2
DB7	49-70	24-34	1-1/2 x 1-1/2	2.75-3.18	3450	1/4-1/2
DB8	42-61	25-46	1-1/2 x 1	2.88-3.63	3450	1/3-3/4
DB9	46	67	1 x 1	4.18	3450	1/2-3/4
DB10	67-95	28-52	1-1/2 x 1-1/2	3-3.75	3450	1/3-1
DB11	78-116	42-74	2 x 1-1/2	3.63-4.63	3450	3/4-2
DB15	112-136	63-98	2 x 1-1/2	2.3	3450	1.5-3
DB22	136-203	67-184	2 x 2 or 3 x 2	4.5-7.25	3450	3-10

Finish Thompson - SP Series Self-Priming Magnetic Drive Pumps

FTI's SP Series Magnetic Drive Self-Priming Pumps are the product of advanced engineering CFD design software and superior magnetic flux technology. The SP Series combines deep-lift capabilities and lightning-fast priming with the advantages of neodymium magnetic drive technology and corrosion resistant polypropylene and PVDF to handle the most difficult applications with no seal replacement, no leaks and the capability to run-dry without damage.

Features:

- Big on power - short on energy consumption
- Deep-lift capabilities (up to 25'/7.6m)
- Lightning-fast priming (18'/5.5m in 90 seconds)
- Ease of operation
- No seal replacement and no leaks
- Corrosion-resistant materials handle the most difficult applications

*Threaded (NPT or BSP), flanged or union connections

SP Specifications

- Up to 70% operating efficiency
- High working pressure up to 90 psi/6.2 bar
- Maximum viscosity:
 - Up to 50 cP
- Maximum temperature:
 - Polypropylene - 180 °F (82 °C)
 - PVDF - 220 °F (104 °C)

SP Specifications

- SP retains fluid for re-priming when shut off without a check valve
- SP lifts up to 25' (7.6m)
- SP primes up to 18' (5.5m) in 90 seconds

SP Applications

- Sumps
- Underground storage tanks
- Rail cars and tanker trucks
- Over-the-wall applications
- Double containment tanks
- Piping systems that tend to have trapped or entrained air



Model	Max Flow (GPM)	Max Head (ft)	Suction/Discharge	Impeller Diameter	RPM (60Hz)	HP Requirement*
SP10	38-53	25-63	1 x 1	3-4.18	3450	1/3-1.5
SP11	78-104	40-68	1-1/2 x 1-1/2	3.63-4.63	3450	1-2
SP15	99-120	59-90	1-1/2 x 1-1/2	4.25-5.13	3450	2-3
SP22	160-230	73-142	2 x 2 or 3 x 2	5-6.5	3450	5-10

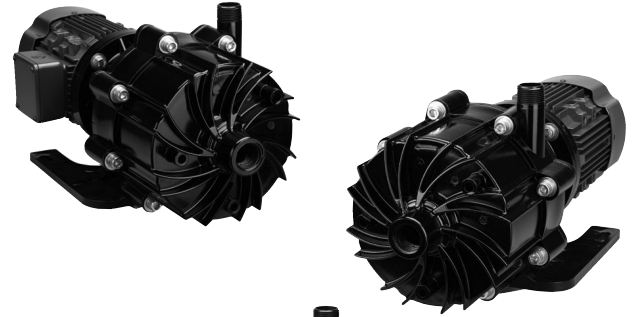
Centrifugal Pumps

Finish Thompson - MSDB Series Multi-stage Magnetic Drive Pumps

FTI's MSDB Series magnetic drive multi-stage pumps are ideal for high head, low flow applications like spray, filtration and chemical delivery. Based on proven DB11/15 platform, the MSDB produces much higher heads at lower flows allowing the use of a smaller, less expensive pump.

Features:

- Heads up to 300 feet, Minimum flow rate is 1 gpm
 - Maximum working pressure up to 135 PSI and High specific gravity handling - over 1.8
 - Horizontal or vertical (with IEC motor only) installation
 - Sealless design improves reliability with no seal maintenance to perform or seal leaks
 - High power neodymium magnetic drive system handles high specific gravity fluids
 - Two stage versions contain two impellers, three stage versions contain three impellers
 - Engineered for corrosive fluids with polypropylene/Ryton® construction or PVDF/Ryton® construction
 - Compact close-coupled design
- *Threaded (NPT or BSP) or flanged



MSDB Specifications

- Up to 47% operating efficiency
- High working pressure up to 135 psi/9.3 bar
- Maximum viscosity:
 - Up to 150 cP
- Maximum temperature:
 - Polypropylene/Ryton® (MSDB) - 180 ° F (82 ° C)
 - PVDF/Ryton® (MSDB) - 220 ° F (104 ° C)

MSDB Applications

- Spray applications like rinse, acid etch, product application, ball spray head tank cleaning
- Filtration
- DI/conditioned/RO/ultrafiltration water systems
- Wet scrubbers
- Chemical delivery systems
- Small diameter piping systems

Model	Max Flow (GPM)	Max Head (ft)	Suction/Discharge	Impeller Diameter	RPM (60Hz)	HP Requirement*
MSDB2	67-70	100-205	1 x 1	4-5.35	3450	2-5
MSDB3	66-69	150-306	1 x 1	4-5.35	3450	3-7.5

*Horsepower based on 1.0 SG

Finish Thompson - UC Series ANSI Dimensional Mag Drive Pumps

Engineered for extreme reliability in the most extreme chemical processing applications, UC Series is a heavy duty, magnetically driven, ANSI dimensional pump. It features exterior components constructed from tough ductile iron with a pure ETFE lining and no wetted metallic parts for superior corrosion resistance. With available 18 models UC Series pumps offer a tremendous hydraulic range to handle the widest range of applications.

Features:

- Meets ANSI/ASME B73.1m & 73.3 dimensional requirements for foot and flange for easy installation
- Single piece, snap fit impeller, allows impeller to be replaced if damaged without having to purchase inner drive magnet
- Silicon carbide, Dri-Coat silicon carbide or carbon bushing options for application flexibility
- High strength neodymium iron boron magnets to transfer maximum power reliably
- Wide hydraulic coverage from 1 gpm to 1,450 gpm, heads to 492 feet
- Temperatures to 250° F/121° C
- Viscosity to 200 cP
- Gas engine options for remote or emergency applications



Model	Suction x Discharge x Maximum Impeller Ø	ANSI Dimension Designator	Flow Range @ 60 Hz (GPM)	Max Head (ft)	Power Range (HP)*
UC1516	1-1/2" x 1" x 6"	AA	5-167	180	1.7-8.8
UC1516L	1-1/2" x 1" x 6"	AA	1-41	180	1.8-4.6
UC1518	1-1/2" x 1" x 8"	AA	5-181	330	3.6-21.4
UC1518L	1-1/2" x 1" x 8"	AA	1-38	330	3.6-8.8
UC2110	2" x 1" x 10"	A05	15-201	492	5.6-40.2
UC2110L	2" x 1" x 10"	A05	15-83	450	5.3-29.9
UC3110	3" x 1" x 10"	--	15-201	492	5.6-40.2
UC3156	3" x 1-1/2" x 6"	AB	5-320	161	2.4-13.1
UC3158	3" x 1-1/2" x 8"	A50	20-445	280	5.7-34.3
UC326	3" x 2" x 6"	AC	5-450	167	2.6-17.6
UC326H	3" x 2" x 6"	A10	5-450	167	2.6-17.6
UC328	3" x 2" x 8"	A60	20-445	280	5.7-34.3
UC3210	3" x 2" x 10"	A60	15-640	480	10-100
UC436L	4" x 3" x 6"	--	5-440	167	3-30
UC436	4" x 3" x 6"	--	20-670	190	11.7-26.3
UC438	4" x 3" x 8"	A70	20-825	290	6.9-55.1
UC4310H	4" x 3" x 10"	A70	75-1,050	118	4-27.1
UC6410	6" x 4" x 10"	A80	75-1,450	112	7.9-34.7

*Power at smallest to largest impeller diameter on 1.0 specific gravity

AODD Pumps

Finish Thompson - FTI Air Air-Operated Double Diaphragm Pumps

FTI Air's line of AODD pumps offer outstanding versatility in a myriad of applications. Designed and manufactured to be incredibly rugged, easy to operate and maintain, they are built to survive the harshest applications and installation locations. All backed by an incredible five year warranty.

Features:

- Easy to install
- Runs on compressed air
- No electricity required
- Installation versatility
- Flooded suction, suction lift or can be submerged
- Portable to allow use in multiple locations
- Self-priming for applications where the liquid is below the pump
- Pump solids and abrasives
- Can be deadheaded without damage
- Economical compared to other positive displacement technologies



AODD Material Specifications*

Wetted Materials: Polypropylene, PVDF, Aluminum, Stainless Steel

Diaphragm Materials: Neoprene, Santoprene, FKM, EPDM, PTFE, Hytrel®, polyurethane

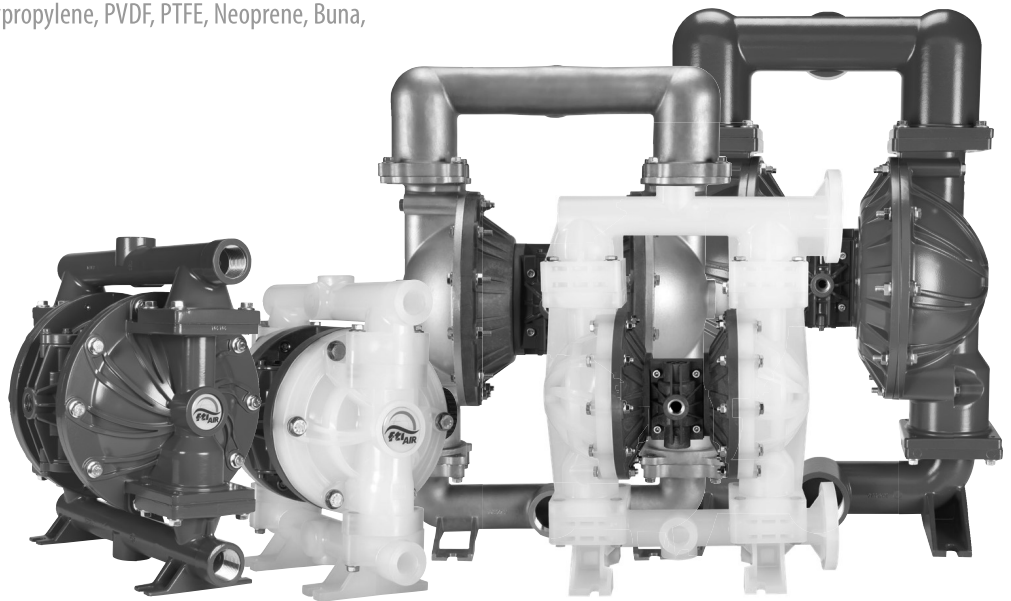
Ball Materials: Neoprene, Buna, EPDM, FKM, Santoprene, PTFE, Stainless Steel

Seat Materials: Aluminum, Stainless Steel, Polypropylene, PVDF, PTFE, Neoprene, Buna, EPDM, FKM, Santoprene, Hytrel®, Polyurethane

*Varies by size and wetted material selection

AODD Applications

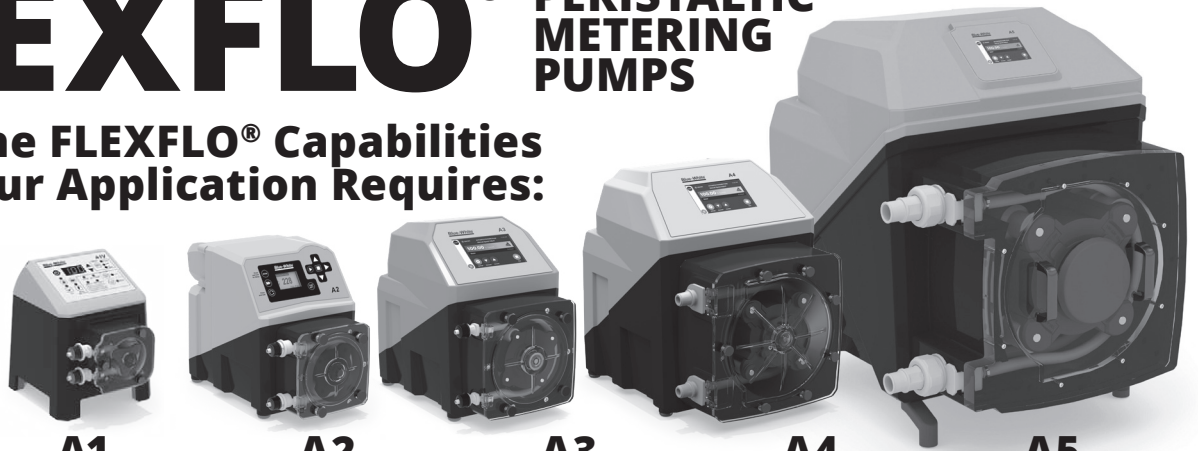
- Plating and finishing
- Chemical/petrochemical
- Mining
- Paint/ink/coatings
- Ceramic slip/glaze
- Industrial/municipal wastewater treatment
- Pulp & paper



Model	Port Size (in.)	Port Types	Max Flow (GPM)	Construction Materials
FT025	1/4 x 1/4	NPT or BSPT	5.8	Polypro, PVDF & Conductive Polypro
FT05	1/2 x 1/2	NPT or BSPT	19-20	Polypro, PVDF, Conductive Polypro, Aluminum & 316SS
FT10	1 x 1	NPT, BSPT or Flanges	49-56	Polypro, PVDF, Aluminum & 316SS
FT15Z	1-1/2 x 1-1/2	NPT, BSPT or Flanges	123-133	Polypro, PVDF, Aluminum & 316SS
FT20	2 x 2	NPT, BSPT or Flanges	154-156	Polypro, PVDF, Aluminum & 316SS
FT30	3 x 3	NPT, BSPT or Flanges	240	Aluminum & 316SS

FLEXFLO® PERISTALTIC METERING PUMPS

Choose the FLEXFLO® Capabilities Your Application Requires:



	A1	A2	A3	A4	A5
Flow Output Range	.001–5.6 GPH (.002 – 21.2 LPH)	.02–17.2 GPH (.07–65.1 LPH)	.001–33.3 GPH (.003–126.1 LPH)	.01–158 GPH (.04–600 LPH)	.0498–540 GPH (.1884–2044 LPH)
Turndown	2,000:1	100:1		2,500:1	
Warranty	2 YEAR				
Variable Speed DC Motor	BRUSHLESS	BRUSH		BRUSHLESS	
TFD (Pat. #7,001,153 and 7,284,964)	YES	YES	YES	YES	YES
Maintenance Mode (Pat. #8,215,931)	NO	YES	YES	YES	YES
Motor Reverse	NO	YES	YES	YES	YES
Tube Info Button	NO		TIMER		
Input: Remote Start/Stop	YES	YES	YES	YES	YES
Input: 4-20mA	YES	YES	YES	YES	YES
Input: Frequency (Pulsed)	NO	YES	YES	YES	YES
Output: 4-20mA	NO	Optional	YES	YES	YES
Output: Pulse	NO	NO	YES	YES	YES
Proportional Dosing	NO	NO	YES	YES	YES
Password Protect (PIN)	NO	NO	YES	YES	YES
Industrial Ethernet (IP)	NO	NO	YES	YES	YES
Profibus	NO	NO	YES	YES	YES
Modbus-TCP	NO	NO	YES	YES	YES

FLEXFLO® PERISTALTIC PUMPS have smooth, quiet pumping action and deliver accurate amounts of chemical to your system. Four FlexFlo® models are offered featuring a broad range of output rates, electronics options and features. If you don't see the FlexFlo® pump that meets your system requirements, please contact the factory. Blue-White® specializes in meeting OEM requirements.

FLEXFLO® APPLICATIONS INCLUDE
 Chemical Metering
 Chlorination
 Chloramination
 Fluoridation
 Polymer Injection
 Pulp and Paper Slurries
 Printing Inks
 Oil Based Fluids
 Gaseous Fluids
 Shear Sensitive Fluids
 Caustics
 Chemical Slurries
 Food and Beverage

Accessories

<p>Quick Disconnects</p> <p>*KIT-QSV FKM O-RINGS *KIT-QBV FKM *KIT-QMV FKM *KIT-QSE EP O-RINGS *KIT-QBE EP *KIT-QME EP</p>	<p>1/4" x 3/8" "S" Fitting 1/2" Hose Barb "B" Fitting 1/2" MNPT "M" Fitting</p>	<p>KIT-PSM Wall Mount Bracket, HDPE</p>	<p>KIT-M12 Two M12 Cables - 9.8 ft.</p>
<p>90010-663 115V/60Hz NEMA 5/15 90010-664 220V/50Hz CEE 7/11 90010-665 230V/50Hz UK 90010-666 240V/50Hz AS 3112 90010-696 230V US</p> <p>POWER CABLES - 6 ft</p>	<p>KIT-DP3 Profibus Cable, 3 ft</p>	<p>TI40-6V T.I. Injector, 3/8" OD</p>	<p>C-340-A FOOT VALVE</p>

6 PUMPS & FILTRATION



FLEXFLO[®] A1 Peristaltic Metering Pumps

A1 Ordering Matrix

A1	FLEXFLO [®] Peristaltic Metering Pump					
Series						
F	Standard Control Methods (Manual, Remote On/Off)					
V	4-20mA Input, In Addition to Standard Control Methods (Manual, Remote)					
Power Cord (Operating voltage requirement 96VAC to 264VAC)						
4	115V 50/60Hz, power cord NEMA 5/15 plug (US)	6	220V 50/60Hz, power cord CEE 7/11 plug (EU)			
Pump Tube Size and Material						
1	1/4" OD Flex-A-Thane [®] 0.001 – 1.09 GPH .035 - 69 mL/Min 65 PSI (4.5 bar)					
3	7/16" OD Flex-A-Thane [®] 0.003 – 5.60 GPH .176 - 353 mL/Min 50 PSI (3.45 bar)					
4	1/4" OD Flex-A-Prene [®] 0.001 - 0.44 GPH .014 - 28 mL/Min 100 PSI (6.89 bar)					
6	3/8" OD Flex-A-Prene [®] 0.001 – 1.35 GPH .043 - 85 mL/Min 100 PSI (6.89 bar)					
7	7/16" OD Flex-A-Prene [®] 0.002 – 4.17 GPH .132 - 263 mL/Min 50 PSI (3.45 bar)					
8	7/16" OD Flex-A-Chem [®] 0.002 – 3.09 GPH .098 - 195 mL/Min 50 PSI (3.45 bar)					
Inlet/Outlet Connection Size, Connection Type						
T	3/8" OD x 1/4" Tube Compression Fitting					
M	1/2" Male NPT Fitting					
MB	1/2" Male BSPT Fitting, Natural PVDF (Kynar)					
A1	F	4	-	1	T	Sample Model Number



Accessories

<p>KIT-S07 KIT-S15 KIT-S30</p> <p>* Includes suction tubing and foot valve</p> <p>KIT-S07 (7 Gallon), KIT-S15 (15 Gallon), KIT-S30 (30 Gallon) STAR III TANKS, PP</p>	<p>KIT-PSM WALL MOUNT BRACKET, HDPE</p>	<p>KIT-MB FLOOR MOUNTING BRACKETS</p>
<p>90010-663 115V/60Hz NEMA 5/15 90010-664 220V/50Hz CEE 7/11 90010-665 230V/50Hz UK 90010-666 240V/50Hz AS 3112 90010-696 230V US</p> <p>POWER CABLES - 6 ft</p>	<p>CABLE-UAC USB A-C CABLE - 3 ft</p>	<p>KIT-M12 TWO M12 CABLES - 9.8 ft</p>
<p>T140-6V T.I. INJECTOR, 3/8" OD</p>	<p>C-340A FOOT VALVE</p>	<p>A1-(see spare parts page) Spare Tube Element</p>

Visit Accessory Pages for More Options

FLEXFLO[®] A2 Peristaltic Metering Pumps

A2 Ordering Matrix

A2	FLEXFLO [®] Peristaltic Metering Pump		with 4-20ma output option						
Series Control Options									
V	Multiple automatic input output control and alarm modes (remote control)								
Power Cord (operating voltage requirement 96VAC to 264VAC)									
4	115V / 60HZ, power cord NEMA 5/15 plug (US)	8	240V / 50HZ, power cord AS 3112 plug (AU/New Zealand)						
5	230V / 60HZ, power cord NEMA 6/15 plug (US)	9	230V / 50HZ, power cord BS 1363 plug (UK)						
6	220V / 50HZ, power cord CEE 7/VI plug (EU)	X	No Power Cord						
Inlet/Outlet Connection Size, Connection Type, Connection Material									
S	3/8" OD x 1/4" ID Tube Compression Fitting, Natural PVDF (Kynar)								
M	1/2" Male NPT Fitting, Natural PVDF (Kynar)								
B	1/2" ID Tubing Barb Fitting, Natural PVDF (Kynar), available for ND, NEE, and NGG only								
C	1/2"-3/4" Tri-clamp connections, Natural PVDF (Kynar), available for ND, NEE, and NGG only								
Q	Quick Disconnect, Natural PVDF (Kynar), available for ND, NEE, and NGG only (valves sold separately)								
MB	1/2" Male BSPT Fitting, Natural PVDF (Kynar)								
Pump Tube Material, Pump Tube Size									
ND	Flex-A-Prene [®] .075 ID .02-1.7 GPH 125 PSI	GE	Flex-A-Thane [®] .125 ID .04-4.0 GPH 65 PSI						
NEE	Flex-A-Prene [®] .093 ID .044-4.44 GPH 110 PSI	GG	Flex-A-Thane [®] .187 ID .09-9.3 GPH 65 PSI						
NGG	Flex-A-Prene [®] .187 ID .172-17.2 GPH 110 PSI	GH	Flex-A-Thane [®] .312 ID .21-21.23 GPH 65 PSI						
TH	Flex-A-Chem [®] .250 ID .14-14.3 GPH 50 PSI								
Options (leave this blank for standard model with left facing pump head inlet/outlet)									
3	4-20 mA analog output								
R	Right facing pump head, input / output (Left facing fluid input / output is standard)								
D	Down facing pump head, input / output (Left facing fluid input / output is standard)								
A2	F	2	4	-	S	ND	-	3	Sample Model Number

Accessories

 <p>1/4" x 3/8" "S" Fitting 1/2" Hose Barb "B" Fitting 1/2" MNPT "M" Fitting</p> <p>Quick Disconnects *KIT-QSV FKM O-RINGS *KIT-QSE EP O-RINGS *KIT-QBV FKM *KIT-QBE EP *KIT-QMV FKM *KIT-QME EP</p>	 <p>KIT-PSM Wall Mount Bracket, HDPE</p>	
 <p>TI40-6V T.I. INJECTOR, 3/8" OD</p>	 <p>C-340A FOOT VALVE</p>	 <p>A2-(see spare parts page) Spare Tube Element</p>



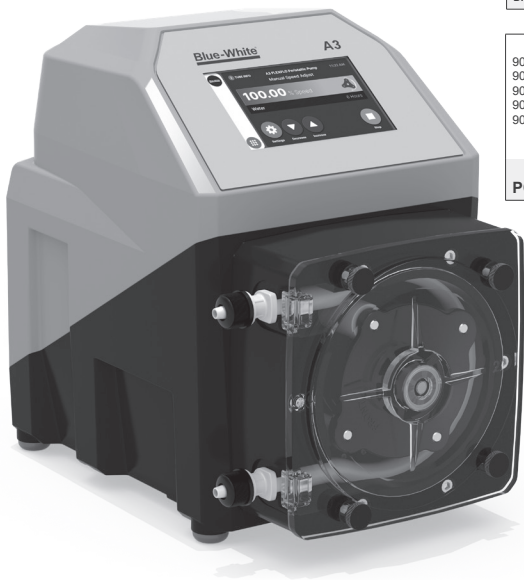
6 PUMPS & FILTRATION

FLEXFLO® A3 Peristaltic Metering Pumps

A3 Ordering Matrix

A3 FLEXFLO® A3 Peristaltic Metering Pump									
Power Cord (operating voltage requirement 96VAC to 264VAC)									
4	115V / 60HZ, power cord NEMA 5/15 plug (US)								
6	220V / 50HZ, power cord CEE 7/VII plug (EU)								
X	No Power Cord								
Inlet/Outlet Connection Size, Connection Type, Connection Material									
S	3/8" OD x 1/4" ID Tube Compression Fitting, Natural PVDF (Kynar)								
M	1/2" Male NPT Fitting, Natural PVDF (Kynar)								
B	1/2" ID Tubing Barb Fitting, Natural PVDF (Kynar), available for ND, NEE, NGG, and NKL only								
C	1/2"-3/4" Tri-clamp connections, Natural PVDF (Kynar), available for ND, NEE, NGG, and NKL only								
Q	Quick Disconnect, Natural PVDF (Kynar): ND, NEE, NGG, and NKL only (Valves sold separately)								
MB	1/2" Male BSPT Fitting, Natural PVDF (Kynar)								
Pump Tube Material, Pump Tube Size									
ND	Flex-A-Prene® .075 ID .001-2.1 GPH 125 PSI	GE	Flex-A-Thane® .125 ID .002-4.60 GPH 65 PSI						
NEE	Flex-A-Prene® .093 ID .002-4.76 GPH 110 PSI	GG	Flex-A-Thane® .187 ID .004-10.1 GPH 65 PSI						
NGG	Flex-A-Prene® .187 ID .007-19.02 GPH 110 PSI	GH	Flex-A-Thane® .312 ID .010-24.9 GPH 65 PSI						
NK	Flex-A-Prene® .375 ID .013-33.3 GPH 125 PSI	GK	Flex-A-Thane® .375 ID .011-28.5 GPH 65 PSI						
NKL	Flex-A-Prene® .375 ID .013-33.3 GPH 30 PSI	TH	Flex-A-Chem® .250 ID .006-15.06 GPH 50 PSI						
NHL	Flex-A-Prene® .250 ID .006-17.39 GPH 65 PSI	TK	Flex-A-Chem® .375 ID .011-28.5 GPH 50 PSI						
Options (leave this blank for standard model with left facing head)									
R	Right facing pump head, input / output (Left facing fluid input / output is standard)								
D	Down facing pump head, input / output (Left facing fluid input / output is standard)								
A3	S	V	2	4	-	S	ND	Sample Model Number	

PUMPS & FILTRATION



Accessories

1/4" x 3/8" "S" Fitting
1/2" Hose Barb "B" Fitting
1/2" MNPT "M" Fitting

Quick Disconnects *KIT-QSV FKM O-RINGS *KIT-QBV FKM *KIT-QMV FKM
*KIT-QSE EP O-RINGS *KIT-QBE EP *KIT-QME EP

KIT-PSM
Wall Mount Bracket, HDPE

KIT-M12
Two M12 Cables - 9.8 ft.

90010-663 115V/60Hz NEMA 5/15
90010-664 220V/50Hz CEE 7/V11
90010-665 230V/50Hz UK
90010-666 240V/50Hz AS 3112
90010-696 230V US

POWER CABLES - 6 ft

KIT-DP3
Profibus Cable, 3 ft

TI40-6V
T.I. Injector, 3/8" OD


C-340-A
FOOT VALVE

FLEXFLO[®] A4 Peristaltic Metering Pumps

A4 Ordering Matrix

A4	FLEXFLO [®] A4 Peristaltic Metering Pump							
Power Cord (operating voltage requirement 96VAC to 264VAC)								
4	115V / 60HZ, power cord NEMA 5/15 plug (US)							
6	220V / 50HZ, power cord CEE 7/VI plug (EU)							
X	No Power Cord							
Inlet/Outlet Connection Size, Connection Type, Connection Material								
M	1/2" Male NPT Fitting, Natural PVDF (Kynar)							
B	1/2" ID Tubing Barb Fitting, Natural PVDF (Kynar)							
C	1/2" - 3/4" Tri-clamp connections, Natural PVDF (Kynar)							
Q	Quick Disconnect, Natural PVDF (Kynar), NP flow rate reduced 16.5% with Quick Disconnect connections (Valves sold separately)							
MB	1/2" Male BSPT Fitting, Natural PVDF (Kynar)							
Pump Tube Material, Pump Tube Size NOTE: * = Dual tube								
NH	Flex-A-Prene [®] .250 ID .01–28.5 GPH 125 PSI	GH	Flex-A-Thane [®] .312 ID .01–39.6 GPH 65 PSI					
NHH*	Flex-A-Prene [®] .250 ID .02–54.0 GPH 100 PSI	GHH*	Flex-A-Thane [®] .312 ID .03–71 GPH 65 PSI					
NHHL*	Flex-A-Prene [®] .250 ID .02–54.0 GPH 65 PSI	GK	Flex-A-Thane [®] .375 ID .02–55.5 GPH 65 PSI					
NHL	Flex-A-Prene [®] .250 ID .01–28.5 GPH 65 PSI	GKK*	Flex-A-Thane [®] .375 ID .04–100 GPH 65 PSI					
NK	Flex-A-Prene [®] .375 ID .02–50.7 GPH 80 PSI	TH	Flex-A-Chem [®] .250 ID .01–25.4 GPH 30 PSI					
NL	Flex-A-Prene [®] .500 ID .04–100.0 GPH 50 PSI	TK	Flex-A-Chem [®] .375 ID .02–54.0 GPH 30 PSI					
NP	Flex-A-Prene [®] .750 ID .06–158.5 GPH 30 PSI	TKK*	Flex-A-Chem [®] .375 ID .05–126 GPH 30 PSI					
Options (leave this blank for standard model with left facing head)								
R	Right facing pump head, input / output							
D	Down facing pump head, input / output							
A4	S	V	2	4	-	M	NH	Sample Model Number

Accessories



1/4" x 3/8" "S" Fitting
1/2" Hose Barb "B" Fitting
1/2" MNPT "M" Fitting

Quick Disconnects

*KIT-QSV FKM O-RINGS	*KIT-QBV FKM	*KIT-QMV FKM
*KIT-QSE EP O-RINGS	*KIT-QBE EP	*KIT-QME EP




KIT-PSM
Wall Mount Bracket, HDPE



KIT-M12
Two M12 Cables - 9.8 ft.

90010-663 115V/60Hz NEMA 5/15
90010-664 220V/50Hz CEE 7/VI
90010-665 230V/50Hz UK
90010-666 240V/50Hz AS 3112
90010-696 230V US

POWER CABLES - 6 ft



KIT-DP3
Profibus Cable, 3 ft

Visit Accessory Pages for More Options



6 PUMPS & FILTRATION

FLEXFLO® Peristaltic Metering Pumps

FLEXFLO® A5 Peristaltic Metering Pumps

A5 Ordering Matrix

A5	FLEXFLO® Peristaltic metering pump							
Power Cord (operating voltage user selectable 115V/240 VAC 50/60Hz)								
4	115V / 60Hz, power cord NEMA 5/15 plug (US)							
6	220V / 50HZ, power cord CEE 7/II plug (EU)							
X	No Power Cord							
Inlet/Outlet Connection Size, Connection Type, Connection Material								
M	1.5" Male NPT Fitting, Polypropylene, FKM O-rings							
B	1.5" Hose Barb, Polypropylene, FKM O-rings							
Pump Tube Material, Pump Tube Size, Output Range, Pressure								
NPP	Flex-A-Prene® .750 ID .22 – 534 GPH 30 PSI							
NLL	Flex-A-Prene® .500 ID .12 – 286 GPH 50 PSI							
NHHL	Flex-A-Prene® .250 ID .03 – 75.6 GPH 65 PSI							
GKK	Flex-A-Thane® .375 ID .06 – 154.2 GPH 50 PSI							
Options (leave this blank for standard model with left facing pump head inlet/outlet)								
R	Right facing pump head, input / output (Left facing fluid input / output is standard)							
E	EP O-rings							
A5	S	2	4	-	M	NPP	R	Sample Model Number

Accessories

90010-663 115V/60Hz NEMA 5/15
 90010-664 220V/50Hz CEE 7/II
 90010-665 230V/50Hz BS 1363/A
 90010-666 240V/50Hz AS 3112
 90010-696 230V/60Hz NEMA 6/15

POWER CABLES - 6 ft



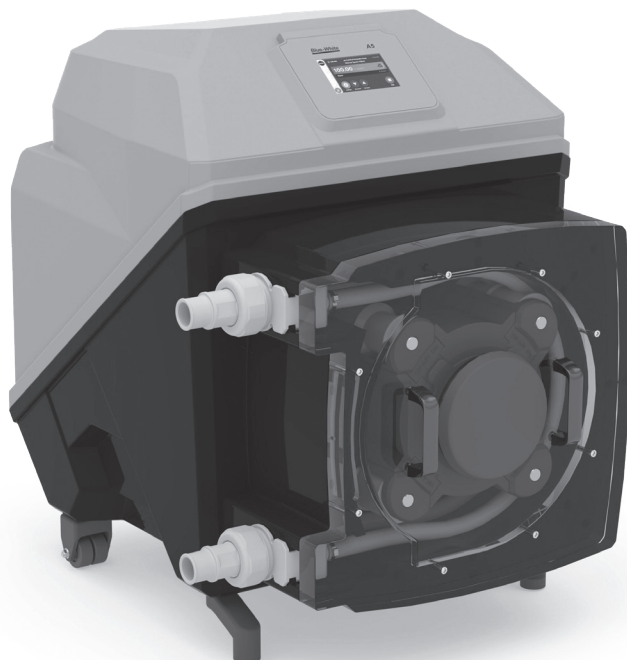
CABLE-UAC
 USB A-C CABLE



KIT-M12
 TWO M12 CABLES



KIT-DP3
 ONE 3ft PROFIBUS CABLE



6

PUMPS & FILTRATION

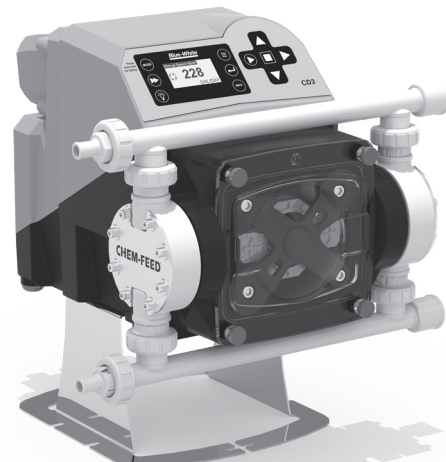
CHEM-FEED[®] Diaphragm Metering Pumps

CHEM-FEED[®] Diaphragm Metering Pumps

Choose the CHEM-FEED[®] Capabilities Your Application Requires:



CD1



CD3

Flow Output Range	.004-7.70 GPH (.015-29.2 LPH)	.05-52.6 GPH (.2-199 LPH)
Turndown	1,000:1	
Warranty	2 YEAR	
Variable Speed DC Motor	BRUSHLESS	
Dia-Flex [®] PVDF Single-layer Diaphragm	YES	YES
DFD (Diaphragm Failure Detection)	YES	YES
Protective LCD Snap-on Cover	YES	NO
Maintenance Mode	NO	YES
Input: Remote Start/Stop	YES	YES
Input: 4-20mA	YES	YES
Input: Frequency (Pulsed)	NO	YES
Output: 4-20mA	NO	YES
Proportional Dosing	NO	YES
Password Protect (PIN)	LOCKOUT BUTTON	YES

CHEM-FEED[®] DIAPHRAGM METERING PUMPS provide superior chemical resistance, precision chemical metering capabilities, and are designed to provide excellent service in a wide range of applications.

CHEM-FEED[®] APPLICATIONS INCLUDE

Chemical Metering	Pulp and Paper Slurries	Caustics
Chlorination	Printing Inks	Chemical Slurries
Chloramination	Oil Based Fluids	Food and Beverage
Fluoridation	Gaseous Fluids	
Polymer Injection	Shear Sensitive Fluids	

6
PUMPS & FILTRATION

CHEM-FEED[®] Diaphragm Metering Pumps

CHEM-FEED[®] CD1 Multi-Diaphragm Metering Pump

CD1 Ordering Matrix

CD1	CHEM-FEED [®] Diaphragm Metering Pump				
Control					
F	Standard Control Methods (Manual, Remote, FVS)				
V	4-20mA Input in addition to Standard Control Methods (Manual, Remote, FVS)				
Diaphragm and O-Rings Material					
V	DiaFlex [®] Diaphragms and TFE/P O-Rings (For all chemicals excluding caustic soda and aqueous ammonia)				
E	Flex-A-Prene [®] Diaphragms and EP O-Rings (For caustic soda and aqueous ammonia)				
Power Cord (Operating voltage requirement 96VAC to 264VAC)					
4	115V 50/60Hz, power cord NEMA 5/15 plug (US)				
6	220V 50/60Hz, power cord CEE 7/11 plug (EU)				
CD1	F	V	1	4	Sample Model Number

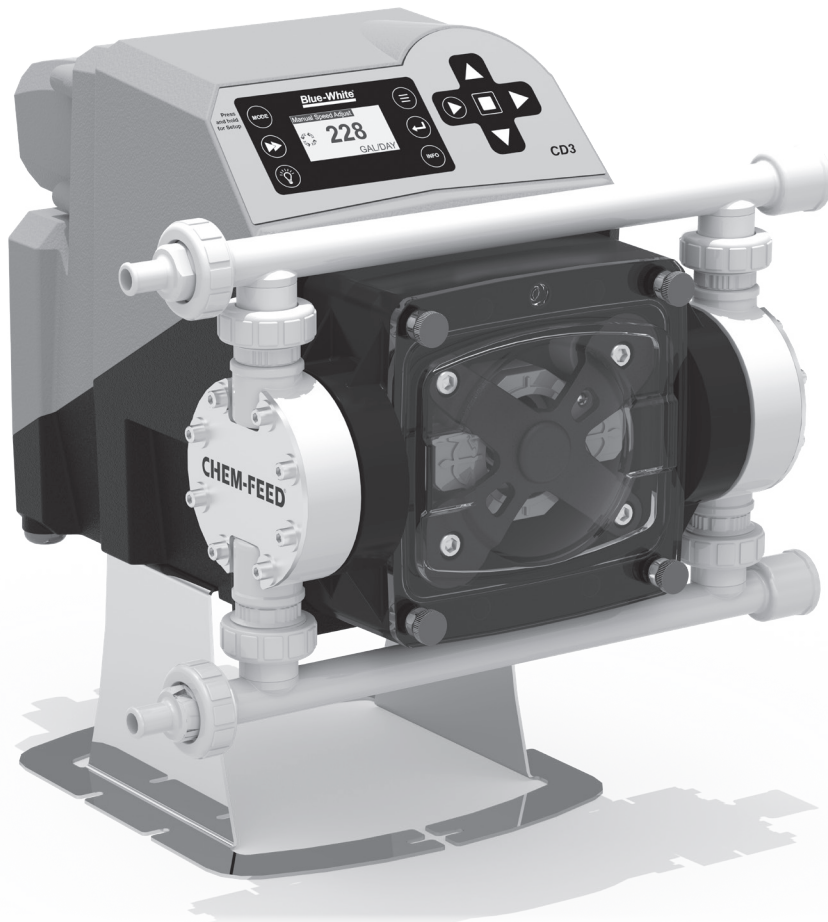
6
PUMPS & FILTRATION



CHEM-FEED[®] CD3 Multi-Diaphragm Metering Pump

CD3 Ordering Matrix

CD3	CHEM-FEED [®] Multi-Diaphragm Metering Pump								
Input Voltage / Power Cord									
4	115V / 60Hz, power cord NEMA 5/15 plug (US)								
5	230V / 60Hz, power cord NEMA 6/15 plug (US)								
6	220V / 50HZ, power cord CEE 7/II plug (EU)								
8	240V / 50HZ, power cord AS 3112 plug (Australia/New Zealand)								
9	230V / 50HZ, power cord BS 1363/A plug (United Kingdom)								
X	No Power Cord								
Elastomer Material (O-Rings)									
V	TFE/P								
E	EP								
Options (leave blank for standard model)									
S	Flex-A-Prene [®] Diaphragms (Caustic Soda resistant diaphragms)								
CD3	2	4	4	X	V	X	-	A	Sample Model Number



CHEM-FEED® CFPS Engineered Skid Systems

CHEM-FEED® CFPS ENGINEERED SKID SYSTEMS ship fully assembled with all necessary components. This Drop-in-Place design facilitates fast install and quick startup.

CHEM-FEED® CFPS skids are constructed from strong, light-weight chemical and UV resistant polyethylene and feature leak-free threadless connections. One, Two or Three Pump units with your choice of diaphragm or Peristaltic Pumps. Pipe material options include PVC, CPVC, PVDF, and Chem Proline® (PE).

An optional SONIC-PRO® Chemical Flow Meter provides accurate measurement of chemical dosing and features an isolated 4-20 mA output, process control via configurable solid state relay, and user-configurable flow rate and total set-point triggers.

CFPS Skid Systems are offered in One, Two or Three Pump configurations.

System Type:
Single, Double, and Triple pump system

Product Compatibility:
A1, A2, A3, A4, CD1, CD3, C2, C3

Frame Material: Polyethylene

Mounting Position: Floor or Wall

PSI: 150

Bar: 10.3



CHEM-FEED® CFWS Wall Mount Single & Double Skid System

NOT ENOUGH FLOORSPACE TO ACCOMMODATE A STANDARD FLOOR MODEL SKID SYSTEM? We have the solution.

The all-new CHEM-FEED® Wall Mount Skid Systems are designed to be mounted on a wall, freeing up that valuable floor space.

Wall mount skid system available in one or two pump units, your choice diaphragm or peristaltic. Pipe material options include PVC, CPVC, PVDF, and Chem Proline® (PE).

An optional SONIC-PRO® Chemical Flow Meter provides accurate measurement of chemical feed and features an isolated 4-20 mA output, process control via configurable solid state relay, and user-configurable flow rate and total set-point triggers.

System Type:
Single and Double pump system

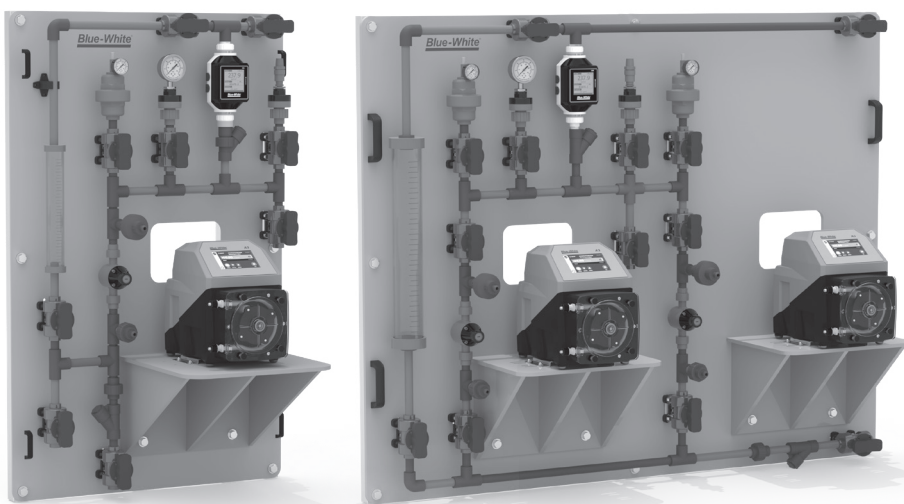
Product Compatibility:
A1, A2, A3, A4, CD1, CD3, C2, C3

Frame Material: Polyethylene

Mounting Position: Wall

PSI: 150

Bar: 10.3



CFPS-1 Ordering Matrix

CHEM-FEED[®] Simplex Skid System Matrix - Industrial

CFPS-1 Single pump system - PE structure

Inlet/Outlet															
A	Single Inlet / Single Outlet														
X	None, Skid Panel Only														
Piping/Unions															
A	B	C	D												
PVC				CPVC	PVDF	Chem Proline [®]									
Seals															
V	E														
FKM				EPDM											
Tubing Connections															
A	B	C	D												
1/2" ID PVC Braided		1/2" ID PTFE	1/4" ID PE	1/4" ID PTFE											
Calibration Column															
A	F														
128 GPH (4000 ml) PVC				3 GPH (100 ml) PVC											
B	P														
64 GPH (2000 ml) PVC				32 GPH (1000 ml) Glass											
C	Q														
32 GPH (1000 ml) PVC				16 GPH (500 ml) Glass											
D	R														
16 GPH (500 ml) PVC				8 GPH (250 ml) Glass											
E	S														
8 GPH (250 ml) PVC				3 GPH (100 ml) Glass											
Pulsation Dampener															
P	X														
10 cubic in				Not Included											
Back Pressure Valve															
B	X														
Included				Not Included											
Pressure Gauge w/Guard															
A	B	C													
200 PSI			100 PSI	30 PSI											
Pressure Switch w/Guard															
S	X														
Included				Not Included											
Flow Meter w/Strainer															
A	B														
10-5000 ml/m				100-10000 ml/m											
X															
Not Included															
Terminal Box															
T	X														
Included				Not Included											
Pumps															
P	X														
Mounted				Not Included											
Pump Model (purchased separately)															
-XX	Specify Model used on Skid														
CFPS-1	I	A	A	V	A	A	P	B	A	S	A	T	P	-A3SV24-MNGG	Sample Model Number

CFPS-2 Ordering Matrix

CHEM-FEED[®] Duplex Skid System Matrix - Industrial

CFPS-2 Dual pump system - PE structure

Inlet/Outlet															
A	Single Inlet / Single Outlet														
B	Single Inlet / Dual Outlet														
X	None, Skid Panel Only														
Piping/Unions															
A	B	C	D												
PVC				CPVC	PVDF	Chem Proline [®]									
Seals															
V	E														
FKM				EPDM											
Tubing Connections															
A	B	C	D												
1/2" ID PVC Braided		1/2" ID PTFE	1/4" ID PE	1/4" ID PTFE											
Calibration Column															
A	F														
128 GPH (4000 ml) PVC				3 GPH (100 ml) PVC											
B	P														
64 GPH (2000 ml) PVC				32 GPH (1000 ml) Glass											
C	Q														
32 GPH (1000 ml) PVC				16 GPH (500 ml) Glass											
D	R														
16 GPH (500 ml) PVC				8 GPH (250 ml) Glass											
E	S														
8 GPH (250 ml) PVC				3 GPH (100 ml) Glass											
Pulsation Dampener															
P	X														
10 cubic in				Not Included											
Back Pressure Valve															
B	X														
Included				Not Included											
Pressure Gauge w/Guard															
A	B	C													
200 PSI			100 PSI	30 PSI											
Pressure Switch w/Guard															
S	X														
Included				Not Included											
Flow Meter w/Strainer															
A	B														
10-5000 ml/m				100-10000 ml/m											
X															
Not Included															
Terminal Box															
T	X														
Included				Not Included											
Pumps															
P	X														
Mounted				Not Included											
Pump Model (Purchased separately)															
-XX	Specify Model used on Skid *														
CFPS-2	I	A	A	V	A	A	P	B	A	S	A	T	P	-A3SV24-BNGG	Sample Model Number

6 PUMPS & FILTRATION



CFWS-1 & CFWS-2 Ordering Matrix

CFWS-1	Single pump system - single chemical / single outlet, PE structure													
CFWS-2	Duplex pump system - single chemical / single outlet, PE structure													
Inlet/Outlet														
A	Single Inlet / Single Outlet													
X	None, Skid Panel Only													
Piping/Unions														
A	PVC			C	PVDF									
B	CPVC			D	CHEM PROLINE [®]									
Seals														
V	FKM			E	EPDM									
Tubing Connections														
A	1/2" ID PVC Braided			C	1/4" ID PE									
B	1/2" ID PTFE			D	1/4" ID PTFE									
Calibration Column														
A	128 GPH (4000 ml) PVC			F	3 GPH (100 ml) PVC									
B	64 GPH (2000 ml) PVC			P	32 GPH (1000 ml) Glass									
C	32 GPH (1000 ml) PVC			Q	16 GPH (500 ml) Glass									
D	16 GPH (500 ml) PVC			R	8 GPH (250 ml) Glass									
E	8 GPH (250 ml) PVC			S	3 GPH (100 ml) Glass									
Pulsation Dampener														
P	10 cubic in			X	Not Included									
Back Pressure Valve														
B	Included			X	Not Included									
Pressure Gauge w/Guard														
A	200 PSI			B	100 PSI			C	30 PSI					
Pressure Switch w/Guard														
S	Included			X	Not Included									
Flow Meter w/Strainer														
A	10-5000 mL/min													
B	100-10000 mL/min													
X	Not Included													
CFWS-2	I	A	A	V	A	A	P	B	A	S	A	X	X	Sample Model Number

NOTES: When ordering pumps for skids, pump head orientation is standard LEFT facing only. Terminal Boxes quoted and mounted separately. All skids are pressure tested prior to shipment. Pumps are purchased and shipped separately.

SONIC-PRO[®] S6A Chemical Feed Flow Meter

THE S6A ACCURATELY MEASURES LIQUID CHEMICAL FEED from ranges of 10 – 5,000 mL/min and 100 -10,000 mL/min. This plug-and-play flow meter works right out of the box but is easily configurable via Blue-Central[®] desktop software.

Pre-calibrated chemicals include Water, Aqueous Ammonia 10%, Ammonium Hydroxide 30%, Ferric Chloride 40%, Sodium Hypochlorite 12.5%, Sodium Permanganate 40%, Hydrofluorosilicic Acid 25%, and Ammonium Sulfate 10%. Additional chemicals can be calibrated by performing a custom chemical calibration.

Chemical Meter Model Number

S6A	S6A Chemical Feed Flow Meter				
Flow Range					
1	10 - 5000 mL/min (0.158 - 79.2 GPH)				
2	100 - 10,000 mL/min (1.58 - 158.5 GPH)				
Display Options					
1	Remote Mount Display				
2	Meter Mount Display				
Elastometer Material (O-Ring)					
V	TFE/P				
E	EP				
S6A	1	1	V	X	Sample Model Number

Display Options



6
PUMPS & FILTRATION

FLEXFLO® A-100N Peristaltic Metering Pump

LOOKING FOR A METERING PUMP THAT'S SIMPLE TO OPERATE and also provides Accurate, Dependable Chemical Feed? FLEXFLO® A-100NV delivers. This compact and cost-effective peristaltic pump is compatible with a wide range of chemical and the low velocity injection system of peristaltic pumps provides gentle and efficient pumping action with No vapor lock, No lost prime.

FLEXFLO® A-100N FEATURES:

OVERVIEW

- Patented TFD (Tube Failure Detection) system protects against chemical spills from a worn out tube and activates an alarm output relay.
- Self-Priming against maximum line pressure.
- Cannot Vapor Lock or Lose Prime.
- Four pump tube material options: Norprene®, Norprene® Chemical, Tygothane®, and FKM.

WHAT'S INCLUDED

- A-100N Peristaltic Metering Pump
- Two tube assemblies
- Discharge injection fitting with check valve
- Suction tube – clear PVC – 5' length (3/8" OD, 1/4" ID)
- Suction strainer
- Suction ceramic weight
- Discharge tube – opaque polyethylene – 5' length (3/8" OD, 1/4" ID)
- Display shield
- Tube nuts (x2)
- Mounting hardware

FLEXFLO® A-100N SPECIFICATIONS:

Max. working pressure:

A-100NV and A-100NF: 100 psig (6.9 bar)
A-100NVP and A-100NFP: 65 psig (4.5 bar)

Max. fluid temperature:

130° F (54° C)

Max. ambient temperature:

14° to 110° F / -10° to 4°3 C

Duty cycle:

Continuous

Maximum viscosity:

5,000 Centipoise

Maximum suction lift:

30 ft. Water 0 psig

Maximum Solids:

50% by volume

Enclosure:

NEMA 3R, (IP23)

Output adjustment range:

14 & 30 RPM with -1T, -2T, -4T tubes: 5-100% (20:1 turndown)
All other models: 10-100% (10:1 turndown)

Voltage (amp draw):

115VAC/60Hz, 1ph (.350 amp max)
230VAC/60Hz, 1ph (.173 amp max)
220VAC/50Hz, 1ph (.175 amp max)
240VAC/50Hz, 1ph (.193 amp max)

Power Cord Plug Type:

115V60Hz = NEMA 5/15 (USA)
230V60Hz = NEMA 6/15 (USA)
220V50Hz = CEE 7/VII (EUROPE)
240V50Hz = CEE 7/VII (EUROPE)

Approximate shipping wt:

12 lb. (5.4 kg)



The Exclusive Patented

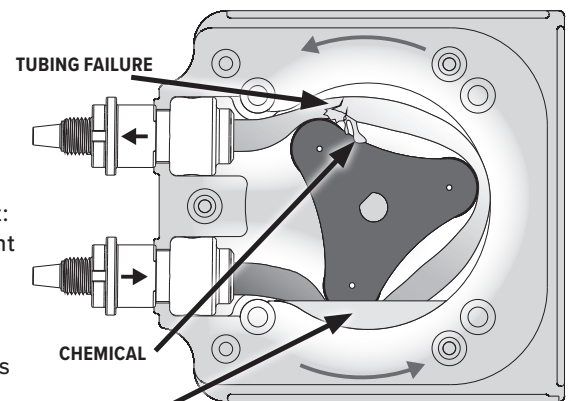
Tube Failure Detection System



BLUE-WHITE'S EXCLUSIVE PATENTED TUBE FAILURE DETECTION

SYSTEM, no one comes close to this breakthrough technology (U.S. patent: 7,001,153 and 7,284,964). In fact, the TFD may be the most important patent ever awarded for peristaltic metering pumps. The TFD System will detect a wide range of conductive chemicals with no false triggering. If the TFD senses tube failure, the pump will automatically shut off and energize a relay or switch, permitting communication with external equipment, such as a back-up pump or alarm.

Simple, efficient and BUILT-IN to every FLEXFLO® Pump

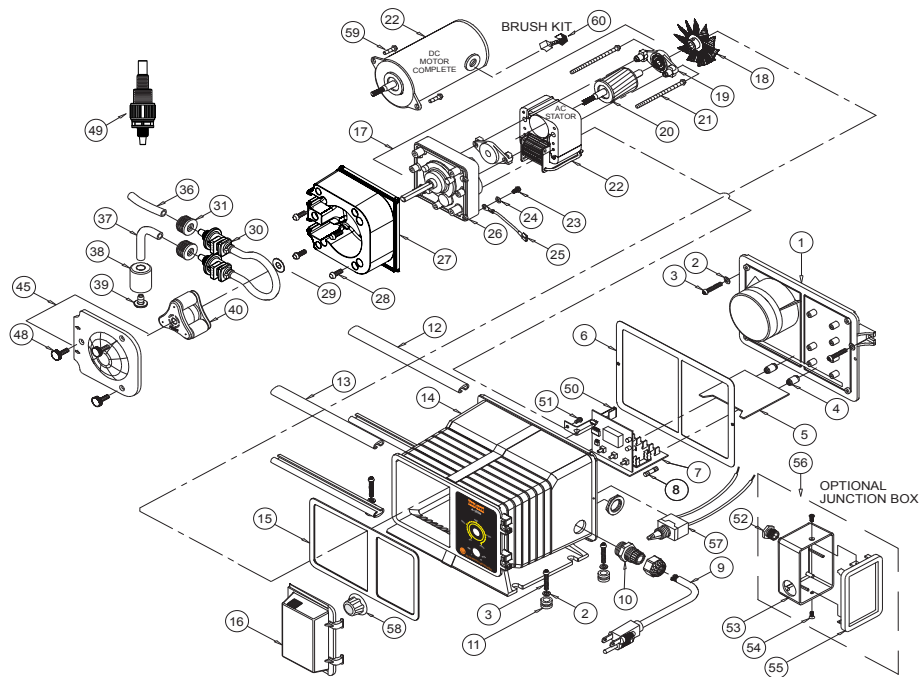


CHEMICAL IS IMMEDIATELY DETECTED IN THE PUMP HEAD. THE PUMP SHUTS DOWN.

A-100N Ordering Matrix

A1N	FLEXFLO [®] Peristaltic Metering Pump
Maximum Motor RPM	
0	14 RPM
1	30 RPM
2	45 RPM
3	60 RPM
Power Cord	
0	115V / 60HZ, power cord NEMA 5/15 plug (US)
1	220V / 50HZ, power cord CEE7/VI plug (EU)
Input/Output Control	
F	Analog Speed Control
V	Digital Speed Control with external input
Pump Tube Material, Pump Tube Size	
1	1/4" OD Flex-A-Thane [®] , 65 PSI
2	3/8" OD Flex-A-Thane [®] , 65 PSI
3	7/16" OD Flex-A-Thane [®] , 50 PSI
4	1/4" OD Flex-A-Prene [®] , 100 PSI
6	3/8" OD Flex-A-Prene [®] , 100 PSI
7	7/16" OD Flex-A-Prene [®] , 50 PSI
8	7/16" OD Flex-A-Chem [®] , 50 PSI
Options (leave this blank for standard model with left facing pump head inlet/outlet)	
X	NSF 61 certified (ships without accessories)
A1N 0 0 F - 1 T - X	Sample Model Number

A-100N[®] Replacement Parts



CHEM-FEED[®] Diaphragm Metering Pumps

CHEM-FEED[®] C-600P Diaphragm Metering Pump

THE CHEM-FEED[®] C-600P DIAPHRAGM METERING PUMP is a simple and economical solution to a wide range of commercial and industrial fluid process applications. This compact pump features an all-ball bearing, permanently lubricated gear motor for smooth, powerful, and quiet operation. Stroke adjustment from 4-100% permits accurate small injections at a high rate per minute.

CHEM-FEED[®] C-600P FEATURES:

BENEFITS

- All ball bearing, permanently lubricated gear motor for smooth, quiet, powerful operation.
- Double-ball inlet and outlet cartridge type ceramic check valves. Chemical resistant PVDF pump head, valve body and fittings, ceramic balls, FKM static seals and TFE/P ball seat orings. No metal springs are used.
- Outputs to 516 GPD.
- Output pressures to 125 PSI.
- Stroke adjustment from 4-100% permits accurate small injections at a high rate per minute. 27:1 turndown.
- PTFE coated Ethylene Propylene diaphragm can handle a wide variety of applications.
- Durable metal epoxy coated construction.
- PVDF suction (foot) valve with FKM and TFE/P o-rings, ceramic check ball and removable polypropylene filter screen.
- Includes 3/8" OD x 1/4" ID suction and discharge tubing, Injection fitting with spring-loaded check valve and all mounting hardware.

CHEM-FEED[®] C-600P SPECIFICATIONS:

Max. working pressure:
125 psig (8.6 bar)

Maximum Fluid Temperature
130° F (54° C)

Maximum Ambient Temperature
14 to 110° F/ -10 to 43° C

Maximum Viscosity
1,000 Centipoise

Maximum Suction Lift
10 ft. Water at sea level (14.7 atm psi)

Operating Voltage
115VAC/60Hz, 1ph (.74 Amp Maximum)
230VAC/60Hz, 1ph (.36 Amp Maximum)
220VAC/50Hz, 1ph (.31 Amp Maximum)
24VAC/60Hz, 1ph (3.40 Amp Maximum)
12VAC/60Hz, 1ph (3.00 Amp Maximum)
24VAC/50Hz, 1ph (1.50 Amp Maximum)



Power Connection
Junction box for field wiring

Motor
AC shaded pole

Duty Cycle Continuous

Output Adjustment Range
4% – 100% motor speed

Enclosure NEMA 1 (IP20) powder coated zinc

Approximate shipping wt 8 lb. (3.63 Kg)

RoHS Compliant Yes

Standards
NSF/ANSI 50, UL, CSA, CE

C-600P Ordering Matrix

C-6 CHEM-FEED[®] Diaphragm Model Number

Maximum Motor RPM*

14	14 RPM	60	60 RPM
30	30 RPM	125	125 RPM
45	45 RPM	250	250 RPM

Power Supply Voltage

115VAC	115V60Hz	24VAC	24V60Hz
220VAC	220V50Hz (20% less output)	12VDC	12V DC
230VAC	230V60Hz	24VDC	24V DC

C-6 14 P - 115VAC Sample Model Number

Optional Accessories and Components

70000-193 PTFE coated FKM diaphragm
90010-110 Power Cord with Plug, 115V
K-568A-4 Bullet Valve (Double Ball), Aflas - 4 Pack
K-568E-4 Bullet Valve (Double Ball), EP - 4 pack

CHEM-FEED® C-600P Diaphragm Metering Pump

THE CHEM-FEED® C-600P DIAPHRAGM METERING PUMP is a simple and economical solution to a wide range of commercial and industrial fluid process applications. This compact pump features an all-ball bearing, permanently lubricated gear motor for smooth, powerful, and quiet operation. Stroke adjustment from 4-100% permits accurate small injections at a high rate per minute.

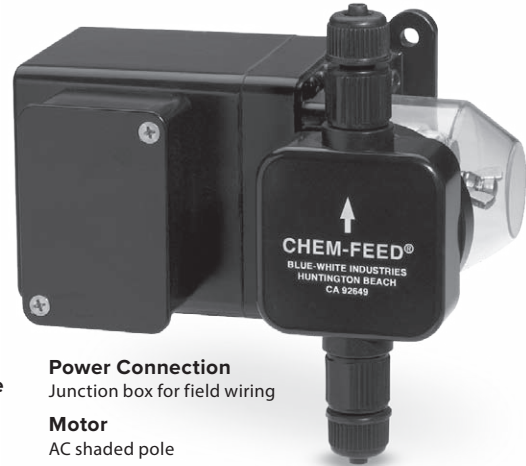
CHEM-FEED® C-600P FEATURES:

BENEFITS

- All ball bearing, permanently lubricated gear motor for smooth, quiet, powerful operation.
- Double-ball inlet and outlet cartridge type ceramic check valves. Chemical resistant PVDF pump head, valve body and fittings, ceramic balls, FKM static seals and TFE/P ball seat orings. No metal springs are used.
- Outputs to 516 GPD.
- Output pressures to 125 PSI.
- Stroke adjustment from 4-100% permits accurate small injections at a high rate per minute. 27:1 turndown.
- PTFE coated Ethylene Propylene diaphragm can handle a wide variety of applications.
- Durable metal epoxy coated construction.
- PVDF suction (foot) valve with FKM and TFE/P o-rings, ceramic check ball and removable polypropylene filter screen.
- Includes 3/8" OD x 1/4" ID suction and discharge tubing, Injection fitting with spring-loaded check valve and all mounting hardware.

CHEM-FEED® C-600P SPECIFICATIONS:

- Max. working pressure:**
125 psig (8.6 bar)
- Maximum Fluid Temperature**
130° F (54° C)
- Maximum Ambient Temperature**
14 to 110° F / -10 to 43° C
- Maximum Viscosity**
1,000 Centipoise
- Maximum Suction Lift**
10 ft. Water at sea level (14.7 atm psi)
- Operating Voltage**
115VAC/60Hz, 1ph (.74 Amp Maximum)
230VAC/60Hz, 1ph (.36 Amp Maximum)
220VAC/50Hz, 1ph (.31 Amp Maximum)
24VAC/60Hz, 1ph (3.40 Amp Maximum)
12VAC/60Hz, 1ph (3.00 Amp Maximum)
24VAC/50Hz, 1ph (1.50 Amp Maximum)



Power Connection

Junction box for field wiring

Motor

AC shaded pole

Duty Cycle

Continuous

Output Adjustment Range

4% - 100% motor speed

Enclosure

NEMA 1 (IP20) powder coated zinc

Approximate shipping wt

8 lb. (3.63 Kg)

RoHS Compliant

Yes

Standards

NSF/ANSI 50, UL, CSA, CE

C-1500N Ordering Matrix

C15N		0		Sample Model Number	
Maximum Motor RPM				Footvalve	
1 = 30 RPM				0 = C-340 (PVDF/Polypropylene)	
2 = 45 RPM				1 = C-340 (PVDF/Polypropylene - bulkhead mount)	
3 = 60 RPM				Injection Fitting	
4 = 125 RPM				0 = A-014N (Polypropylene - 1/2 lb spring)	
				1 = C-395N (Polypropylene - 6 lb spring)	
				7 = A-014PN (PP1/2 lb short depth)	
				8 = C-395PN (PP 6 lb spring)	
				X = None	
				Elastomer Material	
				V = Viton	
				E = EP	
				Diaphragm Style	
				0 = Lg. PTFE/EP	
				6 = Sm. PTFE/EP	
				Pump Head Style	
				0 = Lg. Diaphragm	
				2 = Sm. Diaphragm	
				4 = Lg. Diaphragm Carwash	
				6 = Sm. Diaphragm Carwash	
				Optional Accessories and Components	
				C-340-6T PTFE Foot Valve	
				A-014NK-6A PVDF Injector (1/2 psi spring)	
				C-395NK-6A PVDF Injector (6 psi spring)	
				C-406VT-15N Large Diaphragm, PTFE/Viton	
				R-106VT-15N Small Diaphragm PTFE/Viton	
				Contact Factory for alternate bullet cartridge options	
Power Supply (motor protection)					
0 = 115V60Hz(IP) 7 = 24V50Hz(none)*					
1 = 220V50Hz (20% less output) (IP)					
2 = 230V60Hz (IP)					
3 = 24V60Hz (IP)					
4 = 115V60Hz(TP)					
5 = 220V50Hz(TP)					
6 = 230V60Hz(TP)					
8 = 240V50Hz(TP)					
IP = Impedance protection, TP = Thermal protection *Intermittent duty only					
Cam Stroke Length					
1 = .125"					
2 = .055"					
3 = .187"					
4 = .100"					
Output Control & Electrical					
X = Standard Equipment					
A = Junction Box Replaces Power Cord					
Pump Head Material					
0 = Injection molded PVDF					

CHEM-FEED[®] Diaphragm Metering Pumps

CHEM-FEED[®] C-600HV Diaphragm Metering Pump

THE CHEM-FEED[®] C600HV (HIGH VOLUME) DIAPHRAGM METERING PUMP is a simple and economical solution to a wide range of commercial and industrial fluid process applications. This compact pump features an all ball bearing, permanently lubricated gear motor for smooth, powerful, and quiet operation. Stroke adjustment from 4-100% permits accurate small injections at a high rate per minute.



C-600HV Ordering Matrix

C-6 CHEM-FEED[®] High Volume (HV) Diaphragm Model Number

Maximum Motor RPM*

60	60 RPM
125	125 RPM
250	250 RPM

Power Supply Voltage

115VAC	115V60Hz	240VAC	240V60Hz
220VAC	220V50Hz (20% less output)	12VDC	12V DC
230VAC	230V60Hz	24VDC	24V DC

C-6 60 HV 115VAC Sample Model Number

NOTE: See the output specifications below.

Optional Accessories and Components

C-3106NV FKM Diaphragm
 F-5012V FKM O-ring (2 req.)
 C-926V FKM Check (2 req.)
 90010-110 Power Cord with Plug, 115V

Vertical Immersible Pumps

Hayward T Series Vertical Seal-less Immersible Pump 1/3, 1/2, 3/4, 1, 1-1/2 Hp



The new T Series Webster by Hayward thermoplastic pump features a single, non-coupled motor/impeller shaft with a proprietary patent-pending shaft seal.

Compared to a pump with a coupled shaft and o-ring seal, the T Series design combines the multiple components into one thereby reducing the possibility of failure by components.

The new shaft seal is made from PTFE allowing greater chemical compatibility and less wear due to degradation over time that would reduce pump performance.

The shaft sleeve has also been extended to move the seal point up and away from the weep hole protecting the metal shaft as well as centralizing the sleeve.

The new T Series is offered in CPVC as standard for the pump head assembly, with GFPP and PVDF as optional materials.

KEY FEATURES

- Single, Non-Coupled Motor Shaft 303 SS
- Proprietary, Patent-Pending PTFE Shaft Seal
- Extended Shaft Sleeve

BENEFITS

- Solid, Stable One-Piece Shaft
- Seal Point Away from Weep Hole
- Less Vibration
- Runs True

TYPICAL APPLICATIONS

- Chemical Processing and Transfer
- Metal Plating
- Waste and Water Treatment
- Mining
- Aquatic and Animal Life Support Systems
- Electronics

OPTIONS

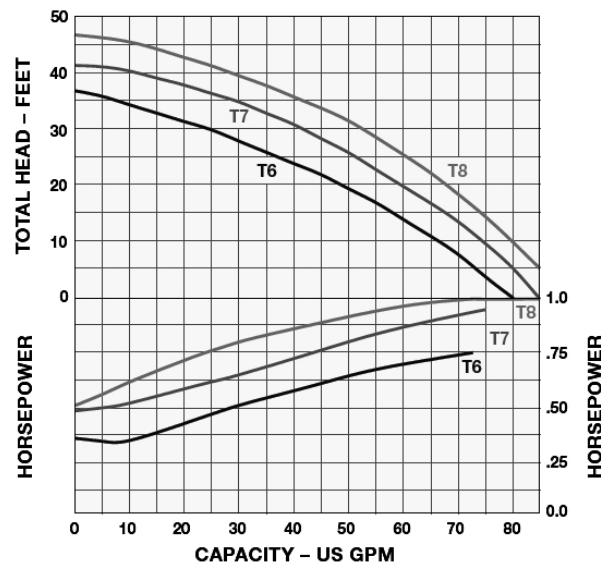
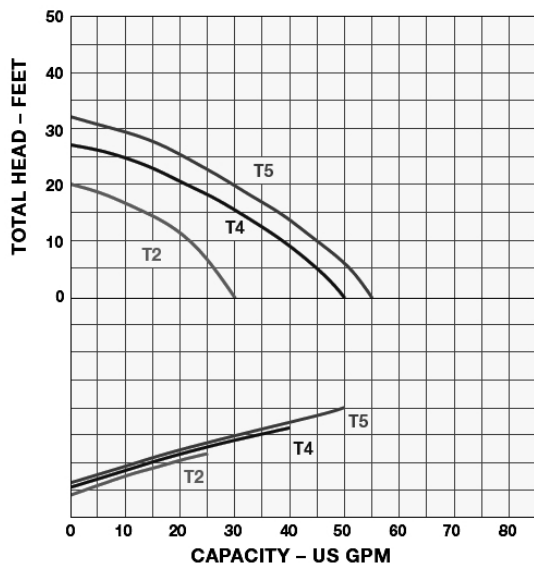
- Optional Inlet Screen
- In-Tank Filtration
- Impeller Trim Variations
- Explosion-Proof Motors
- Wash-Down Motors
- 575V Motors

MATERIALS

- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- PVDF per ASTM D3222, II



PUMP PERFORMANCE CURVES – 60 HZ



6 PUMPS & FILTRATION



Vertical Immersible Pumps

Hayward D Series Vertical Seal-Less Immersible Pumps

1/8 HP



KEY FEATURES

- CPVC, Natural PP and PVDF
- No Seals to Leak or Replace
- PTFE Fume Barrier
- FPM Elastomer
- Optional Inlet Screens

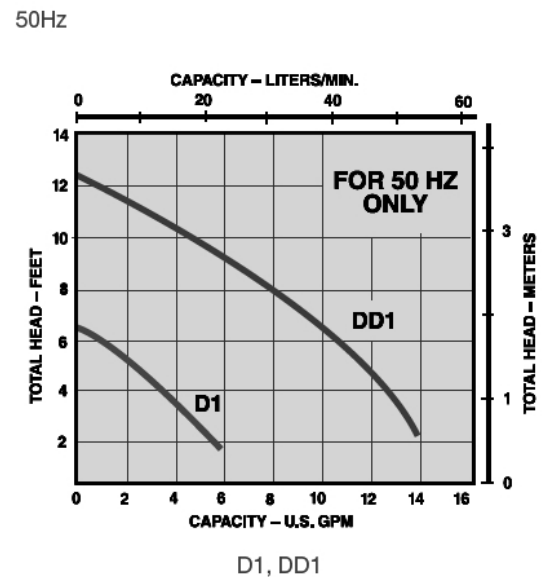
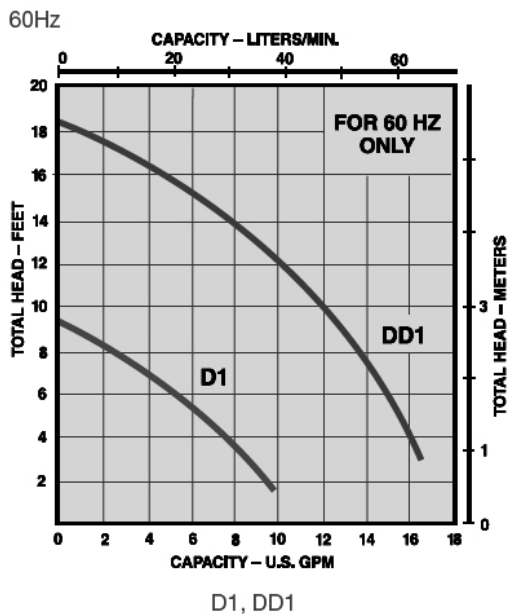
OPTIONS

- In-Tank Filtration
- Inlet Screens
- EPDM Elastomer
- Impeller Trim Variations
- Explosion Proof Motors
- Washdown Motors
- 575V Motors
- S-J Type Electrical Cord

MATERIALS

- CPVC Cell Class 23447 per ASTM D1784
- PP per ASTM D4101
- GFPP Cell Class 85580 per ASTM D4101
- PVDF

PERFORMANCE CURVES



Hayward Plastic Y-Strainers



Hayward® Y-Strainers protect piping system components from damage caused by dirt or debris in the process media. They cost less than other types of strainers and are light weight and very compact. Because they can often be supported by the pipeline alone, they work in applications where other types of strainers cannot.

Hayward® Y-Strainers are supplied with a 1/32" perforated plastic screen. This screen is ultrasonically welded, not glued, for superior strength. Screens fabricated from Type 316 stainless steel are also available in openings from 1/2" down to a super fine 325 mesh. All screens have an open area at least twice that of the equivalent pipe size cross-sectional area to minimize pressure drop.

All sizes of Hayward® Y-Strainers feature a heavy-duty hex cap that permits quick and easy removal of the strainer screen when cleanout becomes necessary. Hayward® Y-Strainers work equally well in the horizontal or vertical position, simplifying piping system layout. This strainer is available in clear PVC which permits viewing of the strainer screen in operation. This helps determine when it needs cleaning based on a visual check of the amount of debris retained by the screen. These Y-Strainers are available in sizes from 1/2" to 2" with socket or threaded pipe connections.

PVC

PART #	SIZE	END CONN.
YS10050T	1/2"	Thread
YS10050S	1/2"	Socket
YS10075T	3/4"	Thread
YS10075S	3/4"	Socket
YS10100T	1"	Thread
YS10100S	1"	Socket
YS10125T	1-1/4"	Thread
YS10125S	1-1/4"	Socket
YS10150T	1-1/2"	Thread
YS10150S	1-1/2"	Socket
YS10200T	2"	Thread
YS10200S	2"	Socket
YS10200F	2"	Flanged
YS10250T	2-1/2"	Thread
YS10250S	2-1/2"	Socket
YS10250F	2-1/2"	Flanged
YS10300T	3"	Thread
YS10300S	3"	Socket
YS10300F	3"	Flanged
YS10400T	4"	Thread
YS10400S	4"	Socket
YS10400F	4"	Flanged

CPVC

PART #	SIZE	END CONN.
YS20050T	1/2"	Thread
YS20050S	1/2"	Socket
YS20075T	3/4"	Thread
YS20075S	3/4"	Socket
YS20100T	1"	Thread
YS20100S	1"	Socket
YS20125T	1-1/4"	Thread
YS20125S	1-1/4"	Socket
YS20150T	1-1/2"	Thread
YS20150S	1-1/2"	Socket
YS20200T	2"	Thread
YS20200S	2"	Socket
YS20200F	2"	Flanged
YS20250T	2-1/2"	Thread
YS20250S	2-1/2"	Socket
YS20250F	2-1/2"	Flanged
YS20300T	3"	Thread
YS20300S	3"	Socket
YS20300F	3"	Flanged
YS20400T	4"	Thread
YS20400S	4"	Socket
YS20400F	4"	Flanged

CLEAR PVC

PART #	SIZE	END CONN.
YS00050T	1/2"	Thread
YS00050S	1/2"	Socket
YS00075T	3/4"	Thread
YS00075S	3/4"	Socket
YS00100T	1"	Thread
YS00100S	1"	Socket
YS00125T	1-1/4"	Thread
YS00125S	1-1/4"	Socket
YS00150T	1-1/2"	Thread
YS00150S	1-1/2"	Socket
YS00200T	2"	Thread
YS00200S	2"	Socket



Features

- Horizontal or Vertical Installation
- 2:1 Open Air Ratio
- Hex Cap for Easy Access to Screen
- Plastic Screen has 1/32" Perforation
- Two-Year Warranty

Options

- Stainless Steel Strainer Screens
- True Union Design
- EPDM O-Rings Seals

Notes:

- All Y-Strainers have an FPM o-ring seal and are assembled with silicone free lubricant. Each Y-Strainer includes one 1/32" perforated plastic screen.
- Y-strainers are available with Stainless steel screens. To replace the plastic screen with an all stainless one, there will be a price added. Screens have some plastic components.
- Stainless steel screens are available in perforations of 1/32", 1/16", 1/8", 3/16", & 1/2". 1/2" perf offered only on 1-1/2" and larger Y-strainers.
- Stainless steel mesh screens come in sizes 20, 40, 60, 80, 100, 200 and 325

Basket Strainers

Hayward SB Series Simplex Basket Strainers

1/2" TO 8" PVC, CPVC, GFPP BLACK, GFPP PLATINUM AND EASTAR®



NSF

PVC and CPVC

KEY FEATURES

- PVC, CPVC, GFPP and Eastar®
- True Union
- Ergonomic Hand-Removable Cover
- In-Line or Loop Connections
- External Cover Threads
- Integral Flat Mounting Bases
- PVC or CPVC Baskets Standard
- NSF/ANSI 61 Listed

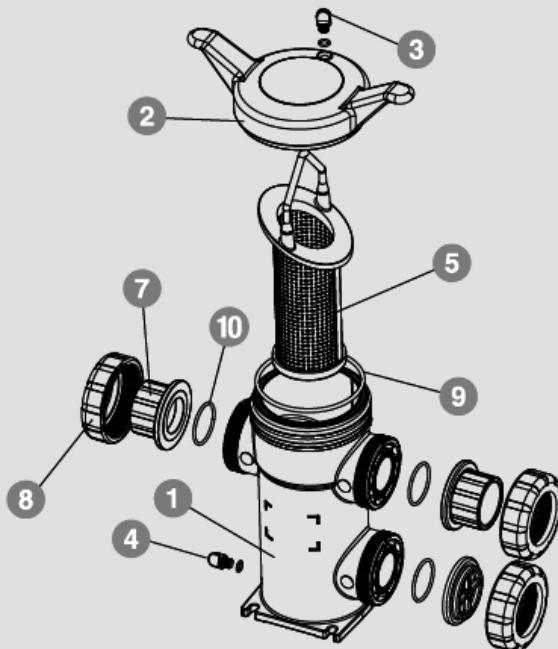
OPTIONS

- Stainless Steel, Monel®, Hastelloy® and Titanium Strainer Baskets
- Pressure Differential Gauge and Switch
- Baskets Available with Perforated or Mesh Liners

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- GFPP Cell Class 85580 per ASTM D4101
- Eastar®
- FPM and EPDM O-Ring Seals

EXPLODED VIEW



SELECTION CHART

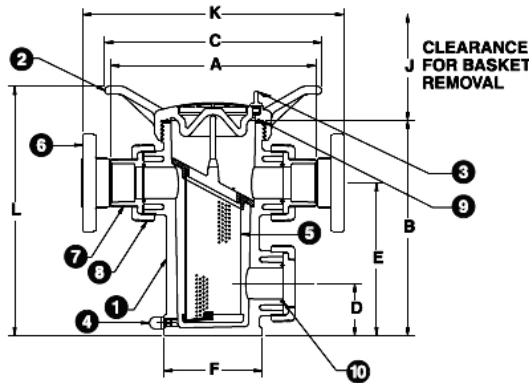
SIZE	MATERIAL	END CONNECTION	SEALS	PRESSURE RATING
1/2" - 4" (DN15 - DN100)	PVC or CPVC	Socket, Threaded or Flanged	FPM or EPDM	150 PSI @ 70°F Non-Shock
	Eastar®*			100 PSI @ 70°F Non-Shock
	GFPP	Threaded or Flanged		150 PSI @ 70°F Non-Shock

* End connections and assembly nuts are PVC

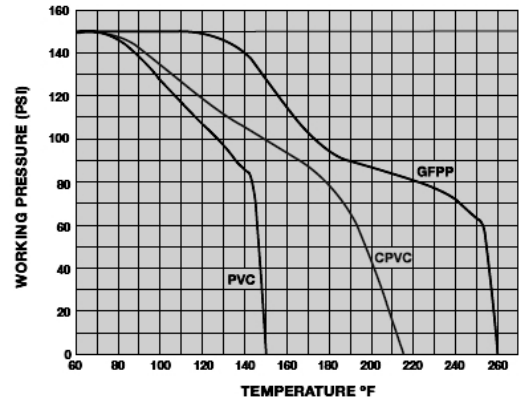
Technical Information

PARTS LIST

1. Body
2. Cover
3. Vent Plug and O-Ring
4. Drain Plug and O-Ring
5. Basket
6. Flange (Optional)
7. End Connector
8. Nut
9. Cover O-Ring
10. End Connector O-Ring



OPERATING TEMPERATURE/PRESSURE



Cv VALUES

SIZE IN/DN	Cv VALUES
1 / 2 / 15	15
3 / 4 / 20	18
1 / 25	20
1-1/4 / 32	55
1-1/2 / 40	58
2 / 50	60
2 1/2 / 65	290
3 / 80	300
4 / 100	350
6 / 150	1000
8 / 200	750

The above Cv Values were determined using a 1/16" perforated plastic basket in 1/2" through 4" strainers.

To calculate pressure drop through vessels using other than 1/16" perforated baskets, first calculate the pressure drop using the listed Cv, and then multiply the result by the correction factor in the Correction Factors chart to the left.

BASKET PERFORATION CORRECTION FACTORS

FOR 1/2" TO 4" STRAINERS

PLASTIC		STAINLESS STEEL			
1/32"	1.05	1/32"	.82	20 Mesh	.79
1/16"	1.00	1/16"	.74	40 Mesh	1.01
1/8"	.58	1/8"	.58	60 Mesh	1.20
3/16"	.46	5/32"	.37	80 Mesh	1.16
		3/16"	.46	100 Mesh	1.20
		1/4"	.58	200 Mesh	1.09
		3/8"	.45	325 Mesh	1.22

PVC

PART #	SIZE	END CONN.
SB1050SF	1/2"	Flanged
SB1075ST	3/4"	Skt/Thd
SB1075SF	3/4"	Flanged
SB1100ST	1"	Skt/Thd
SB1100F	1"	Flanged
SB1125ST	1-1/4"	Skt/Thd
SB1125F	1-1/4"	Flanged
SB1150ST	1-1/2"	Skt/Thd
SB1150F	1-1/2"	Flanged
SB1200ST	2"	Skt/Thd
SB1200F	2"	Flanged
SB1250T	2-1/2"	Threaded
SB1250S	2-1/2"	Socket
SB1250F	2-1/2"	Flanged
SB1300T	3"	Threaded
SB1300S	3"	Socket
SB1300F	3"	Flanged
SB1400T	4"	Threaded
SB1400S	4"	Socket
SB1400F	4"	Flanged
SB1600FT	6"	Flanged
SB1800FT	8"	Flanged

CPVC

PART #	SIZE	END CONN.
SB2050SF	1/2"	Flanged
SB2075ST	3/4"	Skt/Thd
SB2075SF	3/4"	Flanged
SB2100ST	1"	Skt/Thd
SB2100F	1"	Flanged
SB2125ST	1-1/4"	Skt/Thd
SB2125F	1-1/4"	Flanged
SB2150ST	1-1/2"	Skt/Thd
SB2150F	1-1/2"	Flanged
SB2200ST	2"	Skt/Thd
SB2200F	2"	Flanged
SB2250T	2-1/2"	Threaded
SB2250S	2-1/2"	Socket
SB2250F	2-1/2"	Flanged
SB2300T	3"	Threaded
SB2300S	3"	Socket
SB2300F	3"	Flanged
SB2400T	4"	Threaded
SB2400S	4"	Socket
SB2400F	4"	Flanged
SB2600FT	6"	Flanged
SB2800FT	8"	Flanged

For 6-8" Strainers Contact Fabco

Basket Selection

- The 1/2" to 1" strainers can be ordered with either a 1/32" or 1/16" perf plastic basket.
- The 1 1/2" and 2" with a 1/32", 1/16", 1/8", or 3/16" perf plastic basket.
- The 3" and 4" with a 1/16", 1/8" or 3/16" perf plastic basket.
- The 6" and 8" with a 1/8" or 3/16" perf plastic basket.
- Stainless steel baskets for all size strainers are available in these perfs: 1/32", 3/64", 1/16", 5/64", 7/64", 1/8", 5/32", 3/16", 1/4", 3/8", 1/2"; and in mesh sizes: 20, 40, 60, 80, 100, 200, 325

Baskets

SB and DB Series Replacement/Extra Baskets



It is recommended that one spare basket per strainer be kept on hand at all times.

Stainless steel baskets are made to order and not returnable.

Hastelloy® and Monel available, consult us.

FOR 1/2", 3/4" AND 1"

PERFORATION PART NUMBER

PVC

1/32"	BS11001/32
1/16"	BS11001/16
1/8"	BS11001/8
3/16"	BS11003/16

CPVC

1/32"	BS21001/32
1/16"	BS21001/16
1/8"	BS21001/8
3/16"	BS21003/16

GFPP

1/32"	BS41001/32
1/16"	BS41001/16
1/8"	BS41001/8
3/16"	BS41003/16

316 STAINLESS STEEL PERFORATION*

1/32"	BS7101/32
1/16"	BS7101/16
1/8"	BS7101/8
3/16"	BS7103/16

316 STAINLESS STEEL MESH*

MESH*	PART NUMBER
20	BS71020
40	BS71040
60	BS71060
80	BS71080
100	BS710100

FOR 1-1/4", 1-1/2" AND 2"

PERFORATION PART NUMBER

PVC

1/32"	BS12001/32
1/16"	BS12001/16
1/8"	BS12001/8
3/16"	BS12003/16

CPVC

1/32"	BS22001/32
1/16"	BS22001/16
1/8"	BS22001/8
3/16"	BS22003/16

GFPP

1/32"	BS42001/32
1/16"	BS42001/16
1/8"	BS42001/8
3/16"	BS42003/16

316 STAINLESS STEEL PERFORATION*

1/32"	BS7201/32
1/16"	BS7201/16
1/8"	BS7201/8
3/16"	BS7203/16

316 STAINLESS STEEL MESH*

MESH*	PART NUMBER
20	BS72020
40	BS72040
60	BS72060
80	BS72080
100	BS720100

FOR 2-1/2", 3" AND 4"

PERFORATION PART NUMBER

PVC

1/32"	BS14001/32
1/16"	BS14001/16
1/8"	BS14001/8
3/16"	BS14003/16

CPVC

1/32"	BS24001/32
1/16"	BS24001/16
1/8"	BS24001/8
3/16"	BS24003/16

GFPP

1/32"	BS44001/32
1/16"	BS44001/16
1/8"	BS44001/8
3/16"	BS44003/16

316 STAINLESS STEEL PERFORATION*

1/32"	BS7401/32
1/16"	BS7401/16
1/8"	BS7401/8
3/16"	BS7403/16

316 STAINLESS STEEL MESH*

MESH*	PART NUMBER
20	BS74020
40	BS74040
60	BS74060
80	BS74080
100	BS740100

FOR 6"

PERFORATION PART NUMBER

PVC

1/32"	BS16001/32
1/16"	BS16001/16
1/8"	BS16001/8
3/16"	BS16003/16

CPVC

1/32"	BS26001/32
1/16"	BS26001/16
1/8"	BS26001/8
3/16"	BS26003/16

316 STAINLESS STEEL PERFORATION*

1/32"	BS76001/32
1/16"	BS76001/16
1/8"	BS76001/8
3/16"	BS76003/16

316 STAINLESS STEEL MESH*

MESH*	PART NUMBER
20	BS76001420
40	BS76001440
60	BS76001460
80	BS76001480
100	BS760014100

FOR 8"

PERFORATION PART NUMBER

PVC

1/32"	BS18001/32
1/16"	BS18001/16
1/8"	BS18001/8
3/16"	BS18003/16

CPVC

1/32"	BS28001/32
1/16"	BS28001/16
1/8"	BS28001/8
3/16"	BS28003/16

316 STAINLESS STEEL PERFORATION*

1/32"	BS78001/32
1/16"	BS78001/16
1/8"	BS78001/8
3/16"	BS78003/16

316 STAINLESS STEEL MESH*

MESH*	PART NUMBER
20	BS78001420
40	BS78001440
60	BS78001460
80	BS78001480
100	BS780014100

FOR 200 MESH ONLY*

SIZES PART NUMBER

1/2" - 1	BS710200
1-1/4" - 2	BS720200
2-1/2" - 4	BS740200
6"	BS760014200
8"	BS780014200

FOR 325 MESH ONLY*

1/2" - 1	BS710325
1-1/4" - 2	BS720325
2-1/2" - 4	BS740325
6"	BS760014325
8"	BS780014325

Hayward FLV Series Simplex Bag Filters

DOUBLE LENGTH – 32" GFPP

1-1/4" TO 2" PIPE SIZES



Note: May not be exactly as shown

KEY FEATURES

- Platinum Glass Filled Polypropylene
- One-Piece Injection Molded Construction
- Hand Removable, Ergonomic Cover with Liquid Displacing Dome
- Vent Valve Included on Cover
- Rated up to 100 GPM (1 1/4 - 2" Pipe Size)
- Rated up to 150 GPM (2 1/2 - 4" Pipe Size *GFPP ONLY)
- True Union Socket, Threaded or Flanged End Connections
- In-Line or Loop Flow Configurations
- Solid Basket
- Drain Port at Bottom
- Integral Mounting Base

BENEFITS

- Easier Installations Due to True Union Connectivity
- Vertical Flow Flutes in Basket, No Bag Snag and More Flow Area

TYPICAL APPLICATIONS

- Water and Wastewater Treatment
- Desalinization, RO and Deionized Water Systems
- Chemical Processing
- Food and Beverage
- Aquatic and Animal Life Support Systems
- Metal Finishing and Plating
- Marine and Corrosive Environments

OPTIONS

- Single length 16" (1 1/4-2" Pipe Size)
- Gauge with Gauge Guard
- Pressure Differential Gauge and Switch
- EPDM O-Ring Seals
- Cartridge Adapters
- Hinged Basket
- 316 Stainless Steel Basket

MATERIALS

- GFPP per ASTM D4101, Cell Class 85580
- FPM Standard O-Ring Seals
- PVC/CPVC

Technical Information

Size/Body Material	End Connections	Piping Sizes	O-Ring Seals	Pressure Rating (Bar)
Double Length 7"x32" GFPP	GFPP (Threaded and Flanged) PVC (Socket) CPVC (Socket)	1-1/4" - 2" rated @ 100GPM* 2-1/2" - 4" rated @ 150GPM (GFPP Only)	FPM or EPDM	150 PSI @ 70 F Non-Shock (10 Bar / 1 MPa @ 21 C)

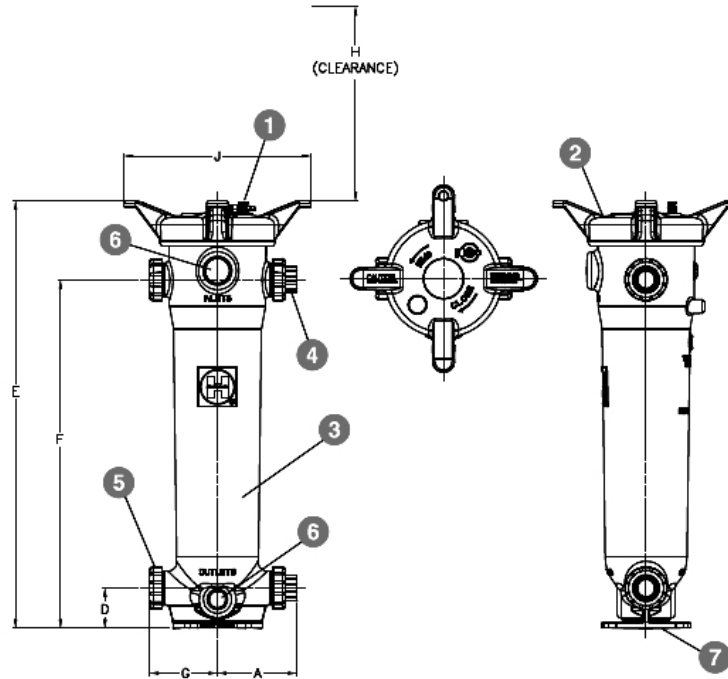
*May be Limited by Pipe Size or Bag Choice

Bag Filters

PARTS LIST*

1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

* See page 8 for a complete Parts List



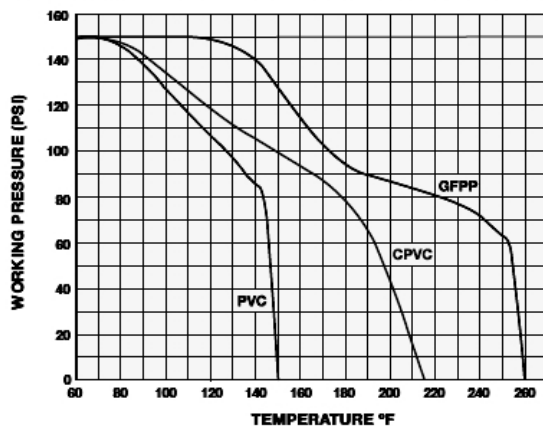
DIMENSIONS

FILTER SIZE	A	D	E	F	G	H	J
IN/DIN	IN/MM	IN/MM	IN/MM	IN/MM	IN/MM	IN/MM	IN/MM
1-1/4/32	8.86/225	4.50/114	47.83/1215	39.00/193	7.80/193	31.25/794	20.93/532
1-1/2/40	8.86/225	4.50/114	47.83/1215	39.00/193	7.80/193	31.25/794	20.93/532
2/50	8.91/226	4.50/114	47.83/1215	39.00/193	7.80/193	31.25/794	20.93/532
2-1/2/55	8.79/249	4.50/114	47.83/1215	39.00/193	8.38/213	31.25/794	20.93/532
3/80	9.73/247	4.50/114	47.83/1215	39.00/193	8.38/213	31.25/794	20.93/532
4/100	10.1/258	4.50/114	47.83/1215	39.00/193	8.38/213	31.25/794	20.93/532

Dimensions are subject to change without notice – consult factory for installation information

* Clearance from top for basket removal

OPERATING TEMPERATURE / PRESSURE



1 1/4 - 2"

Flow Rate: 100 GPM (May be Limited by Pipe Size or Bag Choice)

Weight: 64.1 lbs.

SPECIFICATIONS

Material of Construction: GFPP

Inlet Connections: GFPP (Threaded and Flanged)
PVC (Socket)
CPVC (Socket)

Outlet Connections: GFPP (Threaded and Flanged)
PVC (Socket)
CPVC (Socket)

Bag Size: Bag Size #2: 7" x 32"

Pressure Rating: 150 PSI @ 70°F Non-Shock

O-Ring Seals: FPM or EPDM

Bag Ratings: 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns

2 1/2" - 4"

Flow Rate: 150 GPM (May be Limited by Pipe Size or Bag Choice)

Weight: 69.1 lbs.

FLV Series PVC & CPVC Bag Filters

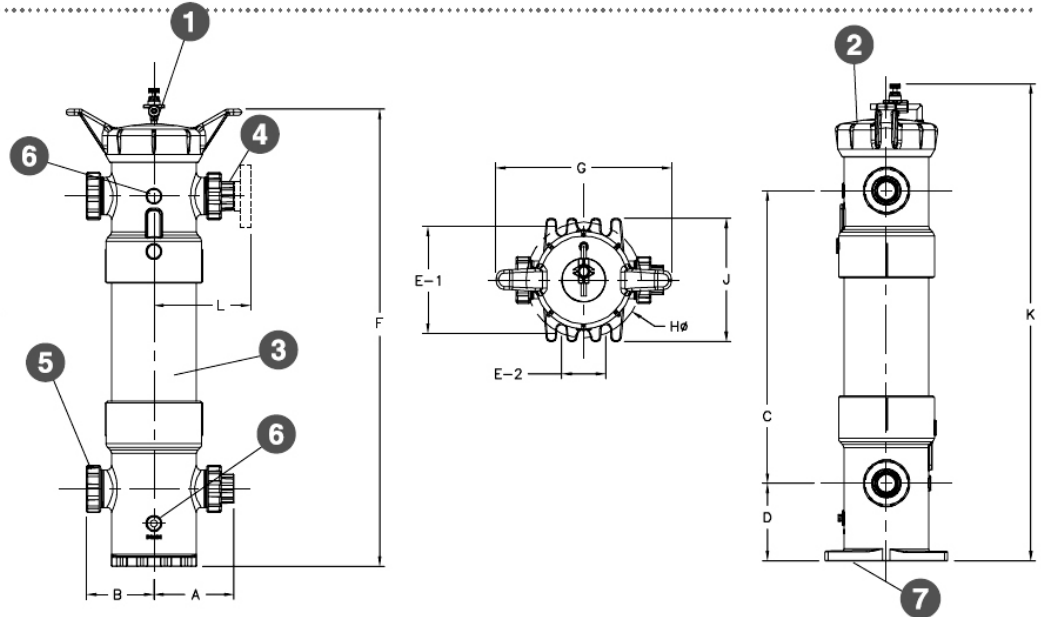
DOUBLE LENGTH – 32"

1-1/4" TO 4" PIPE SIZES

TECHNICAL INFORMATION

PARTS LIST

1. Vent Valve (Included)
2. Cover
3. Filter Vessel Body
4. End Connector
5. Assembly Nut
6. Drain Port & Plug with O-Ring
7. Integrally Molded Mounting Pad

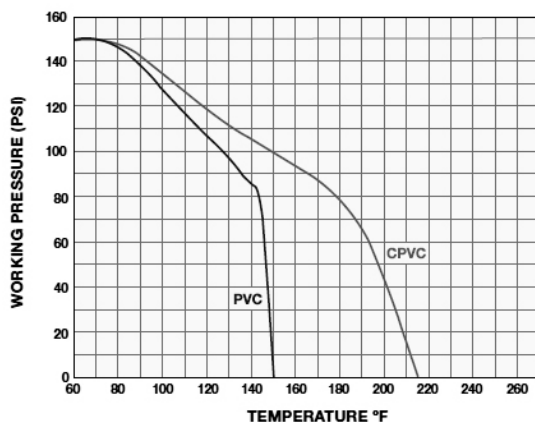


DIMENSIONS

FILTER SIZE	A	B	C	D	E1	E2	F	G	H* B/C	J	K	L
IN/DIN	IN/MM											
1-1/4/32	8.16/ 207	6.88/ 175	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	9.58/ 243
1-1/2/40	8.07/ 205	6.88/ 175	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	9.66/ 245
2/50	8.16/ 207	6.88/ 175	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	9.90/ 251
2-1/2/55	8.92/ 227	7.50/ 191	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	10.96/ 278
3/80	8.83/ 224	7.50/ 191	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	10.85/ 276
4/100	9.24/ 235	7.50/ 191	29.75/ 756	7.87/ 200	10.86/ 276	4.50/ 114	46.50/ 1181	17.90/ 455	11.75/ 298	12.50/ 318	48.0/ 1219	11.70/ 297

Dimensions are subject to change

OPERATING TEMPERATURE / PRESSURE



SPECIFICATIONS

Material of Construction: PVC or CPVC

Inlet Connections: PVC (Socket, Threaded and Flanged)
CPVC (Socket, Threaded and Flanged)

Outlet Connections: PVC (Socket, Threaded and Flanged)
CPVC (Socket, Threaded and Flanged)

Bag Size: Bag Size #2: 7" x 32"

Pressure Rating: 150 PSI @ 70°F Non-Shock

O-Ring Seals: FPM or EPDM

Bag Ratings: 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns

Flow Rate: 100 GPM (May be Limited by Pipe Size or Bag Choice)

Weight: 71 lbs.

Bag Filters

Hayward FLV Series Duplex Bag Filters

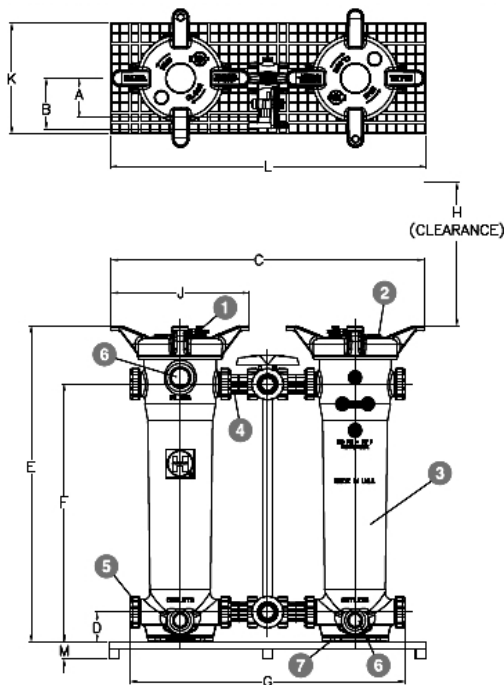
DOUBLE LENGTH – 32" GFPP

2" TO 4" PIPE SIZES

PARTS LIST*

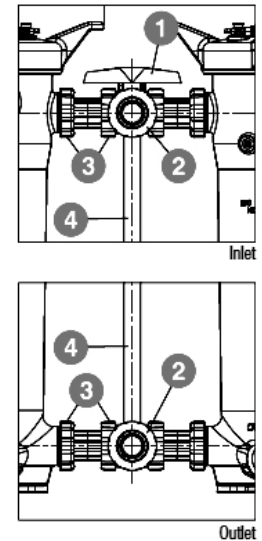
1. Vent Valve (Included)
2. Cover
3. Filter Body
4. End Connector
5. Assembly Nut
6. Alternate 2" NPT Ports
7. Integrally Molded Mounting Pad

* See page 8 for a complete Parts List



PIPING PARTS LIST

1. Handle
2. Hayward® LA Series Three-Way Lateral Valve
3. Spool Assembly (Each Side)
4. Stem Extension Pipe

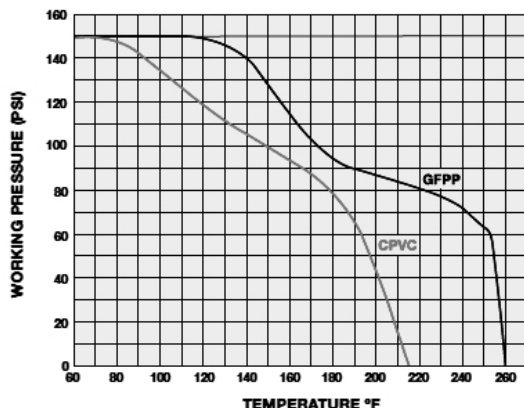


DIMENSIONS

FILTER SIZE	A	B	C	D	E	F	G	H*	J	K	L	M
IN/DIN	IN/MM											
2/50	6.00/ 152	7.77/ 197	47.44/ 1206	4.50/ 1215	47.83/ 1215	39.00/ 991	41.70/ 1059	31.25/ 794	20.93/ 532	16.75/ 425	48.00/ 1219	2.62/ 67
3/80	7.60/ 193	9.95/ 205	55.17/ 1401	4.50/ 1215	47.83/ 1215	39.00/ 991	50.99/ 1295	31.25/ 794	20.93/ 532	16.75/ 425	48.00/ 1219	2.62/ 67
4/100	9.33/ 237	11.76/ 299	55.17/ 1401	4.50/ 1215	47.83/ 1215	39.00/ 991	50.99/ 1295	31.25/ 794	20.93/ 532	16.75/ 425	48.00/ 1219	2.62/ 67

Dimensions are subject to change. *Clearance from top for basket removed

OPERATING TEMPERATURE / PRESSURE



SPECIFICATIONS

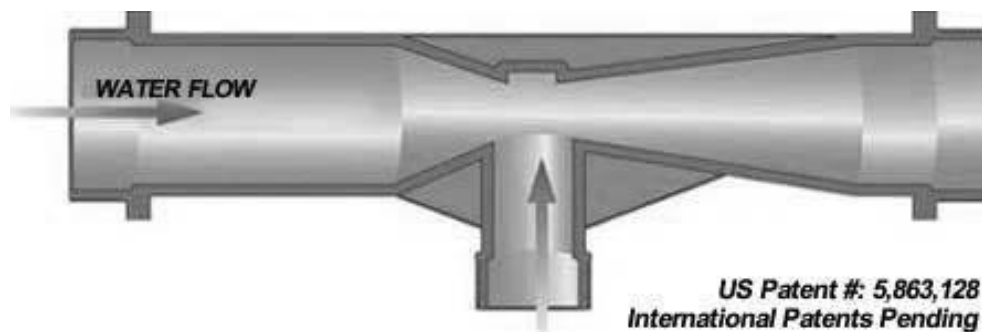
- Material of Construction: GFPP
- Inlet Connections: GFPP (Threaded and Flanged)
CPVC (Socket, Threaded or Flanged)
- Outlet Connections: GFPP (Threaded and Flanged)
CPVC (Socket, Threaded or Flanged)
- Bag Size: Bag Size #2: 7" x 32"
- Pressure Rating: 150 PSI @ 70°F Non-Shock
- O-Ring Seals: FPM or EPDM
- Bag Ratings: 1, 5, 10, 25, 50, 100, 150, 200, 400, 600 and 800 Microns
- Maximum Flow Rates: 100 GPM – 2"
(May be Limited by Pipe Size or Bag Choice)
150 GPM – 3" to 4"
(May be Limited by Pipe Size or Bag Choice)
- Mounting Base: Fiberglass
- Hardware: Stainless Steel
- Weight: up to 2" – 132.0 lbs. / 3" to 4" – 145.0 lbs.

Mazzei Injectors

Mazzei® Injectors are high efficiency, Venturi-type, differential pressure injectors. A pressure difference between the inlet and outlet ports of the injector creates a vacuum inside the injector body, which initiates suction through the suction port.

How a Mazzei® Injector Works

When a pressurized operating (motive) fluid enters the injector inlet, it is constricted toward the injection chamber and changes into a high velocity jet stream. The increase in velocity through the injection chamber results in a decrease in pressure, thereby enabling an additive material to be drawn through the suction port and entrained into the motive stream. As the jet stream is diffused toward the injector outlet its velocity is reduced and it is reconverted into pressure energy (but at a pressure lower than injector inlet pressure). Mazzei® Injectors are extremely efficient. They operate over a wide range of pressures and require only a minimal pressure differential between inlet and outlet sides to initiate a vacuum at the suction for either liquid or gas.



Applications

- Chemical
- Wastewater treatment
- Chlorination
- Pulp & Paper Slurries
- Printing inks
- Oil based fluids
- Gaseous fluids
- Shear sensitive fluids
- Caustics
- Chemical Slurries
- Food and Beverage

Special Features

- Considerable cost savings versus other injection methods
- Single unit construction-Trouble free operation with no moving parts
- No electrical connections needed
- Can run dry with no problems
- Molded of: Polypropylene, PVDF (KYNAR) or 316 L Stainless Steel
- Flow ranges of 1/2 GPM (2 liters/min.) through 4,000 GPM (15 m³ per min)
- ISO-R (BSPT) threads available in Kynar models
- Proven Performance

Mazzei® Injectors are available in High Performance PVDF (Kynar®)

- PVDF is an advanced thermoplastic that is superior to other types including PVC, Polypropylene & Polyethylene
- Stronger/Higher pressure and temperature-handling capabilities
- Resistant to ozone
- Greater chemical resistance / Resistant to Chlorine, Sulfuric and Nitric Acids
- Abrasion and wear resistant
- Sunlight (UV) resistant

Things you need to know

1. What do you want to inject (i.e. liquid or gas?)
2. How much do you want to inject (i.e. liquid in GPH or gas in scfh?)
3. Motive Flow Rate (i.e. how much water needs to run through the injector?)
4. Inlet Pressure in psi (i.e. what is the pressure upstream from the injector?)**
5. Outlet Pressure in psi (i.e. what pressure will the injector see downstream?)**

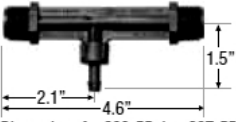
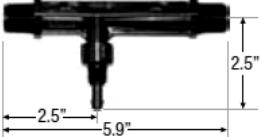
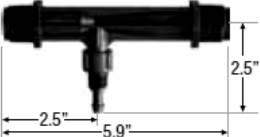


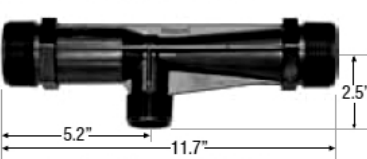
Mazzei® Injectors are of very high quality and are technically designed for exact performance. In order to select the right injector for your application please contact Fabco so that we can match your requirement to the Mazzei® performance tables.

**Remember, for the injector to operate it must experience a higher inlet pressure than outlet pressure (called the differential pressure). Our injectors are very efficient and begin to operate with as little as 20% differential pressure!

Injectors

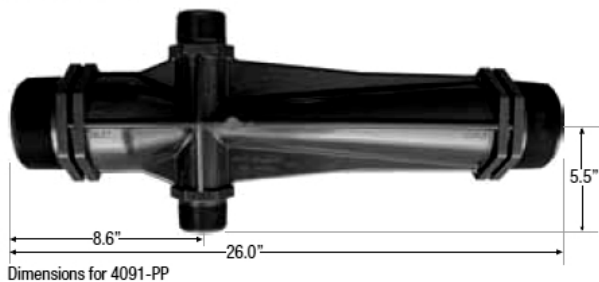
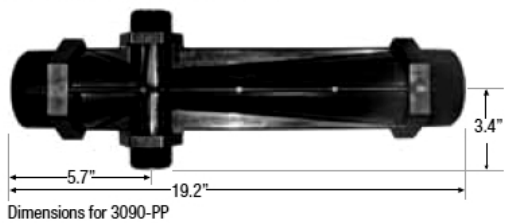
Mazzei® Injectors

NPT

	Part Number	Inlet & Outlet (Nominal Pipe Size) Male NPT	Suction Port		Weight (with Box)
			Barb (Inner Diameter)	Thread (Nominal Pipe Size)	
Black Polypropylene					
 <p>Dimensions for 283-PP thru 287-PP</p>	283-PP	1/2"	1/4"	N/A	0.07 lbs
	287-PP	1/2"	1/4"	N/A	0.07 lbs
 <p>Dimensions for 384-PP thru 584C-PP</p>	384-PP	1/2"	1/4"	1/4"	0.14 lbs
	384X-PP	1/2"	1/4"	1/4"	0.14 lbs
	484-PP	1/2"	1/4"	1/4"	0.14 lbs
	584C-PP	1/2"	1/4"	1/4"	0.14 lbs
	484A-PP	3/4"	1/4"	1/4"	0.16 lbs
 <p>Dimensions for 484A-PP thru 584-PP</p>	584-PP	3/4"	1/4"	1/4"	0.16 lbs
	878-03-PP	1"	1/2"	1/2"	0.34 lbs
 <p>Dimensions for 878-03-PP thru 1078-03-PP</p>	885X-03-PP	1"	1/2"	1/2"	0.34 lbs
	978-03-PP	1"	1/2"	1/2"	0.34 lbs
	1078-03-PP	1"	1/2"	1/2"	0.34 lbs
	1583A-PP	1 1/2"	1/2"	1/2"	0.61 lbs
	1584A-PP	1 1/2"	1/2"	1/2"	0.57 lbs
 <p>Dimensions for 1583A-PP thru 1587-PP</p>	1585X-PP	1 1/2"	1/2"	1/2"	0.58 lbs
	1587-PP	1 1/2"	1/2"	1/2"	0.59 lbs
	2081A-PP	2"	N/A	1 1/4"	0.87 lbs
	2083X-PP	2"	N/A	1 1/4"	0.92 lbs
 <p>Dimensions for 2081A-PP thru 2083X-PP</p>	3090-PP	3"	N/A	1 1/2" each port	2.45 lbs
	4091-PP	4"	N/A	2" each port	5.78 lbs

Notes:

- Also available in PVDF
- Dimensions and models may vary



6

PUMPS & FILTRATION

Penguin PE Penductor Sparging Eductors



Based on established eductor principles, the Series PE Penductor was designed especially for industrial sparging applications. The nozzle was designed utilizing the same orifice size as a typical 3/8" NPT tank mixing eductor, with a larger connection size, thus giving you the same flow characteristics with less pressure drop. This can reduce the horsepower required on larger systems. The larger connection size allows you to use standard PVC reducing tees without extra bushings or reducing couplings, thus saving you valuable tank space. The diffuser was designed with a larger plume dispersion angle for more uniform agitation and a lower profile to allow you to utilize your tank space more efficiently. The result, the Penductor, a more efficient space-saving eductor made specifically for the surface finishing industry.

Features

- Flows Comparable with Conventional 3/8" Tank Mixing Eductors
- Lower Profile Helps Save Valuable Tank Space and Makes for Easier Retrofits
- Larger Connection Sizes Eliminate Need for Multiple Bushings When Using Standard Fittings or P-Series Pump
- Larger Plume Dispersion Angle Helps Eliminate Dead Spots Between Eductors
- Maximum Temperature 280° F

PART #	IPS SIZE	MATERIAL
PE-3/4B	3/4" FPT	PP
PE-3/4C	3/4" FPT	PVDF
PE-1B	1" MPT	PP
PE-1C	1" MPT	PVDF

Nomenclature

PE Penductor	3/4M Connection Size	C Material of Construction
	3/8M = 3/8" MPT	A = CPVC (Grey)
	3/4F = 3/4" FPT	B = Polypropylene (Blue)
	3/4M = 3/4" MPT	B-1 = Polypropylene (Black)
	1M = 1" MPT	C = PVDF (Black)

Specifications

	10	15	20	25	30	35	40	50
Motive Pressure (PSI)								
Motive Flow (GPM)	7	9	10	11	13	14	15	17
Total Gallons Circulated (GPM)	35	45	50	55	65	70	75	85

Mass Transfer Multiplier (MTM) Mixing Nozzles & Nozzle Manifolds



Get outstanding performance at low pressure differentials

Mazzei MTM mixing nozzles provide dynamic mixing under pressure, which results in great mass transfer. When used in conjunction with the patented Mazzei injector, these nozzles dramatically enhance system mixing and contacting performance. Mazzei nozzles allow the delivery of treatment gases to any depth - all within a compact design, with trouble-free operation and easy installation. Many models are available for various applications.

Mazzei MTM Mixing Nozzles Provide:

- Enhanced gas/liquid interface renewal
- Dynamic mixing under pressure yields greater mass transfer
- Desired back pressure to the Mazzei injector
- Delivery of treatment gases to any depth
- Compact design for trouble-free operation and ease of installation
- Polypropylene (PP) construction for nozzles 3" and larger
- Polyvinylidene Fluoride (PVDF) construction for nozzles 2" and smaller
- Various models designed to match your application

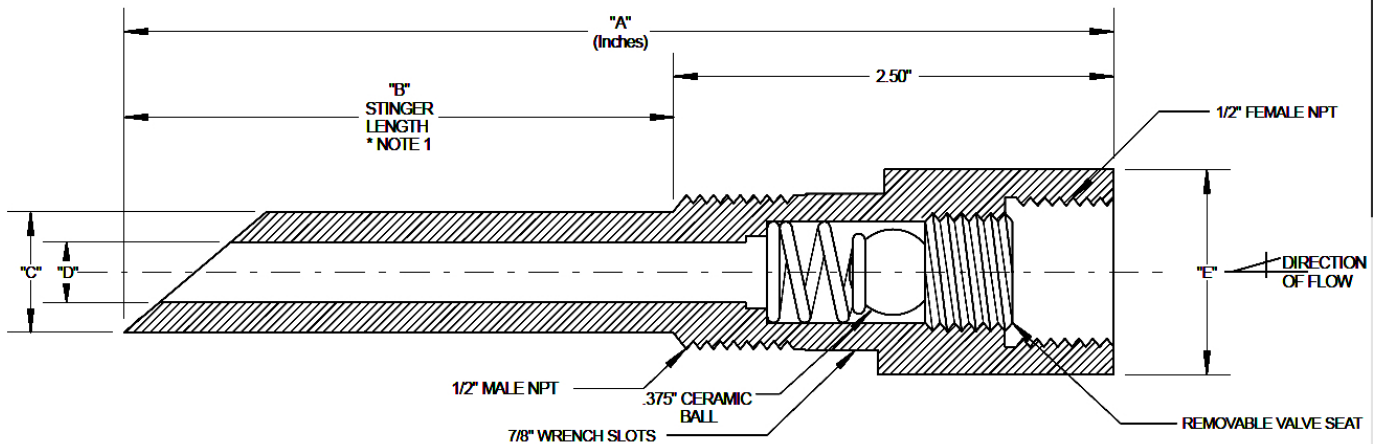


Chemical Injection Valves & Quills

Koflo Chemical Injection Quills



Koflo Chemical Injection Quills are used to introduce medium to highly corrosive chemicals into a pipeline without damage to the side port or pipe wall at the point of injection. Chemical injection quills insure that chemicals are evenly dispersed into the center of the pipeline, which prevents channeling of the chemical down the pipe wall. The body and stinger are both constructed of chemical resistant plastics or alloys (PVC, Kynar, 316 SS, or Hastelloy C-276). Each unit comes complete with an integral removable spring loaded ball check to prevent flow of the injected chemical into the main flow when the system is shut down. Injection quills with stinger lengths of 3" and 5" are available from stock.* All injection quills come with FNPT x MNPT connections for ease of installation.



MODEL	CONN. SIZE	"A"	"B"	"C"	"D"	"E"	BODY MATERIAL	SPRING MATERIAL	BALL MATERIAL	PRESSURE MAX (PSIG)	TEMP MAX. (°F)
QP-.5-3	1/2"	5.5"	3"	.575"	.250"	1.125"	PVC	Hastelloy C	Ceramic	150	140
QP-.5-5	1/2"	7.5"	5"	.575"	.250"	1.125"	PVC	Hastelloy C	Ceramic	150	140
QK-.5-3	1/2"	5.5"	3"	.575"	.250"	1.125"	Kynar	Hastelloy C	Ceramic	150	280
QK-.5-5	1/2"	7.5"	5"	.575"	.250"	1.125"	Kynar	Hastelloy C	Ceramic	150	280
QS-.5-3	1/2"	5.5"	3"	.530"	.350"	1.125"	316 SS	Hastelloy C	Ceramic	3000	500
QS-.5-5	1/2"	7.5"	5"	.530"	.350"	1.125"	316 SS	Hastelloy C	Ceramic	3000	500
QH-.5-3	1/2"	5.5"	3"	.530"	.350"	1.125"	Hastelloy C	Hastelloy C	Ceramic	3000	500
QH-.5-5	1/2"	7.5"	5"	.530"	.350"	1.125"	Hastelloy C	Hastelloy C	Ceramic	3000	500

Notes:

- Note 1: THE CRACKING PRESSURE FOR INJECTION QUILLS IS APPROXIMATELY 50 PSI
- LENGTH OF CUSTOM STINGERS IS DETERMINED BY THE LAST NUMERICAL DIGIT IN THE MODEL CODE
- Maximum pressures stated above at 70°F
- Longer stinger lengths available, please consult your Fabco Representative

Chemical Injection Valves & Quills

Hayward IV SERIES Injection Valves & IQ SERIES Injection Quills



VALVE AND QUILL SIZES 1/2" TO 1"

The IV Series Injection Valves and IQ Series Injection Quills facilitate injection of chemicals away from pipe or tank inner walls, ensuring rapid mixing and preventing corrosion. Each design includes a built-in ball check valve with Hastelloy C™ spring to prevent back-flow of the process liquid into the chemical feed line. Both the IV and IQ Series provide MNPT process connections with the IV featuring an union allowing the ball check to be rebuilt. All Injection Quills are available in PVC, CPVC and PVDF to match the widest range of chemicals.

KEY FEATURES AND BENEFITS

- Built-in ball check valve with Hastelloy C™ spring, with the IV check being rebuildable
- Threaded MNPT End Connections
- FPM O-Ring Seals
- 45° Bevel on Quill Tip
- Pressure rated to 150 psi @ 70°F

OPTIONS

- Flat Bevel
- BSPT or Socket End Connections
- EPDM O-Ring Seals

TYPICAL APPLICATIONS

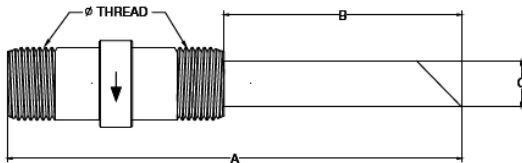
- Chemical Dosing
- Transfer and Processing
- Chlorination Systems

MATERIALS

- PVC Cell Class 12454 per ASTM D1784
- CPVC Cell Class 23447 per ASTM D1784
- PVDF
- FPM or EPDM O-Ring Seals

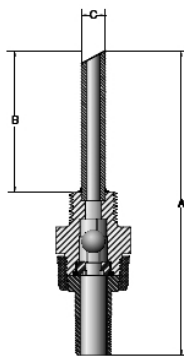
IQ SERIES PARTS LIST

1. Check Valve
2. Quill



IV SERIES PARTS LIST

1. Check Valve
2. Union Nut
3. Quill



VALVE DIMENSIONS (INCHES / MILLIMETERS)

CONNECTION SIZE in / DN	A in / mm	B in / mm	C in / mm
1/2 / 15	8.50 / 216	4.00 / 102	0.54 / 14
3/4 / 20	8.50 / 216	4.00 / 102	0.67 / 17
1 / 25	8.50 / 216	4.00 / 102	0.84 / 21

QUILL DIMENSIONS (INCHES / MILLIMETERS)

CONNECTION SIZE in / DN	A in / mm	B in / mm	C in / mm
1/2 / 15	5.50 / 140	3.00 / 76	0.54 / 14
3/4 / 20	6.10 / 155	3.00 / 76	0.67 / 17
1 / 25	7.90 / 200	4.00 / 102	0.84 / 21

Calibration Cylinders

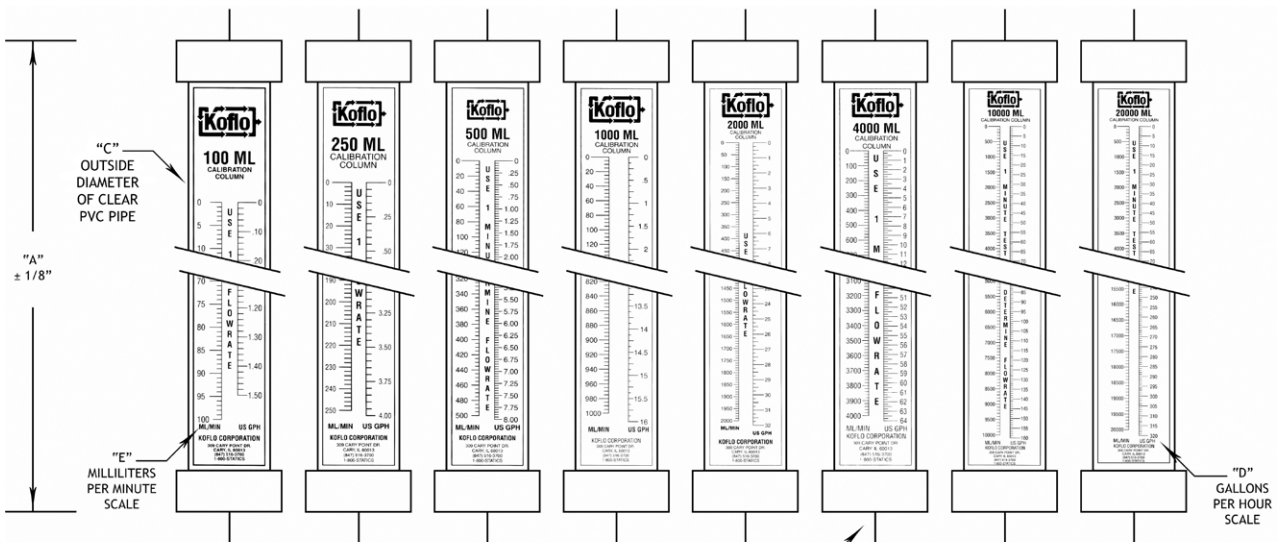
Koflo Calibration Cylinders



Koflo pump calibration columns and calibration cylinders provide an easy method for determining pump flowrate using industry standard graduations of milliliters/minute and gallons/hour. An equal starting point for both graduated scales gives the operator both ml/min. and GPH in one test. High contrast blue lettering enhances readability in all light conditions, and all scales have a protective Mylar lamination to protect against chemical attack. All sizes feature rugged construction using industrial grade machined PVC fittings.

CAPACITY	FIXED CAPS	TOP SLIP CAP	TUBE O.D.	COLUMN HEIGHT	FNPT END CONNECTIONS	WEIGHT
100ML 0-1.5GPH	100ML	100ML-SC	1.315"	12 1/2"	1/2"	7 OZ
250ML 0-4GPH	250ML	250ML-SC	1.660"	16 1/4"	1/2"	12 OZ
500ML 0-8GPH	500ML	500ML-SC	2.375"	16"	3/4"	22 OZ
1000ML 0-16GPH	1000ML	1000ML-SC	2.375"	25"	3/4"	30 OZ
2000ML 0-32GPH	2000ML	2000ML-SC	3.500"	24"	1"	4 LB
4000ML 0-64 GPH	4000ML	4000ML-SC	4.000"	34"	1"	6.5 LB
10,000ML 0-160GPH	10,000ML	10,000ML-SC	6.625"	27"	2"	7.5 LB
20,000ML 0-320GPH	20,000ML	20,000ML-SC	6.625"	46"	2"	10 LB

Koflo Calibration Columns with Fixed Caps



NOTE: - USE ONE (1) MINUTE TEST TO DETERMINE FLOWRATE
- CALIBRATION COLUMNS ARE USED IN GRAVITY SYSTEMS OPEN TO THE ATMOSPHERE AND THEREFORE ARE NOT PRESSURE RATED

MODEL	"A"	"B"	"C"	"D"	"E"	INCREMENTS
100 ML	12 1/2"	1/2"	1.315"	1.5	100	1 ML / .02 GPH
250 ML	16 1/4"	1/2"	1.650"	4.0	250	2 ML / .05 GPH
500 ML	16"	3/4"	2.375"	8.0	500	5 ML / .05 GPH
1000 ML	25"	3/4"	2.375"	16.0	1000	5 ML / .125 GPH
2000 ML	24"	1"	3.500"	32.0	2000	10 ML / .25 GPH
4000 ML	34"	1"	4.000"	64.0	4000	20 ML / .25 GPH
10 000 ML	27"	2"	6.625"	160.0	10 000	100 ML / 1 GPH
20 000 ML	46"	2"	6.625"	320.0	20 000	100 ML / 1 GPH

Koflo Clear PVC Static Mixers, Series 308



In response to a growing need for high quality PVC static mixers at a lower price, Koflo developed the Series 308 PVC Static Mixer. This unit is a clear PVC static mixer, which unlike other static mixers, allows for a visual inspection of the mixing process. All Series 308 static mixers are made in standard 6 element and 12 element configurations. Additionally, all PVC static mixers are edge sealed to the inside of the housing. The advantages of edge sealing are twofold. Not only does edge sealing increase mixing efficiency, but this bonding method also increases the structural integrity of the entire mixer. All mixers come standard with male NPT threads. Sizes 3/8"- 2" are in stock for immediate delivery.

One of the primary uses of the Series 308 static mixers is in the dilution of polymers and flocculants. With proper blending, it is quite common to recover the cost of a mixer in a relatively short period of time, due to the lower chemical costs associated with better mixing.

Other Applications:

- Admixing of water treatment chemicals
- pH control
- Chlorination and ozonation
- Process control sampling

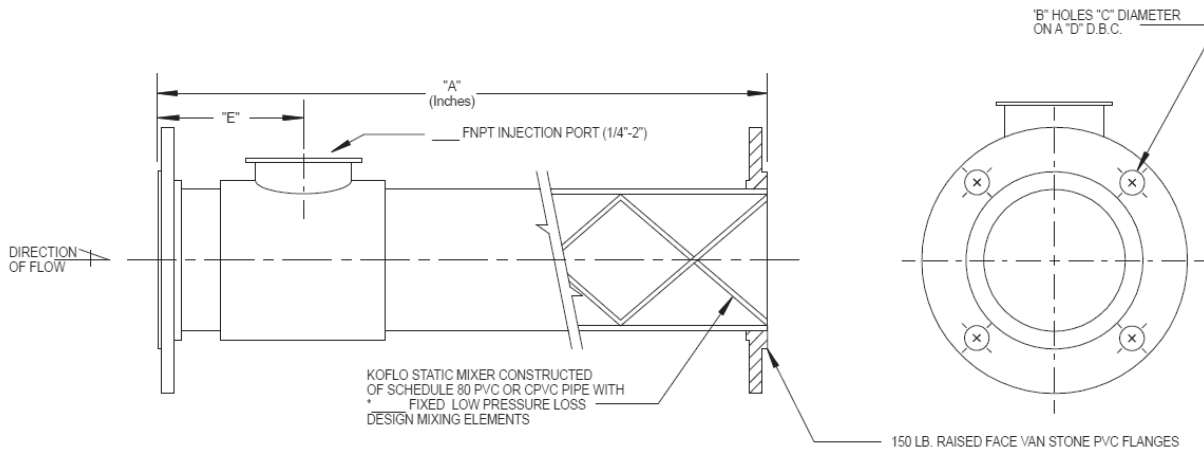
MODEL NUMBER	PIPE DIA. MNPT ENDS	NUMBER OF ELEMENTS	LENGTH	WEIGHT	MAX. WORKING PRESSURE (PSI @75 °F)	TYPICAL FLOW (GPM)	PRESSURE LOSS (PSI)
TECHNICAL SPECIFICATIONS							
3/8-40C-4-6-2	3/8"	6	6 1/2"	1.3 OZ	310	.4-3	.25-11.25
3/8-40C-4-12-2	3/8"	12	11"	2.1 OZ	310	.4-3	.50-22.5
1/2-40C-4-6-2	1/2"	6	7"	2.1 OZ	300	.65-5	.25-10
1/2-40C-4-12-2	1/2"	12	12"	3.3 OZ	300	.65-5	.50-20
3/4-40C-4-6-2	3/4"	6	9"	3.7 OZ	240	1.5-12	.25-11
3/4-40C-4-12-2	3/4"	12	15"	5.8 OZ	240	1.5-12	.50-22
1-40C-4-6-2	1"	6	11"	6.5 OZ	220	2.5-16	.30-11.75
1-40C-4-12-2	1"	12	18"	9.9 OZ	220	2.5-16	.60-23.5
1.25-40C-4-6-2	1 1/4"	6	14"	12.2 OZ	180	4-32	.25-13.5
1.25-40C-4-12-2	1 1/4"	12	25"	18.3 OZ	180	4-32	.50-27
1.5-40C-4-6-2	1 1/2"	6	15"	14.8 OZ	170	6-40	.25-12.25
1.5-40C-4-12-2	1 1/2"	12	28"	25.4 OZ	170	6-40	.50-24.5
2-40C-4-6-2	2"	6	19"	25 OZ	140	9-60	.25-9.25
2-40C-4-12-2	2"	12	35"	43 OZ	140	9-60	.50-18.5

Note:

- Also available in gray PVC, PVDF, PFA, Fiberglass & Stainless Steel

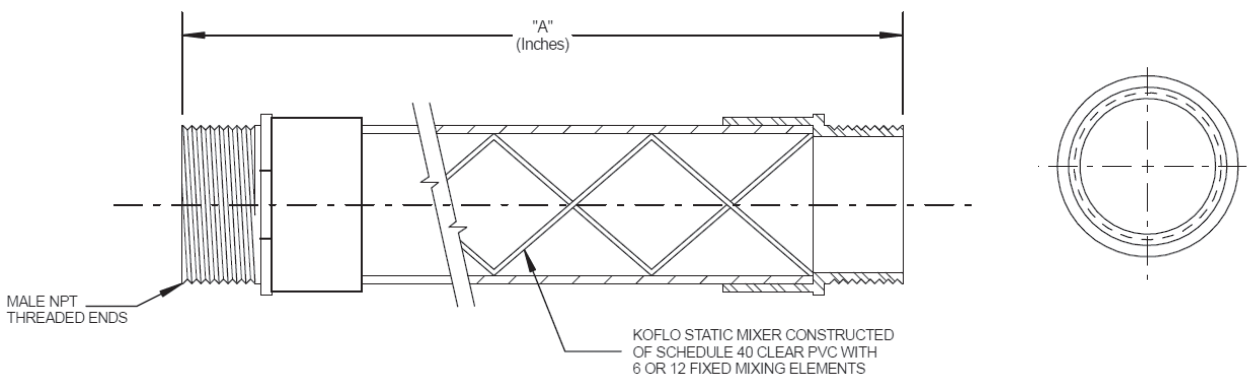
Static Mixers

Koflo Static Mixer Flanged Schedule 80



SIZE	"A" *NUMBER OF ELEMENTS					"B"	"C"	"D"	"E"	PORT SIZE (FNPT)
	2	3	4	5	6					
1	12	12	12	13	13	4	5/8"	3 1/8"	4"	1/2"
1 1/2"	14	14	16	18	19	4	5/8"	3 7/8"	5"	1/2"
2	15	16	19	21	23	4	3/4"	4 3/4"	5"	3/4"
2 1/2"	17	19	22	25	27	4	3/4"	5 1/2"	6"	3/4"
3	21	23	27	31	33	4	3/4"	6"	7"	3/4"
4	22	27	32	37	41	8	3/4"	7 1/2"	7"	3/4"
6	27	33	41	49	56	8	7/8"	9 1/2"	8"	1"
8	32	43	53	63	73	8	7/8"	11 3/4"	9"	1"
10	39	52	66	79	90	12	1"	14 1/4"	12"	1"
12	45	60	76	90	105	12	1"	17"	12"	1"

Koflo Static Mixer Clear PVC Schedule 40



SIZE	6 ELEMENT MODEL NUMBER	"A" 6 ELEMENT	12 ELEMENT MODEL NUMBER	"A" 12 ELEMENT
3/8"	3/8-40C-4-6-2	6 1/2	3/8-40C-4-12-2	11
1/2"	1/2-40C-4-6-2	7	1/2-40C-4-12-2	12
3/4"	3/4-40C-4-6-2	9	3/4-40C-4-12-2	15
1"	1-40C-4-6-2	11	1-40C-4-12-2	18
1 1/4"	1.25-40C-4-6-2	14	1.25-40C-4-12-2	25
1 1/2"	1.5-40C-4-6-2	15	1.5-40C-4-12-2	28
2"	2-40C-4-6-2	19	2-40C-4-12-2	35



Section 7: Tanks and Accessories

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Tanks and Accessories

Fabco Plastics is recognized as a leader in a wide variety of storage solutions for industrial markets; fiberglass tanks, polyethylene tanks, double wall tanks and custom fabrication. Our polyethylene tanks are North American manufactured to strict quality guidelines to ensure years of customer satisfaction. Impact-resistant, non-corrosive, one-piece seamless linear and cross linked HDLPE and polyethylene construction storage and processing for industrial and municipal chemical storage and processing. Fabco also is a first tier distributor for Canada's largest manufacture of Tank Accessories.

FABCO supply's HDLPE Chemical Storage Tanks that conform to ASTM D1998 testing standard NSF/ANSI Standard 61 addresses crucial aspects of drinking water system components. ASTM D1998 is the only world-wide quality specification for polyethylene storage tanks. Fabco Plastics is offering HDLPE storage tanks built to ASTM D1998 specification that are also certified to NSF/ANSI 61 standards for chemical storage. Fabco Plastics HDLPE tanks in Natural and Opaque White UV Block-Out resin have been tested with the NSF-61 exposure waters, as well as with corrosive chemicals, to ensure they are safe for potable water use!

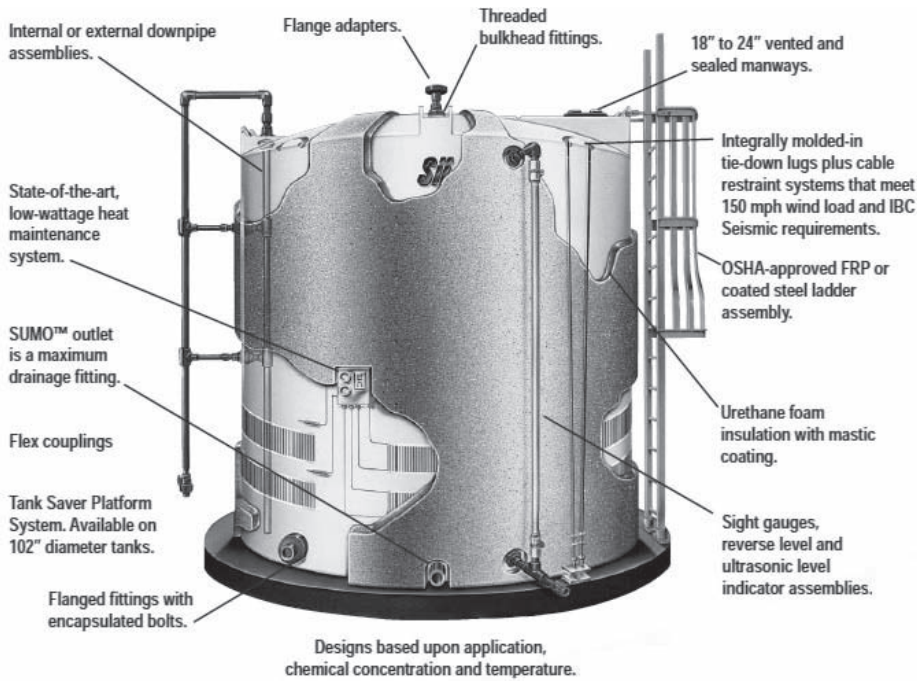
Fabco Plastics tanks are designed, built and tested to ASTM D1998 Standards. Insist your tanks meet all aspects of ASTM. Fabco also offers NSF/ANSI Standard 61 listed tanks as shown by our listing on www.nsf.org. Fabco's HDLPE resin complies with FDA Regulation 177.1520.

Fabco Plastics matches each specific chemical to the correct tank material to ensure compatibility. All materials are UV stabilized for long-term outdoor service.



Acetic Acid 80%	Peracetic Acid 30%
Aluminum Chlorohydrate 100%	Phosphoric Acid 75%
Aluminum Sulfate 50%	Poly Aluminum Chloride 100%
Calcium Carbonate 100%	Polyorthophosphate 100%
Calcium Chloride 30%	Potable Water
Chlorine Dioxide 38%	Potassium Hydroxide 50%
Citric Acid 100%	Potassium Permanganate 4%
Copper Sulfate 25%	Sodium Aluminate 100%
Deionized Water 100%	Sodium Bisulfite 40%
Ferric Chloride 50%	Sodium Carbonate 85%
Ferric Sulfate 60%	Sodium Chloride 26%
Ferrous Chloride 37%	Sodium Chlorite 34%
Ferrous Sulfate 30%	Sodium Hydroxide 50%
Hydrochloric Acid 37%	Sodium Hypochlorite 0.8%
Hydrofluoric Acid 52%	Sodium Hypochlorite 15%
Hydrofluosilicic Acid 30%	Sodium Permanganate 40%
Hydrogen Peroxide 10%	Sodium Silicate 100%
Liquid Ammonium Sulfate 45%	Sulfuric Acid 98%
Magnesium Chloride 35%	Zinc Orthophosphate 100%

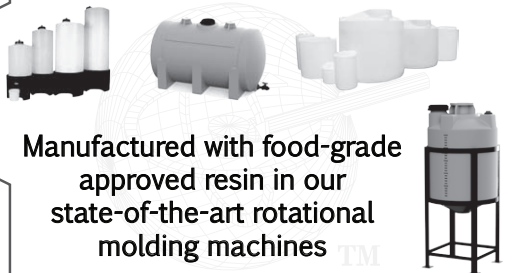
Snyder Tank Systems



SNYDER IS THE ONLY MANUFACTURER with High Density Linear Polyethylene (HDLPE) chemical tanks certified to NSF/ANSI 61 Standards that designs, manufactures, & tests to ASTM D1998 quality standards! NSF/ANSI Standard 61 addresses crucial aspects of drinking water system components. ASTM D1998 is the only world-wide quality specification for polyethylene storage tanks. Snyder is the **ONLY** manufacturer offering HDLPE storage tanks built to ASTM D1998 specification that are also certified to NSF/ANSI 61 standards for chemical storage. Snyder's HDLPE tanks in Natural and Opaque White UV Block-Out resin have been tested with the NSF-61 exposure waters, as well as with corrosive chemicals, to ensure they are safe for potable water use!

Note: FABCO recommends Flex Connectors for all lower outlets and inlets

RTS Plastics



Vertical Conical | Horizontal | Dispensing | Open Top | Stands

With our trained engineers, developers, and project managers, we are one of the few tank manufacturers who is able to produce a wide range of custom tanks to suit your needs.



Chem-Tainer



7
TANKS & ACCESSORIES

Chemical Resistance Chart

Snyder Chemical Resistance Chart

CHEMICAL	CONCENTRATION	RESIN	DESIGN INFO	FITTING MATERIAL	GASKET MATERIAL	BOLT MATERIAL
Acetic Acid	60	HDLPE & XLPE	1.5/ASTM	PP/PVC	EPDM	316SS/Hastelloy/Titan.
Acetic Acid	80	HDLPE	1.9/ASTM	PP	EPDM	316SS/Hastelloy/Titan.
Acrylic Emulsions	50	XLPE	1.9/ASTM	PVC	EPDM	316SS
Aluminum Sulfate	50	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Ammonium Sulfate	40	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Calcium Carbonate	Saturated	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Calcium Chloride	40	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Citric Acid	Saturated	HDLPE	1.9/ASTM	PVC/PP	EPDM	316SS
DEF (Diesel Exhaust Fluid)	32.5	HDLPE & XLPE	1.35/ASTM	316SS	EPDM	316SS
Deionized Water	Up to 18.3M	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS
Ethylene Glycol	100	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Ferric Chloride	50	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	Hastelloy/Titan.
Ferric Sulfate	60	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Ferrous Chloride	Saturated	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	Hastelloy/Titan.
Ferrous Sulfate	20	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	Hastelloy
Hydrochloric Acid	37	HDLPE	1.9/ASTM	PVC	Viton	Hastelloy
Hydrofluoric Acid	48	HDLPE	1.9/ASTM	PP/PVC	Viton	Hastelloy
Hydrofluosilicic Acid	26	HDLPE/XLPE*	1.9/ASTM	PP/PVC	Viton	Hastelloy
Hydrogen Peroxide	50	HDLPE	1.9/ASTM	PVC	Viton	316SS/Hastelloy/Titan.
Magnesium Chloride	30	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Motor Oil	100	HDLPE & XLPE	1.9/ASTM	316SS	Viton	316SS
Peracetic Acid	-	HDLPE	1.9/ASTM	316SS	Aflas	316SS
Phosphoric Acid	85	HDLPE	1.9/ASTM	PVC	Viton	316SS
Polymers (Deposition)***	-	XLPE	1.5/ASTM	PVC	EPDM	316SS
Potable Water	-	HDLPE	1.5/ASTM	PVC	EPDM	316SS
Potassium Carbonate	50	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Potassium Hydroxide	Saturated	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Propylene Glycol	-	HDLPE & XLPE	1.9/ASTM	PP/316SS	EPDM	316SS
Sodium Bisulfate	-	HDLPE	1.9/ASTM	PVC/PP	EPDM	316SS
Sodium Bisulfite	-	HDLPE	1.9/ASTM	PVC/PP	EPDM	316SS
Sodium Carbonate	30	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Sodium Carbonate	Saturated	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS**/Hastelloy/Titan.
Sodium Hydroxide	50	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Sodium Hypochlorite-in(Non-UV)	<16.5	HDLPE	1.9/ASTM	PVC	Viton	Titanium
Sodium Hypochlorite-out (UV)	<16.5	HDLPE#880059	1.9/ASTM	PVC	Viton	Titanium
Sodium Hypochlorite-out (UV)	<16.5	HDLPE Insulated	1.9/ASTM	PVC	Viton	Titanium
Sodium Thiosulfate	40	HDLPE & XLPE	1.9/ASTM	PVC	EPDM	316SS
Sulfuric Acid	98	HDLPE#880046*	1.9/ASTM	CPVC	Viton	Hastelloy
Sulfuric Acid	93	HDLPE#880046*	1.9/ASTM	CPVC	Viton	Hastelloy
Surfactants	-	XLPE	1.5/ASTM	PVC	EPDM	316SS
Urea Solution	50	HDLPE & XLPE	1.35/ASTM	PP/PVC	EPDM	316SS
Water w/ Ozone up to 10 PPM	-	HDLPE & XLPE	1.5/ASTM	PVC	EPDM	316SS
Zinc Orthophosphate	-	HDLPE	1.9/ASTM	PP/316SS	EDPM	316SS

Notes:

- Ambient Temperature.
- Chart applies to Industrial ASTM designed tanks.
- *Chemical may cause tank material to discolor.
- ** 316SS may pit upon drying. Not recommended for SUMOs.
- *** There are a wide variety of polymer chemical compositions. To confirm compatibility secure an SDS and have it reviewed by Snyder
- High purity chemical applications are limited to natural tank color or special hot compounded resins.
- For chemicals or chemical blends not listed on the above chart, please contact Snyder Industries

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TANKS & ACCESSORIES

Snyder Vertical Tanks



Features:

- Industrial (ASTM D-1998-06) and Commercial design standards available.
- Available with cable restraint systems that meet 150 mph wind load and IBC seismic requirements.
- Specific gravity ratings are based on the industry's most severe calculation.
- Standard specific gravity choices are 1.5 and 1.9, other ratings are available upon request.
- All materials are UV stabilized for long-term outdoor service.

Material options:

- High-density linear polyethylene (HDLPE) - black and natural white color - Complies with FDA Regulation 177.1520 and NSF standard 61.
- Cross-linked, high-density polyethylene (XLPE) - black and natural white color.
- Opaque white sodium hypochlorite resin #880059 up to 12,500 gallons for outdoor application.
- Sulfuric acid HDLPE resin #880046 up to 15,000 gallons.

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Note: FABCO recommends Flex Connectors for all lower outlets and inlets

PART NUMBER	US GALLONS	US BRIMFUL	DIAMETER (IN)	HEIGHT (IN)	MANWAY (IN)
153000N	22	22	18"	23"	2"
154100N	30	30	23"	23"	10"
1000110N	35	35	22"	36"	6"
1540700N	50	56	23"	38"	10"
568000N	60	60	26"	40"	14"
155000N	65	70	23"	46"	6"
1007200N	70	70	23"	42"	8"
100900N	70	70	23"	41"	8"
5690100N	90	94	34"	41"	14"
1012700N	100	100	30"	41"	8"
801000N	110	115	33"	41"	10"
5700100N	120	125	34"	51"	14"
1540200N	120	120	32"	39"	10"
1007300N	130	130	29"	51"	8"
1009500N	130	130	29"	49"	8"
1012800N	150	150	30"	59"	18"
5710100N	150	155	34"	61"	14"
1008400N	175	175	29"	66"	8"
1540400N	190	205	42"	47"	10"
1012900N	210	210	36"	55"	18"
100800N	200	200	36"	53"	18"
5720100N	200	213	40"	57"	14"
154000N	200	235	40"	48"	6"
1540300N	200	200	36"	59"	10"
802000N	200	215	33"	69"	10"
1008100N	250	250	36"	64"	18"
5730100N	250	260	40"	69"	18"
5740100N	275	285	47"	59"	18"
101300N	290	290	36"	72"	18"
163000N	300	300	35"	80"	18"
1630200N	290	310	42"	59"	10"
1630100N	300	300	36"	82"	10"
803000N	300	315	33"	94"	10"
1011200N	300	300	35"	85"	8"
804000N	300	318	46"	51"	10"
5750100N	330	342	47"	68"	18"
1630300N	330	360	48"	55"	10"
1008200N	330	330	47"	50"	18"
1011600N	330	330	44"	58"	18"
5760100N	360	373	53"	59"	18"
174000N	400	400	45"	62"	18"
5770100N	440	456	53"	69"	18"
5780100N	500	518	53"	77"	18"
180000N	550	550	48"	75"	18"
182000N	550	580	64"	47"	18"
806000N	550	580	64"	46"	18"
1700200N	710	710	60"	68"	18"
181000N	850	850	48"	117"	18"
183100N	1000	1100	60"	89"	18"
183000N	1100	1140	64"	90"	18"
171000N	1100	1150	86"	55"	18"
812000N	1100	1150	86"	55"	18"
1830200N	1200	1240	60"	109"	18"
1830400N	1300	1400	72"	87"	18"
1840300N	1400	1500	60"	128"	18"
177000N	1500	1550	86"	72"	18"
8120100N	1500	1550	86"	72"	18"

continued..

Vertical Tanks



Note:

Snyder's integrally molded-in bottom drain fitting, SUMO, provides maximum drainage for vertical bulk storage tanks 2000 Gal. and larger and is available as an option in diameter sizes up to 6" depending on tank size.

Narrow Vertical Storage Tanks

Features:

- 18" manways for easy clean-out.
- Narrow 29" width designed to fit through 30" doorways.
- Fitting inset to protect against impact damage.
- Water applications only.



PART NUMBER	US GALLONS	US BRIMFUL	DIAMETER (IN)	HEIGHT (IN)	MANWAY (IN)
1840000N	1550	1600	64"	124"	18"
1780200N	1900	1930	72"	119"	18"
8300000N	1900	1950	64"	147"	18"
5050300N	2000	2000	96"	84"	18"
5050000N	2000	2300	90"	88"	18"
8130000N	2000	2100	90"	88"	18"
5090000N	2500	2600	90"	107"	18"
8140000N	2500	2600	90"	107"	18"
5090300N	2500	2600	96"	98"	18"
8390000N	2650	3000	102"	97"	18"
5130300N	3000	3000	96"	111"	18"
5130000N	3000	3150	90"	127"	18"
8160000N	3000	3150	90"	127"	18"
7410000N	3000	3200	102"	96"	18"
8190000N	3650	4000	102"	126"	18"
5190000N	3900	4100	90"	163"	18"
7421100N	4000	4300	120"	104"	18"
7360000N	4100	4200	102"	130"	18"
8200000N	4100	4400	120"	100"	18"
5210000N	4400	4600	90"	182"	18"
7420000N	4500	4700	102"	142"	18"
7000500N	4600	5100	120"	116"	18"
8210000N	4650	5000	102"	154"	18"
5480000N	4900	5100	90"	202"	18"
1002100N	5000	5100	102"	154"	18"
7020000N	5500	5600	90"	216"	18"
7000000N	5500	6000	120"	132"	18"
5250000N	5600	6350	142"	102"	18"
7430000N	6000	6300	102"	188"	18"
7140300N	6000	6500	120"	145"	18"
8220000N	6200	6300	120"	140"	18"
7140000N	6500	7000	120"	153"	18"
5300400N	6600	7100	120"	158"	18"
5330700N	7000	7700	142"	122"	18"
7440000N	7500	7800	102"	234"	18"
7370000N-	7900	8150	120"	177"	18"
5300600N	8000	8300	120"	186"	18"
7400000N	8500	8950	120"	194"	18"
5360100N	8750	9250	142"	146"	18"
7450000N	9500	9900	120"	215"	18"
5330000N	10,500	10,850	142"	169"	18"
5330300N	10,500	10,850	143"	177"	18"
5350000N	12,500	12,750	142"	198"	18"
3030100N	13,800	15,000	165"	184"	24"
5370000N	15,000	15,250	142"	234"	18"
5380000N	16,500	16,800	142"	257"	18"
3030000N	18,800	20,000	165"	242"	24"

NARROW VERTICAL STORAGE TANKS

PART NO.	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	MANWAY (IN)
44330S 300 NST	300	66	29	49
43856S 400 NST	400	66	29	70

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Snyder Dual-Containment Tanks



Smaller dual-containment tanks provide added safety and environmental protection in more confined or remote storage locations. The advanced double-wall tank design is enclosed to prohibit foreign matter from entering the secondary containment tank, and a unique octagonal shape provides optimal spacing and sealing surface for the industry's most reliable transition fitting.

PART NO.	STYLE	US GALLONS	DIAMETER (IN)	HEIGHT (IN)	MANWAY (IN)
1000112N	DCT	35	22	36	6
5680002N	DCT	60	26	41	14
5700102N	DCT	120	34	51	14
5710102N	DCT	150	34	62	14
5740102N	DCT	275	47	63	18
5760102N	DCT	360	53	63	18
5780102N	DCT	500	53	81	18
5990102N	DCT	1000	81	69	18

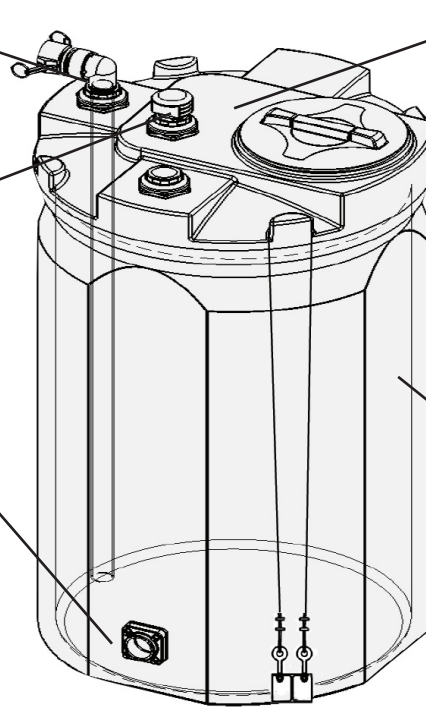
Top Draw-Tube Assembly enables material contents to be safely dispensed from the top of the tank. (optional)

2" Vent provides pressure vacuum relief for interior tank. (optional)

Available in XLPE and HDPE resin packages.

Transition Fitting allows sidewall safe installation and long-term sealing power through both walls of tank. (optional)

Forklift Channels are available on 275, 360 and 500 gallon sizes.



Flat Surface Areas provides ample space on top for a variety of fitting sizes and styles.

Two Tanks within one design provide double-wall protection.

Narrow Diameter provides location versatility in that it can fit through most any doorway on sizes up to 150 gallons.

Secondary Containment Tank provides 120% of inner tank's capacity. Complies with 40 CFR-264.193.

All Other Snyder Industrial Product Fittings and accessories are available wherever applicable.

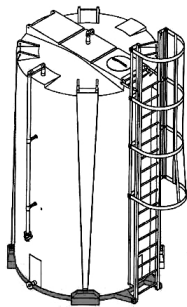
ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Double-Wall Tanks

Snyder Captor Containment Systems



Snyder's revolutionary Captor Containment System is designed to alleviate the ever-changing environmental and safety concerns regarding bulk chemical storage and containment for the 21st century. Captor's unique tank-in-a-tank design enables users and specifiers to incorporate advanced performance and safety features on a bulk-handling system, which provides total containment protection. Captor's double-wall construction is completely enclosed so that external matter, such as dust, rain and snow is prevented from collecting in the outer containment tank. Besides delivering unparalleled performance benefits, Captor Containment Systems also contribute to your company's bottom line by significantly reducing installation and procurement cost. Captors are shipped fully assembled on either a standard or wide-load flatbed trailer, which reduces comparable costs by an average of 35 percent.



Tank-Saver Platform System

Adds mobility and versatility, and can extend tank life.

Available on 102" Captor, and 102" single wall tanks.

PART NO.	US GALLONS	DIAMETER (IN)	HEIGHT (IN)	MANWAY (IN)
5040000N	550	76	65	18
5470000N	1100	76	104	18
5490000N	1550	76	136	18
5570000N	2000	102	103	18
5580000N	2500	102	122	18
5590000N	3000	102	142	18
5600000N	3500	102	158	18
5610000N	4000	102	178	18
5620000N	4500	102	197	18
5630000N	5000	102	216	18
5660000N	5500	120	172	18
5670000N	6500	120	199	18
1006400N	8700	142	197	18
1006600N	10000	142	226	18
1031100N	12500	142	274	18

Flanged Outlets and other fitting designs can be securely fastened and sealed to many of the large flat areas located on the top section of the tank (optional).

U-Vent Assemblies are available in a variety of sizes to relieve vacuum pressures.

Fill and/or Draw Pipe Assemblies can be installed to facilitate different material loading or un-loading requirements. (optional).

U.F.O. (Unified Fitting Outlet) is uniquely designed to mechanically seal fitting outlet through both the inner and outer tank walls. Material unloading is easier and more cost effective than pumping contents from the top of the tank (optional).

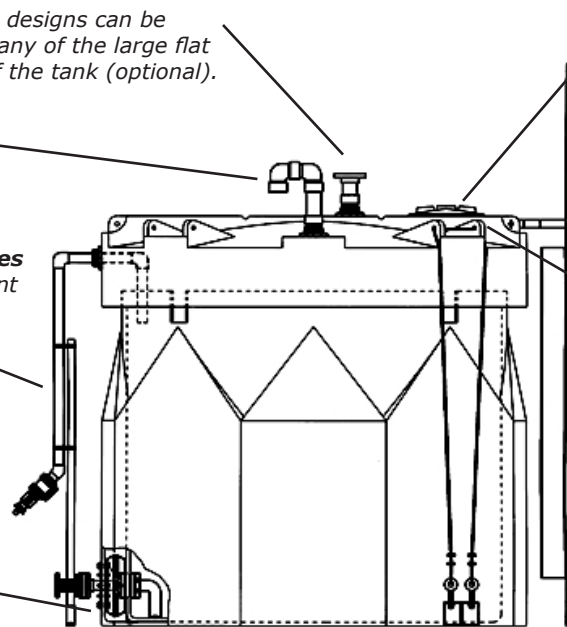
Bolted and Threaded Manways are available in sizes up to 24". Standard size is an 18" threaded manway.

OSHA Approved Ladders are available with and without cages in fiberglass and steel construction.

Molded in Tie-Down Lugs interface with optional cable restraint system to meet seismic and 150 mph wind load requirements.

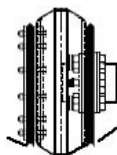
Outer Containment Tank provides 115-120% of inner tanks capacity for added safety factor. Complies with 40 CFR-264.193.

Double Wall Tank Construction encloses and interlocks outer and inner tank to prevent rain, snow, and debris from entering outer containment tank.



Sectional Side View

Captor containment tank wall



Captor primary tank wall

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Snyder Horizontal Leg Tanks

Features:

- Skids, saddles, cradles and side mounts for a wide range of stationary storage or mobile liquid transport applications.
- Low-profile designs increase safety factors.
- Available in a wide variety of styles, 25 - 3,400 gallons.
- Horizontal products are available in specific gravities up to 1.9.
- All materials are UV stabilized for long-term outdoor service.



Note:

Hoops are required on horizontal leg tanks 730 gallons and above.

Material options:

- High-density linear polyethylene (HDLPE) - black and natural white color - Complies with FDA Regulation 177.1520 and NSF standard 61.
- Cross-linked, high-density polyethylene (XLPE) - black and natural white color.
- Opaque white sodium hypochlorite resin #880059 (available on HLT's up to 525 gallons) for outdoor application.
- Sulfuric acid resin #880046 (available on HLT's up to 525 gallons).

PART NO.	US GALLONS	DIAMETER (IN)	LENGTH (IN)	HEIGHT (IN)	MANWAY (IN)
108000N	30	23	20	26	6
106000N	60	23	39	26	6
103150N	65	32	37	20	6
112000N	125	30	49	35	10
100360N	125	32	44	35	6
100390N	225	38	52	42	6
128000N	230	38	52	43	10
132100N	300	38	68	44	10
132000N	300	38	72	43	10
100410N	335	44	56	49	6
140010N	500	49	72	55	18
140000N	525	48	75	53	10
140030N	535	48	78	52	18
136000N	730	54	80	58	10
130000N	750	46	117	48	18
144000N	1025	48	139	50	18
1000700N	1650	71	142	55	18
146000N	1685	62	159	62	18
1002300N	2000	84	142	55	18
751000N	2000	62	160	70	18
847000N	2600	82	155	70	24
750000N	3000	92	142	76	18
752000N	3400	82	155	86	24

SUMO™

Snyder Industries' unique molded drain fitting, the SUMO™, has been developed from knowledge accumulated from over 50 years of rotationally molding polyethylene tanks. The SUMO™ was designed to help ensure maximum liquid drainage from vertical bulk storage tanks.

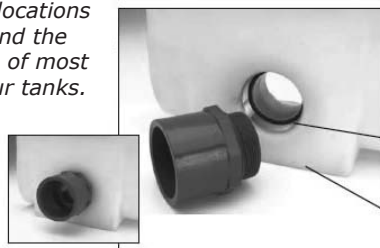
Maximum Drainage:

Using standard bulkhead fittings as outlets for vertical storage tanks can leave as much as 9" of liquid in the bottom of the tank. This means the tank is keeping your product, and your money. The SUMO™ provides maximum drainage so the product gets to your customer. It also helps reduce unscheduled maintenance downtime due to build up of sediment.

Ease of Installation:

Because SUMO™ is molded into the tank, pipe and fitting assembly is also easier with no secondary siphon tube assembly required.

The Sumo's™ encapsulated insert allows for modification free attachment to two, three, four, and six inch ANSI pipe sizes, and can be located at 90° locations around the base of most of our tanks.



Snyder is able to encapsulate either a stainless steel, hastelloy, or titanium insert into the wall of the tank. This encapsulated insert is then sealed off from the liquid contents of the tank by the two O-rings that are installed on a specially machined male adapter.

The SUMO™ provides a metal reinforcement completely isolated from any chemical attack.

Maximum tank drainage results from the SUMO™ being molded at the knuckle radius of the tank.

Longer Tank Life:

With other polyethylene tank "full drainage" outlets, additional flange connections are required. With the SUMO™ you eliminate this cost by piping directly into it. A molded-in outlet also reduces the stress on the tank caused by cutting and bolting. This means you'll save even more money since your tank will last longer. More importantly, you avoid having resin that is not fully cured in the area of the tank that is most stressed. And, if the SUMO™ fitting is damaged for any reason, it can be repaired. This further extends your tank life.

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Open Top Tanks

Snyder Open Top Tanks Systems



Vertical open-top containment tank designs incorporate an inward top flange lip, which provides optimum container structural integrity.



Open-top tanks come equipped with a standard lid cover and molded-in gallon/liter indicators. Standard lids incorporate unique rib designs to better support top-fitting installations.

SNYDER VERTICAL OPEN TOP CONTAINMENT TANKS

PART NO.	STYLE	US GALLONS	DIAMETER (IN)	HEIGHT (IN)
1550200N	VOT	175	42	30
1550300N	VOT	290	42	47
1540600N	VOT	345	48	46
1540500N	VOT	500	48	65
1370200N	VOT	650	60	58
527000N	VOT	700	64	54
1370300N	VOT	775	72	44
1370400N	VOT	975	60	80
5400000N	VOT	1000	64	80
5420000N	VOT	1250	86	55
5030100N	VOT	1350	72	76
1370600N	VOT	1450	60	120
5030500N	VOT	1550	96	51
5920000N	VOT	1800	86	76
5030200N	VOT	1850	72	109
5030300N	VOT	1900	96	62
5940000N	VOT	2500	102	76
5030400N	VOT	2500	96	78
5070200N	VOT	2850	96	90
5030600N	VOT	3000	120	65
5950000N	VOT	3600	102	108
5220100N	VOT	4000	120	83
5230100N	VOT	4900	143	72
5960000N	VOT	5800	120	125
5220200N	VOT	6100	120	126
5970000N	VOT	6900	120	146



SNYDER TANK STANDS

PART NO.	STAND DIAMETER (IN)	NOMINAL BOTTOM CLEARANCE
1370000N	22	12
1370001N	22	18
1690000N	30	12
1690001N	30	18
1730000N	36	12
1730001N	36	18
1750000N	42	12
1750001N	42	18
1760000N	48	12
1760001N	48	18



SNYDER OPEN TOP FLAT BOTTOM TANKS

PART NO.	US GALLONS	DIAMETER (IN)	HEIGHT (IN)	LID OPENING (IN)
10001VOT	30	18	31	22
56800VOT	55	22	37	26
56900VOT	90	30	36	34
57000VOT	120	30	47	34
57100VOT	150	30	57	34
57200VOT	200	36	53	40
57300VOT	250	36	65	40
57400VOT	275	42	53	47
57500VOT	330	42	63	47
57600VOT	360	48	53	53
57700VOT	440	48	64	53
57800VOT	500	48	72	53

SNYDER OPEN TOP 'TOTAL DRAIN' BOTTOM TANKS

PART NO.	US GALLONS	HEIGHT (IN) 12" STAND	HEIGHT (IN) 18" STAND	DIAMETER WITH STAND
568TDVOT	55	52	58	34
569TDVOT	90	52	58	42
570TDVOT	120	63	69	42
571TDVOT	150	73	79	42
572TDVOT	200	70	76	48
573TDVOT	250	81	87	48
574TDVOT	275	71	77	54
575TDVOT	330	80	86	54
576TDVOT	360	72	78	60
577TDVOT	440	82	88	60
578TDVOT	500	90	96	60

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Open & Closed Top Tank Systems

Mixer Mount Assembly

Enables a wide variety of mixers to be attached and incorporated into batch tank system service capabilities. (optional)

100% HDLPE

Material Construction complies with FDA Regulation 177.1520 and National Sanitation Foundation (NSF) standard 61.

Top Stiffening Ribs

Provide additional strength to help support top-fitting installations.

Outward Top Tank Flange Design

Provides optimum rigidity and strength.

Flat and Total Drain Bottom Tank Configurations

Designed to interface with respective tank stands.

Fitting Options

including welded, bolted or bulkhead types of fittings.



Hinged Lid Design

Superior all plastic hinge provides more reliable service and greater protection from dust and debris. Bolted and sealed lids also available. (optional)

Molded in Gallon and Liter Markers

Provide permanent gallonage indication for the life of the tank.

Unique Stand Leg Design

Provides strength and accessibility for forklift handling when tanks are full and empty with appropriate restraint banding. Also can be permanently mounted to the floor for long-term installations.

Heavy-Duty Plastic Stand Design

Corrosion proof and available for both flat and total drain bottom tank configurations; stands elevate tanks 12" to 18" off the floor for fitting and piping clearance. (optional)

Snyder Closed Top 'Total Drain' Tanks



Minimize waste and improve tank cleanout efficiencies with Snyder's total drain bottom tank designs.

Total drainage can be achieved through both welded fitting (open top only) and mechanically fastened bottom fitting arrangements.

PART NO.	US GALLONS	HEIGHT (IN)	DIAMETER (IN)	LID	O.D.	HEIGHT 12" STAND	HEIGHT 18" STAND
5680001N	60	42	26	14	34	55	61
5690101N	90	41	34	14	42	55	61
5700101N	120	51	34	14	42	66	72
5710101N	150	62	34	14	42	76	82
5720101N	200	58	40	14	48	72	78
5730101N	250	70	40	14	48	84	90
5740101N	275	60	47	14	54	73	79
5750101N	330	69	47	14	54	83	89
5760101N	360	60	53	14	60	74	80
5770101N	440	71	53	14	60	85	91
5780101N	500	79	53	14	60	93	99
1800100N	550	86	48	18	60	94	100
1810100N	850	126	48	18	60	136	N/A

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Cone Bottom Tanks

Snyder Cone Bottom Tanks



Features:

- Available in 30, 45 and 60-degree slopes, sizes range from 15-13,000 gallons.
- Available with cable restraint system that meets 150 mph wind load and IBC seismic requirements.
- Specific gravity ratings are based on the industry's most severe calculation.
- Standard specific gravity choices are 1.5 and 1.9, other ratings are available upon request. Maximum operating temperature is 100° F.
- All materials are UV stabilized for long-term outdoor service.

Material options:

- High-density linear polyethylene (HDPE) - black and natural white color - Complies with FDA Regulation 177.1520 and NSF standard 61.
- Cross-linked, high-density polyethylene (XLPE) - black and natural white color



Smaller cone bottom tanks are ideal for small mix or batch applications.



Large cone bottom tanks ranging in sizes from 2,500 to 13,000 gallons, are used to store and deliver up to 10,000 cubic ft. of bulk resins at a processing plant.

PART NO.	US GALLONS	DIAMETER (IN)	CONE DEGREE	HEIGHT IN STAND (IN)	MANWAY (IN)
1520000N	15	17	45	38	17
1850000N	17	19	60	34	8
1580000N	35	30	30	34	10
1560000N	65	30	30	41	10
6070000N	110	30	30	56	10
*1560400N	225	48	30	54	18
*1560500N	325	48	30	66	18
6190000N	500	64	45	80	18
1890000N	1000	86	30	83	10
5000000N	1000	64	45	120	18
8310000N	1250	95	30	91	18
1900000N	1400	86	30	94	10
5010000N	1500	64	45	158	18
8330000N	1600	95	30	95	18
1910000N	1650	86	30	110	10
5070000N	2000	90	30	125	18
5110000N	2500	90	30	148	18
8350000N	2500	95	30	125	18
5100000N	2600	90	45	160	18
5150000N	3000	90	30	167	18
8360000N	3000	95	30	141	18
5440000N	3900	90	30	203	18
5180000N	4100	90	45	216	18
5200000N	4400	90	30	222	18
7040000N	5500	90	30	255	18
5280200N	6000	142	30	159	18
7180000N	6500	90	30	296	18
5320100N	7400	142	30	183	18
5340100N	11500	142	30	238	18
7490100N	13000	142	30	262	18

*Tank comes complete with poly stand only.

ALL DIMENSIONS AND US GALLON CAPACITIES ARE NOMINAL AND SUBJECT TO CHANGE

Note: FABCO recommends Flex Connectors for all lower outlets and inlets



Double Flanged Fittings with PE Encapsulated Bolts

Increase corrosion resistance without jeopardizing bolted fitting strength by utilizing Snyder's encapsulated bolted fittings which ensure no metals come in contact with interior liquids. Available with PVC, CPVC, or PP flanges and with 316 SS, Titanium or Hastelloy encapsulated bolts.



Stainless Steel Bolted Fittings

For maximum sealing power and fitting strength, Snyder specially cast, 316 stainless steel fitting to provide long-term durability and leak resistance.

Heavy Duty Bulk Head Fittings



SIZE (IN)	BLACK PPG	NATURAL PP	PVC	CPVC	RED PVDF	NATURAL PVDF
1/2	PG7025807DT	PP7025807DT	P7025807DT	CP7025807DT	PVR7025807DT	PV7025807DT
3/4	PG7025808DT	PP7025808DT	P7025808DT	CP7025808DT	PVR7025808DT	PV7025808DT
1	PG7025809DT	PP7025809DT	P7025809DT	CP7025809DT	PVR7025809DT	PV7025809DT
1-1/4	PG7025810DT	PP7025810DT	P7025810DT	CP7025810DT	PVR7025810DT	PV7025810DT
1-1/2	PG7025811DT	PP7025811DT	P7025811DT	CP7025811DT	PVR7025811DT	PV7025811DT
2	PG7025812DT	PP7025812DT	P7025812DT	CP7025812DT	PVR7025812DT	PV7025812DT
3	PG7025814DT	PP7025814DT	P7025814DT	CP7025814DT	PVR7025814DT	PV7025814DT
4	PG7025816DT	PP7025816DT	P7025816DT	CP7025816DT	PVR7025816DT	PV7025816DT

Notes:

- Moulded, with double tapped NPT internal threads.
- Heavy duty bulkhead fittings feature double tapped internal NPT threads and a unique left hand self tightening nut.
- Complete with one (1) EPDM gasket (Buna-N and Viton gasketing materials available upon request). Gasket effectively seals against curved or irregular surfaces.



Universal Ball Dome Fittings

The Universal Ball Dome Fittings are "self-aligning" which allow for vertical plumbing on the dome of the tank and available in PVC or CPVC. It allows piping to be plumbed vertically and is a economical alternative to UBD flange style (no additional bolts required). Available in a variety of diameters.

Expansion Joints

Proco 260R Series Wide Arch Low Spring Rate

Proco Series 260R rubber expansion joints are specifically designed for use with plastic or FRP piping systems. They are molded wide-arch expansion joints that have lower spring forces to compress, extend, or laterally offset. The Proco Series 260R molded expansion joints can be used in circumstances where metallic hoses/expansion joints or old-design rubber expansion joints were originally used.

Features and Benefits:

- Absorption of Directional Movement
- Absorption of Vibration, Noise and Shock
- Compensation for Misalignment
- Self-Cleaning Wide Arch
- Wide Choice of Flange Construction Materials Available
- Lighter Weight

AVAILABLE STYLES & MATERIALS

261-R*	262-R*	PROCO MATERIAL CODE	COVER** ELASTOMER	TUBE ELASTOMER	MAX. OPERATING TEMP. °F (°C)	BANDING LABEL COLOR	F.S.A. MATERIAL CLASS
X	X	/BB	Chlorobutyl	Chlorobutyl	250 (121)	Black	STD. III
S	S	/EE	EPDM	EPDM	250 (121)	Red	STD. III
S	S	/NH	Neoprene	CSM	212 (100)	Green	STD. II
X	X	/NN	Neoprene	Neoprene	225 (107)	Blue	STD. II
S	S	/NP	Neoprene	Nitrile	225 (107)	Yellow	STD. II

Notes:

All products are reinforced with tire cord and metal materials.

* Products mark (S) are in stock items.

** All NN, NH & NP elastomer designated joints meet the Coast Guard Requirements and conform to ASTM F 1123-87.

Proco 261R Series Molded Wide Arch

Proco Style 261R molded wide arch expansion joints have the lowest spring rates of any expansion joints currently on the market. They also boast low forces to deflect, and are built to withstand even the most rigorous piping system configurations.

They allow for axial compression or axial extension, and lateral deflection as well as angular and torsional movements.

PROCO STYLE 440-BD



The Proco Style 440-BD Molded Expansion Joints can be used for corrosive applications that are found in industries such as chemical-petrochemical, industrial process piping systems, power generation plants, pulp/paper plants, water and wastewater sewage, and pollution control systems. Wherever metallic joints, lap joints, or PTFE and FEP-lined rubber expansion joints were previously used, the Proco Style 440-BD can also be used.

EXPANSION JOINT SOLUTION

FOR PLASTIC PIPING SYSTEMS



Proco Series 260R low spring rate rubber expansion joints are specifically designed for use with plastic or FRP piping systems.



440- Proco Series 440 Molded PTFE Expansion Joints can be used for corrosive applications

BOTH MODELS CAN ALSO BE USED FOR CONNECTIONS OFF TANKS



THE EXPANSION JOINT AND CHECK VALVE PEOPLE

Features:

- Absorption of pipe-wall and fluid-borne noise
- Reduction of system stress and strain
- Isolation of mechanical vibration and motion
- Superior "Flex Life" and strength
- Tested force pound and spring rate tables
- Coated flanges and factory set limit bolts
- Chemical service capability at minimal cost
- Elimination of electrolysis
- Protection against start up and surge forces

SEE PAGE 18 FOR MORE DETAILS ON EXPANSION JOINTS

Flexible hose connection recommendations

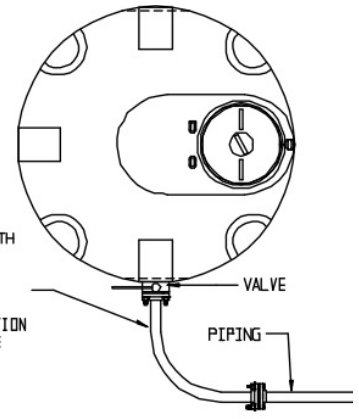


SII strongly recommends using flexible hose, expansion joints or other provisions for all tank sidewall connections. Please see the hose connection examples. SII has developed the Flexmaster expansion joint for 2" and 3" bolted tank connections.

FLEX HOSE - 90° EXAMPLE

NOTE: CHANGING THE ELEVATION OF THE HOSE FOR GROUND SUPPORT IS ACCEPTABLE. UNSUPPORTED HOSE DISTANCE SHOULD BE THE LESSER OF HALF THE HOSE LENGTH OR 24".

FLEX HOSE AT MAXIMUM RADIUS - HOSE MUST BE USED IN 90° ORIENTATION AND SUPPORTED AT MIDDLE WITH SUPPORT THE SAME WIDTH AS THE HOSE DIAMETER.



Ladders & Seismic Restraint Systems



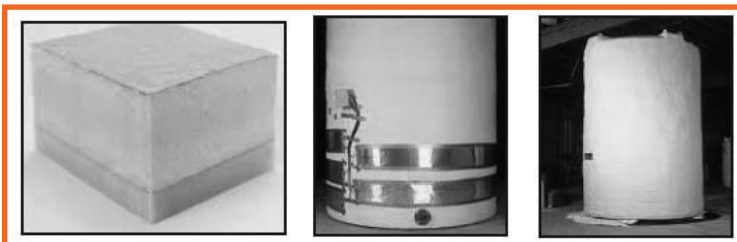
OSHA compliant ladders are available with and without cages in fiberglass and steel construction. Cable restraint systems are available that meet 150 mph wind load and IBC seismic requirements.

Variety of Manways



A wide variety of manways are available from 8" to 24" size in threaded vented styles, 12" to 24" in hinged styles, and 14" to 24" in bolted and sealed "vapor tight" styles.

Insulation and Heat Tracing

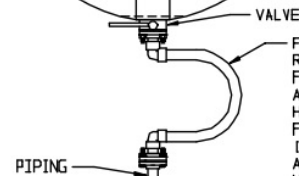


A heating element and thermostat can be installed to allow regulation of temperature. In temperature sensitive applications, Snyder tanks can be insulated with rigid urethane foam. The insulation carries an R-16 rating and has a chemical and weather resistant acrylic latex mastic coating.

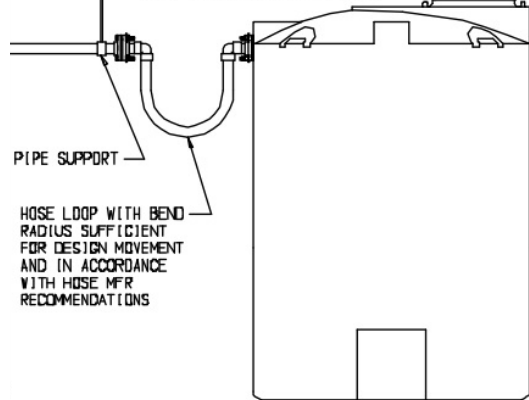
FLEX HOSE - 180° EXAMPLE

NOTE: CHANGING THE ELEVATION OF THE HOSE FOR GROUND SUPPORT IS ACCEPTABLE. UNSUPPORTED HOSE DISTANCE SHOULD BE THE LESSER OF HALF THE HOSE LENGTH OR 24".

FLEX HOSE MUST HAVE BEND RADIUS LARGE ENOUGH TO ALLOW FOR CHANGE IN TANK DIAMETER AND STILL MAINTAIN MINIMUM HOSE BEND RADIUS. FLEX HOSE MUST BE SUPPORTED IN THE MIDDLE WITH SUPPORT AT LEAST AS WIDE AS THE HOSE DIAMETER.



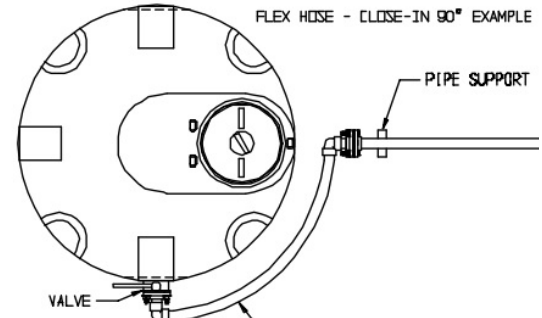
TRAVELING HOSE LOOP EXAMPLE



FLEX HOSE - CLOSE-IN 90° EXAMPLE

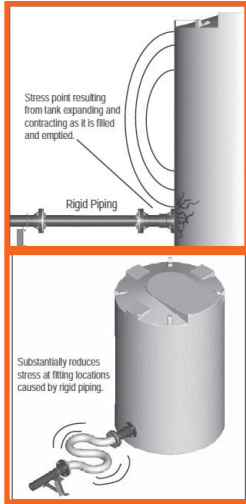
NOTE: CHANGING THE ELEVATION OF THE HOSE FOR GROUND SUPPORT IS ACCEPTABLE. UNSUPPORTED HOSE DISTANCE SHOULD BE THE LESSER OF HALF THE HOSE LENGTH OR 24".

FLEX HOSE MUST HAVE CLEARANCE TO TANK TO ALLOW FOR CHANGE IN RADIUS DUE TO FLEXURE. FLEX HOSE MUST BE SUPPORTED IN THE MIDDLE WITH SUPPORT AT LEAST AS WIDE AS THE HOSE DIAMETER.



Tank Accessories

Snyder Flexmaster™



In recent years, a variety of expansion joint products have been utilized to help alleviate the stress generated at the tank and piping interface points. While some of these products can be an expensive alternative in steel tank installations, none provide the degree of expansion required in a plastic tank, which is why Snyder engineering has been compelled to develop a solution to this age-old problem.

The Flexmaster™ is a uniquely designed flexible tank connection that allows a tank's sidewall to move freely, which substantially reduces stress at fitting locations, resulting in longer, trouble free tank installations.

It's a well known fact within the tank manufacturing industry that the majority of all tank failures occur at a fitting location. This is because, the rigidity of a tank's plumbing connection apparatus typically does not allow the tank sidewall to expand and contract adequately, which creates a stress point that ultimately becomes the cause of failure at some stage within a tanks useful life.

Bottom Line, Flexmaster will increase the useful life of your company's tanks while reducing the risk of premature tank failures, which will ultimately result in more profits. Flexmaster is constructed of the same polyethylene resin as the tank, which guarantees superior chemical resistance at a lower cost than traditional expansion joints.

PART NO.	DESCRIPTION
5390100N95401L	2" Flange Connector Assembly - HDLPE
5390100N99601L	2" Flange Connector Assembly - XLPE
5390000N95401L	3" Flange Connector Assembly - HDLPE
5390000N99601L	3" Flange Connector Assembly - XLPE



Snyder Ultrasonic Level Indicator



Snyder's Ultrasonic Level Indicator allows a simple and reliable non-contact level measurement of fluids in a vertical single wall or double wall polyethylene tank.

Ultrasonic sensors transmit pulsed waves of high frequency sound. If the sound wave meets a reflective object, such as liquid, it bounces back toward the sensor. The sensor records the information and calculates the distance to the object.

Snyder's Ultrasonic Level Indicator system provides a visual display of liquid level in tank showing gallonage in measurements of hundreds of gallons along with 4-20 mA output for other alarm or control systems as well as four independent contacts capable of handling 10 amps each. Each contact can be programmed to operate in different opening and closing methods (7 modes). Contacts can be used to controls pumps, valves, alarms, etc.

Benefits

- Easy to install
- Self-contained sensor is virtually maintenance free
- Internal temperature compensation
- Provides visual level, switch, controller and transmitter capabilities
- Replacement of multi-point float, conductivity and pressure switches
- Tank inventory monitoring and logistics improvement
- Process control – filling and emptying tanks

Features

- Provides switch, controller and transmitter capabilities.
- All plastic construction with NEMA 4X rating.
- Replacement of multi-point float, conductivity and pressure switches.
- Range: 20 foot
- Dead band: 12 inches
- Signal output: 4-20 mA
- Supply voltage: 110 or 220 VAC and 24 VDC
- Contact amperage: 10 amps
- Number of contacts: 4
- Connection: 2" NPT standard
- Accuracy: 0.25% of range (with no temperature gradient)

7

TANKS & ACCESSORIES

Process Technology Electric Immersion Heaters

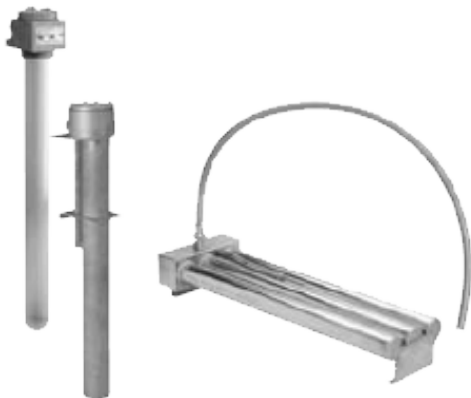


Fluoropolymer (PTFE) Heaters

Compatible with virtually any chemistry. Sizes up to 18 kilowatt, single or three phase. Large variety of standard and custom configurations for over-the-side and tank bottom installations. Screw plug and flange heaters in sizes from 1/2-inch screw plug (100 Watt) to 6-inch flange (18 kW). Thermal overtemperature protection standard (except screw plug). cULus and CE.

Metal Heaters

Variety of materials to match your application (titanium, 316 and 304 stainless steel, and plain steel). Sizes up to 54 kW. Standard and custom configurations for over-the-side and bottom installations in open tanks. Screw plug and flange heaters in titanium and 316 stainless, sizes from 1/2-inch screw plug (100 Watt) to 6-inch flange (72 kW). Thermal overtemperature protection standard (except screw plug) cULus and CE.



Special Application Heaters

We specialize in unique and difficult applications. Configurations available include: quartz heaters, phosphate heaters, lab heaters, flexible riser heaters, deep tank heaters, Varipower™ heaters, EASYPLUG™ heaters (heater plugs into the control, the control plugs into the wall).

Process Technology Inline Heaters



Water Heaters

Point of use electric water heaters for industrial applications. Excellent for DI spray rinse, precision cleaning, reverse osmosis water, city water, and salt water. Integrated heater and control system. Wall mounted up to 72 kW, floor mounted up to 144 kW. Single pass or recirculation. All titanium or stainless steel wetted parts. Custom controls available. cULus.

Chemical/Solvent Heaters

Optimum solution for heating solvents and IPA! 316SS Electropolished heaters for Surface Finishing and Solvent applications. Up to 36 kW and temperature range up to 180°C. Single pass or recirculation. All 316 stainless steel wetted parts. Custom controls available. UL823, UL499, CSA 22.2 and CE certified.



Tank Controls

Process Technology Immersion Coils and Inline Exchangers



Metal Immersion Coils

Designed and built to your specific application needs. Grid coils (single and multi-layer), serpentine coils, helical coils and "U" coils. Standard and custom designs. Steam or water service for heating or cooling. Immersion liquid-to-liquid heating/cooling. Wide variety of materials available including: titanium, 316 stainless steel, and zirconium.



Fluoropolymer Immersion Coils

Rugged construction for difficult applications. Integral perforated fluoropolymer guards. Excellent chemical compatibility. 30 PSI steam, 60 PSI steam, or water service. Integral inlet/outlet manifolds for single point plumbing connections. Immersion liquid-to-liquid heater/cooling. Up to 46 square feet (4.3 square meters) exchangers are available.



Inline Heat Exchangers

Sized to your application. 316L stainless steel spiral plate (up to 15 square feet/1.4 square meters) design. Custom manufactured shell and tube fluoropolymer heat exchangers also available, contact factory for assistance.

Power Supplies

Power Supplies/Rectifiers

Now offering a wide range of highly accurate and precise DC, Pulse, and Pulse Reverse power supplies! Featuring output ranges from 0.001 amperes to 13,000 amperes.



Temperature and Liquid Level Controls

Temperature Controls

Wide range of styles available for your wet process application. Digital controls in 1/4, 1/8 and 1/16 DIN sizes. Combination controls for large heater installations up to 150 amp capacity. Custom designed central control stations. Fluoropolymer-covered temperature sensors included standard. Plastic enclosures for chemical resistance.



Liquid Level Controls

Conductivity and capacitive style level controls for the ultimate in reliability. Multi-level controls available (up to five levels in one probe assembly). Can be packaged and matched with our temperature controls. Several materials available for chemical compatibility.



Accessories

We offer a wide variety of accessories including: thermowells to stabilize temperature sensors in the tanks, digital timers to start heat up cycles, amp hour meters to measure rectifier output, solenoid valves to turn on/off heat exchangers, strainers to remove contaminants from steam lines, coil insulators to protect metal heat exchangers from stray electrical current, vacuum breakers for protecting fluoropolymer heat exchangers in steam lines from collapse, and rigid temperature sensors.



DynaMix Mixers & Agitators

MMX Series: Drum Mixers

50 - 250 Gal



Drum Lid Mount



Bung Mount



Universal Drum Mount (a - open, b - closed)



ITM Series: Tote Mixers

200 - 600 Gal



Plastic Tote Mount



Stainless Steel Tote Mount

DMX Series: Portable Mixers

100 - 3,000 Gal



Plate Mount

Clamp Mount

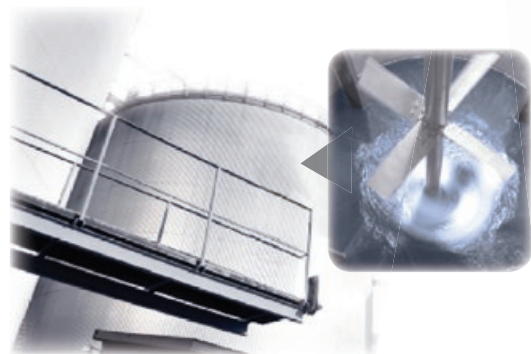
GMX Series: Medium Tanks

2,000 - 10,000 Gal



NMX Series: Large Industrial Tanks

2,500 - 100,000 Gal



Side Entry Mixers

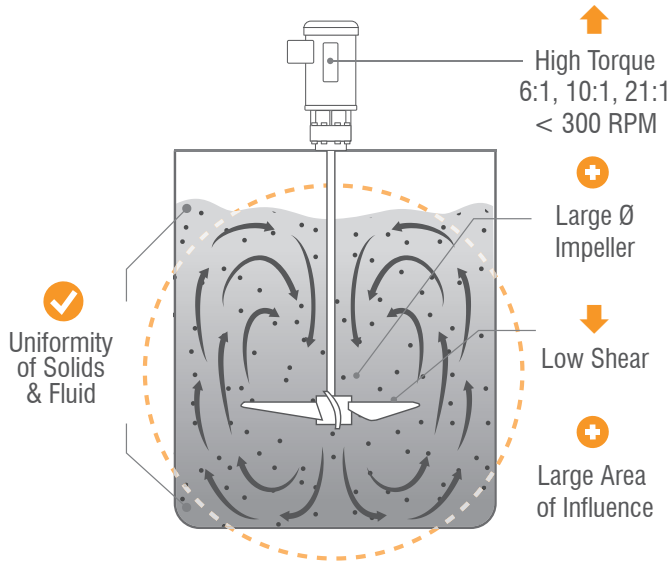
DMX



NMX



Mixers & Agitators



Consistent Product Quality Control

Axial flow pattern achieves uniformity by fully involving the entire tank

A High Speed Mixer

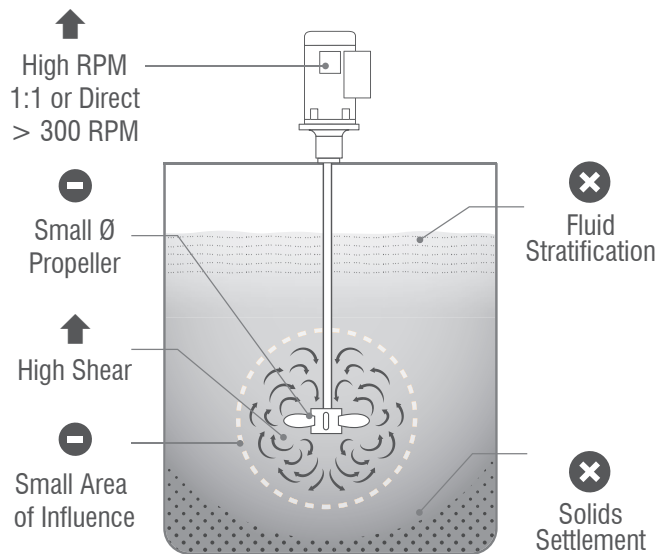
Will not fully involve your tank.

▲ The Problem:

Using a high RPM motor with a small propeller introduces high shear - and more importantly, it only creates a small area of influence.

▲ The Result:

Poor product quality control with an increased risk of product damage, and a mixture that does not reach uniformity.



Little / No Product Quality Control

Localized agitation can damage product while failing to address suspension issues

▲ The Dynamix Approach:

After defining your mixing objective, we balance the power and pumping requirements of a specific impeller with the torque required to achieve uniformity. Your drive may cost a little more, but the increase in product quality control and savings in process time cover this cost immediately.

By achieving true axial flow mixing, we can guarantee the time to uniformity. This is our process guarantee – **Our Solution Assurance.**

The Result = **Uniformity of Solids & Fluid**

This is why we ask for:

- Specific Gravity
- Product Viscosity
- Particle Size
- Settling Rate
- Tank Configuration



This information, combined with our mixer engineering, allows us to guarantee your mixing time to uniformity.

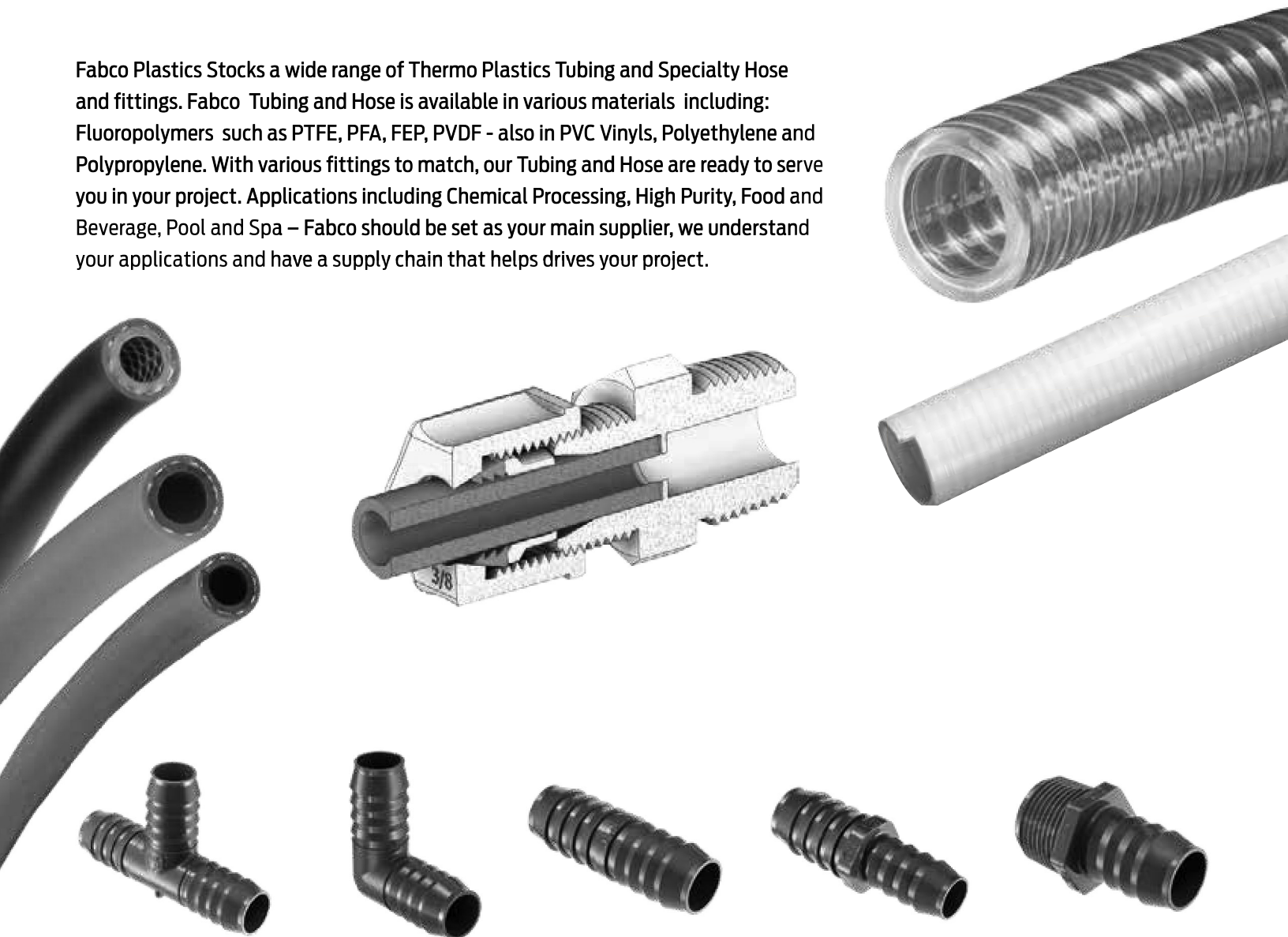
Section 8: Flexible Tube, Hosing and Fittings

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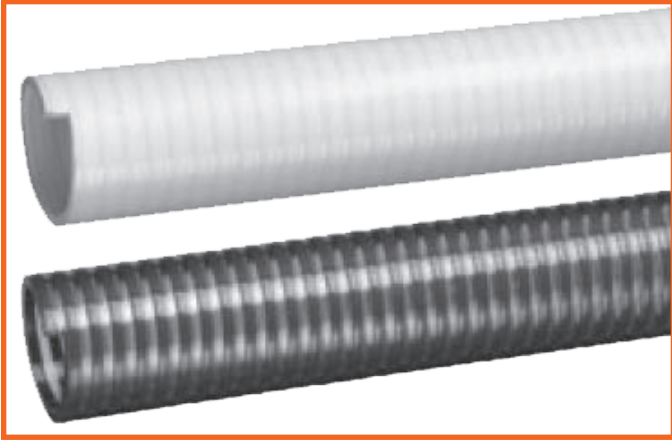


Flexible Tube, Hosing

Fabco Plastics Stocks a wide range of Thermo Plastics Tubing and Specialty Hose and fittings. Fabco Tubing and Hose is available in various materials including: Fluoropolymers such as PTFE, PFA, FEP, PVDF - also in PVC Vinyls, Polyethylene and Polypropylene. With various fittings to match, our Tubing and Hose are ready to serve you in your project. Applications including Chemical Processing, High Purity, Food and Beverage, Pool and Spa – Fabco should be set as your main supplier, we understand your applications and have a supply chain that helps drives your project.



Fabco Flex



PVC has been optimized to ensure the hose remains tough and flexible, and is more flexible than the current hose on the market. Our spa hose replaces rigid pipe for pools, spa and hot tub installations ideal for working in confined areas.

TEMPERATURE

-5°C to + 60°C (23F to 140F)

Actual Service Temperature range is application dependent.

APPLICATION:

- Pool – Above Ground
- Pool – Inground
- Spa – Hot Tub
- Jetted or Aerated Tubs
- Landscaping & Ponds
- Use with PVC Solvent Cements

PART #	IPS SIZE (IN)	OD		MAX. WORKING PRESSURE (PSI)		STD LENGTH (FT)	APPROX. WEIGHT (LBS/FT)
		(IN)	(MM)	@ 68°F	@ 104°F		
PFH050A	1/2"	0.850	21.50	100	70	100	0.14
PFH075A	3/4"	1.053	26.75	100	70	100	0.22
PFH100A	1"	1.320	33.53	100	70	100	0.31
PFH150A	1 1/2"	1.904	48.36	70	50	100	0.48
PFH200A	2"	2.381	60.48	70	50	100	0.61
PFH300A	3"	3.500	89.00	65	40	50	1.20

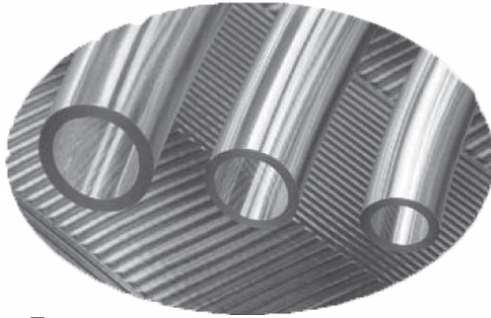
FEATURES:

- Lightweight
- Full Vacuum
- Ultra Flexible
- White PVC Construction
- Virgin Materials
- Smooth Bore Construction
- Tight Tolerances



Clear PVC Hose

Kuri-Tec Clear PVC Hose



Fabco clear vinyl tubing is constructed of a Clear non-toxic food and crystal clear PVC compound which makes it ideal for beverage grade PVC tubing. It is formulated with ingredients in compliance with applicable FDA(03) requirements, meets USDA(17), 3A(01), NSF(13), UL(16), RoHS(15) and USP(18) Class VI criteria. The service temperature Range: is between +25°F (-4°C) and +150°F (+65°C). Hose clamps and fittings are also available. See index for types and locations.

Features:

- High gloss crystal clear appearance with glass smooth interior to reduce sediment buildup.
- Non-toxic blue tint to enhance clarity.
- NSF-51 and NSF-61 certified material.
- Self-extinguishing.
- Compound hardness 73 ±3 Shore "A".

Applications:

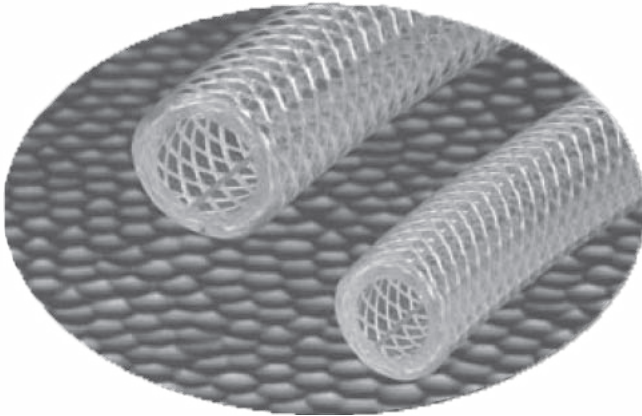
- Tubing for laboratories.
- Water distillation lines.
- Deionized water systems.
- Air conditioning and refrigeration drainage.
- Air lines and bottling plants.
- Beverage dispensing units.
- Ice making machines.
- High efficiency furnace drainage.
- Transfer of weak chemicals & acids.

PART NUMBER	NOMINAL I.D.	NOMINAL O.D.	WALL THICKNESS	WP/PSI 68°F (20°C)	STANDARD LENGTH (FT)	APPROX. WT PER ROLL (LBS.)
CVT037	1/8"	1/4"	1/16"	65	100	2.0
K0100304	3/16"	1/4"	1/32"	50	100	1.2
CVT051	3/16"	5/16"	1/16"	55	100	2.7
K0100306	3/16"	3/8"	3/32"	60	100	4.5
CVT071	1/4"	3/8"	1/16"	55	100	3.4
CVT073	1/4"	7/16"	3/32"	58	100	5.5
CVT074	1/4"	1/2"	1/8"	60	100	8.0
CVT092	5/16"	7/16"	1/16"	50	100	4.0
K0100508	5/16"	1/2"	3/32"	55	100	6.5
K0100509	5/16"	9/16"	1/8"	60	100	9.4
CVT107	3/8"	1/2"	1/16"	45	100	4.7
CVT108	3/8"	9/16"	3/32"	50	100	7.5
K0100610	3/8"	5/8"	1/8"	55	100	10.7
K0100709	7/16"	9/16"	1/16"	35	100	6.0
CVT135	1/2"	5/8"	1/16"	30	100	6.0
CVT137	1/2"	11/16"	3/32"	40	100	9.5
CVT138	1/2"	3/4"	1/8"	45	100	13.4
K0101012	5/8"	3/4"	1/16"	26	100	8.2
CVT164	5/8"	13/16"	3/32"	35	100	11.6
CVT165	5/8"	7/8"	1/8"	40	100	16.1
CVT180	3/4"	1"	1/8"	35	100	18.8
K0101218	3/4"	1 1/8"	3/16"	40	100	30.0
CVT185	3/4"	1-1/4"	1/4"	45	100	42.9
K0101418	7/8"	1 1/8"	1/8"	30	100	21.4
K0101420	7/8"	1 1/4"	3/16"	35	100	34.1
CVT210	1"	1-1/4"	1/8"	25	100	24.1
CVT213	1"	1-3/8"	3/16"	30	100	38.2
K0101624	1"	1 1/2"	1/4"	35	100	53.6
K0102024	1-1/4"	1 1/2"	1/8"	20	50	14.8
CVT241	1-1/4"	1-5/8"	3/16"	30	50	23.1
K0102028	1-1/4"	1 3/4"	1/4"	40	50	32.2
K0102430	1 1/2"	1 7/8"	3/16"	30	50	27.1
K0102432	1 1/2"	2"	1/4"	35	50	37.5
K0103240	2"	2 1/2"	1/4"	35	50	48.2

Notes:

- Working Pressure decreases as temperature increases.
- Pressure ratings can only be obtained with proper coupling procedures.
- Use of compression fittings with non-reinforced PVC tubing is not recommended. Hose claims involving use of these fittings will be disallowed.

Kuri-Tec Clear Braided PVC Hose



Kuri-Tec clear braided PVC hose is a lightweight standard wall crystal clear yarn reinforced hose suitable for a wide variety of food and beverage applications. It is constructed of crystal clear PVC compound, formulated with ingredients in compliance with applicable FDA(03) requirements, meets USDA(17), 3A(01), NSF(13), UL(16), RoHS(15) and USP(18) Class VI criteria. It is reinforced with spiraled polyester yarn and longitudinal orange tracer yarns for identification. The service temperature Range: is between +25°F (-4°C) and +150°F (+65°C). Hose clamps and fittings are also available. See index for types and locations.

Features:

- Constructed with non-toxic compounds.
- NSF-51 and NSF-61 certified material.
- Crystal clear — allows visual confirmation of product flow.
- Longitudinally-reinforced to reduce elongation under pressure.
- Light weight.
- Self-extinguishing.
- Non-marking.
- Silicone-free.
- Non-conductive.
- One-piece lengths.
- Resistant to chemicals.
- Compound hardness 73 ±3 Shore "A".

Applications:

- Food & beverage dispensing.
- Deionized water.
- Liquid food products.
- Air and water lines.
- Powdered food products.
- Potable water transfer.
- Air breathing lines.
- Pneumatic lines.
- Packaging machines.

PART NUMBER	NOMINAL I.D.	NOMINAL O.D.	WALL THICKNESS	WP/PSI 70°F (20°C)	WP/PSI 122°F (50°C)	STANDARD LENGTH (FT)	APPROX. WT PER ROLL (LBS.)
NYR-050	3/16"	0.375"	3/16"	250	150	300	13
NYR-055	1/4"	0.438"	1/16"	250	150	300	17
NYR-060	5/16"	0.531"	1/16"	250	135	300	24
NYR-072	3/8"	0.594"	1/16"	225	125	300	27
NYR-080	1/2"	0.750"	3/32"	200	100	300	40
NYR-090	5/8"	0.891"	1/8"	200	100	200	35
NYR-100	3/4"	1.031"	1/16"	150	85	200	43
NYR-110	1"	1.300"	3/32"	125	75	200	59
NYR-120	1-1/4"	1.620"	1/16"	100	55	100	45
NYR-130	1-1/2"	1.938"	3/32"	100	50	100	64
NYR-150	2"	2.490"	1/8"	75	35	100	94
K3150MM04	4 mm	9 mm	2.5 mm	250	150	100	4
k3150MM06	6 mm	11 mm	2.5 mm	250	150	100	6
K3150MM08	8 mm	13.5 mm	2.75 mm	250	135	100	8
K3150MM10	10 mm	16 mm	3 mm	225	125	100	10
K3150MM12	12 mm	18 mm	3 mm	200	100	100	12
k3150MM19	19 mm	26 mm	3.5 mm	150	85	100	21

Notes:

- Working Pressure decreases as temperature increases.
- Pressure ratings can only be obtained with proper coupling procedures.
- Use of compression fittings with braided hose is not recommended. Hose claims involving use of these fittings will be disallowed.

Series K7130 Heavy Wall PVC Transfer Hose



Series K7130 Heavy Wall PVC Food & Beverage Vacuum/ Transfer Hose is made from crystal clear PVC compound, formulated in compliance with applicable FDA(03) requirements, meets USDA(17), 3A(01), NSF(13), UL(16), USP(18) and RoHS(15) criteria. It is reinforced with helically-wound spring steel wire. Hose clamps and fittings are also available.

Features:

- 29.9" HG vacuum rating.
- Spiral wire reinforcement prevents kinking or collapsing, hose diameter will not expand under normal rated working pressures.
- Crystal clear — allows visual confirmation of product flow.
- Glass-smooth interior — reduces material buildup.
- Electrogalvanized helical steel wire can be used for static dissipation.
- Compound hardness 73 ±3 Shore "A".
- Self-extinguishing.
- Non-marking, non-toxic and silicone-free.

Applications

- Industrial vacuum pumps and lines.
- Food & beverage dispensing.
- Car wash applications.
- Coolant and air breathing lines.
- Deionized water systems.

SERIES NUMBER	SIZE CODE	NOMINAL ID (IN)	NOMINAL OD (IN)	WP/PSI 70°F	WP/PSI 122°F	STANDARD LENGTH OF COIL	APPROX. WT PER ROLL	MIN. BEND RADIUS @ 70°F
K7130	04	1/4	0.500	250	80	100 ft.	10 lbs.	1"
K7130	06	3/8	0.625	150	80	100 ft.	13 lbs.	1 1/2"
K7130	08	1/2	0.813	150	80	100 ft.	21 lbs.	2"
K7130	10	5/8	1.000	150	65	100 ft.	30 lbs.	2"
K7130	12	3/4	1.125	150	65	100 ft.	36 lbs.	3"
K7130	16	1	1.375	100	50	100 ft.	44 lbs.	4"
K7130	20	1 1/4	1.750	100	50	50 ft.	37 lbs.	5"
K7130	24	1 1/2	2.000	100	35	50 ft.	42 lbs.	6"
K7130	32	2	2.500	100	35	50 ft.	56 lbs.	8"

Notes:

- The service temperature range is from +25°F (-4°C) to +150°F (+65°C).
- NSF 51 certified

Series K7160 Standard Wall PVC Hose



Series K7160 Standard Wall PVC Food & Beverage Vacuum/ Transfer Hose is made from crystal clear PVC compound, formulated with ingredients in compliance with applicable FDA(03) requirements, meets USDA(17), 3A(01), NSF(13) and RoHS(15) criteria. It is reinforced with a helically-wound spring steel wire.

Features:

- 29.9" HG vacuum rating.
- Spiral wire reinforcement prevents kinking or collapsing, hose diameter will not expand under normal rated working pressures.
- Crystal clear — allows visual confirmation of product flow.
- Glass-smooth interior — reduces material buildup.
- Electrogalvanized helical steel wire can be used for static dissipation.
- Self-extinguishing.
- Non-marking, non-toxic and silicone-free.

Applications:

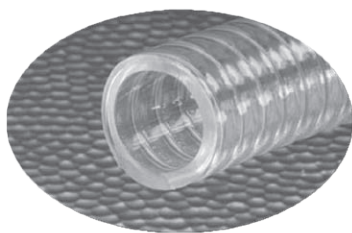
- Industrial vacuum pumps and lines
- Food & beverage dispensing.
- Car wash applications.
- Coolant and air breathing lines.
- Deionized water systems.

SERIES NUMBER	SIZE CODE	NOMINAL ID (IN)	NOMINAL OD (IN)	WP/PSI 70°F	WP/PSI 122°F	STANDARD LENGTH OF COIL	APPROX. WT PER ROLL	MIN. BEND RADIUS @ 70°F
K7160	04	1/4	.460	150	70	100 ft.	7 lbs.	1"
K7160	06	3/8	.600	100	70	100 ft.	11 lbs.	1 1/2"
K7160	08	1/2	.750	100	70	100 ft.	15 lbs.	2"
K7160	10	5/8	.891	100	50	100 ft.	19 lbs.	2"
K7160	12	3/4	1.031	70	50	100 ft.	24 lbs.	3"
K7160	16	1	1.297	70	35	100 ft.	33 lbs.	4"
K7160	20	1 1/4	1.609	70	35	50 ft.	25 lbs.	5"
K7160	24	1 1/2	1.860	50	30	50 ft.	29 lbs.	6"
K7160	32	2	2.391	50	30	50 ft.	42 lbs.	8"
K7160	36	2 1/4	2.750	50	30	50 ft.	58 lbs.	9"
K7160	40	2 1/2	3.000	50	30	50 ft.	69 lbs.	10"
K7160	48	3	3.500	50	30	50 ft.	81 lbs.	12"

Notes:

- The service temperature range is from +25°F (-4°C) to +150°F (+65°C).
- NSF 51 certified

K3130 Series BF Heavy Wall PVC Hose



A heavier walled crystal clear yarn reinforced hose suitable for a wide variety of food and beverage applications. It is constructed of crystal clear PVC compound, formulated in compliance with applicable FDA(03) requirements, meets USDA(17), 3A(01), NSF(13), UL(16), RoHS(15) and USP(18) Class VI criteria. It is reinforced with spiraled polyester yarn and longitudinal blue tracer yarns for identification.

Features:

- Constructed with non-toxic compounds.
- NSF-51 and NSF-61 certified material.
- Crystal clear — allows visual confirmation of product flow.
- Longitudinally-reinforced to reduce elongation under pressure.
- Light weight.
- Self-extinguishing.
- Non-marking and Silicone-free.
- One-piece lengths.
- Compound hardness 73 ±3 Shore "A".

Applications:

- Food & beverage dispensing.
- Coolant and air breathing lines.
- Deionized water systems.
- Liquid food products.
- Powdered food products.
- Potable water transfer.
- Pneumatic lines.
- Packaging machines.

Notes:

- The service temperature range is from +25°F (-4°C) to +150°F (+65°C).
- NSF 51 certified
- Working Pressure decreases as temperature increases. Pressure ratings can only be obtained with proper coupling procedures.
- Use of compression fittings with yarn-reinforced hose is not recommended. Hose claims involving use of these fittings will be disallowed.

SERIES #	SIZE CODE	NOMINAL ID (IN)	NOMINAL OD (IN)	WP/PSI 70°F	WP/PSI 122°F	STANDARD LENGTH OF COIL	APPROX. WT PER ROLL
K3130	02	1/8	.328	350	200	300 ft.	12 lbs.
K3130	03	3/16	.406	350	200	300 ft.	17 lbs.
K3130	04	1/4	.500	350	200	300 ft.	24 lbs.
K3130	05	5/16	.563	275	160	300 ft.	28 lbs.
K3130	06	3/8	.625	275	145	300 ft.	32 lbs.
K3130	08	1/2	.813	250	130	300 ft.	52 lbs.
K3130	10	5/8	1.000	225	125	200 ft.	52 lbs.
K3130	12	3/4	1.125	200	120	200 ft.	60 lbs.
K3130	16	1	1.375	150	85	200 ft.	76 lbs.
K3130	20	1 1/4	1.750	125	75	100 ft.	64 lbs.
K3130	24	1 1/2	2.000	100	65	100 ft.	75 lbs.
K3130	32	2	2.500	75	55	100 ft.	96 lbs.

Series UBK Abrasion-Resistant PVC Hose



Series UBK Polyurethane-lined abrasion-resistant PVC material handling hose is ideal for dry applications.

The smooth polyurethane lining provides resistance to abrasion and eliminates material build up. The black HMW PVC is flexible provides sub-zero flexibility and light weight for easy handling. It is formulated with static-dissipative compounds. Exposed black rigid PVC helix is abrasion-resistant and allows hose to slide easily and makes it easier handle.

Applications:

- Roof rock cleaning.
- Abrasive material transfer.
- Sand/shot blast recovery line.

PART #	NOMINAL ID (IN)	NOMINAL OD (IN)	APPROX. LINER THICKNESS (IN)	WP/PSI 68°F	WP/PSI 104°F	STANDARD LENGTH OF COIL	APPROX. WT (LBS./FT)	VACUUM / (IN OF HG) 68 °F	VACUUM / (IN OF HG) 104°F	MIN. BEND RADIUS @ 70°F
UBK200	2	2.40	0.7	15	40	100/50	0.59	Full	28	2"
UBK250	2 1/2	3.07	0.9	15	40	100/50	0.79	Full	28	4"
UBK300	3	3.64	1.0	15	40	100/50	0.83	Full	28	4"
UBK400	4	4.76	1.2	13	35	100/50	1.37	Full	28	6"
UBK500	5	5.69	1.2	10	30	100/50/20	2.28	28	15	10"
UBK600	6	6.81	1.5	10	30	100/50/20	3.10	28	15	12"
UBK800	8	9.02	2.0	10	30	50/20	4.51	28	15	15"

Notes:

- The service temperature range is from -40°F to +150°F.
- Actual service temperature range is application-dependent.
- Spiral Double Bolt Clamps
- Service life may vary depending on operating conditions and type of material being conveyed.

FLEXIBLE TUBE, HOOSING & FITTINGS



Series E Instrument Grade PE Tubing



Parflex flexible polyethylene thermoplastic tubing is extruded from high molecular weight resin for increased dimensional stability, uniformity and long-term strength. Its resistance to environmental stress cracking greatly exceeds that of ordinary polyethylene tubing as measured by ASTM D-1693. (10% IGEPAL). Parflex polyethylene tubing is available in black as well as seven coding colours as recommended by the Instrument Society of America. Black (EB) tubing contains an ultra-violet inhibitor which is recommended for use in sunlit areas. Ingredients of natural and colour tubing (except black) listed below meet F.D.A. requirements for food contact applications. All tubing conforms to ASTM D-1248, Type I, Class A, Category 4, Grade E5. Parker Fast & Tite fittings or Parker Brass fittings are recommended for this type of Tubing. The suggested operating temperature -80F (-62C) to +150F (+66C).

PART NO.	COLOUR	OD (IN)	ID (IN)	WALL THICKNESS	LENGTH (FT)	WD @73°F	MIN. BURST PSI @ 73°F	MIN. BEND RADIUS (IN)	WEIGHT PER 100 FT
E-43-0100	Natural	1/4	0.170	0.040	100	120	625	1	1.17
E-43-0500	Natural	1/4	0.170	0.040	500	120	625	1	0.74
E-43-1000	Natural	1/4	0.170	0.040	1000	120	625	1	0.32
EB-43-0100	Black	1/4	0.170	0.040	100	120	625	1	1.28
EB-43-0500	Black	1/4	0.170	0.040	500	120	625	1	0.78
EB-43-1000	Black	1/4	0.170	0.040	1000	120	625	1	0.66
E-43-R-0100	Red	1/4	0.170	0.040	100	120	625	1	0.99
E-43-R-0500	Red	1/4	0.170	0.040	500	120	625	1	0.78
E-43-B-0100	Blue	1/4	0.170	0.040	100	120	625	1	1.02
E-43-B-0500	Blue	1/4	0.170	0.040	500	120	625	1	0.78
E-43-O-0500	Orange	1/4	0.170	0.040	500	120	625	1	0.93
E-43-Y-0500	Yellow	1/4	0.170	0.040	500	120	625	1	0.74
E-43-P-0500	Purple	1/4	0.170	0.040	500	120	625	1	0.74
E-43-G-0500	Green	1/4	0.170	0.040	500	120	625	1	0.74
E-53-0500	Natural	5/16	0.187	0.062	500	145	800	1 1/8	1.02
EB-53-0500	Black	5/16	0.187	0.062	500	145	800	1 1/8	1.03
E-64-0100	Natural	3/8	0.250	0.062	100	125	675	1 1/4	1.10
E-64-0500	Natural	3/8	0.250	0.062	500	125	675	1 1/4	0.62
EB-64-0100	Black	3/8	0.250	0.062	100	125	675	1 1/4	1.93
EB-64-0500	Black	3/8	0.250	0.062	500	125	675	1 1/4	1.28
E-64-R-0500	Red	3/8	0.250	0.062	500	125	675	1 1/4	1.35
E-64-B-0500	Blue	3/8	0.250	0.062	500	125	675	1 1/4	1.40
E-64-O-0500	Orange	3/8	0.250	0.062	500	125	675	1 1/4	1.38
E-64-Y-0500	Yellow	3/8	0.250	0.062	500	125	675	1 1/4	1.42
E-64-P-0500	Purple	3/8	0.250	0.062	500	125	675	1 1/4	1.38
E-64-G-0500	Green	3/8	0.250	0.062	500	125	675	1 1/4	1.38
E-86-0100	Natural	1/2	0.375	0.062	100	90	425	2 1/2	1.78
EB-86-0100	Black	1/2	0.375	0.062	100	90	425	2 1/2	2.44
E-108-0100	Natural	5/8	0.500	0.062	100	70	325	4	3.35
EB-108-0100	Black	5/8	0.500	0.062	100	70	325	4	3.27
E-108-0500	Natural	5/8	0.500	0.062	500	70	325	4	1.20
EB-108-0500	Black	5/8	0.500	0.062	500	70	325	4	1.99

Laboratory Grade PP Tubing



Parflex polypropylene tubing may be used at higher temperatures and working pressures than polyethylene tubing. Resistance to hot water and hot corrosive acids is excellent. Polypropylene tubing will last many times longer than nylon tubing in hot water service. Parflex polypropylene tubing is available in white or ultra-violet resistant black. Good resistance to vegetable oils. Water absorption is less than .01% and it's resistance to environmental stress cracking is excellent. It meets FDA requirements for food contact. It is flexible and dimensionally stable. The recommended fittings for this pipe are the Parflex Fast & Tite fittings or the Parker Brass fitting. Other sizes available upon request.

Notes:

- Suggested operating temperatures, depending upon conditions are 0°F (-18°C) to +200°F (+93°C).
- The recommended fittings for this pipe are the Parflex Fast & Tite fittings or the Parker Brass fitting.

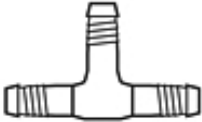
PART #	COLOUR	O.D. (IN)	I.D. (IN)	WALL (IN)	COIL LENGTH (FT)	WORKING PRESSURE AT 73°F (PSI)	MIN. BURST AT 73°F (PSI)	MIN. BEND RADIUS (IN)	WEIGHT PER 100 FEET
PP-21-1000	White	1/8	.080	.023	1000	300	1400	1/2	.30
PPB-21-1000	Black	1/8	.080	.023	1000	300	1400	1/2	.30
PP-32-0500	White	3/16	.120	.034	500	300	1400	3/4	.70
PPB-32-0500	Black	3/16	.120	.034	500	300	1400	3/4	.70
PP-43-0500	White	1/4	.170	.040	500	300	1200	1	1.1
PPB-43-0500	Black	1/4	.170	.040	500	300	1200	1	1.1
PP-53-0500	White	5/16	.187	.062	500	300	1400	1 1/4	2.1
PPB-53-0500	Black	5/16	.187	.062	500	300	1400	1 1/4	2.1
PP-64-0500	White	3/8	.250	.062	500	300	1200	1 1/4	2.4
PPB-64-0500	Black	3/8	.250	.062	500	300	1200	1 1/4	2.4
PP-86-0250	White	1/2	.375	.062	250	200	900	2 1/2	3.5
PPB-86-0250	Black	1/2	.375	.062	250	200	900	2 1/2	3.5

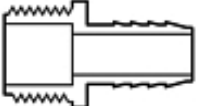


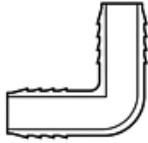
Hose Insert Fittings

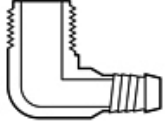
PVC Hose Insert Fittings


Engineered to provide positive grip and ease of installation. A wide variety of PVC and PP insert configurations and adapters are available for use with polyethylene pipe sizes 1/2" through 4", plus 6" & 8" Couplings and Adapters for lay-flat type irrigation hose. Special 3/8" barbed configurations allow clamp-free connection to 1/2" I.D. polyethylene irrigation hose. They are manufactured from high quality PVC materials to meet or exceed the applicable requirements of ASTM D 2609. Available fittings include crosses, Numerous male and female NPT threaded adapters, elbows and tees plus white PVC Schedule 40 solvent cement socket and spigot adapters. The special spiral barb allows "twist-on" connection of hose without need for clamping. They are NSF Certified for Use with Potable Water. Other sizes and materials are also available upon request.

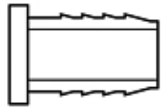
INSERT TEE	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X INSERT X INSERT)	1/2	1401005	PT1G
	3/4	1401007	PT2G
	1	1401010	PT3G
	1 1/4	1401012	PT4G
	1 1/2	1401015	PT5G
	2	1401020	PT6G

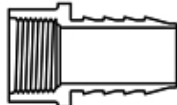
INSERT MALE ADAPTER	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X MIPT)	1/2	1436005	PA1G
	3/4	1436007	PA2G
	1	1436010	PA3G
	1 1/4	1436012	PA4G
	1 1/2	1436015	PA5G
	2	1436020	PA6G
	2 1/2	1436020	1436020


INSERT 90° ELBOW	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X INSERT)	1/2	1406005	PE1G
	3/4	1406007	PE2G
	1	1406010	PE3G
	1 1/4	1406012	PE4G
	1 1/2	1406015	PE5G
	2	1406020	PE6G
	2 1/2	1406025	1406025

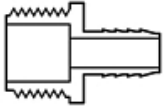
INSERT 90° ELBOW	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X MIPT)	1/2	1413005	PEM1G
	3/4	1413007	PEM2G
	1	1413010	PEM3G
	1 1/4	1413012	PEM4G
	1 1/2	1413015	PEM5G
	2	1413-020	PEM6G


INSERT COUPLING	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X INSERT)	1/2	1429005	PC1G
	3/4	1429007	PC2G
	1	1429010	PC3G
	1 1/4	1429012	PC4G
	1 1/2	1429015	PC5G
	2	1429020	PC6G
	2 1/2	1429025	1429025

INSERT PLUG	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT)	1/2	1449005	-
	3/4	1449007	-
	1	1449010	-
	1 1/4	1449012	PP4G
	1 1/2	1449015	PP5G
	2	1449020	PP6G

INSERT FEMALE ADAPTER	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X FIPT)	1/2	1435005	-
	3/4	1435007	-
	1	1435010	-
	1 1/4	1435012	-
	1 1/2	1435015	-
	2	1435020	-

INSERT REDUCING COUPLING	SIZE (IN)	PVC PART NO.	PP PART NO.
(INSERT X INSERT)	3/4X1/2	1429101	PC21G
	1X1/2	1429130	PC31G
	1X3/4	1429131	PC32G
	1X7/8	14291315	PC42G
	1-1/4X3/4	1429167	PV43G
	1-1/4X1	1429168	PC52G
	1-1/2X3/4	1429210	PC53G
	1-1/2X1	1429211	PC54G
	1-1/2X1-1/4	1429212	PC63G
	2X1	1429249	PC64G
	2X1-1/4	1429250	PC65G
	2X1-1/2	1429251	1429251
	2-1/2X1-1/2	1429291	1429291

REDUCING MALE ADAPTER	SIZE (IN)	PVC PART NO.	PP PART NO.
(MIPT X INSERT)	1/2X3/4	1436101	-
	1/2X1	1436130	-
	3/4X1/2	1436131	PA21G
	3/4X1	14361315	-
	1X3/4	1436167	PA32G
	1X1-1/4	1436168	-
	1X1-1/2	1436210	-
	1-1/4X3/4	1436211	PA42G
	1-1/4X1	1436212	PA43G
	1-1/4X1-1/2	1436249	-
	1-1/2x3/4	-	PA53G
	1-1/2X1	1436250	-
	1-1/2X1-1/4	1436251	PA54G
	1-1/2X2	1436291	-
	2x1-1/2	-	PA65G

INSERT REDUCING TEE	SIZE (IN)	PP PART NO.
(INSERT X INSERT X INSERT)	3/4 X 3/4 X 1/2	PT221G
	1 X 1 X 1/2	PT331G
	1 X 1 X 3/4	PT332G
	1 1/2X1 1/2X1/2	PT551G
	1 1/2x1 1/2X3/4	PT552G
	1 1/2 X1 1/2 X 1	PT553G
	2 X 2 X 3/4	PT662G
	2 X 2 X 1	PT663G
	3/4 X 1/2 X 1/2	PT211G
	1 X 3/4 X 1/2	PT321G
	1 X 3/4 X 3/4	PT322G

Black HDPE and Nylon Insert Fittings



Black HDPE and Nylon Insert Fittings are ideal for all types of tubing and are available in a variety of sizes and configurations.

Notes:

- Other sizes available upon request.
- Available in PVC upon request.

MALE ELBOW (INSERT X MPT)	SIZE (IN)	HDPE PART NO.	WHITE NYLON PART NO.
	1/4	P4MEB4	N4MEB4
	3/8	P6MEB6	N6MEB6
	1/2	P8MEB8	N8MEB8

REDUCING TEE UNION (INSERT)	SIZE (IN)	PART NO.	WHITE NYLON PART NO.
	3/8x3/8 x 1/4	P6TUB4	N6TUB4
	3/8x3/8 x 1/2	P6TUB8	N6TUB8
	1/2x1/2 x 3/8	P8TUB6	N8TUB6

MALE BRANCH TEE (INSERT X INSERT X MPT)	SIZE (IN)	PART NO.	WHITE NYLON PART NO.
	1/4 x 1/4 x 1/4	P4MTB4	N4MTB4
	3/8 x 3/8 x 3/8	P6MTB6	N6MTB6
	1/2 x 1/2 x 1/2	P8MTB8	N8MTB8

HEX PIPE NIPPLE (MPT)	SIZE (IN)	PART NO.	WHITE NYLON PART NO.
	1/8	P2HPN2	N2HPN2
	1/4	P4HPN4	N4HPN4
	3/8	P6HPN6	N6HPN6
	1/2	P8HPN8	N8HPN8
	3/4	P12HPN12	N12HPN12

MALE CONNECTOR (INSERT X MPT)	SIZE (IN)	PART NO.	WHITE NYLON PART NO.
	1/4	P4MCB4	N4MCB4
	3/8	P6MCB6	N6MCB6
	1/2	P8MCB8	N8MCB8
	3/4	N12MCB12	N12MCB12

TEE UNION (INSERT)	SIZE (IN)	BLACK HDPE PART NO.	WHITE NYLON PART NO.
	1/8	P2TUB2	N2TUB2
	3/16	P3TUB3	N3TUB3
	1/4	P4TUB4	N4TUB4
	5/16	P5TUB5	N5TUB5
	3/8	P6TUB6	N6TUB6
	1/2	P8TUB8	N8TUB8
	5/8	P10TUB10	N10TUB10

UNION CONNECTOR (INSERT)	SIZE (IN)	BLACK HDPE PART NO.	WHITE NYLON PART NO.
	1/8	P2UCB2	N2UCB2
	3/16	P3UCB3	N3UCB3
	1/4	P4UCB4	N4UCB4
	5/16	P5UCB5	N5UCB5
	3/8	P6UCB6	N6UCB6
	1/2	P8UCB8	N8UCB8
	5/8	P10UCB10	N10UCB10

REDUCING HEX PIPE NIPPLE (MPT X MPT)	SIZE (IN)	BLACK HDPE PART NO.	WHITE NYLON PART NO.
	1/4 x 1/8	P4HPN2	N4HPN2
	3/8 x 1/8	P6HPN2	N6HPN2
	3/8 x 1/4	P6HPN4	N6HPN4
	1/2 x 1/8	P8HPN2	N8HPN2
	1/2 x 1/4	P8HPN4	N8HPN4
	1/2 x 3/8	P8HPN6	N8HPN6
	3/4 x 3/8	P12HPN6	N12HPN6
3/4 x 1/2	P12HPN8	N12HPN8	

HEX HEAD PIPE PLUG (MPT)	SIZE (IN)	BLACK HDPE PART NO.	WHITE NYLON PART NO.
	1/8	P2HPL	N2HPL
	1/4	P4HPL	N4HPL
	3/8	P6HPL	N6HPL
	1/2	P8HPL	N8HPL
	3/4	P12HPL	N12HPL

ELBOW UNION (INSERT)	SIZE (IN)	BLACK HDPE PART NO.	WHITE NYLON PART NO.
	1/4	P4EUB4	N4EUB4
	3/8	P6EUB6	N6EUB6
	1/2x1/4	P8EUB4	N8EUB4
	1/2x3/8	P8EUB6	N8EUB6
	1/2	P8EUB8	N8EUB8
	5/8	P10EUB10	N10EUB10

PP Cam Coupler Fittings

PP Cam Coupler Fittings

The Cam Coupler is a rugged engineered plastic design quick lock style for hose and pipe coupling. The Cam Coupler is moulded of polypropylene to exacting tolerances. It is light weight, corrosion resistant, wear resistant, rugged and interchangeable with other couplers of similar design and size. Cam couplers are suited for a variety of applications and corrosive materials including chemical handling, agricultural fertilizers, herbicides & irrigation, dry bulk industrial use, and barge and tank unloading. Other features include Positive Action (No springs, ball bearings, snaps or lugs to fit), no maintenance, special tools or techniques required to operate. Buna-N Gaskets are standard; EPDM gaskets are available upon request. All handles are zinc plated steel; Stainless steel handles are available upon request.

FEMALE THREADED ADAPTERS (TYPE A)		SIZE (IN)	PART NO.
		1/2	24011
		3/4	24111
		1	24211
		1 1/4	24311
		1 1/2	24411
		2	24511
		3	24711

MALE THREADED COUPLERS (TYPE B)		SIZE (IN)	PART NO.
		1/2	24002
		3/4	24102
		1	24202
		1 1/4	24302
		1 1/2	24402
		2	24502
		3	24702

HOSE SHANK COUPLERS (TYPE C)		SIZE (IN)	PART NO.
		1/2	24003
		3/4	24103
		1	24203
		1 1/4	24303
		1 1/2	24403
		2	24503
		3	24703

FEMALE THREADED COUPLERS (TYPE D)		SIZE (IN)	PART NO.
		1/2	24004
		3/4	24104
		1	24204
		1 1/4	24304
		1 1/2	24404
		2	24504
		3	24704

HOSE SHANK ADAPTERS (TYPE E)		SIZE (IN)	PART NO.
		1/2	24015
		3/4	24115
		1	24215
		1 1/4	24315
		1 1/2	24415
		2	24515
		3	24715

MALE THREAD ADAPTERS (TYPE F)		SIZE (IN)	PART NO.
		1/2	24016
		3/4	24116
		1	24216
		1 1/4	24316
		1 1/2	24416
		2	24516
		3	24616

Notes:

- 1/2" couplers and adapters will interchange with 3/4" couplers and adapters. Only the threads and barbs are 1/2".
- 1-1/4" couplers and adapters will interchange with 1-1/2" couplers and adapters. Only the threads and barbs are 1-1/4".

DUST CAPS (TYPE G)		SIZE (IN)	PART NO.
		1/2	24008
		3/4	24108
		1	24208
		1 1/4	24308
		1 1/2	24408
		2	24508
		3	24708

DUST PLUGS (TYPE DP)		SIZE (IN)	PART NO.
		1/2	24017
		3/4	24117
		1	24217
		1 1/4	24317
		1 1/2	24417
		2	24517
		3	24717

90° MALE ADAPTER WITH FEMALE THREAD (TYPE 90° A)		SIZE (IN)	PART NO.
		1 1/2	249015A
		2	249020A

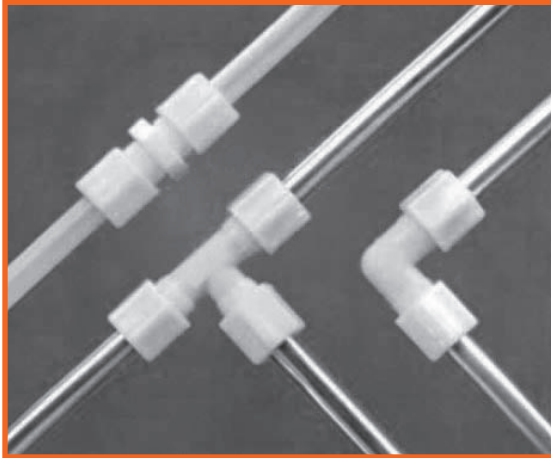
90° FEMALE COUPLER WITH HOSE SHANK (TYPE 90° C)		SIZE (IN)	PART NO.
		1 1/2	249015C
		2	249020C

90° FEMALE COUPLER WITH FEMALE THREAD (TYPE 90° D)		SIZE (IN)	PART NO.
		1 1/2	249015D
		2	249020D

90° MALE ADAPTER WITH MALE THREAD (TYPE 90° F)		SIZE (IN)	PART NO.
		1 1/2	249015F
		2	249020F

SIZE (IN)	EPDM GASKET PART #	SIZE (IN)	STAINLESS STEEL HANDLE PART #
1/2-3/4	61570	1/2-1	61594
1	61571	1 1/4-2	61595
1 1/4-1 1/2	61572	3	61596
2	61574		
3	61575		

Jaco Compression Tube Fittings



Plastic Fittings That Revolutionized The Techniques of Connecting Tubes.

Compression type metallic fittings have a loose ferrule which requires extra assembly. JACO has been able to mold the sleeve as an integral part of the nut, eliminating the need for a two-piece assembly. Although fittings were originally developed for copper tubing, other fittings were then later engineered with plastic grippers for plastic tubing.

Today, JACO fittings are widely used with all types of tubing including copper, plastic, aluminum and glass.

JACO compression fittings typically cost less than metal fittings and they offer better resistance to corrosion and chemicals. Additionally, we offer four different plastic resins for a range of applications dealing with temperatures, acids and chemicals. JACO plastic fittings offer these additional advantages:

- Good electrical insulating qualities which eliminate electrolytic action that usually corrodes tubing when dissimilar metal meets a fitting.
- The ability to absorb mechanical and acoustical vibrations because of the low density and softness of plastic.
- An inherently low resistance to flow, due to smooth internal surface.
- A resistance to scale buildup.

Fittings are available in size ranges from 1/8" through 7/8" tube O.D. in all common figurations, such as union, bulkhead, male and female connectors, male branch and male run tees, tee unions and ferrule nuts. Metric sizes are also available on a special order basis.

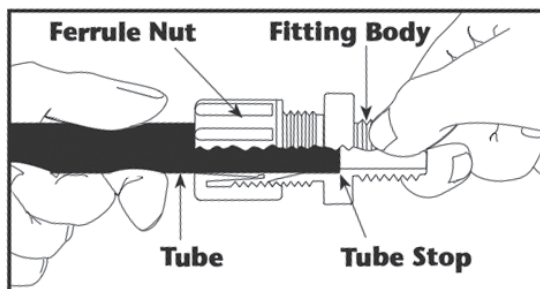
Various resins are used, depending on the application. JACO plastic fittings are made of either nylon, acetal copolymer, polypropylene, or polyvinylidene fluoride.

INSTALLATION INSTRUCTIONS FOR JACO TUBE FITTINGS

1. Cut the tubing end squarely and remove the internal and external burrs.
2. Insert the tubing through the back of the nut all the way through the nut assembly to the tube stop in the fitting body (see illustration). If the tubing does not enter the nut easily, loosen the nut one turn and then insert the tubing all the way to the tube stop in the fitting body.
3. Turn the nut hand tight.
4. Wrench tighten the nut 1-1/2 - 2 turns.
5. All nuts must be retightened when the system reaches projected operating temperature.

NOTE: Squeaking sound when tightening nut is normal. For pipe threaded connections, Teflon Tape* must be used.

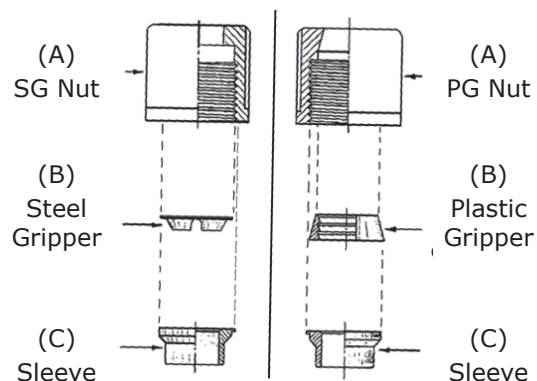
*Dupont's Reg. T.M. Patent 1983



Caution: To insure proper assembly, tubing MUST be fully inserted into the fitting body to the tube stop.

NOTE: It is not necessary to disassemble this fitting for application. Merely insert tubing to stop and tighten nut.

SG NUT ASSEMBLY PG NUT ASSEMBLY



ASSEMBLY INSTRUCTIONS FOR JACO NUTS

Please follow these diagrams in assembling nuts. As shown below, insert gripper (B) into nut (A). Push sleeve (C) into nut assembly.

Compression Tube Fittings

Material Selection

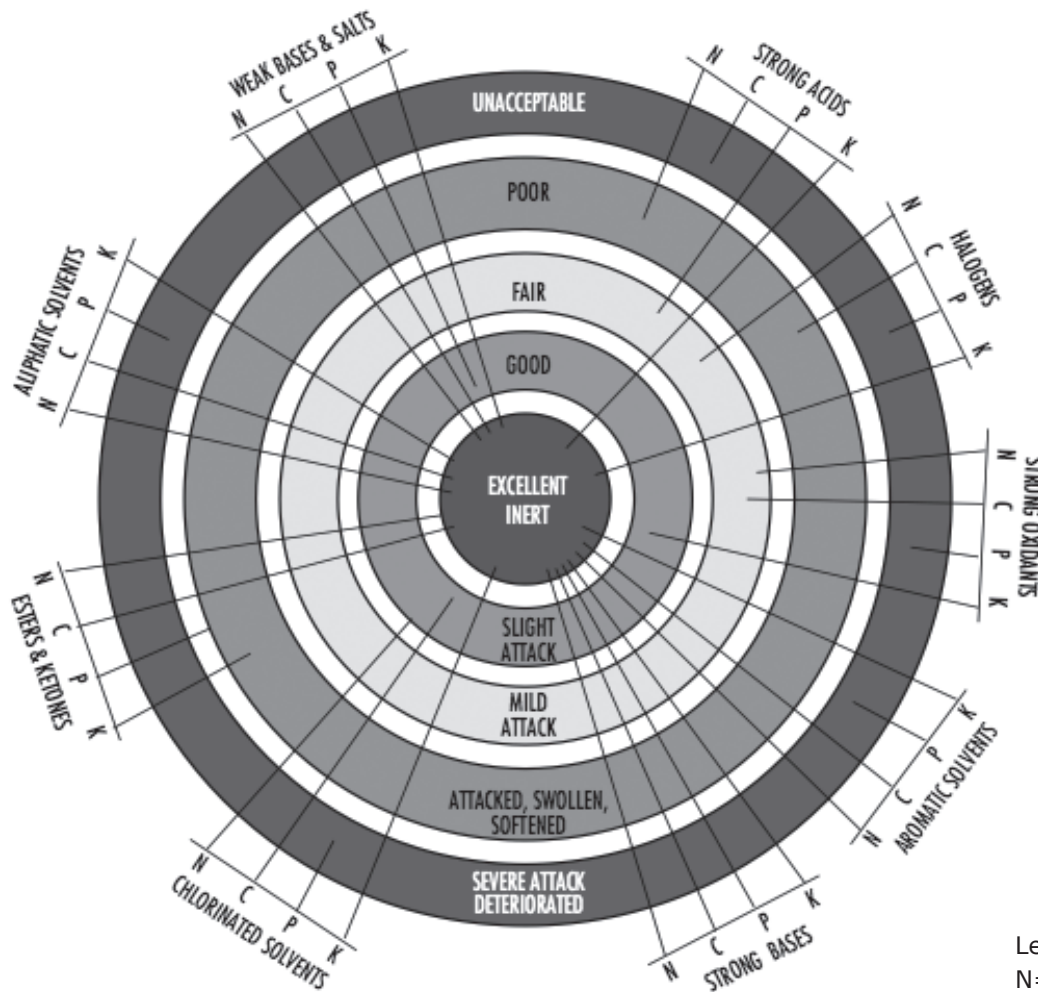
(N) Nylon has good resistance to organic solvents, oils and gasoline. Good strength at high temperatures. Material rating: -40° to 200°F. Cold and hot-water applications. Longtime weathering resistance. Good impact resistance, both single and repeated. Not recommended for use with ammonium, boric acid, calcium, sulfuric acid, or hydrochloric acid. F.D.A. listed. Also N.S.F. listed.

***(C) Celcon, or acetal copolymer,** has high tensile strength and good impact resistance over a broad temperature range. Translucent white color. Not affected by continuous hot-water service and works smoothly with metal tubing. Celcon cannot be recommended for continuous exposure to solutions with a chlorine concentration greater than 1 ppm. Material is rated at -40° to 200°F in open air, and rated for 180°F

in water applications. Unaffected by most inorganics, except sulfuric, nitric and hydrochloric acids. Listed by U.S.D.A. and F.D.A. for coffee, milk and antibiotics. Also N.S.F. listed. Should not be continuously exposed to sunlight.

(P) Polypropylene has good chemical resistance. Material is rated at -30 to 215°. Opaque, white color. Unaffected by most weak acids and alkalis. Below 175°F it has good resistance to organic solvents. Do not use with oxidants or strong acids or in continuous sunlight. N.S.F. listed. 20% glass filled for improved stiffness.

**** (K) Kynar,** a polyvinylidene fluoride, has outstanding chemical resistance for handling highly corrosive fluids. Material rated at -80 to 275°, with a cloudy, white color. F.D.A. listed, N.S.F. Listed.

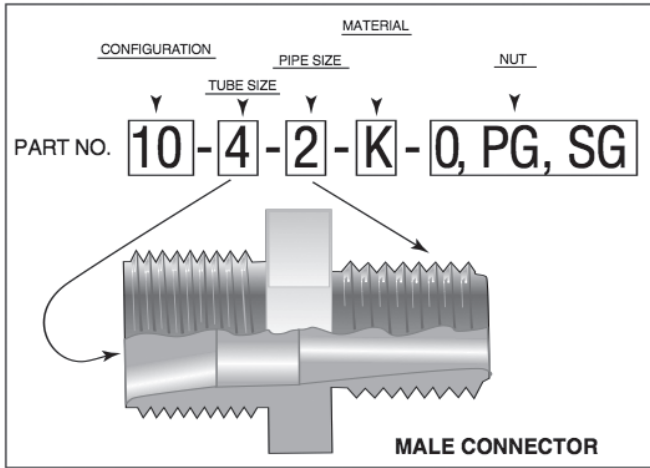


Legend:
 N=Nylon
 *C=Cekon (Acetal)
 P= Polypropylene
 **K=Kynar

Notes:

- *TRADEMARK of Ticona
- **TRADEMARK of Atofina Chemicals, Inc.

Ordering Information



It is not necessary to designate the nut size when ordering complete units as this will be determined by the tube size indication in the part number.

The part number for JACO compression Fittings is designed so that each number and letter immediately identifies the shape, size and material.

For example: the first number identifies the shape, I.E.

- 10 = Male Connector,
- 25 = Female Connector,
- 50 = Union Elbow, etc.

The second number designates the tube size, in 1/16" increments, I.E.

- 4 = 1/4" O.D. Tubing,
- 8 = 1/2" O.D. Tubing.

The third number, also in 1/16" increments, (unless a Union type fitting is required), designates the pipe size.

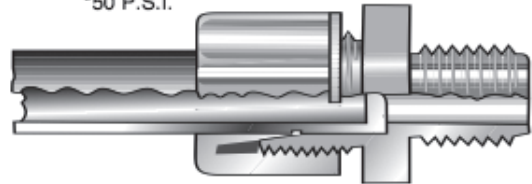
The letter following the numbers indicates the material:

- K =Kynar
- N =Nylon
- P =Polypropylene
- C =Celcon

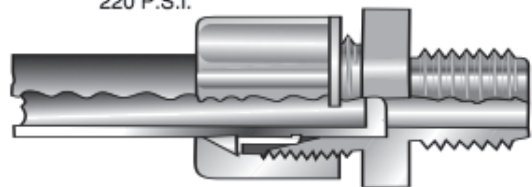
The last letter(s) denote the nut desired:

- O = Standard - *50 P.S.I.
- P.G. = Plastic Gripper for plastic tubing - *220 P.S.I.
- S.G. = Stainless Steel Gripper for use with hard surfaced tubing - *220 P.S.I.

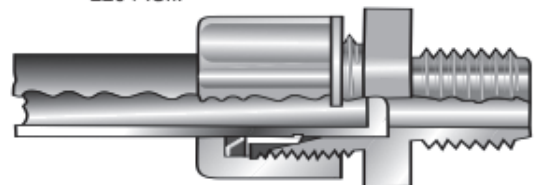
FERRULE NUT
WITH INTEGRAL SLEEVE
LOW PRESSURE APPLICATIONS
SOFT PLASTIC TUBING
*50 P.S.I.



WITH PLASTIC GRIPPER
FOR USE WITH PLASTIC TUBING
FOR SURE GRIP
*220 P.S.I.



WITH STAINLESS STEEL GRIPPER
FOR USE WITH HARD AND SMOOTH
SURFACED TUBING
*220 P.S.I.

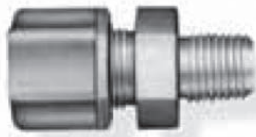


Note: Fitting dimensions as described in this brochure may not reflect running changes made to improve part performance. Check with JACO Manufacturing Company in critical applications.

*Operating pressures of JACO Tube Fittings are regulated by ambient and fluid temperatures, type of fluid being carried, tubing type, and conditions of mechanical abuse. Pressures in excess of above specifications in all fitting sizes should be tested by the customer in their particular application.

Compression Tube Fittings

Jaco Compression Tube Fittings



MALE CONNECTOR

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
10-2-2	1/8	1/8	5/16-24
10-4-2	1/4	1/8	7/16-20
10-4-4	1/4	1/4	7/16-20
10-4-6	1/4	3/8	7/16-20
10-5-2	5/16	1/8	1/2-20
10-5-4	5/16	1/4	1/2-20
10-6-2	3/8	1/8	5/8-20
10-6-4	3/8	1/4	5/8-20
10-6-6	3/8	3/8	5/8-20
10-6-8	3/8	1/2	5/8-20
10-8-2	1/2	1/8	3/4-20
10-8-4	1/2	1/4	3/4-20
10-8-6	1/2	3/8	3/4-20
10-8-8	1/2	1/2	3/4-20
10-10-6	5/8	3/8	7/8-20
10-10-8	5/8	1/2	7/8-20
10-12-8	3/4	1/2	1-1/16-20
10-12-12	3/4	3/4	1-1/16-20
10-14-12	7/8	3/4	1-3/16-16



UNION ELBOW

JACO PART NO.	TUBE O.D.	THREAD
50-4	1/4	7/16-20
50-5	5/16	1/2-20
50-6	3/8	5/8-20
50-8	1/2	3/4-20
50-10	5/8	7/8-20
50-12	3/4	1-1/16
50-14	7/8	1-3/16-16

REDUCING UNION ELBOW

50-14-10	7/8-5/8	1-3/16-20 - 7/8-20
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UNION CONNECTOR

JACO PART NO.	TUBE O.D.	THREAD
15-4	1/4	7/16-20
15-5	5/16	1/2-20
15-6	3/8	5/8-20
15-8	1/2	3/4-20
15-10	5/8	7/8-20
15-12	3/4	1-1/16-20
15-14	7/8	1-3/16-16

REDUCING UNION

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
15-4-2	1/4-1/8	7/16-20	5/16-24
15-5-4	5/16-1/4	1/2-20	7/16-20
15-6-4	3/8-1/4	5/8-20	7/16-20
15-8-6	1/2-3/8	3/4-20	5/8-20
15-10-6	5/8-3/8	7/8-20	5/8-20
15-15-8	5/8-1/2	7/8-20	3/4-20
15-14-10	7/8-5/8	1-3/16-16	7/8-20



MALE RUN TEE

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
75-4-2	1/4	1/8	7/16-20
75-4-4	1/4	1/4	7/16-20
75-5-4	5/16	1/4	1/2-20
75-6-4	3/8	1/4	5/8-20
75-6-6	3/8	3/8	5/8-20
75-8-6	1/2	3/8	3/4-20
75-8-8	1/2	1/2	3/4-20
75-10-8	5/8	1/2	7/8-20
75-12-8	3/4	1/2	1-1/16-20
75-12-12	3/4	3/4	1-1/16-20
75-14-12	7/8	3/4	1-3/16-16



BULKHEAD UNION

JACO PART NO.	TUBE O.D.	THREAD
20-4	1/4	7/16-20
20-5	5/16	1/2-20
20-6	3/8	5/8-20
20-8	1/2	3/4-20
20-12	3/4	1-1/16-20



FEMALE CONNECTORS

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
25-4-2	1/4	1/8	7/16-20
25-4-4	1/4	1/4	7/16-20
25-5-4	5/16	1/4	1/2-20
25-6-4	3/8	1/4	5/8-20
25-6-6	3/8	3/8	5/8-20
25-6-8	3/8	1/2	5/8-20
25-8-6	1/2	3/8	3/4-20
25-8-8	1/2	1/2	3/4-20
25-10-8	5/8	1/2	7/8-20



MALE ELBOW

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
40-2-2	1/8	1/8	5/16-24
40-4-2	1/4	1/8	7/16-20
40-4-4	1/4	1/4	7/16-20
40-4-6	1/4	3/8	7/16-20
40-5-2	5/16	1/8	1/2-20
40-5-4	5/16	1/4	1/2-20
40-6-4	3/8	1/4	5/8-20
40-6-6	3/8	3/8	5/8-20
40-8-4	1/2	1/4	3/4-20
40-8-6	1/2	3/8	3/4-20
40-8-8	1/2	1/2	3/4-20
40-10-6	5/8	3/8	7/8-20
40-10-8	5/8	1/2	7/8-20

Compression Tube Fittings



FEMALE ELBOW

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
45-2-4	1/8	1/4	5/16-24
45-4-2	1/4	1/8	7/16-20
45-4-4	1/4	1/4	7/16-20
45-5-4	5/16	1/4	1/2-20
45-6-4	3/8	1/4	5/8-20
45-6-6	3/8	3/8	5/8-20
45-8-6	1/2	3/8	3/4-20
45-8-8	1/2	1/2	3/4-20
45-10-8	5/8	1/2	7/8-20



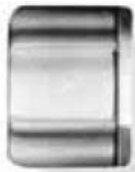
MALE BRANCH TEE

JACO PART NO.	TUBE O.D.	PIPE THD.	THREAD
60-4-2	1/4	1/8	7/16-20
60-4-4	1/4	1/4	7/16-20
60-5-4	5/16	1/4	1/2-20
60-6-4	3/8	1/4	5/8-20
60-6-6	3/8	3/8	5/8-20
60-8-6	1/2	3/8	3/4-20
60-8-8	1/2	1/2	3/4-20
60-10-8	5/8	1/2	7/8-20
60-12-8	3/4	1/2	1-1/16-20
60-12-12	3/4	3/4	1-1/16-20
60-14-12	7/8	3/4	1-3/16-20



UNION TEE

JACO PART NO.	TUBE O.D.	THREAD
70-2	1/8	5/16-24
70-4	1/4	7/16-20
70-5	5/16	1/2-20
70-6	3/8	5/8-20
70-8	1/2	3/4-20
70-10	5/8	7/8-20
70-12	3/7	1-1/16-20
70-14	7/8	1-3/16-16
70-10-6	5/8-3/8	7/8-20 - 5/8-20
70-14-10	7/8-5/8	1-3/16-16 - 7/8-20
70-14-10 -10	7/8-5/8	1-3/16-16 - 7/8-20



COMPRESSION NUTS

FERRULE NUTS WITH INTEGRAL SLEEVE

JACO PART NO.	TUBE O.D.
0-2	1/8
0-4	1/4
0-5	5/16
0-6	3/8
0-8	1/2

PLASTIC GRIPPER NUTS

JACO PART NO.	TUBE O.D.
PG-4	1/4
PG-5	5/16
PG-6	3/8
PG-8	1/2
PG-10	5/8
PG-12	3/4
PG-14	7/8

STAINLESS STEEL GRIPPER NUTS

JACO PART NO.	TUBE O.D.
SG-4	1/4
SG-5	5/16
SG-6	3/8
SG-8	1/2
SG-10	5/8
SG-12	3/4
SG-14	7/8



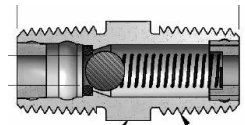
INSERTS*

JACO PART NO.	TUBE O.D.
P-4	1/4
P-5	5/16
P-6	3/8
P-8	1/2



BLIND NUT

JACO PART NO.
0-2 BLD
0-4 BLD
0-5 BLD
0-6 BLD
0-8 BLD



CHECK VALVE*

JACO PART NO.	MALE PIPE NPT
CV-2 K	1/8
CV-4 K	1/4
CV-6 K	3/8
CV-8 K	1/2

- Viton "O" Ring
- Stainless Ball & Spring
- Maximum Operating Temp. 220 P.S.I. @ 180° F
- Cracking Pressure 1-2.5 PSI
- Zero Leakage
- Male Pipe NPT Style



PIPE NIPPLE*

JACO PART NO.	MALE PIPE NPT
PN-2	1/8
PN-4	1/4
PN-6	3/8
PN-8	1/2



BULKHEAD NUTS*

JACO PART NO.
0-4B
0-5B
0-6B
0-8B
0-12B

* These items are offered in addition to our standard fitting product line. Standard discount schedule applies based upon total number of items ordered and are not subject to combined pricing with our standard fitting line.

AltaFluor® 400 PFA Tubing

PFA (perfluoroalkoxy) is the product of choice for applications involving extreme chemical resistance combined with high temperature exposure. Although PFA is available in a variety of resin grades, ALTAFLUOR® 400 PFA tubing is made exclusively from the highest molecular weight resins available giving it superior physical properties making it suitable for even the most demanding applications. ALTAFLUOR® 400 is compatible with flare or conventional type fittings.

Features:

- 100% virgin grade high performance resins used to resist stress cracking
- Chemically inert to nearly all industrial chemicals and solvents
- Higher thermal stability than with FEP
- Lower permeability than with FEP
- Translucent
- Moisture absorption nearly zero
- FDA compliant for food contact
- Non-flammable
- Suitable for use with flare or conventional fittings
- Available in coiled hose and convoluted constructions
- Higher upper surface temperature vs. FEP

Applications:

- Chemical process
- Heat exchangers
- Laboratory applications
- Semiconductor
- Flow monitoring
- Food processing
- Electrical insulation
- Automotive

PART NUMBER	ID	OD	+/-	WALL	+/-	BEND RADIUS (IN)	WORKING PRESSURE @ 73°F
400-0062-015-XX	1/32	1/16	0.003	0.015	.003		
400-0125-030-XX	1/16	1/8	0.004	0.03	.003	1/2	449
400-0156-030-XX	3/32	5/32	0.004	0.03	.003	1/2	360
400-0188-030-XX	1/8	3/16	0.004	0.03	.003	3/4	299
400-0250-030-XX	3/16	1/4	0.004	0.03	.003	1	225
400-0313-030-XX	1/4	5/16	0.005	0.03	.003	1-3/4	179
400-0375-030-XX	5/16	3/8	0.005	0.03	.003	2-1/2	150
400-0438-030-XX	3/8	7/16	0.005	0.03	.003	3-1/2	128
400-0500-030-XX	7/16	1/2	0.005	0.03	.003	4	112
400-0562-030-XX*	1/2	9/16	0.005	0.03	.003		
400-0625-030-XX*	9/16	5/8	0.005	0.03	.003	6-1/2	90
400-0688-030-XX*	5/8	11/16	0.005	0.03	.003		
400-0750-030-XX*	11/16	3/4	0.005	0.03	.003	8	75
400-0250-040-XX	0.17	1/4	0.004	0.04	.003	1	300
400-0250-047-XX	0.156	1/4	0.004	0.047	.003	3/4	352
400-0188-062-XX	1/16	3/16	0.005	0.062	.003	1/2	617
400-0250-062-XX	1/8	1/4	0.005	0.062	.003	1/2	464
400-0313-062-XX	0.313	0.188		0.062	.003	1	371
400-0375-062-XX	1/4	3/8	0.005	0.062	.003	1	310
400-0438-062-XX	5/16	7/16	0.005	0.062	.003	2	265
400-0500-062-XX	3/8	1/2	0.005	0.062	.003	2	232
400-0625-062-XX	1/2	5/8	0.005	0.062	.003	3	186
400-0750-062-XX	5/8	3/4	0.005	0.062	.003	6	155
400-0875-062-XX*	3/4	7/8	0.005	0.062	.003	12	133
400-1000-062-XX	7/8	1	0.005	0.062	.003	22	116
400-1125-062-XX	1	1-1/8	0.006	0.062	.003	-	105
400-1250-062-XX**	1-1/8	1-1/4	0.006	0.062	.003	-	84
METRIC SIZES							
400-0157-040-XX	2mm	4mm	0.005	1mm	.003	1-1/2	468
400-0197-040-XX	3mm	5mm	0.005	1mm	.003		
400-0236-040-XX	4mm	6mm	0.005	1mm	.003	1-3/4	312
400-0276-040-XX	5mm	7mm	0.005	1mm	.003		
400-0315-040-XX	6mm	8mm	0.005	1mm	.003	2-1/2	234
400-0354-040-XX	7mm	9mm	0.005	1mm	.003		
400-0394-040-XX	8mm	10mm	0.005	1mm	.003	2-3/4	187
400-0433-040-XX	9mm	11mm	0.005	1mm	.003		
400-0472-040-XX	10mm	12mm	0.005	1mm	.003	4	156
400-0551-040-XX	12mm	14mm	0.005	1mm	.003		
400-0630-040-XX	14mm	16mm	0.005	1mm	.003		
400-0354-059-XX	6mm	9mm	0.005	1.5mm	.003		
400-0472-059-XX	9mm	12mm	0.005	1.5mm	.003		

* Custom item - please consult for lead time and minimum order requirements.

** Available in straight lengths only.

ADDITIONAL SIZES UP TO 4" OD ARE AVAILABLE AS CUSTOM EXTRUSIONS - MINIMUM ORDER REQUIREMENTS MAY APPLY.

STOCKED IN NATURAL COLOR - PLEASE CONSULT FOR DETAILS ON AVAILABLE COLORS.

THE ABOVE INFORMATION IS BASED ON TESTS PERFORMED AT 73° F AND CAN VARY IN INDIVIDUAL APPLICATIONS BASED ON PARAMETERS SUCH AS TEMPERATURE, CHEMICAL CONCENTRATION, PRESSURE, ETC.

FOR AN ESTIMATE ON BURST PRESSURE AT AMBIENT TEMPERATURE WE CONSIDER A 3:1 RATIO WHEN EXPOSURE TEMPERATURE IS 73° F. HOWEVER ALTAFLUOR DOES NOT RECOMMEND EXCEEDING THE SUGGESTED WORKING PRESSURE LISTED.

FLEXIBLE TUBE, HOSEING & FITTINGS



Specifications:

- General: Meets or exceeds the requirements listed in ASTM D 6867-03
- Temperature: -300 °F to 500 °F
- Flammability: UL 94 VO rated. PFA resists combustion and does not promote flame spread
- FDA: ALTAFLUOR® 400 PFA is approved for use in food contact applications in compliance with FDA regulation: 21 CFR 177.1550
- USP CLASS VI: ALTAFLUOR® 400 meets the requirements of USP Class VI
- NSF: ALTAFLUOR® 400 PFA tubing is certified to NSF 51, NSF 61 and NSF 372



This ALTAFLUOR® 400 PFA has been tested and certified by WQA against NSF/ANSI 51, NSF/ANSI 61 to Commercial Hot (180° F/82° C), and NSF/ANSI 372 for lead free compliance.

PHYSICAL PROPERTY	ASTM TEST METHOD	UNITS	VALUES
Upper Service Temp.		°F	500
Specific Gravity	D 792		2.15
Tensile Strength	D 1708	PSI	4200
Elongation	D 638	%	400
Flex Modulus	D 790	PSI	90 000
MIT Flex Life	D 2176		500 000+
Hardness	D 2240	Shore D	60

THE ABOVE INFORMATION IS BASED ON TESTS PERFORMED AT 73° F AND CAN VARY IN INDIVIDUAL APPLICATIONS BASED ON PARAMETERS SUCH AS TEMPERATURE, CHEMICAL CONCENTRATION, PRESSURE, ETC. PLEASE CONSULT FOR DETAILS.

NOTE: THE VALUES REPRESENTED ABOVE ARE BASED ON THE USE OF 100% VIRGIN GRADE HIGH PERFORMANCE - LOW MELT FLOW PFA RESIN AS USED IN THE PRODUCTION OF ALTAFLUOR® 400 SERIES TUBING. WHEN COMPARING DATA IT IS CRITICAL THAT PERFORMANCE VALUES ARE LISTED FOR THE GRADE OF RESIN USED.

ALTAFLUOR® 400 PFA - STANDARD AND ULTRAFLEX CONVOLUTED CONSTRUCTION

PART NUMBER**	NOMINAL OD SIZE	ID MIN	ID MAX	OD MAX	NOMINAL WALL	STANDARD CONVOLUTED	ULTRA FLEX CONVOLUTED
						CONVOLUTIONS PER INCH	
40C-0375-020-XX*	3/8	0.251	0.275	0.375	0.02	6	9
40C-0500-023-XX*	1/2	0.364	0.375	0.5	0.023	6	9
40C-0625-025-XX*	5/8	0.485	0.5	0.625	0.025	5.5	9
40C-0750-025-XX*	3/4	0.608	0.625	0.75	0.025	5	8
40C-0875-025-XX*	7/8	0.73	0.75	0.875	0.025	4	8
40C-1000-025-XX*	1	0.86	0.875	1	0.025	3.5	8

* Custom item - please consult for lead time and minimum order requirements.

** For Ultraflex Convoluted Construction replace C with U

ALTAFLUOR® 400 PFA - TUBING SCHEDULE 40 PIPE

PART NUMBER	NOMINAL SIZE (IN)	ACTUAL SIZE (IN)	WALL (IN)	STOCK LENGTH (FT)
400-0540-088-0C*	1/4	.540 ±.010	.088 ±.020,-0-	5/10
400-0840-109-0C*	1/2	.840 ± .010	.109 ±.020,-0-	5/10
400-1050-113-0C*	3/4	1.050 ± .010	.113 ±.020,-0-	5/10
400-1315-133-0C*	1	1.315 ± .010	.133 ±.020,-0-	5/10
400-1660-140-0C*	1-1/4	1.660 ± .015	.140 ±.020,-0-	10
400-1900-145-0C*	1-1/2	1.900 ± .015	.145 ±.020,-0-	10
400-2375-154-0C*	2	2.374 ± .015	.154 ±.020,-0-	10

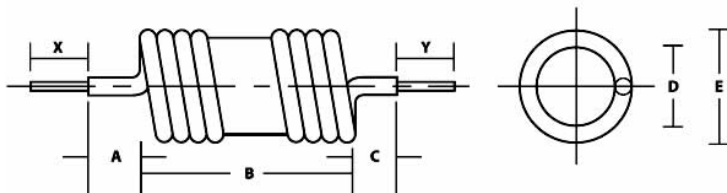
*Custom item - please consult for lead time and minimum order requirements.

PLEASE SEE ALTAFLUOR® 480 PIPE FOR STOCK ITEMS. ADDITIONAL SIZES AND SCHEDULE 80 PIPE AVAILABLE UPON REQUEST.

CUSTOM ITEM - SEE COILED HOSE ORDER FORM FOR ORDERING INFORMATION.

480 SERIES UHP PFA SCHEDULE 40 PIPE IS A STOCK ITEM AND AVAILABLE FOR IMMEDIATE SHIPMENT.

AltaFluor® 400 PFA Coiled Hose

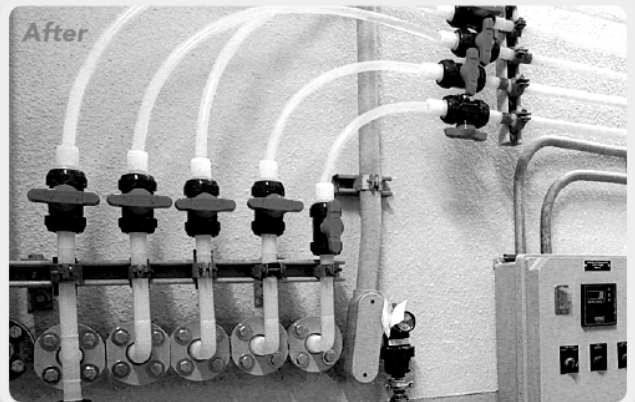
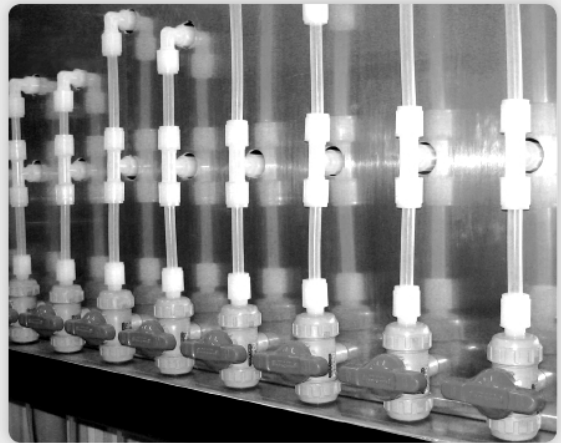


ChemFlare™ Flexible Leak-Free Solutions

ChemLine Single Wall Systems

- Chemline's ChemFlare™ system is the long term leak-free alternative to standard PVC solvent welded piping on sodium hypochlorite chemical feed systems. Valves, controls and pumps with ChemFlare™ ends connect to ChemFlare™ fittings and PFA tubing.
- Systems are easy to install
- Mechanical connections
- No welding or curing waiting time, may be pressure tested immediately
- True Union valve sizes: 1/2", 3/4" & 1"
- Tubing sizes: 1/4", 3/8", 1/2", 3/4" & 1"

Do you have leaking chemicals? Consider a retrofit.



ChemLine Dual Containment Systems

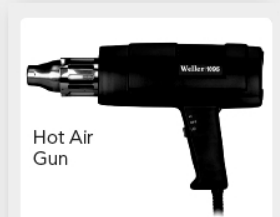
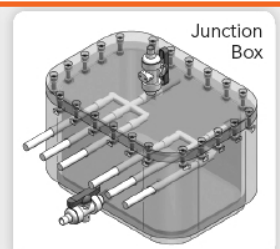
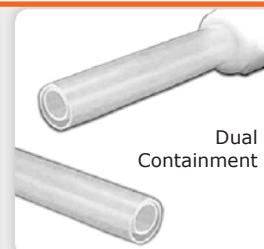
For maximum safety level of chemical containment

Tubing

- The carrier (inner) tube of PFA is the primary chemical line. The containment (outer) tube of FEP is translucent, permitting good visibility of the carrier tube.

Specialty Fittings

- Dripleg Fittings
- Dual containment tubing assemblies
- Dual containment splitter boxes
- Junction Boxes



FLEXIBLE TUBE, HOISING & FITTINGS

88



Section 9: Ventilation

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INSTADUCT

Fittings and Ducting

HVAC/DUCTING ADVANTAGES

Less expensive and better corrosion than stainless steel
 Lighter and faster to install than t316, t304 and Galvanized
 Machine Made offers many benefits over traditional, fabricated fittings



MATERIALS

PVC, CPVC, and Polypropylene ensuring a high level of corrosion resistance and a temperature rating of up to 220° F as well as fire retardant or with abrasive airborne particulate.

UNIFORM DESIGN

Aesthetically Favored Appearance, matches more closely the uniformed profile of Machine Made Duct Extrusions

SMOOTH INTERIOR WALLS

Unimpeded flow, providing reduced Bacterial and Biological sediment build up as well as reduced Turbulence and Static Pressure.

HOMOGENEOUS ONE PIECE CONSTRUCTION

Stronger Unified Fitting, Lighter weight.

TIGHTER RADIUS ON BENDS

Less physical space required.

NON-CONTAMINATING

For purity applications.

PRODUCT AVAILABILITY

Fittings from 6" through 24" diameter.

TOTAL LOWER OVERALL INSTALLATION COSTS



Instaduct® PVC Ventilation Duct Pipe

Fabco's Instaduct is available in sizes ranging from 6" to 24" diameters. It is manufactured from high quality PVC so it will be in service for a long time and resist corrosive fumes and gasses, in all sorts of industrial ventilation applications.

This lightweight piping system is easy to install and features increases flow rates due to the seamless characteristics. Welded construction supplied with socket (belled) ends and fabricated from extruded duct pipe. Call Fabco for special or custom manufactured duct fittings.

Notes:

- Available in 20ft lengths
- Product supplied with plain end

PART NUMBER	DIAMETER (IN)	DIAMETER (MM)	O.D. (IN)	WALL THICKNESS (IN)	WT (LBS/FT)	LENGTH (FT)
010118	6	150	6.625	.125	1.530	20
0101181	6	150	6.625	.187	2.275	20
0101185	7	180	7.375	.187	2.534	20
010119	8	200	8.625	.187	2.982	20
0101195	9	225	9.375	.187	3.239	20
010120	10	250	10.750	.187	3.733	20
010121	11	280	11.375	.187	3.944	20
010122	12	315	12.750	.187	4.440	20
010124	14	355	14.000	.187	4.884	20
010126	16	400	16.000	.187	5.586	20
010128	18	450	18.000	.187	6.750	20
010130	20	500	20.000	.219	8.144	20
010134	24	600	24.000	.250	11.163	20
010138	28	700	28.000	.250	13.470	20
010142	32	800	32.000	.250	17.070	20

Instaduct® PVC Ventilation Duct Fittings



Make EXHAUST SYSTEMS EASIER...that's the mission for FABCO PLASTIC's seamless, moulded, quick connecting (solvent cementable), belled-end, rigid PVC INSTADUCT fittings. INSTADUCT PVC fittings provide a broad range of cost-effective benefits over traditional, fabricated fittings.

Applications:

- Air handling systems
- Air pollution control systems
- Corrosive fume exhaust systems
- Source ventilation of fumes- for metal cleaning, pickling, plating, halogen gas purging and etching
- Exhaust ventilating systems- high humidity areas
- Chemical Processing
- Medical/Hospital Use
- Electroplating
- Pharmaceuticals
- Food Processing
- Dairy Processing
- Laboratory Applications
- Environmental Applications
- Cosmetics
- Beverage Processing
- Fish Hatchery

Benefits:

- Resists chemical and corrosive attack preventing expensive maintenance, replacement and downtime
- Safely withstands temperatures up to 140F, maintaining system integrity in aggressive environments
- Provides consistent uniformity and reduced fabrication time with seamless extruded sizes from 3" through 24" eliminating the need to fabricate from sheet
- Resists bacterial and biological activity
- Reduces labour and keeps installation costs down with lightweight, easily solvent cemented units
- Low overall installed cost than other alternatives
- Offers low flame and smoke generation characteristics
- Reduced sediment build up, turbulence and Static Pressure

Notes:

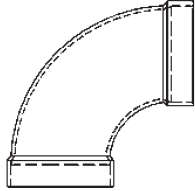
The designer will have responsibility for the following:

- The PVC must not be used to exceed manufacturer's temperature and impact rating.
- Inspection and maintenance opening provided (clean outs) should be on straight runs and elbows. Equipment and special accessories should be accessible for the service required.
- Standard and custom fabricated hoods providing proper capture velocities at those points where fumes are generated.
- Condensate should be collected and drained off. A recommended minimum slope for horizontal ducts pitched downward in the direction of airflows 1 inch in 40 feet, with the recommended minimum slope for ducts pitched downward in the direction opposite the airflow equal to 1 inch in 10 ft. Drains with traps or valves are to be provided.

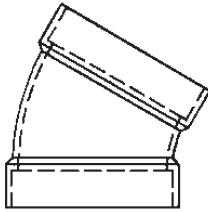


Notes:

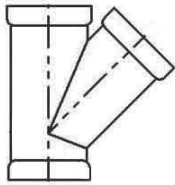
- 4", 7", 9" and 11" fittings can be fabricated on request

90° SOCKET ELBOWS


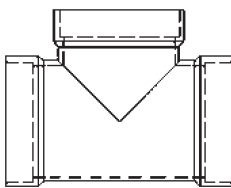
IN.	MM	PART NUMBER
6	160	01010518
8	200	01010519
10	250	01010520
12	315	01010522
14	355	01010524
16	400	01010526
18	450	01010528
20	500	01010530
24	600	0101534

45° SOCKET ELBOWS


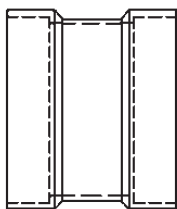
IN.	MM	PART NUMBER
6	160	01010318
8	200	01010319
10	250	01010320
12	315	01010322
14	355	01010324
16	400	01010326
18	450	01010328
20	500	01010330
24	600	01010334

45° WYE


IN.	MM	PART NUMBER
6	160	01010718
8	200	01010719
10	250	01010720
12	315	01010722
14	355	01010724
16	400	01010726
18	450	01010728
20	500	01010730
24	600	01010734

SOCKET TEES


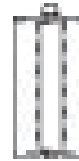
IN.	MM	PART NUMBER
6	160	01010618
8	200	01010619
10	250	01010620
12	315	01010622
14	355	01010624
16	400	01010626
18	450	01010628
20	500	01010630
24	600	01010634

SOCKET COUPLINGS


IN.	MM	PART NUMBER
6	160	01011018
8	200	01011019
10	250	01011020
12	315	01011022
14	355	01011024
16	400	01011026
18	450	01011028
20	500	01011030
24	600	01011034

FLANGES

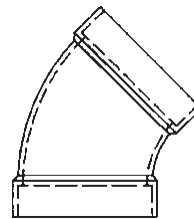

IN.	MM	PART NUMBER
6	160	01011118
8	200	01011119
10	250	01011120
12	315	01011122
14	355	01011124
16	400	01011126
18	450	01011128
20	500	01011130
24	600	01011134

DAMPER ASSEMBLIES


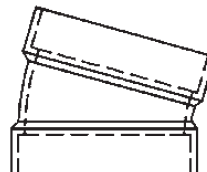
IN.	MM	PART NUMBER
6	160	01011218
8	200	01011219
10	250	01011220
12	315	01011222
14	355	01011224
16	400	01011226
18	450	01011228
20	500	01011230
24	600	01011234

FLEXIBLE VIBRATION SLEEVES


IN.	MM	PART NUMBER
6	160	01011618
8	200	01011619
10	250	01011620
12	315	01011622
14	355	01011624
16	400	01011626
18	450	01011628
20	500	01011630
24	600	01011634

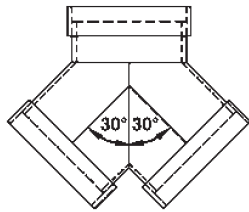
30° ELBOWS


IN.	MM	PART NUMBER
6	160	01010218
8	200	01010219
10	250	01010220
12	315	01010222
14	355	01010224
16	400	01010226
18	450	01010228
20	500	01010230
24	600	01010234

15° ELBOWS


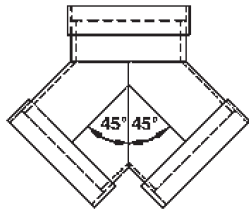
IN.	MM	PART NUMBER
6	160	01010118
8	200	01010119
10	250	01010120
12	315	01010122
14	355	01010124
16	400	01010126
18	450	01010128
20	500	01010130
24	600	01010134

30° PANT LEGS



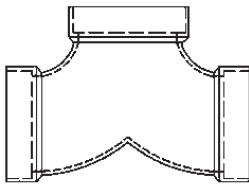
IN.	MM	PART NUMBER
6	160	01011518
8	200	01011519
10	250	01011520
12	315	01011522
14	355	01011524
16	400	01011526
18	450	01011528
20	500	01011530
24	600	01011534

45° PANT LEGS



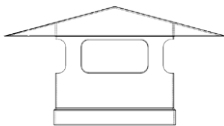
IN.	MM	PART NUMBER
6	160	01011418
8	200	01011419
10	250	01011420
12	315	01011422
14	355	01011424
16	400	01011426
18	450	01011428
20	500	01011430
24	600	01011434

90° PANT LEGS



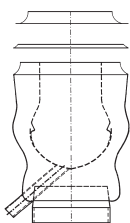
IN.	MM	PART NUMBER
6	160	01011318
8	200	01011319
10	250	01011320
12	315	01011322
14	355	01011324
16	400	01011326
18	450	01011328
20	500	01011330
24	600	01011334

RAIN CAPS



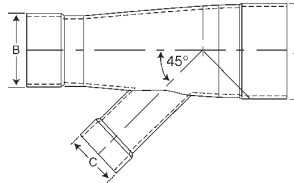
IN.	MM	PART NUMBER
6	160	01011918
8	200	01011919
10	250	01011920
12	315	01011922
14	355	01011924
16	400	01011926
18	450	01011928
20	500	01011930
24	600	01011934

EXHAUST AIR DIFFUSER/DEFLECTOR



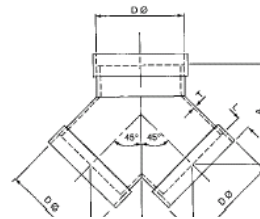
IN.	MM	PART NUMBER
6	160	01013018
8	200	01013019
10	250	01013020
12	315	01013022
14	355	01013024
16	400	01013026
18	450	01013028
20	500	01013030
24	600	01013034

45° REDUCING LATERAL WYES



A X B X C	PART NUMBER
8" x 6" x 4"	010652180
10" x 6" x 4"	010652200
12" x 8" x 6"	010652220
14" x 10" x 8"	010652240
16" x 12" x 10"	010652260
18" x 14" x 12"	010652380
20" x 16" x 14"	010652300
22" x 18" x 14"	010652320
24" x 20" x 16"	010652340
24" x 20" x 18"	010652360
26" x 20" x 18"	010652380
26" x 22" x 20"	010652400
28" x 24" x 18"	010652420
28" x 24" x 20"	010652440
30" x 28" x 18"	010652460
30" x 26" x 20"	010652480
30" x 26" x 24"	010652500
32" x 26" x 20"	010652520
32" x 28" x 20"	010652540
32" x 26" x 22"	010652560
32" x 28" x 24"	010652580
34" x 30" x 20"	010652600
34" x 30" x 18"	010652620
34" x 30" x 24"	010652640
36" x 32" x 20"	010652660
36" x 34" x 18"	010652680
36" x 34" x 20"	010652700

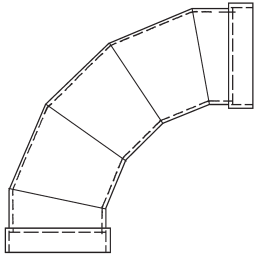
45° REDUCING PANT LEGS



A X B X C	PART NUMBER
8 x 6 x 6	0101140806
10 x 8 x 8	0101141008
12 x 10 x 10	0101141210
14 x 8 x 8	0101141408
14 x 10 x 10	0101141410
16 x 10 x 10	0101141610
16 x 12 x 12	0101141612
18 x 10 x 10	0101141810
18 x 12 x 12	0101141812
18 x 14 x 14	0101141814
20 x 12 x 12	0101142012
20 x 14 x 14	0101142014
20 x 16 x 16	0101142016
22 x 14 x 14	0101142214
22 x 16 x 16	0101142216
22 x 18 x 18	0101142218
24 x 14 x 14	0101142414
24 x 16 x 16	0101142416
24 x 18 x 18	0101142418

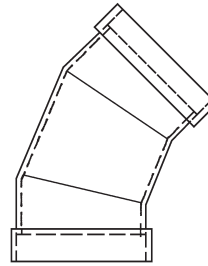
Note: Above fittings are custom fabricated as required

90° ELBOWS



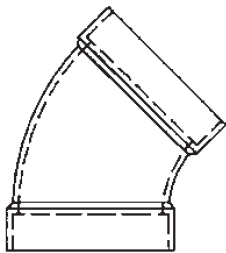
DUCT SIZE (INCH)	PART NUMBER
26	01045236
28	01045238
30	01045240
32	01045242
34	01045244
36	01045246
38	01045248
40	01045250
42	01045252
44	01045254
46	01045256
48	01045258

45° ELBOWS



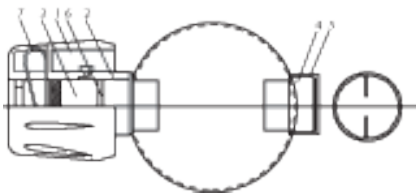
DUCT SIZE (INCH)	PART NUMBER
26	01025236
28	01025238
30	01025240
32	01025242
34	01025244
36	01025246
38	01025248
40	01025250
42	01025252
44	01025254
46	01025256
48	01025258

30° ELBOWS



DUCT SIZE (INCH)	PART NUMBER
26	01005236
28	01005238
30	01005240
32	01005242
34	01005244
36	01005246
38	01005248
40	01005250
42	01005252
44	01005254
46	01005256
48	01005258

Damper Regulator Mechanism



Note: For use with ducts up to 20" in diameter.

This new simple damper regulator is easily installed in plastic ducting featuring a positive action handle that locks into and clearly indicates damper position. Any fabricator or maintenance staff can install the damper regulator. The Fabco damper regulator is made of PVC, Polypropylene or Polyethylene. After installation, it is airtight.

Operation

- Pull (PT #1) positioning handle, turn to position desired and it locks on release.
- Damper position is indicated on position handle by orientation of two indicating slots.

PART NUMBER	MATERIAL	DESCRIPTION
PDR	PVC	DAMPER REGULATOR
PPDR	PP	DAMPER REGULATOR
PEDR	PE	DAMPER REGULATOR

Instaduct® CPVC Ventilation Duct Pipe



CPVC Instaduct® is available in sizes 6" thru to 24" Diameter for Institutional and Industrial hot fume service. This duct provides superior resistance to corrosion and chemical attack. Its lightweight and high-strength characteristics allow for easy, low-cost installation in a wide range of applications such as waste water treatment facilities, metal finishing and plating operations, anodizing and laboratory uses. Conforms to ULC S102.2.

FLAMMABILITY PROPERTIES	CPVC CORZAN®	ASTM TEST METHOD
Average Time of Burning (sec.)	<5	D635
Average Extent of Burning (mm)	<10	
Flame Spread Index	<10	E162
Flame Spread	>25	E84, ULC S102.2
Flash Ignition	900°F	
Smoke Developed	>50	
Limited Oxygen Index (LOI 60)	Self-Extinguishing	D2863
Burning Rate, in./min.	Self-Extinguishing	
Softening Starts, approx. °F	295	
Material becomes viscous, °F	395	
Material carbonizes, °F	450	

Applications:

- Plating
- Corrosive fume extraction
- Chemical blending
- Automotive manufacturing
- Municipal water treatment
- Metal Finishing
- Anodizing
- Laboratories

Features:

- Resists chemical attack replacement and downtime.
- Meets ASTM material standard D-1784
- Safely withstands temperatures of up to 212°F
- Is extruded to IPS dimensions.
- Is lightweight allowing easy, low-cost installation.
- Material has excellent flame resistant
- Is readily available with fabricated fittings of all configurations.

DUCT PART NUMBER	DUCT COUPLING PART NUMBER	DUCT SIZE	AVG. O.D. (IN)	AVG. O.D. TOL.	OUT OF ROUND TOL.*	MIN. WALL (IN)	AVG. WALL (IN)	MAX. WALL (IN)	NOMINAL WT. PER FT.(LB)
020118	02011018	6"	6.625	±.020	±.050	0.172	0.187	0.202	2.555
020119	02011019	8"	8.625	±.020	±.075	0.172	0.187	0.202	3.349
020120	02011020	10"	10.750	±.020	±.075	0.172	0.187	0.202	4.192
020122	02011022	12"	12.750	±.020	±.075	0.172	0.187	0.202	4.986
020124	02011024	14"	14.000	±.030	±.075	0.172	0.187	0.202	5.485
020126	02011026	16"	16.000	±.030	±.075	0.172	0.187	0.202	6.273
020128	02011028	18"	18.000	±.040	±.080	0.172	0.187	0.202	7.580
020130	02011030	20"	20.000	±.070	±.140	0.199	0.199	0.239	9.146
020134	02011034	24"	24.000	±.090	±.180	0.230	0.250	0.270	12.536

Notes:

- Available in 10 ft and 20ft lengths
- Product supplied with plain end.
- Fabricated fittings available upon request.

Fire Retardant Duct Pipe

Fire Retardant PP Ventilation Duct Pipe



Fire retardant polypropylene duct is ideal for hoods and duct systems answering the problems of in-plant safety departments. Corrosive and toxic fumes are removed safely and down time is eliminated as the fire retardant polypropylene resists corrosion. Fire retardant polypropylene can attain a V-O rating according to UL-94 test for flammability of plastic materials. The incorporation of additives such as organic Bromine or Antimony compounds gives the PPS the fire retardant resistance. PPS is chemical and solvent resistant, has a hard surface and low moisture absorbency. Its temperature resistance is up to 100°C (212°F). The material is easily hand welded or fused like normal polypropylene. Care should be exercised in outdoor applications due to limited outdoor weathering resistance.

Applications:

- Corrosive fume extraction
- Chemical blending
- Automotive manufacturing
- Municipal water treatment
- Metal Finishing
- Anodizing
- Laboratories

Features:

- Resists chemical attack replacement and downtime.
- Safely withstands temperatures of up to 212°F
- Is extruded to IPS dimensions.
- Is lightweight allowing easy, low-cost installation.
- Material has excellent flame resistant
- Is readily available with fabricated fittings of all configurations.

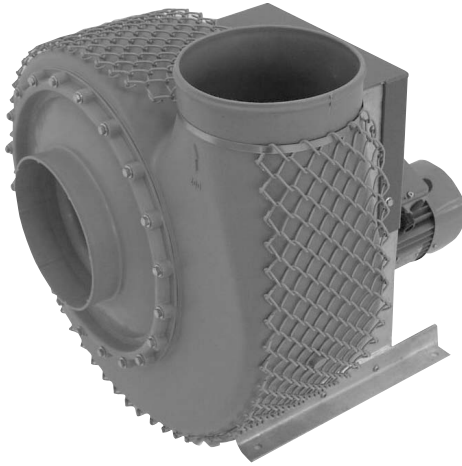
Notes:

- Standard length is 16.4 ft. (5 metres)
- Colour is light grey with limited UV resistance
- Fittings are available upon request
- Product supplied with plain end.

PART NUMBER	OD (MM)	WALL THICKNESS (MM)	WT (LBS/FT)
250114	75	3.0	0.33
250114	90	3.0	0.34
250116	110	3.0	0.62
250117	125	3.0	0.82
2501175	140	3.0	0.92
250118	160	3.0	1.05
2501185	180	3.0	1.19
250119	200	3.0	1.33
2501195	225	3.5	1.74
250120	250	3.5	1.95
250121	280	4.0	2.47
250122	315	5.0	3.45
250124	355	5.0	3.89
250126	400	6.0	5.24
250128	450	7.0	6.82
250130	500	8.0	8.65
250132	560	8.0	9.69
250134	630	10.0	13.14
250138	710	12.0	18.39
250142	800	12	20.74
250146	900	15	29.21



HF Thermoplastic Centrifugal Fans



Fabco's HF thermoplastic radial fans are designed specifically for exhausting aggressive, low-aerosol gases, explosive atmosphere and ultra-clean air. The HF fan is resistant to attack from most chemicals and as such ideally suited for applications in chemical, pulp and paper, mining, plating, anodizing, fertilizer, pharmaceutical, waste water treatment facilities as well as educational and institutional labs. HF radial fans will accommodate explosive atmospheres. Our product range includes more than 150 standard components which allows for the design and construction of numerous versions of fans. Axial, radial, and radial roof fans are available with direct drive motors for consistent and maintenance-free performance. The housing is fabricated from rotationally moulded Polyethylene (PE's) that is both flame retardant and UV inhibited. Additional thermoplastic materials are available to suit most applications. A condensate drain is provided at the bottom point of the fan housing. The housing is mounted within a rigid hot dipped galvanized frame. All sizes are available in clockwise or counter clockwise rotations as well as six standard discharge positions.

Both inlet and outlet diameters are the same sizes for ease of installation of adjacent duct work. In addition, fans can be fitted with optional inlet and outlet flanges. The impeller is manufactured of injection moulded flame retardant polypropylene (PPs), statically and dynamically balanced and keyed to the motor shaft by means of a taper lock bushing. The impeller can be removed without first having to dismantle the housing. All fans are supplied with high efficiency TEFC direct drive motors. Explosion and mill & chemical service rated motors are available upon request. Available accessories include vibration isolators, flexible vibration isolators, inlet/outlet flanges, shaft seals, inspection ports, weather covers, starter/disconnect switches, variable frequency drives. Fans are available in sizes ranging from 6" to 20" diameter with a variety of motors up to 3600 rpm and 1/2 hp. These fans can accommodate flow rates of up to 88,000 cfm and static pressure up to 12" W.G.

HF-centrifugal fans are ideally suitable for extraction of exhaust air and gases. These fans are used mainly for extraction of corrosive fumes in such applications as:

- Electroplating and Metal Finishing
- Circuit Board Manufacturing
- Chemical Processing
- Pulp and Paper
- Water and Waste Water Treatment
- Industrial, Government & Educational Laboratories
- Hospitals
- Pharmaceutical

Standard Construction Features:

Housing

The HF series of fan housings is generally made from rotationally moulded flame and UV retardant polyethylene (PEs). Other thermoplastic materials are available upon request.

The housing is fitted with a splinter guard around the circumference. A condensate drain is installed at the lowest point of the housing.

HF fans are normally produced in an upblast position and capable of rotating the exhaust outlet in steps of 45°. The normal position is either referred to as GR 360 or GL 360. The exhaust outlet may be connected via a flexible connector or flange outlet. Since the outlet is round; attachment to round ducting does not require a transition fitting.

Inlet/Outlet

Both inlet and outlet diameters are the same sizes for ease of installation of adjacent duct work. In addition

Benefits:

- Fan sizes from 6" up to 20" can attain a maximum efficiency of 81% at the operating point.
- Impellers are backward inclined providing the highest and quietest operation with non-overloading horsepower characteristic.
- HF series impellers are 20% larger than the former Oktavent models; providing higher air and pressure specifications.
- The rotationally moulded housing has greater structural integrity, impact strength, flame retardant and UV inhibited.
- Available in axial as well.
- Impeller has massive blades, which are not easily damaged should unforeseen objects enter the intake duct.

fans can be fitted with optional inlet and outlet flanges.

Impeller

The impeller is made of flame retardant polypropylene (PPs) that is balanced both statically and dynamically. In the case of a direct drive fan the impeller is secured to the motor shaft by means of a taper lock bushing. On belt drive fans the impeller is secured in the same way (taper lock bushing) to the drive shaft and supported by flanged double bearings.

The impeller can be removed without having to dismantle the housing from the frame. The fan is mounted to a welded steel frame that is hot dip galvanized.

Drive Arrangements

Arrangement 4 – Direct Drive

Arrangement 9 – Belt Drive

Motors

Supplied as high efficiency TEFC motors. Explosion and mill & chemical service rated motors are optional.

HF Centrifugal Fans

Accessories:

Vibration Isolators

All HF fans are designed to accommodate vibration isolators in either neoprene pads or housed spring units.

Flexible Vibration Connectors

Heavy-duty polyvinyl chloride (PVC) is available.

Inlet/Outlet Flanges

Where applications require tight bolted duct connections. Flanges are available with or without prepunched holes.

Shaft Seals

To limit the air leakage around the housing shaft passage, a felt ring is standard construction. For more stringent applications other shaft seal options are available.

Material Data:

HF-fans are suitable for exhausting aggressive corrosive fumes or humid air. Explosive atmosphere can be delivered with HF-fans especially designed for this purpose. The permissible gas temperatures for plastics most frequently used in our fans are generally:

- For PE, PE-FR (PEs) -20 °C up to 60 °C

These temperature ranges must be reviewed and if necessary limited depending upon gas composition and impeller's rotational speed. In case of exceptionally aggressive media, the reduction must be reviewed and determined from case to case. Our data sheets contain information about mechanical limits. Other applications or design changes must be implemented in consultation with the manufacturer.

Rough assessment of chemical resistance can be made according to the following instructions:

Access/Inspection Port

All HF fans can be provided with an access port, which allows for examination and cleaning of the housing interior without disassembly, resulting in less downtime.

Weather Cover

For outside installation a motor covering hood is available.

Starter & Disconnect Switches

A wide assortment of both enclosed starters/disconnects from Nema 1 to corrosion resistant boxes are available.

Variable Frequency Drives

A wide assortment of VFD's are available to meet both motor capability and application.

Chemical resistance of materials used can be derived from the material manufacturers. In case of critical gas media, please inquire in writing giving all the conditions of the application.

MATERIAL	RESISTANT TO	NOT RESISTANT TO
PE, PE-FR (PEs)	Acids, Caustic Soda, Salt Solutions, Oil and Diluted Solvents	Oxidizing Acids and Halogens

Note: PVC, PP custom fabricated on request.

Explanation of Code Designations:

PE = Polyethylene

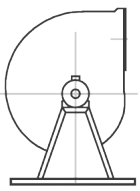
PE-FR (PEs) = Polyethylene flame retardant

PVC = Polyvinyl chloride

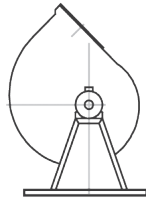
PP = Polypropylene



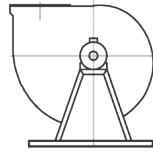
HF Centrifugal Fans



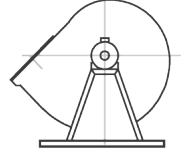
GR90



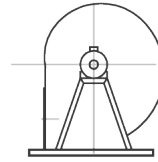
GR45



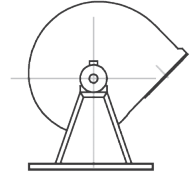
GR360



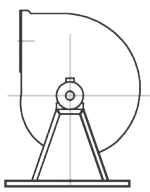
GR315



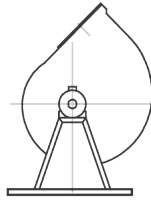
GR270



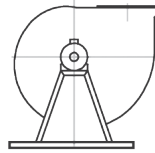
GR135



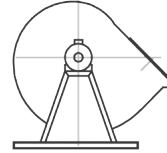
GL90



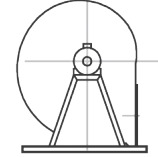
GL45



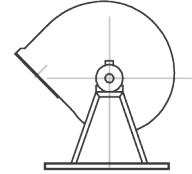
GL360



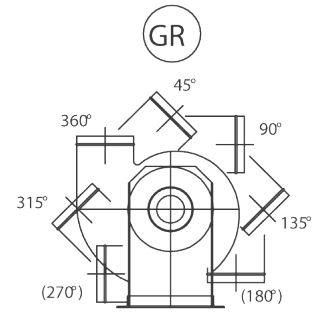
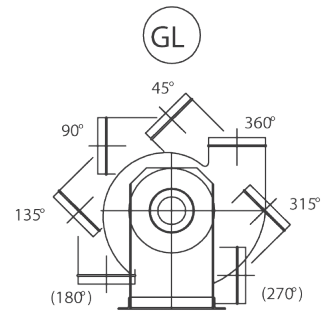
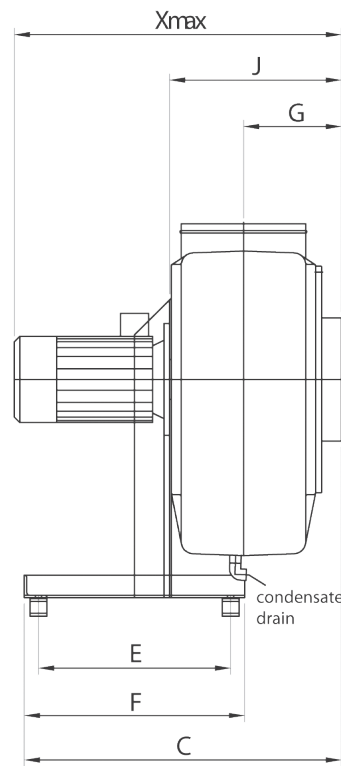
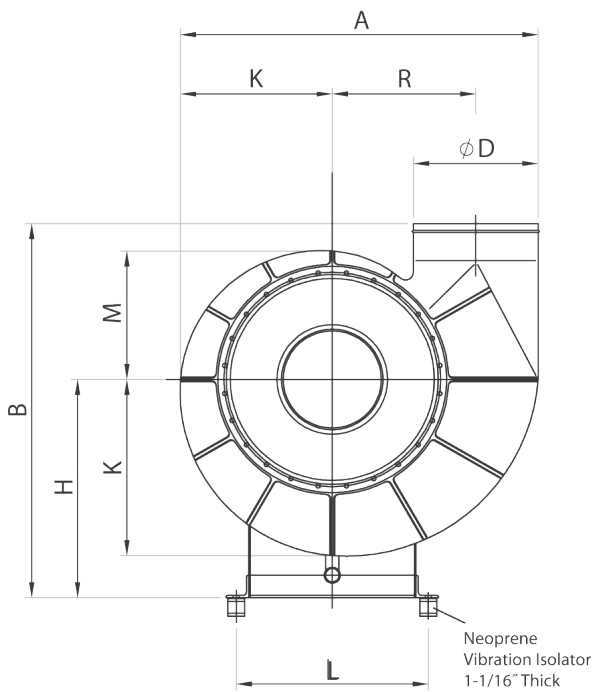
GL315



GL270



GL135



Condensate drain OD size
Type 125 to 315 mm - 3/4" to 1"
Type 355 to 500 mm - 1" to 1-1/4"

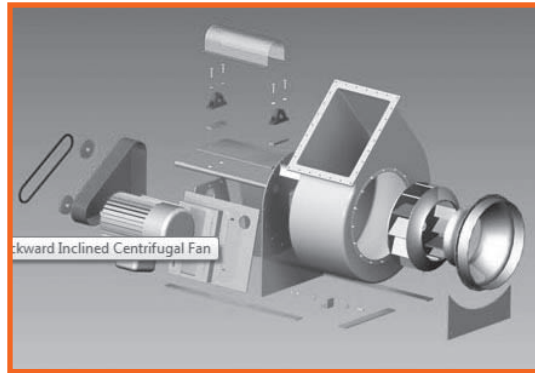
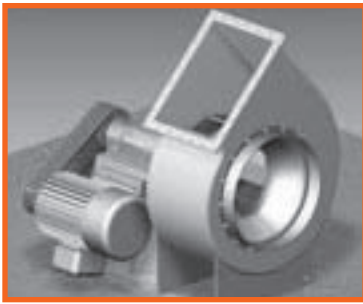
TYPE	D	A	B	C	E	F	G	H	J	K	L	M	N	R	XMAX	LBS
HF R	160	18.27	20.28	18.86	11.42	13.39	5.47	11.02	9.65	7.72	11.42	6.69	9.09	7.40	18.03	49
HF R	200	22.91	24.41	21.65	13.15	15.12	6.38	13.46	11.50	9.61	1315	8.35	11.26	9.37	22.72	68
HF R	250	28.78	29.42	25.00	15.75	17.72	7.24	16.34	13.19	12.32	15.75	10.43	14.13	11.57	25.63	108
HF R	315	36.25	35.75	28.78	16.69	18.66	9.21	20.08	17.28	15.47	16.69	13.19	18.07	14.57	30.55	143
HF R	400	44.92	44.49	34.96	28.46	31.63	11.42	25.59	20.28	19.06	16.22	13.34	22.20	18.00	32.88	192
HF R	500	57.76	55.12	41.42	35.16	38.31	13.27	31.89	23.98	24.53	20.87	21.26	28.27	23.46	38.94	271

Note: For engineering and performance information go to <http://www.fabcoplastics.com/ventilation/index.htm>



Universal FRP Fans

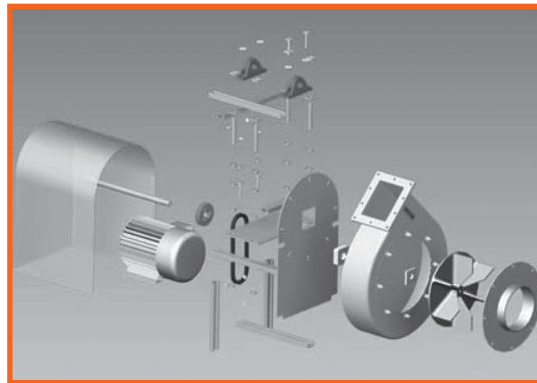
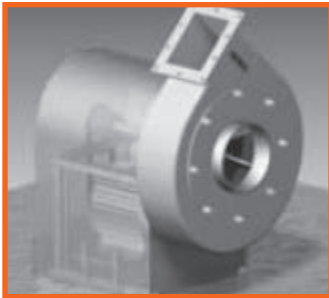
FBIX Backward Inclined Centrifugal Fan



- 17 Sizes : 12.2" to 60.0" ~ 310 mm to 1525 mm
- Volumes : 500 - 80000 cfm ~ 0.24 to 38.0 m³ /s
- Pressures : to 17.0" wg ~ 4250 Pa
- Maximum temperature 200F ~ 94C
- Arrangements 1, 8, 9 and 10

The FBIX backward inclined centrifugal high efficiency fan is designed for severe duty corrosive applications in odour control sewage treatment installations clean rooms and gas scrubber systems.

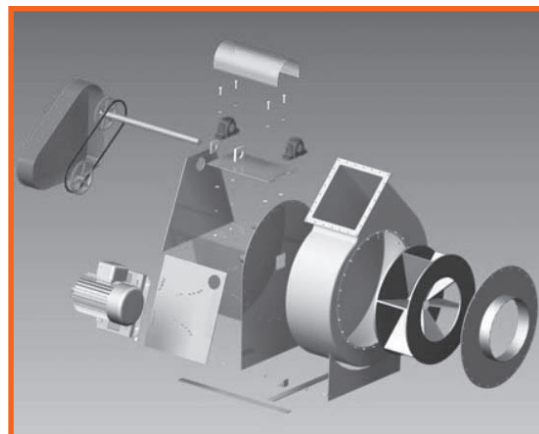
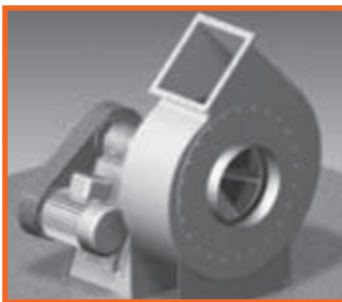
FRBJ Radial Bladed Junior Centrifugal Fan



- 3 Sizes : 10.6" to 13.5" ~ 270 mm to 343 mm
- Volumes : 100 - 2100 cfm ~ 0.05 to 1.05 m³ /s
- Pressures : to 12.0" wg ~ 3000 Pa
- Maximum temperature 200F ~ 94C
- Arrangements 10

The FRBJ Junior radial bladed centrifugal fan is ideal for laboratory fume removal where the many varied gas constituents can rapidly deteriorate steel product.

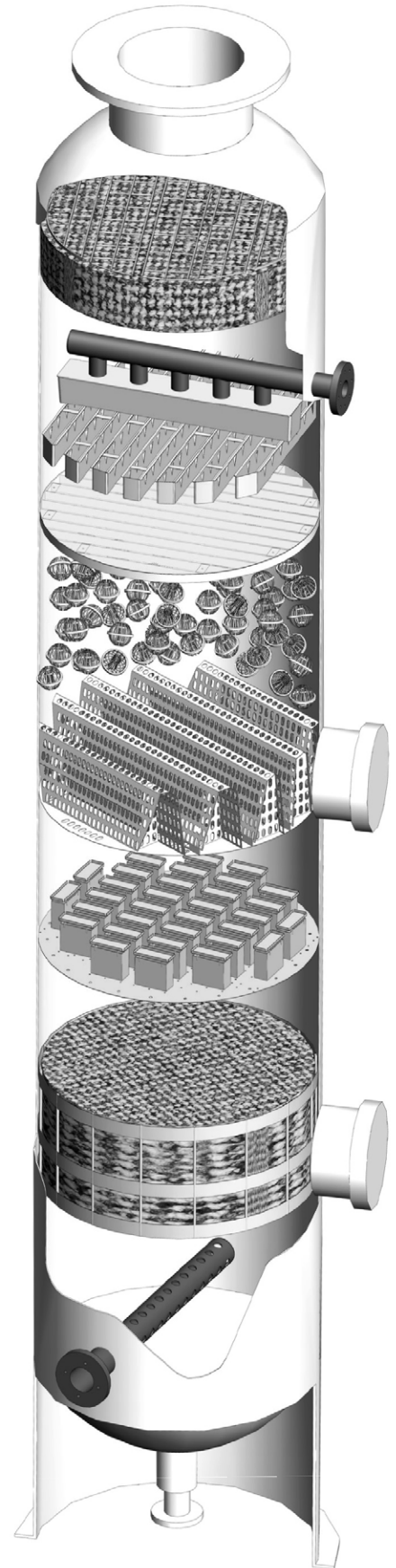
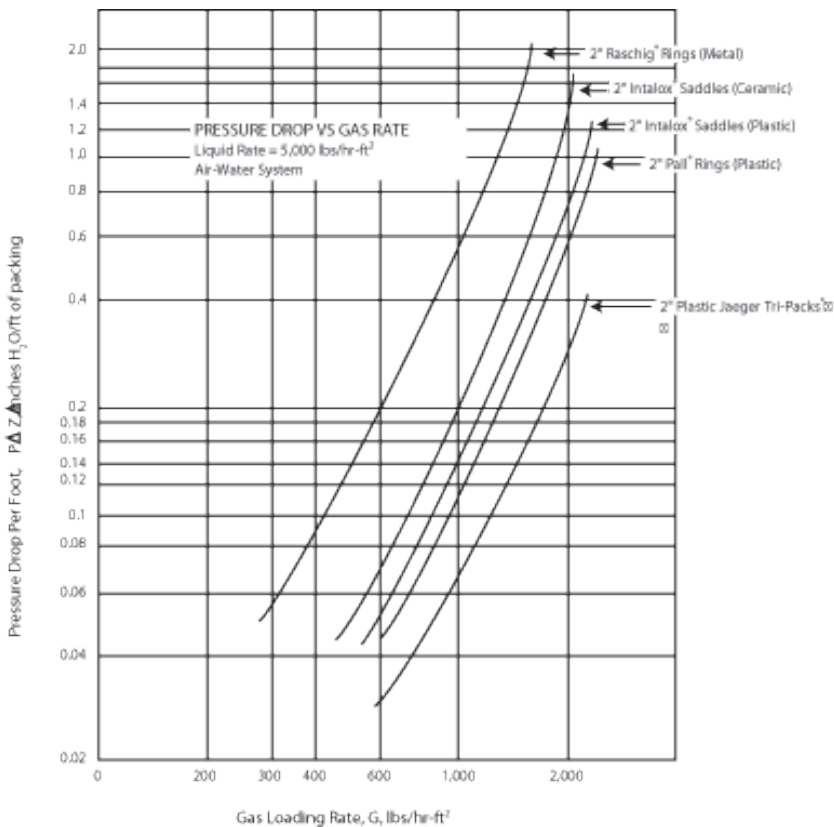
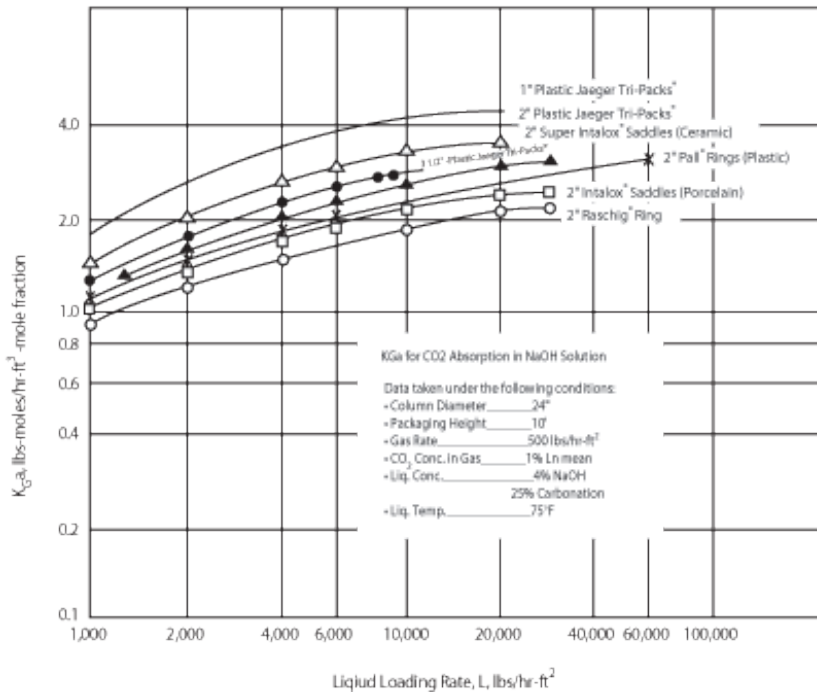
FRBX Radial Bladed Centrifugal Fan



- 11 Sizes : 15.6" to 57.5" ~ 400 mm to 1460 mm
- Volumes : 500 - 38000 cfm ~ 0.24 to 18.0 m³ /s
- Pressures : to 20.0" wg ~ 5000 Pa
- Maximum temperature 200F ~ 94C
- Arrangements 1, 9 and 10

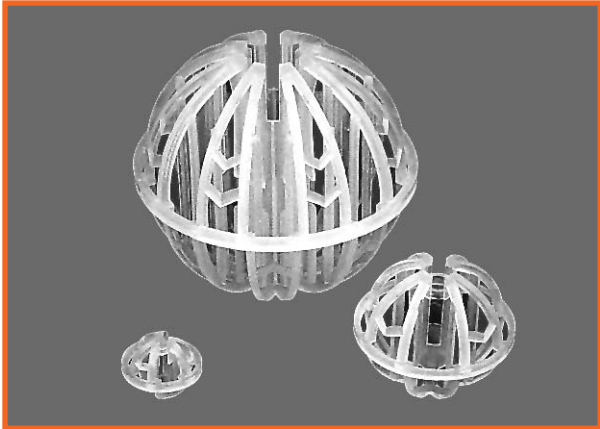
The FRBX radial bladed centrifugal fan is designed for severe duty corrosive applications : waste water treatment plants, plating facilities and gas scrubber systems.

Jaeger Tri-Packs® Plastic Packing



Mass Transfer Packing

Jaeger Tri-Packs® Plastic Packing



Plastic Jaeger Tri-Packs® is a hollow spherical column packing constructed of a unique network of ribs, struts, and drip rods. Its geometry was totally revolutionary and unprecedented at the time of its 1978 introduction and it continues to be the packing to which all others are compared. Plastic Jaeger Tri-Packs® are distinguished from other packing by its superior geometric shape. Their spherical shape allows each element to roll into the "packed position" without forming void areas common to irregular shaped packing or those with excessive pins and appurtenances. With Jaeger Tri-Packs®, there is no need for allowances for settling and nesting is virtually impossible. The round Jaeger Tri-Packs® offers reliable and predictable loading of your tower which means reliable and predictable performance. In addition to the superior geometric shape, an active surface area is vital to mass transfer.

The unique network of ribs, struts and drip rods have proven to give the Jaeger Tri-Packs® a distinct advantage in providing excellent wetting qualities and maintaining liquid distribution through the packed bed. Some suppliers claim more surface area, but surface area alone is not an indication of performance. Excessive surface area can impede proper gas and liquid contact and always results in higher pressure drop which increases horsepower requirements and operating costs. The Jaeger Tri-Packs® offers an optimum surface area to open area ratio which yields excellent mass transfer efficiency and reduced operating costs.

Jaeger Tri-Packs® are available in four sizes, 1", 1.25", 2", and 3.5". Jaeger Products uses only prime, virgin resins and no recycled materials are ever used. Jaeger Tri-Packs® made of polypropylene (PP) have been certified by NSF to Standard 61 for use in potable water applications. Almost any injection moldable resin is available; the most common include PP, PE, PP-G, PVC, CPVC, Noryl, Kynar®, Halar®, Teflon® and many more.

MATERIAL	SERVICE TEMP. (°F) **	1" DIAMETER	1 1/4" DIAMETER	2" DIAMETER	3 1/2" DIAMETER
Polypropylene (PP)	180	901010	901012	901020	901040
Polyethylene(PE)	160	902010	902012	902020	902040
Polypropylene Glass Filled (PP-G)	210-250*	901GF010	901GF012	901GF020	901GF040
Noryl (PPO)	230	951010	951012	951020	951040
Polyvinylchloride (PVC)	140	905010	905012	905020	905040
Corzan (CPVC)	200	903010	903012	903020	903040
Kynar (PVDF)	280	904010	904012	904020	904040
TopEx (LCP)		953010	953012	953020	953040
Tefzel (ETFE)	350	906010	906012	906020	906040
Teflon (PFA)	400	915010	915012	915020	915040
Halar (ECTFE)	290	907010	907012	907020	907040

MASS TRANSFER DATA

ABSORPTION SYSTEM	G (LB/HR-FT2)	L (LB/HR-FT2)	TEMP. (°F)	HTU-INCHES		
				1	2	32
HCl-H2O	1792	2048	77	7.0	10.6	12.0
HCl-NaOH	1567	2048	68	6.1	8.8	10.0
Cl2-NaOH	1229	2202	122	9.9	14.5	16.0
NO2-Na2S+NaOH	717	1127	68	32.0	49.2	54.0
NH3-H2SO4	492	1024	68	4.1	6.0	7.0
NH3-H2O	512	1024	68	5.6	8.4	10.0
NH3-H2O	512	4096	68	3.6	5.4	6.2
SO2-NaOH	1946	4096	140	8.1	12.0	14.0
HF-H2O	1844	3072	77	4.6	6.9	8.1
H2S-NaOH	1229	1331	68	13.0	19.4	22.0

PHYSICAL PROPERTIES

SIZE (IN.)	1	1 1/4	2	3 1/2
GEOMETRIC SURFACE AREA (FT2/FT3)	85	70	48	38
PACKING FACTOR (1/FT.)	28	25	16	12
VOID SPACE (%)	90	92	93	95
WEIGHT (LB/FT3)	6.2	5.6	4.2	3.3
NUMBER O PIECES/FT3	2,300	N/A	380	48

Notes:

- Other plastics are available on request..
- * Depending on glass content
- ** At 1 atm, air/water at max. recommended depth)

Transferlox® Plastic Saddles



The high capacity Transferlox® plastic saddle offers distinct advantages over conventional saddle design. The serrated edges promote high mass transfer rates through effective liquid surface renewal. The serrated edges of the Transferlox® saddle reduce bed settling during operation and assist to maintain packing free space and create lower column pressure drop. The Transferlox® Plastic saddles are available in 1", 2", and 3" sizes. They are available in 5 and 10 cubic foot cardboard boxes. The proper installation is by dry dumping with reasonable care.

Applications:

- Air pollution
- Scrubbing
- Liquid - liquid contact
- Absorption, distillation, extraction, stripping, humidification, dehumidification, decarbonating, de-aerating
- Biological filtration

PHYSICAL PROPERTIES

Nominal Size	1"	2"	3"
No. pcs/m3	57500	6400	1400
No. pcs/ft3	1630	190	42
Wt.*kg/m3	95	60	48
Wt.*lb/ft3	5.85	3.75	3.00
Void Space %	90	93	94

MATERIAL	1"	2"	3"	MAX. CONTINUOUS OPERATING TEMP. (°F)	SPECIFIC GRAVITY
General Grade Polypropylene	918010	918020	918030	220	0.91
Polypropylene (10% Glass reinforced)	919010	919020	919030	260	0.97
High Density Polyethylene	920010	920020	920030	212	0.95
Low Density Polyethylene	9201010	9201020	9201030	190	0.92
PVC	921010	921020	921030	150	1.46
CPVC	922010	922020	922030	185	1.55
PVDF	923010	923020	923030	290	1.77

Transferpack® Plastic Rings



The Transferpack® Plastic ring is a robust ring featuring an open wall construction which maintains even liquid distribution. Reinforced struts provide additional surface area for gas-liquid contact and support the outer ring. The Transferpack® Plastic rings are available in 1", 2", and 3 1/2" sizes. They are available in 5 and 10 cardboard boxes. The proper installation is by dry dumping with reasonable care.

Applications:

- Air pollution
- Scrubbing
- Liquid - liquid contact
- Absorption, distillation, extraction, stripping, humidification, dehumidification, decarbonating, de-aerating
- Biological filtration

PHYSICAL PROPERTIES

Nominal Size	1"	2"	3 1/2"
No. pcs/m3	57500	6400	1400
No. pcs/ft3	1630	190	42
Wt.*kg/m3	95	60	48
Wt.*lb/ft3	5.85	3.75	3.00
Void Space %	90	93	94



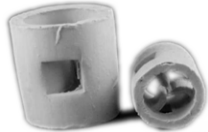
MATERIAL	1"	2"	3 1/2"	MAX. CONTINUOUS OPERATING TEMP. (°F)	SPECIFIC GRAVITY
General Grade Polypropylene	968010	968020	968030	220	0.91
Polypropylene (10% Glass reinforced)	969010	969020	969030	260	0.97
High Density Polyethylene	970010	970020	970030	212	0.95
Low Density Polyethylene	97011010	9701020	9701030	190	0.92
PVC	971010	971020	971030	150	1.46
CPVC	972010	972020	972030	185	1.55
PVDF	973010	973020	973030	290	1.77



Mass Transfer Packing



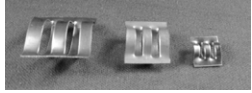
Ceramic Mass Transfer Tower Packings

PHYSICAL PROPERTIES OF CERAMIC PACKINGS

TYPE	SIZE (IN)	PACKING FACTOR (1/FT)	WEIGHT (LB/FT ³)	SURFACE AREA (FT ² /FT ³)	VOID SPACE (%)
RING BUNDLE	2x6	8	42	22	87
 NOVALOX® SADDLES	1/2	201	43	190	73
	3/4	131	41	102	74
	1	97	40	78	74
	1-1/2	52	39	61	75
	2	40	36	37	77
	3	22	35	28	77
 BERL® SADDLES	3/8	457	52.5	201	65
	3/4	259	48.6	131	67
	1	110	43.6	79	70
	1-1/2	79	40.5	54	73
	2	45	37.4	37	75
 PALL RING®	1	107	38.7	67	75
	1-1/2	57	33.7	50	78
	2	43	34.3	37	78
	3	26	33.7	25	78

Metal Mass Transfer Tower Packings

PHYSICAL PROPERTIES OF METAL PACKINGS

TYPE	SIZE	PACKING FACTOR (1/FT)	WEIGHT (LB/FT ³)	SURFACE AREA (FT ² /FT ³)	VOID SPACE (%)
 VSP®	25mm	32	11.9	63	97.5
	40mm	21	10.5	40	98
	50mm	20	9.4	33	98
 TOP-PAK®	75mm	16	10.6	23	98
 INTERPACK®	3/8"	246	40.5	189	90
	5/8"	122	21.5	110	94
	3/4"	73	21.8	79	96
	1-1/2	46	17.1	49	95

Carbon Steel, Stainless Steel, Monel, Nickel, Inconel, Hastelloy, Incolloy, Aluminum, Copper, etc.

Structured Packing

Typical applications for FABCO Metal MAX-PAK™ include:

- Atmospheric crude oil and vacuum columns
- FCC, coker and aromatic fractionators
- Ethyl benzene/styrene distillation for monomer purification
- Ethylene oxide absorbers and isomer splitters
- Caustic/amine absorbers/strippers
- Glycol dehydrators and contactors
- Formaldehyde absorption
- Solvent recovery
- Various heat sensitive purifications such as flavours/fragrances

Available in Alloy Steel

Physical Properties of Metal Max-pak™ Structured Packing

- Nominal Size: 1/2 inch
- Packing Factor: 19-22
- Void Fraction: 97.45%
- Crimp Side: 27/32 inch
- Corrugation Angle: 45 degrees
- Typical HETP: 8-16 inches
- Specific Area: 77 ft²/ft³
- Weight Density: 12.8 lb/ft³
- Nominal Module Height: 12 inch

BASED ON CYCLOHEXANE-HEPTANE DISTILLATION AT TOTAL REFLUX

Column Internals

Fabco Plastics offers a wide variety of internals for a given function. The selection among different types of internals (i.e., liquid distributors) is made based on the characteristics of the application. Some internals operate better at high loads, some at low. Some exhibit better turndown than others. The following list summarizes the points to be considered in the selection of the proper internals.

Liquid Distributors

- Tower diameter
- Pourpoint density
- Geometric coverage
- Turndown
- Presence of solids
- Pressure drop
- Liquid pressure
- Liquid condition
- Entrainment
- Type and size of packing
- Feed inlets
- Space to top of packing
- Material selection

Packing Supports

- Tower diameter
- Pressure drop & capacity
- Packing type and size
- Combinations with collector/redistributors
- Load limitations
- Material selection

Liquid Collector/Redistributors

- Same as for liquid distributors
- Total and effective mixing
- Gas redistribution

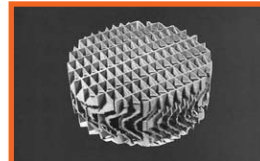
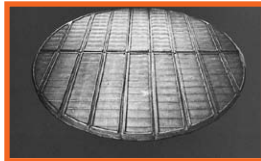
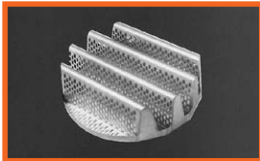
Gas Distributors

- Column size

- Inlet nozzle design
- Available pressure drop
- Turndown
- Space availability
- Material selection

Mist Eliminators

- Efficiency/capacity
- Presence of solids
- Gas velocity and properties
- Pressure drop
- Liquid load
- Mist size and properties



LIQUID DISTRIBUTORS

Trough type distributors are generally used in towers with high liquid rates and/or fouling service. Liquid is introduced into the parting box which properly distributes the liquid into the troughs. Generally, one parting box is used for smaller towers while multiple parting boxes are used for larger diameters or high liquid rates. Trough distributors can be made in plastics, FRP or metals and ceramics. Orifice type distributors are made in various sizes and designs. Typically all sizes have round or rectangular chimneys with a flat floor sealed to the vessel support ring. These distributors can act as bed limiters by having antimigration bars/rods in the open areas. Orifice type distributors can be made in plastics, metals or ceramics.

SUPPORT PLATES/GRIDS

Multibeam support plates are composed of corrugated sheets perforated with slots/holes to separate gas and liquid flow paths maximizing total throughput. The slots/holes are laid out in a uniform pattern where the open area approaches or exceeds the cross-sectional area of the tower. The slots/holes sizes are such that the packing do not fall through them. The angle of corrugation, height and width of each beam varies with design and material used. Multibeam support plates are available in various metals, plastics and ceramics.

MIST ELIMINATORS

Knitted wire filament mist eliminators are available in various densities, filament sizes and surface areas to suit specific process conditions for maximum removal of mist and micron-size droplets. Mist eliminators can be made in various metals and plastics. Additionally, our random and structured packing can be used as mist eliminators. Chevron and plate type mist eliminators are suitable for high liquid load, dirty services and high capacities. They can be applied in horizontal flow or used in vertical upflow and they can be made in sections to be installed through a manway. Chevron mist eliminators can be made in plastics or metals.

CUSTOM INTERNALS

Special internals for liquid and gas distribution can also be provided. Fabco has experience in flashing feed, collector tray, and sparger designs.

BED LIMITERS/HOLD DOWN

Bed limiters, or holddowns as they are also called, are used to limit the packing bed from moving and getting packing pieces entrained away from the bed. They are secured to the wall or loosely placed on the packing; they are made of rods and bars or in combination with screens or expanded metal, depending on the application. Bed limiters can be made in various metals and plastics.

COLLECTOR/REDISTRIBUTORS

Collector redistributors are similar to the orifice liquid distributors with risers. Our model CR01 collector is composed of a flat perforated plate with round or rectangular chimneys. The risers or chimneys have caps to prevent liquid from bypassing. Redistributors are normally used when a long packed bed section has to be split up into smaller sections or when an intermediate feed is inserted in the column. Collector/redistributors can be made in various metals and plastics.

JP-7 - A CHEMICAL LIQUID FOR PREVENTING FOULING OF SCRUBBER PACKING

One of the most common problems with air stripping and absorption towers is that over time they become fouled with solids, resulting in the loss of efficiency, capacity and increased pressure drop. Fabco has accumulated a wealth of knowledge in dealing with packing fouling problems while optimizing stripping and absorption efficiencies. The addition of JP-7 as a pretreatment will keep free iron, calcium, manganese and other minerals in suspension, preventing oxidation within the air stripping column, thus preventing a fouling problem. Typical dosages of JP-7 range from 1 to 3 gallons per million gallons of water. JP-7 is furnished in a stable, liquid form and is fed on a continual basis with a low maintenance chemical feed pump.

Mist Eliminators

Fabco Mist Eliminators

FABCO ELIMINATOR TYPE LTV 1500

for vertical gas flow

The Fabco eliminator Type LTV 1500 has been developed to give high EFFICIENCY MIST ELIMINATION WITH LOW PRESSURE DROP. The multi-chamber profile causes the liquid droplets caught to be moved out of the gas stream such that they can drain back to the process without re-entrainment.

ADVANTAGES

- high efficiency mist elimination combined with very low pressure drop.
- compact size finds wide application.
- can be retrofitted to scrubbers and other process equipment.
- available in a full range of corrosion resistant materials.

OPERATING CONDITIONS

- RECOMMENDED INLET VELOCITY 4 m/s.
- operating velocity range 2.5 - 6m/s.
- limit drop size 40 microns, depending on velocity.
- removal efficiency 99.9% for limit drop size and larger.

APPLICATIONS

- downstream of gas scrubbers, especially spray scrubbers and packed columns.
- fitted also to acid coolers, evaporating coolers and evaporators.

MATERIALS OF CONSTRUCTION

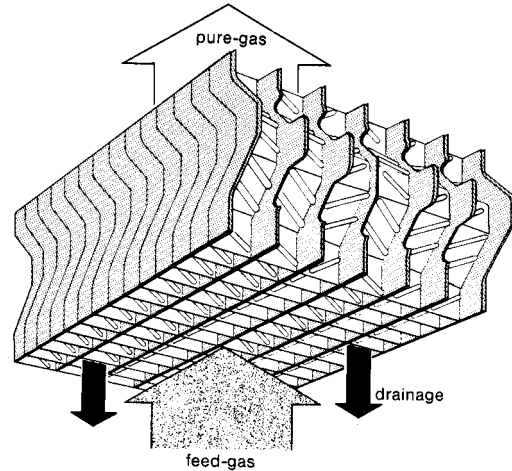
- Polypropylene
- PVDF
- Stainless steel (304, 316)

AVAILABLE ON REQUEST

- POLYSTYRENE
- NORYL
- PVC/CPVC
- RYTON PPO
- ABS

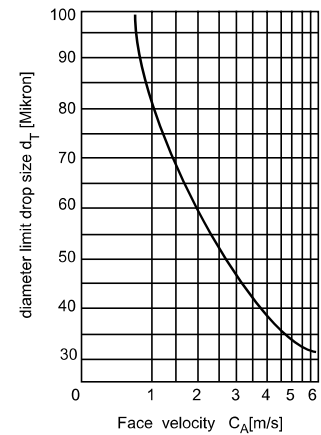
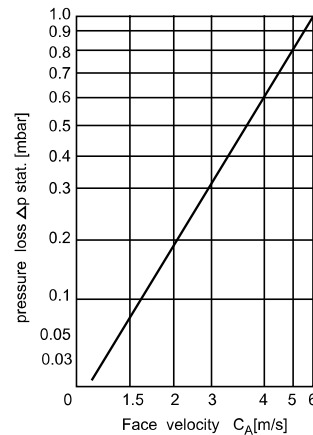
MODE OF OPERATION

The gas and the entrained liquid droplets are deflected by means of the vanes of the profile. The droplets impinge on the walls of the profiles by inertial forces. Ribs placed on the surface of the profile cause the captured liquid to flow down the sides where it can fall back into the process without re-entrainment.



WE SUPPLY

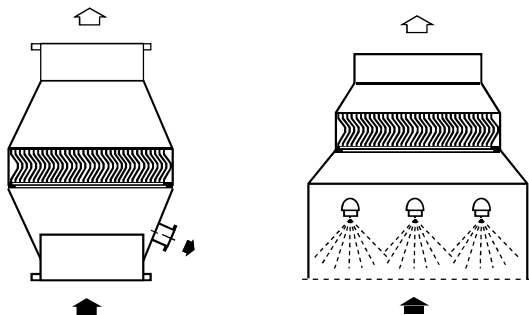
- eliminator packs for retrofitting in existing units.
- complete units with their own housing.
- we design the complete units for your application.



LTV 1500 ELIMINATOR MODULES

PART NO.	MATERIAL	MODULE WIDTH	PRICE per Sq. Ft.
LTV1500	POLYPRO	12" or 24"	\$ P.O.R.
LTV1520	PVC	12" or 24"	\$ P.O.R.
LTV1530	CPVC	12" or 24"	\$ P.O.R.
LTV1540	PVDF	12" or 24"	\$ P.O.R.
LTV2415 *	ABS (BLACK)	12" or 24"	\$ P.O.R.
LTV2415C	ABS (CLEAR)	12" or 24"	\$ P.O.R.
LTV1520C	PVC (CLEAR)	12" or 24"	\$ P.O.R.

* LTV2415 ABS (Black) are Fire Retardant modules.



MIST ELIMINATOR TYPE LTH 2000

for horizontal gas flow

The Fabco Mist Eliminator, Type LTH 2000 is a profile eliminator for horizontal gas flow. It operates at high velocity and captures droplets down to approximately 10 micron diameter. An important aspect of this design is that it has a drain channel which positively prevents the captured liquid from being re-entrained into the gas stream.

ADVANTAGES

- removal efficiency 99.9% of limit drop size droplets and larger.
- high face velocity which results in compact units.
- two profiles available, one with a single drain channel, the other with three to suit different applications.
- easy to clean.

MATERIALS AVAILABLE

- ABS
- PVC
- Polypropylene
- PVDF
- Carbon Steel
- Galvanized Steel
- Stainless Steel (304, 316)

OPERATING CONDITIONS

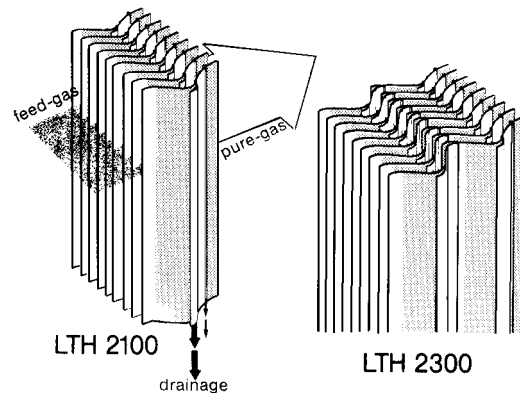
Inlet face velocity 2.5 - 6 m/s, for a single stage of eliminators; up to 12 m/s with two stages or more.

APPLICATIONS

- downstream of scrubbers, especially spray scrubbers or towers.
- process gas cleaning
- evaporators
- acids mists from electro-plating and electro-deposition plants.

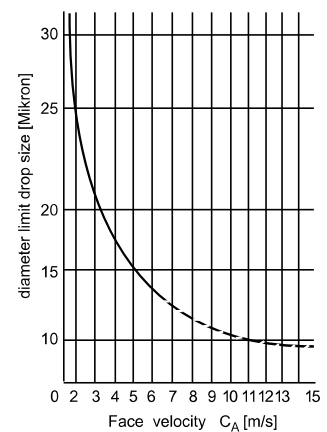
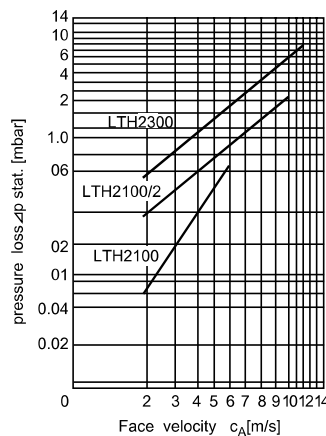
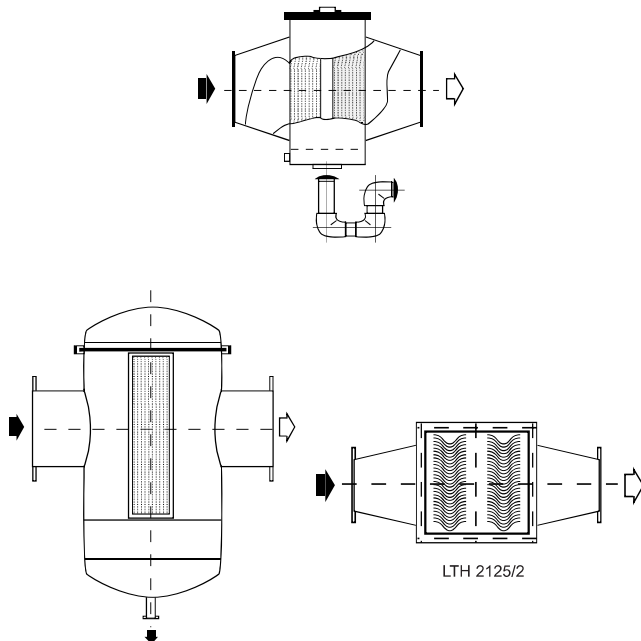
MODE OF OPERATION

The sophisticated aerodynamic design of the profiles cause the elimination of liquid droplets by inertial forces. The profiles are designed with a main drain channel to capture the bulk of the captured liquid and a number of small drain channels to prevent re-entrainment downstream of the venture like throat. By this combination of drain channels the captured liquid droplets are prevented from re-entering.



WE SUPPLY

- modular packs of profiles for installation into existing housings, towers or vessels
- complete units with housing for pressure or vacuum operation
- we custom design the eliminator for your application

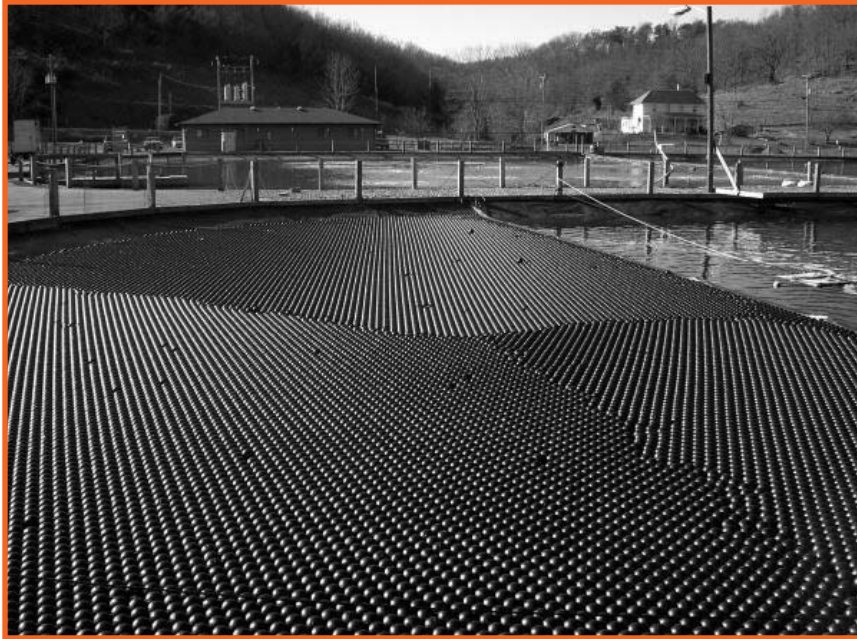


LTH 2100 BLADES

MATERIAL	PART NO.	PRICE/FT.
PVC	LTH2100	P.O.R.
P.P.	LTH2400	P.O.R.

Energy-Saving Hollow Balls

Energy-Saving Hollow Balls



You can save money, conserve energy, and reduce air and noise pollution with Fabco hollow balls. They're not only environmentally sound but they pay for themselves up to 6 times over per year. They just pour onto the surface and covering 91% in a single layer. Balls move out of the way for dipping and float back into position automatically. One layer reduces heat loss by 75% and evaporation by 87%; with two layers, reduction is 81% and 90% respectively. Hollow ball blankets are successfully used in many applications including anodizing, food processing, metal processing and finishing, sewage treatment, gas scrubbing, temperature retardation, and more.

As well, Fabco Hollow Balls control fumes and smell, reduce evaporation and foul smell with 90%, reduce loss of valuable chemicals and fluids, save 70 - 75% energy on heated tanks, and reduce oxygen uptake.

MOULDED HOLLOW BALLS

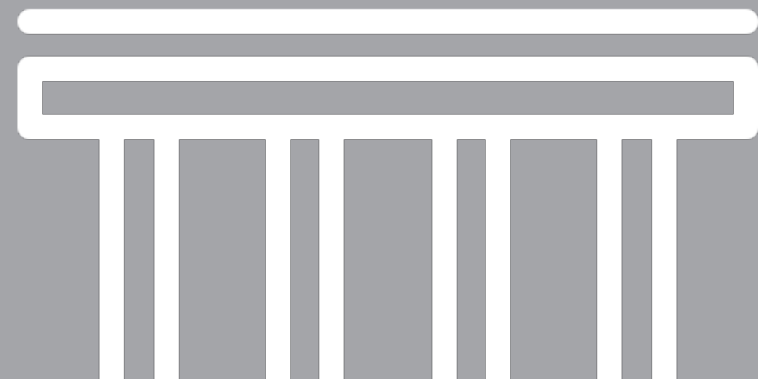
PART NO.	APPROXIMATE DIAMETER (INCHES)	APPROXIMATE DIAMETER (MM)	WEIGHT (GRAMS)	BALLS PER PACK	QUANTITY NEEDED PER SQ. FT.
PP 10	3/8	10	.2	1000	1076
PP 20	3/4	20	1.0	2000	270
PP 25	1	25	1.5	1000	172
PP 38	1 1/2	38	4.5	1000	74
PP 50	2	50	8.0	1000	43
PP 70	2 3/4	70	16.0	300	22
PP 100	4	100	30.0	100	10
PP 150	6	150	90.0	50	4.8

PRECISION GROUND SOLID BALLS

DIAMETER	NYLON	DELIN	ACRYLIC	PP	HDPE	TEFLON
1/8	NY125	DL125	-	PP125	HDPE125	TEF125
5/32	NY156	DL156	-	PP156	HDPE156	TEF156
3/16	NY187	DL187	-	PP187	HDPE187	TEF187
1/4	NY250	DL250	ACR250	PP250	HDPE250	TEF250
5/16	NY312	DL312	-	PP312	HDPE312	TEF312
3/8	NY375	DL375	ACR250	PP375	HDPE375	TEF375
1/2	NY500	DL500	ACR250	PP500	HDPE500	TEF500
9/16	NY562	DL562	-	-	-	-
5/8	NY625	DL625	ACR625	PP625	HDPE625	TEF625
3/4	NY750	DL750	-	PP750	HDPE750	TEF750
7/8	NY875	DL875	-	-	-	-
1	NY1000	DL1000	ACR1000	PP1000	HDPE1000	TEF1000

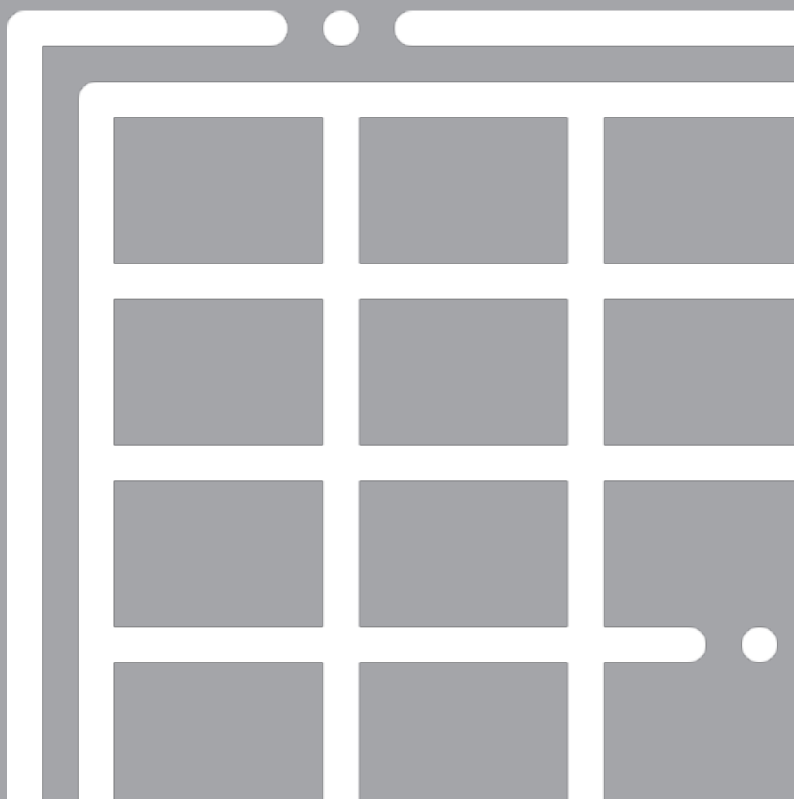
Notes:

- Other plastics are available on request.
- Heat loss data available upon request.
- Case quantities are 1000.
- Smaller quantities available on request.



Section 10: FRP - Fiber Reinforced Plastic and Grating

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FabcoGrate FRP Grating & FabcoRail FRP Safety Railing

FABCO FRP MOLDED GRATING

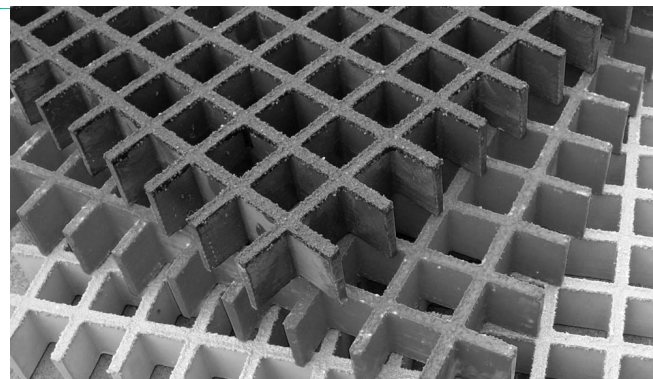
Fabco offers a full range of Fiberglass Molded Grating Panels for most any application- With a grate thickness range of 1", 1 1/2" and 2" and mesh sizes of 1" x 4", 1 1/2" x 1 1/2" or 2" x 2" we have the ability to supply you with panels that meet your projects loading demand . We have a full complement of resin selections available that can be offered with grit top or a plain non-skid surface. Panel sizes are varied and range from 4' x 12' 4' x 8' and 3' x 10'.

FABCO FRP PULTRUDED GRATING

Our Pultruded FRP Grating Product range offered in either poly or vinyl ester flame retardant resins. It is available with Individual bearing bars in various sizes of "I" or "T" shapes or Heavy Duty solid bars up to 2 1/2". This provides Fabco the ability to supply a pultruded grating profile to handle a range of applications from light foot traffic walkways to heavy vehicle traffic in any corrosion environment.

FABCO PHENOLIC GRATING

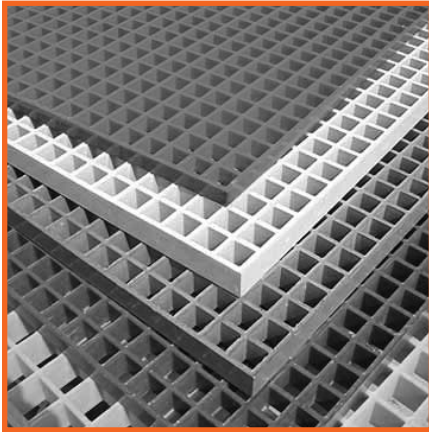
Phenolic grating is a dramatic innovation for markets where fire safety is a major concern; it offers superior resistance to flame and high temperature with low emissions of smoke and toxic fumes. The nonflammable nature of phenolics enable phenolic grating to withstand higher temperatures than polyester or vinyl ester for extended periods of time without major structural damage.



FABCORAIL FRP SAFETY RAILING

Our Safety Railing is fabricated from structural FRP components manufactured by the pultrusion process. Fabco Plastics stocks a wide variety of Safety Railing which can ship from stock for easy on-site assembly. Our standard handrail is a 2-rail system manufactured in a "Safety Yellow" color.

Fabcograte FRP Grating



Features:

- Will not rust.
- Corrosion resistant.
- Non-sparking.
- Fire retardant.
- Non-conductive.
- Maintenance free.
- Molded-in color.
- Light weight.
- Easy to install.
- Impact resistant.
- Quality appearance.

Square Mesh Panel

- Three Heights 1", 1.5" and 2"
- 1.5" Weight: 3.75 lb/ft. sq.
- 1" Weight: 2.5 lb/ft. sq.
- Tolerances: $\pm 1/16"$
- Bar Spacing: 1.5" X 1.5"
- Most popular pattern
- 70% open area
- Load bearing bars in both directions
- Easy to fabricate
- Can be used without continuous side support
- Labour savings
- High material utilization, low waste
- Uniform appearance

THICKNESS	BAR SPACING (IN)	PANEL SIZE (FT)	WT (LBS)
1"	1.5 x 1.5	4 X 12	120
1"	1.5 x 1.5	4 X 10	100
1"	1.5 x 1.5	4 X 8	80
1"	1.5 x 1.5	3 X 12	90
1"	1.5 x 1.5	3 X 10	75
1"	1.5 x 1.5	5 X 10	125
1.5"	1.5 x 1.5	4 X 12	180
1.5"	1.5 x 1.5	4 X 10	150
1.5"	1.5 x 1.5	4 X 8	120
1.5"	1.5 x 1.5	3 X 12	135
1.5"	1.5 x 1.5	3 X 10	113
1.5"	1.5 x 1.5	5 X 10	187
1"	1 x 4	3 X 10	75
1"	1 x 4	44" X 8	75
1"	1 x 4	4 X 8	80
1"	1 x 4	4 X 12	120
2"	2 x 2	4 X 12	192

Rectangular Mesh Panel

- 1" HIGH
- Bar Spacing: 1" X 4"
- 1" Weight: 2.50 lb/ft. sq.
- Tolerances: $\pm 1/16"$
- Economical
- Original pattern
- 69% open area
- Widely used for light traffic and shorter spans

RESIN CODE	DESCRIPTION	BASE RESIN	CORROSION RESISTANCE	FLAME SPREAD RATING	COLOR
CF	CHEMICAL PROOF FIRE RETARDANT	VINYL ESTER	EXCELLENT	CLASS 1: 25 OR LESS	DARK GRAY or ORANGE
CR+	CHEMICAL PROOF FIRE RETARDANT PLUS	VINYL ESTER	EXCELLENT	CLASS 1: 10 OR LESS	BLACK
IF	INDUSTRIAL GRADE FIRE RETARDANT	ISOPHTHALIC	VERY GOOD	CLASS 1: 25 OR LESS	GREEN or GRAY
FF	FOOD GRADE FIRE RETARDANT	ISOPHTHALIC	VERY GOOD	CLASS 2: 30 OR LESS	LIGHT GRAY
AF	ARCHITECTURAL GRADE	ORTHOPHTHALIC	GOOD	CLASS 1: 25 OR LESS	GREEN
AN	ARCHITECTURAL GRADE NON-FIRE RETARDANT	ORTHOPHTHALIC	GOOD	NOT RATED	YELLOW or GREEN

Note : All grating types available with or without grit top for slip resistance.

CF: CHEMICAL PROOF (standard colour is dark gray) is a vinyl ester system specifically engineered to provide premium service in highly corrosive environments. It utilizes an advanced resin system which delivers outstanding resistance to a wide range of harsh corrosive environments ranging from acidic to caustic, plus a high degree of solvent resistance. It has a Class I flame spread rating of 25 or less according to the ASTM E-84 Tunnel Test Method.

CR+: CHEMICAL PROOF PLUS (standard colour is black). This is our only EF.R.P™ Grating to offer a flame spread rating of 10 or less on ASTM E-84 Tunnel Test. It has excellent acid and caustic resistance.

IF: INDUSTRIAL GRADE (standard colour is light gray). This is a premium corrosion resistant isophthalic resin system selected for outstanding acid resistance. It has moderate resistance to caustic and solvent environments. It has a Class I ASTM E-84 Tunnel Test flame spread rating of 25 or less. It is more economical than types CF and CR+.

FF: FOOD GRADE (standard colour is safety yellow). Agriculture Canada approved (all ingredients have been USDA approved) to meet corrosive conditions commonly found in meat production, food processing, bottling and brewing applications. Made with isophthalic polyester. Flame spread rating is 30 or less.

AF: ARCHITECTURAL GRADE FIRE RETARDANT (standard colour is light gray). This is a resin system designed for mildly corrosive environments. Best suited to replace metal gratings that require maintenance to maintain an aesthetically pleasing appearance. It has a Class 1, ASTM E-84 Tunnel Test flame spread rating of 25 or less for indoor use. It is more economical than type IF.

AN: ARCHITECTURAL GRADE (standard colour is green). Similar resin system as type AF but is not fire retardant or flame spread rated. More economical than AF.

Grating Selection Process

1. Select the proper bar spacing and height to meet your load requirements.
2. Select the proper resin to meet your environmental requirements.
3. Select the proper panel size to meet your requirement.
4. Determine if you want grit top or plain top.

Load Deflection Tables

Deflection to Span Ratios

- For a resilient, non-fatiguing, comfortable feel use the STANDARD deflection to span ratio of 1:120.
- For an elevated installation, where a solid feeling is desired, use a deflection to span ratio of 1:180 (NBC-85).
A deflection to span ratio greater than 1:100 (1%) is not recommended. Do not exceed .5" (13mm).

Panel Selection

- Determine the type of loading: concentrated or uniform.
- Estimate the load and determine the span.
- Decide what maximum deflection is appropriate: solid, standard or 1%.
- Enter the appropriate 1" (25mm) table. If the deflection is less than the maximum selected, choose the 1" thickness. It is more economical than 1.5" thick panels.
- If the deflection or span is too great for 1" thick panels, select 1.5" thick FRP Grating and design your support system for the appropriate span.
- Select the resin system.

Panel Installation

- Panels are designed to be supported on all sides.
- Use end clips if panel ends cannot be supported.
- Use hold down clips to prevent panel drift.

CONCENTRATED LOAD: FULL PANEL

2" HEIGHT, 2" X 2" MESH

SPAN (IN)	LOAD (POUNDS)							MAXIMUM LOADS		
	100	250	500	750	1000	1500	2000	SOLID ²	STD ³	1% DEF ⁴
18	.004	.012	.025	.037	.049	.074	.098	2040	3063	3672
24	.007	.018	.036	.054	.072	.107	.143	1860	2793	3352
36 ¹	.015	.037	.073	.110	.146	.219	.293	1290	1938	2326
48 ¹	.030	.074	.149	.223	.298	.447		858	1286	1554

1-1/2" HEIGHT, 1-1/2" X 1-1/2" MESH

18	.007	.016	.032	.048	.064	.096	.128	1560	2340	2808
24	.012	.029	.058	.086	.115	.173	.230	1156	1733	2080
36 ¹	.026	.064	.128	.192	.255	.383		738	1108	1330
48 ¹	.055	.138	.276	.414				463	693	832
60 ¹	.083	.208	.417					386	579	695

1" HEIGHT, 1-1/2" X 1-1/2" MESH

18	.014	.034	.068	.102	.136	.203	.271	738	1105	1325
24	.026	.066	.132	.198	.265	.397		503	755	906
36 ¹	.068	.171	.342					276	414	497
48 ¹	.141	.353						181	272	326

1" HEIGHT, 1" X 4" MESH

18	.011	.028	.056	.084	.113	.169	.225	887	1330	1596
24	.025	.061	.123	.184	.245	.368	.491	543	813	976
36 ¹	.059	.147	.294	.441				321	482	578
44 ¹	.120	.300						213	320	384
48 ¹	.131	.327						196	294	353

UNIFORM LOAD: FULL PANEL

2" HEIGHT, 2" X 2" MESH

SPAN (IN)	LOAD (LB/FT ²)							MAXIMUM LOADS		
	40	65	75	100	150	200	250	SOLID ²	STD ³	1% DEF ⁴
12	.00	.00	.00	.00	.00	.00	.00	4867	5800	5800
18	.003	.004	.005	.007	.010	.014	.017	1439	2158	2590
24	.009	.014	.016	.022	.033	.044	.055	607	910	1092
36 ¹	.044	.072	.083	.111	.167	.222	.278	180	269	323
48 ¹	.141	.228	.264	.351				76	111	133
60 ¹	.343							32	46	55

1-1/2" HEIGHT, 1-1/2" X 1-1/2" MESH

12	.002	.003	.004	.005	.008	.010	.013	2664	5918	7102
18	.005	.008	.010	.013	.019	.025	.032	787	2358	2830
24	.016	.026	.030	.040	.060	.080	.101	331	745	894
36 ¹	.081	.132	.153	.204	.305	.407		98	145	174
48 ¹	.258	.419	.484					41	60	72

1" HEIGHT, 1-1/2" X 1-1/2" MESH

12	.003	.006	.008	.010	.016	.021	.026	633	950	1140
18	.021	.035	.040	.053	.080	.107	.133	187	281	337
24	.067	.110	.126	.169	.253	.337	.422	78	118	142
36 ¹	.342							23	35	42

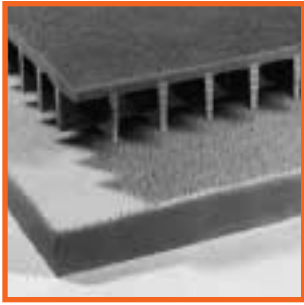
1" HEIGHT, 1" X 4" MESH

12	.002	.004	.005	.006	.009	.012	.014	1158	1737	2084
18	.010	.016	.018	.024	.036	.048	.060	416	625	750
24	.022	.036	.042	.056	.084	.112	.140	238	356	427
36 ¹	.110	.180	.207	.276	.414			72	108	130
44 ¹	.31							34	50	60
48 ¹	.339							31	46	55

Notes:

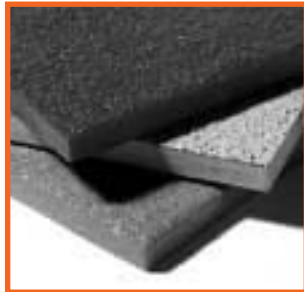
- ¹ - Clear Span is 2" less than width of grating
- ² - Solid Deflection to Span ratio is 1:180
- ³ - Standard Deflection to Span ratio is 1:120
- ⁴ - 1% Deflection to Span ratio is 1:100

Grating Accessories



Fiberglass Covered Grating

All Fiberglass Grating is available with an integral cover plate to prevent fumes in the work area or where high stiffness over drainage trenches is required.



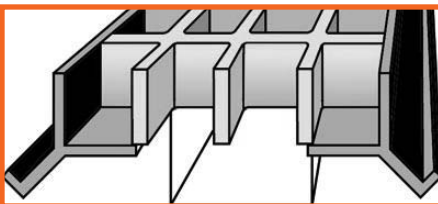
Fiberglass Floor Plate

Available to cover all panel sizes. Easy to clean both top and bottom sides. Can be used as a splash guard. Available in thickness from 1/16" (1.5mm) to 1" (25mm). Grit top surface is standard for floor plate applications.



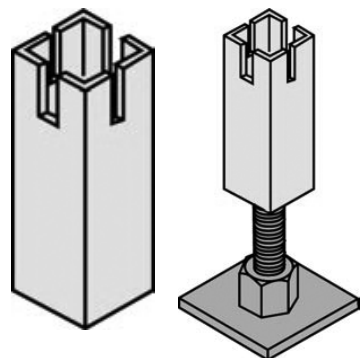
Fiberglass Stair Treads

Fiberglass stair treads come complete with contrasting colored antislip nosing. Available in standard lengths of 24", 30", 36", or 42". Available in widths of 9", 10 1/2", or 12".



Fiberglass Concrete Curb Angle

Pultruded fiberglass Curb Angle provides a strong, firm base for bearing bars. Standard Curb Angle is produced using a gray, fire retardant vinyl ester resin system and is available in three sizes.

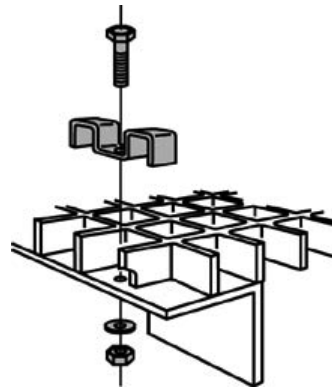


Fiberglass Elevated Floor Systems

Fixed and adjustable Fiberglass Columns are available to provide elevated dry floor. Strongwell's pultruded fiberglass Curb Angle provides a strong, firm base for bearing bars. Standard Curb Angle is produced using a gray, fire retardant vinyl ester resin system and is available in three sizes. Floors can be designed to support up to 2,000 pounds per square foot.

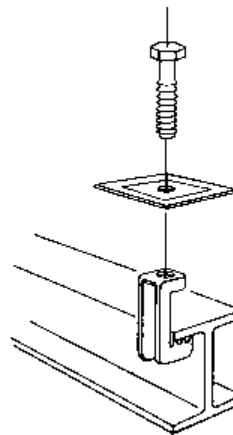
Grating Clips

Prevent panel drift - bold, nut and washer included. Use 2 or 3 for each side of each full size panel; 4 for each Stair Thread. 18-8 stainless steel. The following Types are available:



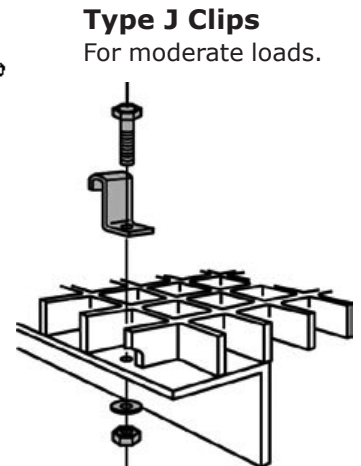
Type M Clips

Restrains movement in all directions. Can use self-drilling screws when attaching to metal supports.



Type G-G Clips

Install from top of grating. No hole to drill. Galvanized available.

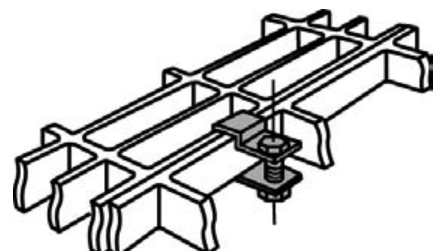


Type J Clips

For moderate loads.

Type C

For joining two unsupported ends.



Pultruded Fiberglass Grating

DURADEK®

SHAPES, SIZES AND AVAILABILITY

SERIES	BEARING BAR THICKNESS	NO. BARS PER FT. WIDTH	BEARING BAR CENTER	OPEN SPACE	OPEN AREA	APPROX. WEIGHT PER FT ²	CROSS-SECTIONAL AREA (PER FT. OF WIDTH)	MOMENT OF INERTIA (PER FT. OF WIDTH)	SECTION MODULUS (PER FT. OF WIDTH)
I-6500	1.0"	7	1.71"	1.11"	65%	2.2 lb	2.190 in ²	0.288 in ⁴	0.575 in ³
I-6500	1.5"	7	1.71"	1.11"	65%	2.7 lb	2.752 in ²	0.814 in ⁴	1.088 in ³
T-5800	2.0"	5	2.40"	1.40"	58%	2.6 lb	2.711 in ²	1.396 in ⁴	top: 1.588 in ³ bottom: 1.247 in ³

How to Specify DURADEK®

Fiberglass grating shall be DURADEK® Series (I-6500 1") (I-6500 1-1/2") (T-5800 2") as manufactured by Strongwell. Grating shall be pultruded and assembled in the U.S.A. Resin shall be fire retardant (polyester) (vinyl ester) meeting the requirements of a Class 1 rating of 25 or less per ASTM E-84 and the self-extinguishing requirements of ASTM D-635. Color shall be (light gray) (yellow). Resin shall be UV inhibited and the composite shall include a veil on all exposed surfaces. Panels shall be assembled into the sizes ordered using a 3-piece pultruded cross-rod system.

The cross-rods shall consist of a center core wedge and two spacer bars that are notched at each bearing bar so that each bearing bar is both mechanically locked and chemically bonded to the web of each bearing bar. The spacer bars shall be continually bonded to the center core wedge. The cross-rods shall be spaced a maximum of 8" in the panel. The top of the panels shall be covered with a bonded epoxy medium grit anti-skid surface.

NOTE: If special options are required that are not stated in the above specification, fill in your special requirement in the appropriate section.

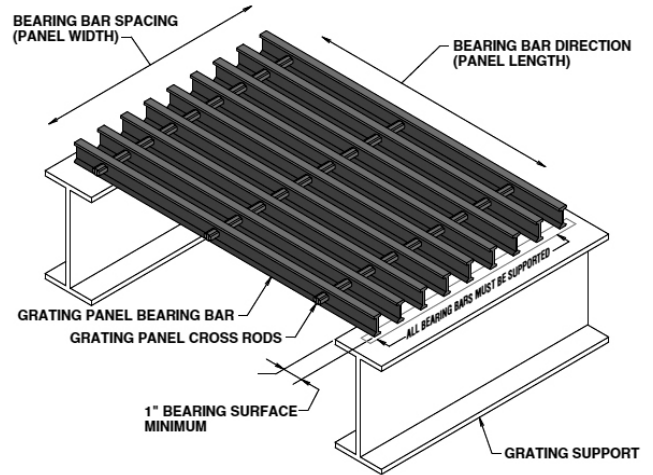
How to Order

When ordering DURADEK®, ensure the bearing bars for installation will be oriented in the correct direction for the application. Bearing bars shall traverse from support to support. Cross-rods are not intended to be applied in the span direction. The adjacent drawing will help specify the width and length of panels.

NOTE: Width is the measurement from end to end of the cross-rods. Length is always the bearing bar length.

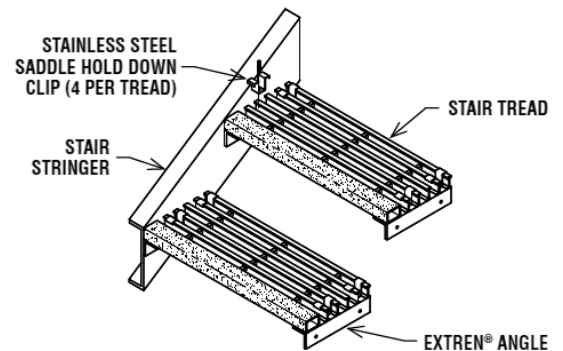
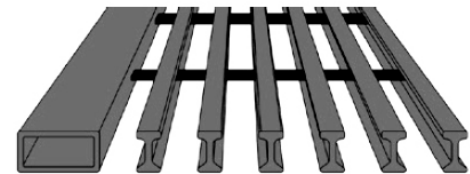
Panel Sizes Are Specified: Width x Length

NOTE: DURAGRID®, Strongwell's line of custom pultruded grating, is available with a wide array of options, including: colors, resin systems, panel sizes, cross rod spacings and more.



Nosings for Stair Treads and Landings

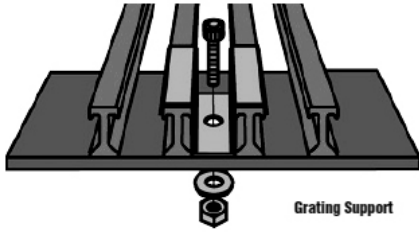
DURAGRID® pultruded stair treads and landings are produced by attaching a 2" deep nosing to the leading edge. This gives added strength and rigidity to the area that takes the most impact and abuse. In addition, the nosing provides more surface area for skid resistance, wear and better visibility. Light gray stair treads with yellow nosing are available at additional cost.



TREAD WIDTH & COLOR	STAIR TREAD SERIES	MAXIMUM SPAN FOR 300 LBS. AT MIDSPAN	
		1/8" OR LESS DEFLECTION	1/4" OR LESS DEFLECTION
11" Light Gray or Yellow	I-6000 1"	29"	37"
11" Light Gray or Yellow	I-6000 1-1/2"	40"	52"
12" Light Gray or Yellow	T-5000 2"	47"	59"

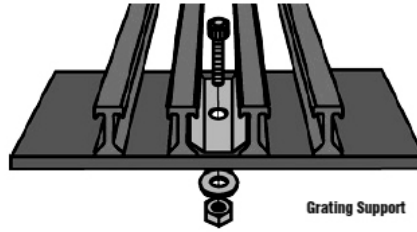
DURADEK® Accessories

Panel Hold Downs



Weldable 316L stainless steel saddle clips are available for all DURADEK® grating series.

*Bolts are priced separately from the saddle clips.

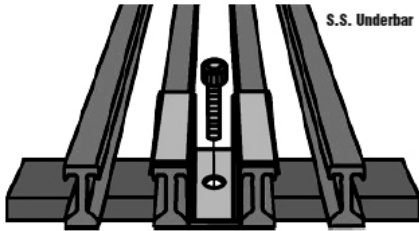


Weldable 316L stainless steel insert clips are available for all DURADEK® grating series.

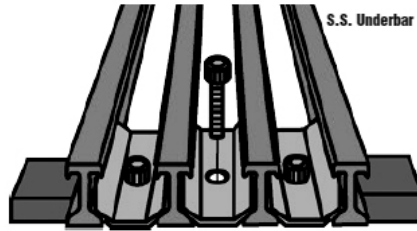
*Bolts are priced separately from the hold-down.

Panel Connectors

Panel Connectors are generally only used at midspan to assist in transferring load from section to section.

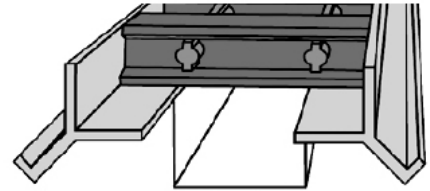


316L stainless steel saddle clips are available as panel connectors for all DURADEK® grating series.



Insert clip hold-downs are available for all DURADEK® grating series.

Curb Angle



Fiberglass Curb Angle provides a strong, firm base for bearing bars and is pultruded from the same material and in the same manner as other DURADEK® products. Corrosion resistant Fiberglass Curb Angles are available for 1", 1-1/2" and 2" grating panel thicknesses in gray fire retardant vinyl ester.

USING THE LOAD/DEFLECTION TABLES

Series Designation

The series designation indicates the bar size and shape and the percent of open area. For example: T-5800 2" means 2" T-bar spaced to give a 58% open area.

Load Table Data

Deflection values are based upon minimum apparent modulus (E) per span. Maximum Recommended Load data was calculated by the Strongwell Test Lab. See FGMC/ANSI Grating Manual for additional information regarding apparent modulus deflection.

STATISTICAL REPORTING METHODS

Minimum Value

A value that is a specified distance from the average. The most common specified distance is three standard deviations.

Characteristic Value

As defined by ASTM D7290, a value that is normally between two and three standard deviations from the average.

Average Value

The sum of a list of values divided by the number of values in the list, without consideration for standard deviations.

Typical Value

No definition. Not recommended for use by Professional Engineers. Can be any value the manufacturer chooses.

NOTE: Strongwell recommends the use of minimum or characteristic values for design calculations

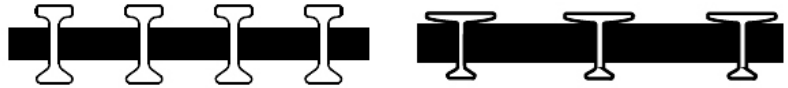
Pultruded Fiberglass Grating

Fiberglass Grating & Stair Treads

DURA DEK®

PULTRUDED FIBERGLASS GRATING & STAIR TREADS

STOCKING LEVELS OF GRATING MAY VARY. CALL FOR AVAILABILITY.



STANDARD SIZE PANELS

Panel Size (Width x Length)	PE I-6000 - 1" VE I-6000 - 1"	PE I-6000 - 1-1/2" VE I-6000 - 1-1/2"	PE T-5000 - 2" VE T-5000 - 2"
	wt. (lbs.)	wt. (lbs.)	wt. (lbs.)
3' x 8'	63	77	80
3' x 10'	78	96	99
3' x 12'	94	116	119
3' x 20'	156	192	198
4' x 8'	84	103	106
4' x 10'	104	128	132
4' x 12'	125	154	159
4' x 20'	208	256	264
5' x 8'	104	128	132
5' x 10'	130	160	165
5' x 12'	156	192	198
5' x 20'	260	320	330

STANDARD SIZE STAIR TREADS

Stair Treads (Width x Length)	PE I-6000 - 1" VE I-6000 - 1"	PE I-6000 - 1-1/2" VE I-6000 - 1-1/2"	PE T-5000 - 2" VE T-5000 - 2"
	wt. (lbs.)	wt. (lbs.)	wt. (lbs.)
11" x 144"	32	39	—
12" x 144"	—	—	40

Colors: Yellow or Gray
Resins: Fire Retardant Polyester - Standard
 Fire Retardant Vinyl Ester - Optional

UV Protection: UV Inhibited with a Veil; Total UV Coating Optional
Top Surface: Epoxy Bonded Grit Coating
Cross Rods: 6" o.c.

FRP - FIBER REINFORCED PLASTIC & GRATING



DURA DEK®

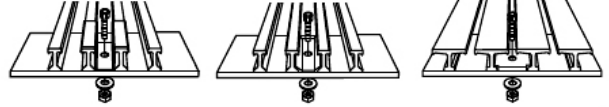
PULTRUDED FIBERGLASS GRATING & STAIR TREADS

ACCESSORY ITEMS

ALL ITEMS GENERALLY ARE IN INVENTORY FOR IMMEDIATE SHIPMENT

PANEL HOLD DOWNS

(Price Does Not Include Nuts, Bolts & Washers)



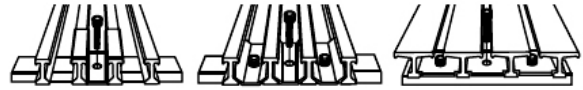
(No Broken Packages)

**Pounds Approx.
(25 per Package)**

S.S. Insert Hold Down, all series (Specify I-6000 or T-5000)	1.00
S.S. Saddle Clip Only, I-6000 - 1"	2.00
S.S. Saddle Clip Only, I-6000 - 1-1/2"	2.25
S.S. Saddle Clip Only, T-5000 - 2"	3.25
1/4" - 20 x 1-1/4" S.S. Socket Head Cap Screw with Nut & Washer (For use with Hold Downs)	0.75

PANEL CONNECTORS ASSEMBLY

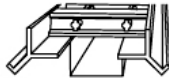
(Assembly includes Hold Down(s), Bolt(s) and Bottom Bar)



**Pounds
Approx.**

S.S. Insert Panel Connector, all series	0.40
S.S. Saddle Clip Panel Connector, I-6000 - 1"	0.29
S.S. Saddle Clip Panel Connector, I-6000 - 1-1/2"	0.30
S.S. Saddle Clip Panel Connector, T-5000 - 2"	0.30

FIBERGLASS CURB ANGLE



**Pounds Approx.
(In. ft.)**

1" x 1-1/2"	STOCKED	0.83
1-1/2" x 1-1/2"	STOCKED	0.93
2" x 1-1/2"	STOCKED	1.03
4" x 2-1/4" x 1/4" (Slate Gray)	NS	5.33

Color: Gray	UV Inhibited with a Veil
Resin: Fire Retardant, Vinyl Ester	Stock Length: 20 feet

MISCELLANEOUS

**Pounds
Approx.**

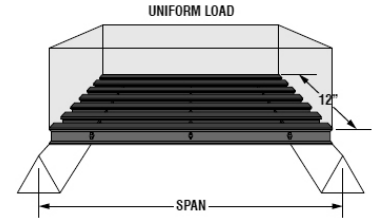
Sealing Kit - 1 pint	1.64
7" Tungston Carbide Tip Circular Blade	0.64
Tungston Carbide Tip Saber Saw Blade	0.03

Pultruded Fiberglass Grating

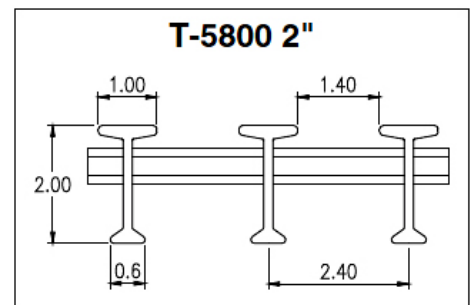
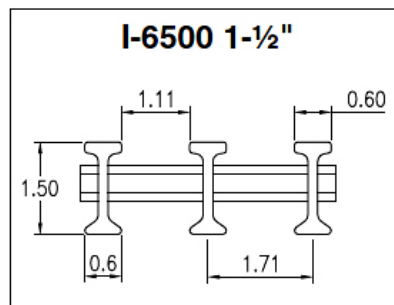
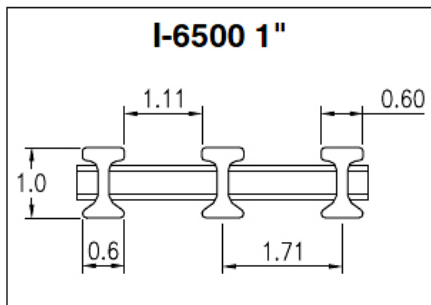
DURADEK® PULTRUDED GRATING

Uniform Load (Deflection in Inches)

Note: () indicates where the load produces $\leq 0.25^\circ$ deflection.



SPAN (IN)	STYLE		LOAD IN LB / SQUARE FOOT (PSF)														MAXIMUM RECOMMENDED LOAD (PSF)	DEFLECTION	E X 10 ⁶ PSI	
	SERIES	DEPTH	50	100	150	200	250	300	400	500	750	1000	2000	3000	4000	5000				6000
12	I-6500	1"	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.06	0.08	0.1		9123	0.19	3.78
	I-6500	1-1/2"	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.04	15439	0.11	3.79
	T-5800	2"	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.02	0.03	9444	0.04	3.8
18	I-6500	1"	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.1	0.19	0.29	0.38	0.48		4346	0.41	4.15
	I-6500	1-1/2"	<0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.07	0.1	0.14	0.17	0.21	6862	0.24	4.05
	T-5800	2"	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.06	0.08	0.1	0.12	6280	0.13	3.91
24	I-6500	1"	0.01	0.03	0.04	0.06	0.07	0.09	0.11	0.14	0.21	0.28	0.57					2544	0.72	4.41
	I-6500	1-1/2"	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.08	0.1	0.21	0.31	0.42	0.52	0.63	3860	0.4	4.24
	T-5800	2"	<0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.05	0.06	0.13	0.19	0.26			4722	0.3	4.01
30	I-6500	1"	0.03	0.07	0.1	0.13	0.17	0.2	0.26	0.33	0.49	0.66						1628	1.07	4.63
	I-6500	1-1/2"	0.01	0.03	0.04	0.05	0.06	0.07	0.1	0.12	0.18	0.25	0.49					2433	0.6	4.4
	T-5800	2"	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.12	0.15	0.31					3022	0.46	4.1
36	I-6500	1"	0.07	0.13	0.2	0.26	0.33	0.39	0.52	0.66								1130	1.48	4.83
	I-6500	1-1/2"	0.03	0.03	0.05	0.08	0.1	0.12	0.15	0.2	0.25	0.37	0.5					1663	0.83	4.5
	T-5800	2"	0.02	0.02	0.03	0.05	0.06	0.08	0.09	0.12	0.16	0.23	0.31					2099	0.66	4.18
42	I-6500	1"	0.12	0.24	0.36	0.48	0.6											827	1.99	4.88
	I-6500	1-1/2"	0.05	0.09	0.14	0.18	0.23	0.27	0.36	0.45	0.68							1194	1.08	4.59
	T-5800	2"	0.03	0.06	0.09	0.11	0.14	0.17	0.23	0.29	0.43							1542	0.88	4.25
48	I-6500	1"	0.2	0.4	0.6													630	2.53	4.98
	I-6500	1-1/2"	0.08	0.15	0.23	0.3	0.38	0.46	0.61									892	1.35	4.66
	T-5800	2"	0.05	0.1	0.14	0.19	0.24	0.29	0.38									1181	1.12	4.34
54	I-6500	1"	0.32	0.64														496	3.18	5
	I-6500	1-1/2"	0.12	0.24	0.36	0.48	0.6											681	1.64	4.71
	T-5800	2"	0.08	0.15	0.23	0.3	0.38											933	1.4	4.41
60	I-6500	1-1/2"	0.18	0.36	0.55													533	1.94	4.74
	T-5800	2"	0.11	0.23	0.34	0.45												756	1.7	4.47
66	I-6500	1-1/2"	0.27	0.53														425	2.26	4.76
	T-5800	2"	0.16	0.33	0.49													624	2.04	4.52
72	T-5800	2"	0.23	0.46														524	2.39	4.58



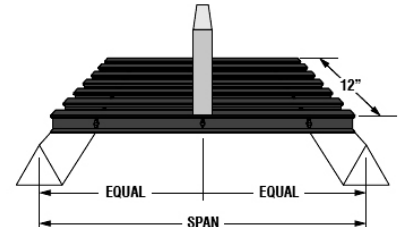
FRP - FIBER REINFORCED PLASTIC & GRATING



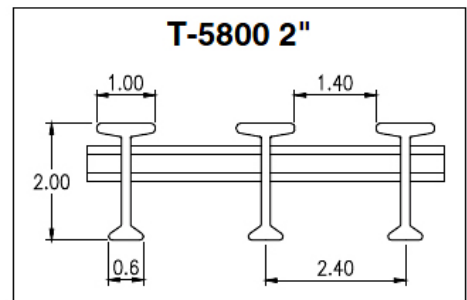
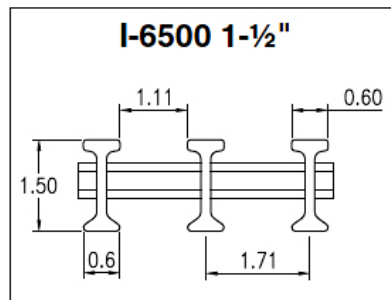
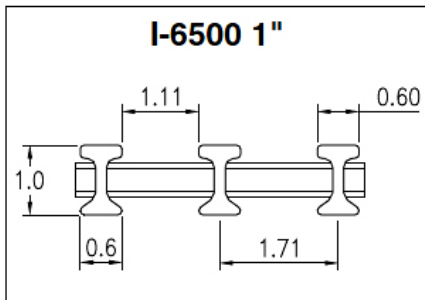
DURADEK® PULTRUDED GRATING

Concentrated Line Load (Deflection in Inches)

Note: () indicates where the load produces ≤ 0.25" deflection.



SPAN (IN)	STYLE		LOAD IN LB / FOOT OF WIDTH (PSF)														MAXIMUM RECOMMENDED LOAD (PSF)	DEFLECTION	E X 10 ⁶ PSI	
	SERIES	DEPTH	50	100	150	200	250	300	400	500	750	1000	2000	3000	4000	5000				6000
12	I-6500	1"	<0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.07	0.10	0.13	0.17	4561	0.15	3.78	
	I-6500	1-½"	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02	0.04	0.05	0.06	0.07	7719	0.09	3.79
	T-5800	2"	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02	0.03			4722	0.03	3.8
18	I-6500	1"	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.08	0.10	0.20	0.31	0.41	0.51	3259	0.33	4.15	
	I-6500	1-½"	<0.01	<0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.07	0.11	0.15	0.18	0.22	5146	0.19	4.05
	T-5800	2"	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.05	0.07	0.09			4722	0.11	3.91
24	I-6500	1"	0.01	0.02	0.03	0.05	0.06	0.07	0.09	0.11	0.17	0.23	0.45	0.68			2544	0.58	4.41	
	I-6500	1-½"	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.17	0.25	0.33	0.42	0.50	3860	0.32	4.24
	T-5800	2"	<0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.10	0.15	0.21			4722	0.24	4.01
30	I-6500	1"	0.02	0.04	0.06	0.08	0.11	0.13	0.17	0.21	0.32	0.42					2035	0.86	4.63	
	I-6500	1-½"	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.12	0.16	0.31	0.47	0.63			3041	0.48	4.4
	T-5800	2"	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.07	0.10	0.20	0.30			3778	0.37	4.1	
36	I-6500	1"	0.04	0.07	0.11	0.14	0.18	0.21	0.28	0.35	0.52						1696	1.19	4.83	
	I-6500	1-½"	0.01	0.03	0.04	0.05	0.07	0.08	0.11	0.13	0.20	0.27	0.53				2495	0.66	4.5	
	T-5800	2"	0.01	0.02	0.03	0.03	0.04	0.05	0.07	0.08	0.13	0.17	0.33				3148	0.52	4.18	
42	I-6500	1"	0.06	0.11	0.17	0.22	0.28	0.33	0.44	0.55							1447	1.59	4.88	
	I-6500	1-½"	0.02	0.04	0.06	0.08	0.10	0.12	0.17	0.21	0.31	0.41					2088	0.86	4.59	
	T-5800	2"	0.01	0.03	0.04	0.05	0.07	0.08	0.10	0.13	0.20	0.26					2698	0.7	4.25	
48	I-6500	1"	0.08	0.16	0.24	0.32	0.40	0.48	0.64								1260	2.02	4.98	
	I-6500	1-½"	0.03	0.06	0.09	0.12	0.15	0.18	0.24	0.30	0.46	0.61					1784	1.08	4.66	
	T-5800	2"	0.02	0.04	0.06	0.08	0.10	0.11	0.15	0.19	0.29	0.38					2361	0.9	4.34	
54	I-6500	1"	0.11	0.23	0.34	0.46	0.57	0.68									1117	2.55	5	
	I-6500	1-½"	0.04	0.09	0.13	0.17	0.21	0.26	0.34	0.43	0.64						1533	1.31	4.71	
	T-5800	2"	0.03	0.05	0.08	0.11	0.13	0.16	0.21	0.27	0.40						2099	1.12	4.41	
60	I-6500	1-½"	0.06	0.12	0.18	0.23	0.30	0.35	0.47	0.58							1333	1.56	4.74	
	T-5800	2"	0.04	0.07	0.11	0.14	0.18	0.22	0.29	0.36							1889	1.36	4.47	
66	I-6500	1-½"	0.08	0.16	0.23	0.31	0.39	0.46	0.62								1170	1.81	4.76	
	T-5800	2"	0.05	0.10	0.14	0.19	0.24	0.29	0.38								1717	1.63	4.52	
72	T-5800	2"	0.06	0.12	0.18	0.24	0.30	0.37									1574	1.92	4.58	



Pultruded Fiberglass Grating

DURAGRID® I-Bar Pultruded Grating

¹ 100 psf load, simple span (dimensions shown), 0.25" deflection.

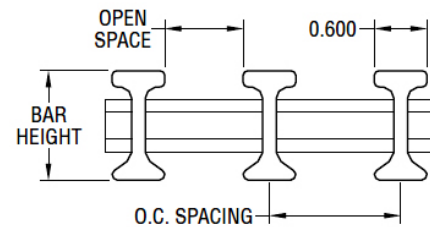
² Weight per square foot is based upon cross rods 6" on center. Deduct 0.186 lbs/ft² for 12" on center.

NOTES:

N/A : Not intended for pedestrian applications.

For full load tables, visit <http://www.strongwell.com/gratingloadtables>

SERIES	ON CENTER SPACING	OPEN SPACE	# BARS PER FOOT OF WIDTH	% OPEN SPACE	BAR HEIGHT	SPAN ¹	WT/FT ²	FIGURE
I-2000	0.750	0.150	16	20%	1.00"	52	4.5	
					1.25"	58	5.0	
					1.50"	67	5.5	
I-3000	0.850	0.250	14.12	30%	1.00"	51	4.0	
					1.25"	56	4.5	
					1.50"	65	4.9	
I-4000	1.000	0.400	12	40%	1.00"	48	3.4	
					1.25"	54	3.9	
					1.50"	62	4.2	
I-4800	1.161	0.561	10.33	48%	1.00"	47	3.0	
					1.50"	60	3.8	
I-5000	1.200	0.600	10	50%	1.00"	46	2.9	
					1.25"	52	3.3	
					1.50"	59	3.6	
I-5500	1.330	0.730	9.02	55%	1.00"	45	2.7	
					1.50"	58	3.2	
I-6000	1.500	0.900	8	60%	1.00"	44	2.4	
					1.25"	49	2.7	
					1.50"	56	3.0	
I-6500	1.710	1.110	7.02	65%	1.00"	42	2.2	
					1.25"	47	2.4	
					1.50"	54	2.7	
I-7000	2.000	1.400	6	70%	1.00"	40	1.9	
					1.25"	45	2.1	
					1.50"	52	2.3	
I-7500	2.400	1.800	5	75%	1.00"	N/A	1.7	
					1.25"	N/A	1.8	
					1.50"	N/A	2.0	
I-8000	3.000	2.400	4	80%	1.00"	N/A	1.4	
					1.25"	N/A	1.5	
					1.50"	N/A	1.7	
I-8300	3.600	3.000	3.33	83%	1.00"	N/A	1.3	
					1.25"	N/A	1.3	
					1.50"	N/A	1.4	
I-8500	4.000	3.400	3	85%	1.00"	N/A	1.2	
					1.25"	N/A	1.2	
					1.50"	N/A	1.3	
I-9000	6.000	5.400	2	90%	1.00"	N/A	0.9	
					1.25"	N/A	1.0	
					1.50"	N/A	1.0	



FRP - FIBER REINFORCED PLASTIC & GRATING



DURAGRID® T-Bar Pultruded Grating

NOTES:
¹ 100 psf load, simple span (dimensions shown), 0.25" deflection.
² Weight per square foot is based upon cross rods 6" on center. Deduct 0.186 lbs/ft² for 12" on center.
 N/A : Not intended for pedestrian applications.
 For full load tables, visit <http://www.strongwell.com/gratingloadtables>

SERIES	ON CENTER SPACING	OPEN SPACE	# BARS PER FOOT OF WIDTH	% OPEN SPACE	BAR HEIGHT	SPAN ¹	WT/FT ²	FIGURE	
ET-3300	1.500"	0.500"	8	33%	1.00"	39	2.0		
					1.50"	48	2.4		
ET-5000	2.000"	1.000"	6	50%	1.00"	36	1.6		
					1.50"	45	1.9		
ET-7200	2.600"	1.600"	3.33	72%	1.00"	31	0.9		
					1.50"	38	1.1		
ET-8300	6.000"	5.000"	2	83%	1.00"	N/A	0.8		
ET-8800	8.000"	7.000"	1.71	88%	1.00"	N/A	0.7		
T-0000	1.625"	0.000"	7.38	0%	1.00"	44	3.1		
T-1000	1.800"	0.175"	6.67	10%	1.00"	43	2.9		
T-1200	1.850"	0.225"	6.49	12%	1.00"	43	2.8		
T-1800	2.000"	0.375"	6	18%	1.00"	42	2.6		
T-2500	2.120"	0.495"	5.66	25%	1.00"	42	2.5		
T-3000	2.330"	0.705"	5.15	30%	1.00"	41	2.4		
T-3500	2.400"	0.775"	5	35%	1.00"	40	2.3		
T-3800	2.620"	0.995"	4.58	38%	1.00"	39	2.1		
T-0000	1.625"	0.000"	7.38	0%	1.50"	58	3.8		
T-1000	1.800"	0.175"	6.67	10%	1.50"	57	3.5		
T-1200	1.850"	0.225"	6.49	12%	1.50"	56	3.4		
T-1800	2.000"	0.375"	6	18%	1.50"	55	3.2		
T-2500	2.120"	0.495"	5.66	25%	1.50"	54	3.0		
T-3500	2.400"	0.775"	5	35%	1.50"	53	2.7		
T-3800	2.620"	0.995"	4.58	38%	1.50"	52	2.5		
T-0000	1.000"	0.000"	12	0%	2.00"	78	5.7		
T-1700	1.200"	0.200"	10	17%	2.00"	74	4.8		
T-3300	1.500"	0.500"	8	33%	2.00"	70	3.9		
T-5000	2.000"	1.000"	6	50%	2.00"	65	3.1		
T-5800	2.400"	1.400"	5	58%	2.00"	62	2.6		
T-6700	3.000"	2.000"	4	67%	2.00"	58	2.2		

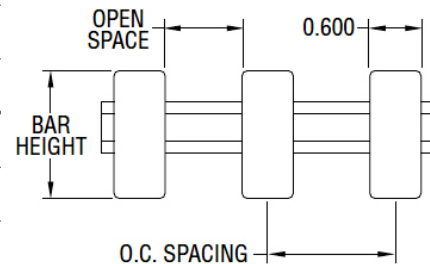
Pultruded Fiberglass Grating

DURAGRID® HD Pultruded Grating

NOTES:

¹ 100 psf load, simple span (dimensions shown), 0.25" deflection.
² Weight per square foot is based upon cross rods 6" on center. Deduct 0.186 lbs/ft² for 12" on center.
 HD Grating is generally suitable for long spans or heavy wheel loads.
 For full load tables, visit <http://www.strongwell.com/gratingloadtables>

SERIES	ON CENTER SPACING	OPEN SPACE	# BARS PER FOOT OF WIDTH	% OPEN SPACE	BAR HEIGHT	SPAN ¹	WT/FT ²	FIGURE
HD-3000	0.850'	0.250'	14	30%	1.00'	56	7.8	
					1.25'	66	9.5	
					1.50'	75	11.3	
					1.75'	85	13.0	
					2.00'	93	16.1	
					2.25'	102	17.1	
					2.50'	110	18.2	
HD-4000	1.000'	0.400'	12	40%	1.00'	54	7.0	
					1.25'	63	8.5	
					1.50'	72	10.1	
					1.75'	82	11.6	
					2.00'	89	14.4	
					2.25'	98	14.7	
HD-5000	1.200'	0.600'	10	50%	1.00'	51	5.9	
					1.25'	61	7.2	
					1.50'	68	8.5	
					1.75'	78	9.8	
					2.00'	85	11.1	
					2.25'	94	12.4	
					2.50'	101	13.7	
HD-6000	1.500'	0.900'	8	60%	1.00'	48	4.9	
					1.25'	57	5.9	
					1.50'	65	7.0	
					1.75'	73	8.0	
					2.00'	80	9.0	
					2.25'	89	10.1	
					2.50'	95	11.1	



FRP - FIBER REINFORCED PLASTIC & GRATING



Pultruded Fiberglass Grating & Fiberglass Stair Tread Covers

DURAGRID® R-Bar Pultruded Grating

NOTES:
¹ 100 psf load, simple span (dimensions shown), 0.25" deflection.
² Weight per square foot is based upon cross rods 6" on center. Deduct 0.186 lbs/ft² for 12" on center.
 N/A : Not intended for pedestrian applications.
 For full load tables, visit <http://www.strongwell.com/gratingloadtables>

SERIES	ON CENTER SPACING	OPEN SPACE	# BARS PER FOOT OF WIDTH	% OPEN SPACE	BAR HEIGHT	SPAN ¹	WT/FT ²	FIGURE
R-6200	0.813"	0.500"	14.77	62%	1.00"	46	4.5	
R-7300	1.188"	0.875"	10.1	73%	1.00"	42	3.2	
R-8300	1.875"	1.563"	6.4	83%	1.00"	37	2.2	
R-9000	3.000"	2.688"	4	90%	1.00"	N/A	1.4	
R-9500	6.000"	5.688"	2	95%	1.00"	N/A	0.7	
R-9700	11.875"	11.563"	1	97%	1.00"	N/A	0.4	

Duratread™ Fiberglass Stair Tread Covers

DURATREAD™

MOLDED FIBERGLASS STAIR TREAD COVERS

STOCKING LEVELS MAY VARY. CALL FOR PRICING, COLOR OPTIONS AND AVAILABILITY.

RESINS OPTIONS:

GP — GENERAL POLYESTER RESIN SYSTEM VE — VINYL ESTER RESIN SYSTEM
 PP — PREMIUM POLYESTER RESIN SYSTEM FF — FOOD GRADE RESIN SYSTEM

Tread (inches)	Thickness 1/8" Weight (.lbs)	Thickness 1/4" Weight (.lbs)
8	16	31
9	18	34
10	19	37
11	21	40
12	23	44

*All covers are 12' long. • No minimum on black with yellow nose covers. • The minimum order quantity for all other colors is 5 pieces.

FRP - FIBER REINFORCED PLASTIC & GRATING



Fiberglass Ladder & Cage Systems

SAFRAIL™ Fiberglass Ladder and Cage Systems



SAFRAIL™ fiberglass ladders and ladder cages mounted on the sides of tanks and buildings are a common sight in a wide range of industries. Fiberglass ladder and ladder cage systems have been in use since the 1950's in chemical plants and other corrosive environments. Even in complete immersion applications, fiberglass has outlasted aluminum and steel and required little or no maintenance.

Sizes & Availability

SAFRAIL™ ladders are fabricated in a standard 18" (457mm) rung width configuration with 12" (305mm) rung spacings. Various ladder lengths can be produced as practical. Standard SAFRAIL™ ladder and ladder cage systems are designed and fabricated to meet the requirements of OSHA 1910.23 and 1926.1053. Custom colors and custom designed ladders and access cages can be fabricated upon request. Ladders can be shipped pre-assembled for installation in the field.

Materials of Construction

SAFRAIL™ ladders and ladder cage systems are produced using a premium grade polyester resin system with flame retardant and ultraviolet (UV) inhibitor additives. A vinyl ester resin system is available upon request for additional corrosion resistance. Standard side rails and cages are pigmented OSHA safety yellow. The rungs are a pultruded fiberglass polyester tube with a fluted, nonskid surface.

*Strongwell recommends a coating to reduce color fade for outdoor applications. If a coating is not applied, color will fade.



*NSF International
Strongwell ladder and cage
systems can be manufactured
using NSF-61 certified materials.
Contact for details.*

SAFRAIL™

FRP - FIBER REINFORCED PLASTIC & GRATING

10

FABCORAIL FRP Safety Railing

Our Safety Railing is fabricated from structural FRP components manufactured by the pultrusion process. Fabco Plastics stocks a wide variety of Safety Railing which can ship from stock for easy on-site assembly. Our standard handrail is a 2-rail system manufactured in a "Safety Yellow" color.



Fiberglass Handrail Systems

SAFRAIL™ Industrial Fiberglass Handrails



SAFRAIL™ industrial fiberglass handrails are commercial railing systems for stair rails, platform/walkway handrails and guardrails. SAFRAIL™ systems are fabricated from pultruded fiberglass components produced by Strongwell and molded thermoplastic connectors. The railing systems are particularly well-suited to corrosive environments like those found in industrial, chemical and wastewater treatment plants as well as commercial structures with urban and salt air corrosion. SAFRAIL™ fiberglass handrail systems are corrosion resistant, easy to field fabricate, structurally strong, low in thermal conductivity, impact resistant, have low electrical conductivity and are lightweight. SAFRAIL™ systems are the result of more than 40 years of experience in the manufacture, design and fabrication of fiberglass handrail systems. The systems offer the following advantages:

- Ease of Assembly — SAFRAIL™ systems are produced in lightweight standard sections that include both post and rail. Systems can be prefabricated in large sections and shipped to the site or they can also be fabricated and installed on site with simple carpenter tools.
- Internal Connection System — All connections fit flush, resulting in a pleasing, streamlined appearance. The internal connections allow the construction of continuous handrail systems around circular tanks without special fittings.
- Safety Features — SAFRAIL™ systems come in a “safety yellow colour”, feature low electrical conductivity for worker safety and exhibit high strength. Systems meet US federal OSHA standards with a 2:1 factor of safety with a 6-foot (1830mm) maximum post spacing. SAFRAIL™ systems also comply with international standard AFNOR NF E 85-101.
- Low Maintenance — Corrosion resistant fiberglass with molded-in colour will outlast aluminum or steel systems with virtually no maintenance.
- Cost Effective — Fiberglass components and easy-to-assemble design provide savings on labor and maintenance, resulting in long- term savings and elimination of the cost and inconvenience of “downtime for repairs” in plant operations.

SAFRAIL™ industrial systems can be used in guardrail applications where railing is needed to protect the open side of an elevated walkway. SAFRAIL™ systems meet OSHA requirements for a height of 42” (1067mm) from the top of walkway to the top of the guardrail. The OSHA loading requirement for both guardrail and handrail is a 200 pound (890 N) concentrated load at any point or direction on the top rail. Other building codes may require different loading conditions. Moulded-in color plus an optional tough polyurethane coating will outlast aluminum or steel systems and requires virtually no maintenance.

SAFRAIL™
FIBERGLASS HANDRAIL SYSTEMS

Custom Fiberglass Handrail Systems

Handrail may be ordered in custom colors and/or resins and may also be pre-fabricated. Prices and ship dates for custom fabricated handrail may be obtained by calling Customer Service.

NOTE: UV Coating is recommended for exterior applications and is available at an additional cost.



Square Handrail System Components

COMPONENT	WEIGHT (LBS.)
2" x 2" x .156" Square Tube, Yellow Polyester Fire Retardant UV Inhibited @ 240"	0.95 / ft.
2-3/8" x 2-3/8" x 3/16" Square Tube, Yellow Polyester Fire Retardant UV Inhibited @ 240"	1.36 / ft.
4" Kickplate Yellow Polyester Fire Retardant UV Inhibited @ 240"	0.65 / ft.
6" Kickplate Yellow Polyester Fire Retardant UV Inhibited @ 240" (1,200 ft. mill run)	0.73 / ft.
Black End Caps	0.03 ea.
Adjustable Corner Assembly (Total Assembly)	0.36 ea.
90° Corner Plug	0.35 ea.
Kickplate Splice	0.11 ea.
Kickplate 90° Splice	0.15 ea.
Split Tube 8" Length (for square handrail)	0.35 ea.
Split Tube 4" Length (for square handrail)	0.18 ea.
Split Tube 144" Length (for square handrail)	6.12 ea.
6" Square Plug	0.76 ea.
Square Plug 144" Length	18.24 ea.
1/8" x 1-1/2" Tension Pins	.04 / 10 pcs.
Epoxy Kits - 1 Pint Clear	1.64 ea.
FRP Base Plate with Post - Total Height 40" (Polyester)	5.50 ea.
Alternate Handrail Post, 2-3/8" x 2-3/8" x 50", Routed Out, No Bottom Plugs	5.70 ea.
90° Corner Sample	1.30 ea.
Tee Sample	0.90 ea.

Round Handrail System Components

COMPONENT	WEIGHT (LBS.)
1.9" OD x 1.5" ID Yellow Polyester Fire Retardant UV Inhibited	0.88 / ft.
4" Kickplate Yellow Polyester Fire Retardant UV Inhibited @ 240"	0.65 / ft.
Black End Caps	0.05 ea.
Adjustable Corner Assembly (Total Assembly)	0.36 ea.
90o Corner Assembly	0.35 ea.
Intermediate Connectors	0.05 ea.
Kickplate Splice	0.11 ea.
Kickplate 90o Splice	0.15 ea.
Split Tube, 1.5 x 4" (for round handrail)	0.15 ea.
Split Tube, 1.5 x 8" (for round handrail)	0.30 ea.
Round Connector, 1.5 x 8"	0.53 ea.
1/8" x 1-1/2" Tension Pins	0.04 / 10 pcs.
FRP Base Plate with Post, Total Height 39-9/16" (YFRPE)	5.50 / pc.
Stainless Steel Kickplate Bracket	0.12 ea.
1/4" x 1" Stainless Steel Bolt Assembly	.05 ea.



Channel Top Handrail System Components

COMPONENT
1" Diameter Mid Rail, Yellow Polyester Fire Retardant, UV Coated (5,000 linear feet min. run)
Channel Top Handrail, Yellow Polyester Fire Retardant, UV Coated (5,000 linear feet min. run)
2" x 2" x .156" Tube (for post), Yellow Polyester Fire Retardant, UV Coated
4" Kick Plate, Yellow Polyester Fire Retardant, UV Coated

NOTE: UV Coating is recommended for exterior applications and is available at an additional cost.

FRP Structural Shapes and Plates

EXTREN® Structural Shapes and Plates

EXTREN® is a proprietary combination of fiberglass reinforcements and thermoset polyester or vinyl ester resin systems. It is produced in more than 100 standard shapes. All EXTREN® shapes have a surface veil to protect against glass fibers penetrating the resin surface in service and to increase corrosion and UV resistance.

EXTREN® is offered in three series designed for different environments and applications:

EXTREN® 500: An all-purpose series utilizing a premium polyester resin system with a UV inhibitor.

Color: olive green

EXTREN® 525: An all-purpose series utilizing a fire retardant premium polyester resin system with a UV inhibitor.

Color: slate gray (plus certain handrail and fixed-ladder components in yellow)

EXTREN® 625: A premium series — both fire retardant and highly corrosion resistant — utilizing a vinyl ester resin system with a UV inhibitor.

Color: beige



All structural shapes are available in a polyester resin (Strongwell PE) and vinyl ester resin (Strongwell VE) which are certified to NSF-61. Any Series 500, 525 and 625 EXTREN® product can be manufactured upon request to meet the mechanical and physical properties of BS EN 13706 (E23) European standards.

FABRICATING WITH EXTREN®

JOINING - EXTREN® can be fastened mechanically with screws, bolts or rivets. FIBREBOLT® fiberglass studs and hex nuts (available from FABCO) can also be used with EXTREN®. EXTREN® can be joined by adhesives. The strongest connections can be made by using a combination of mechanical fasteners with adhesives. Suggested fabrication techniques for EXTREN® are covered in MFG's EXTREN® Fabrication and Repair Manual.

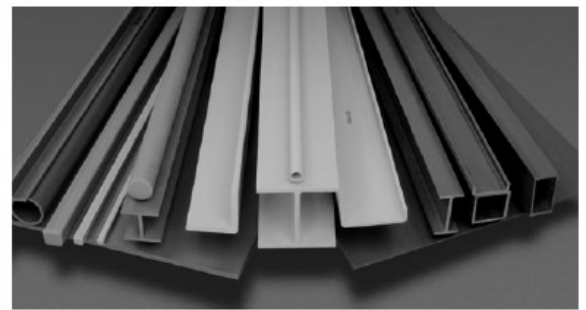
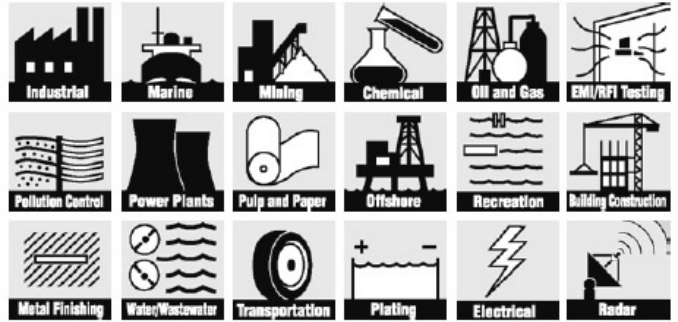
Features

- Corrosion Resistant
- Low Conductivity - Thermally and Electrically
- Non-Magnetic - Electromagnetic
- Lightweight
- High Strength
- Dimensional Stability
- Low Maintenance



Strongwell's pultruded fiberglass structural materials - including structural shapes, grating, stair treads, decking, handrail, ladders and more - are ideal for use in extreme environments like waterparks and pools.

EXTREN® FIBERGLASS STRUCTURAL SHAPES & PLATE



The three EXTREN® series: (left to right) 500, 625 and 525.



EXTREN® structural shapes were used in a SXEW copper refinery because of the highly corrosive environment.



A 63' (19.2m) high freestanding fiberglass stair tower at Ft. Story Army Base, Virginia Beach, Virginia.

FRP Structural Shapes and Plates

EXTREN® FIBERGLASS STRUCTURAL SHAPES & PLATE

EQUAL LEG ANGLES



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
1 x 1/8	STOCKED	STOCKED	STOCKED	0.18
1-1/4 x 1/8	NS	NS	NS	0.22
1-1/4 x 3/16	STOCKED	STOCKED	NS	0.35
1-1/2 x 1/8	NS	STOCKED	NS	0.28
1-1/2 x 3/16	NS	NS	NS	0.41
1-1/2 x 1/4	STOCKED	STOCKED	STOCKED	0.50
2 x 1/8	NS	NS	NS	0.37
2 x 3/16	STOCKED	STOCKED	NS	0.56
2 x 1/4	STOCKED	STOCKED	STOCKED	0.73
3 x 1/4	STOCKED	STOCKED	STOCKED	1.08
3 x 3/8	STOCKED	STOCKED	STOCKED	1.66
4 x 1/4	STOCKED	STOCKED	STOCKED	1.50
4 x 3/8	STOCKED	STOCKED	STOCKED	2.08
4 x 1/2	NS	STOCKED	STOCKED	2.86
5 x 1/2	NS	NS	NS	3.80
6 x 1/4	NS	STOCKED	NS	2.29
6 x 3/8	NS	NS	NS	3.56
6 x 1/2	STOCKED	STOCKED	STOCKED	4.41

CHANNELS



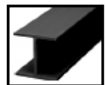
Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
1-1/2 x 1 x 3/16	NS	NS	NS	0.46
1-1/2 x 1-1/2 x 1/4	NS	STOCKED	NS	0.74
2 x 9/16 x 1/8	STOCKED	STOCKED	NS	0.28
2 x 7/8 x 1/4	NS	NS	NS	0.76
2-5/8 x 1/8 x 1-1/4 x 3/16	NS	NS	NS	0.59
3 x 1 x 3/16	NS	NS	NS	0.68
3 x 7/8 x 1/4	STOCKED	STOCKED	STOCKED	0.77
3 x 1-1/2 x 1/4	NS	NS	NS	1.06
3-1/2 x 1-1/2 x 3/16	NS	STOCKED	NS	0.90
4 x 1-1/16 x 1/8	NS	NS	NS	0.53
4 x 1-3/8 x 3/16	STOCKED	STOCKED	NS	0.87
4 x 1-1/8 x 1/4	STOCKED	STOCKED	NS	1.07
5 x 1-3/8 x 1/4	NS	NS	NS	1.35
5-1/2 x 1-1/2 x 3/16	NS	NS	NS	1.19
5-1/2 x 1-1/2 x 1/4	NS	STOCKED	NS	1.55
6 x 1-5/8 x 1/4	STOCKED	STOCKED	STOCKED	1.68
6 x 1-11/16 x 3/8	NS	STOCKED	NS	2.38
8 x 2-3/16 x 1/4	NS	STOCKED	NS	2.24
8 x 2-3/16 x 3/8	STOCKED	STOCKED	STOCKED	3.41
10 x 2-3/4 x 1/2	NS	STOCKED	STOCKED	5.50
12 x 3 x 1/2	NS	NS	NS	6.50
14 x 3-1/2 x 3/4	NS	NS	NS	10.73
18 x 2-3/16 x 3/16	NS	NS	NS	3.88
24 x 3 x 260	NS	NS	NS	6.16

I-BEAMS



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
2 x 1 x 1/8	NS	NS	NS	0.37
3 x 1-1/2 x 1/4	NS	NS	NS	1.11
4 x 2 x 1/4	STOCKED	STOCKED	STOCKED	1.48
5-1/2 x 2-1/2 x 1/4	NS	STOCKED	NS	2.00
6 x 3 x 1/4	NS	STOCKED	NS	2.31
6 x 3 x 3/8	NS	NS	NS	3.39
6 x 4 x 1/4	NS	NS	NS	3.20
8 x 4 x 3/8	STOCKED	STOCKED	NS	4.40
8 x 4 x 1/2	NS	NS	NS	5.96
10 x 5 x 3/8	NS	NS	NS	5.55
10 x 5 x 1/2	NS	NS	NS	7.81
12 x 6 x 1/2	NS	NS	NS	9.07
18 x 3/8 x 4-1/2 x 1/2	NS	NS	NS	8.52
24 x 3/8 x 7-1/2 x 3/4	NS	NS	NS	15.77

WIDE FLANGE BEAMS



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
2 x 1/8	NS	NS	NS	0.58
3 x 1/4	STOCKED	STOCKED	NS	1.69
4 x 1/4	STOCKED	STOCKED	STOCKED	2.35
6 x 1/4	STOCKED	STOCKED	STOCKED	3.39
6 x 3/8	STOCKED	STOCKED	STOCKED	5.19
8 x 3/8	NS	STOCKED	STOCKED	6.97
8 x 1/2	NS	NS	NS	9.37
10 x 1/2	NS	NS	NS	8.78
10 x 3/8	NS	NS	NS	12.06
12 x 1/2	NS	NS	NS	13.98

All items are stocked in 20 foot lengths unless otherwise noted
 ■ Items are non-stocked items

Series 500 - Polyester resin, olive green
 Series 525 - Polyester resin, flame retardant, slate gray
 Series 625 - Vinyl Ester resin, flame retardant, beige

FRP - FIBER REINFORCED PLASTIC & GRATING



FRP Structural Shapes and Plates

SQUARE TUBE



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
1 x 1/8	STOCKED	STOCKED	NS	0.35
1-1/4 x 1/8	NS	NS	NS	0.41
1-1/2 x 1/8	STOCKED	STOCKED	NS	0.56
1-1/2 x 1/4	NS	NS	NS	0.98
1-3/4 x 1/8	NS	NS	NS	0.64
1-3/4 x 1/4	NS	NS	NS	1.19
2 x 1/8	NS	STOCKED	NS	0.72
2 x 1/4*	STOCKED	STOCKED	STOCKED	1.37
2-1/2 x 1/4	NS	NS	NS	1.73
3 x 1/8	NS	NS	NS	1.16
3 x 1/4	STOCKED	STOCKED	STOCKED	2.26
3 x 3/8	NS	NS	NS	3.20
3-1/2 x 1/4	NS	STOCKED	NS	2.81
4 x 1/4	STOCKED	STOCKED	STOCKED	2.99
4 x 3/8	NS	NS	NS	4.24
6 x 3/8	NS	STOCKED	NS	6.62

ROUND TUBE



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
1 x 1/8	NS	NS	NS	0.25
1-1/4 x 1/8	NS	NS	NS	0.32
1-1/2 x 1/8	NS	NS	NS	0.45
1-1/2 x 1/4	NS	NS	NS	0.79
1-3/4 x 1/8	NS	NS	NS	0.52
1-3/4 x 1/4	NS	NS	NS	0.94
2 x 1/8	NS	NS	NS	0.60
2 x 1/4	STOCKED	STOCKED	NS	1.12
2-1/2 x 1/4	STOCKED	STOCKED	NS	1.43
3 x 1/4	NS	NS	NS	1.70
3-1/2 x .140	NS	NS	NS	1.21
4 x 1/4	NS	NS	NS	2.36
5 x 1/4	NS	NS	NS	3.08
6 x 1/8	NS	NS	NS	1.92
6 x 1/4	NS	NS	NS	3.76

RECTANGULAR TUBE



Sizes in Inches	Series 500	Series 525	Series 625	Lbs. Per Lin. Ft.
2-1/2 x 1-5/8 x 1/8	NS	NS	NS	0.75
4 x 1/8 x 2 x 1/4	STOCKED	STOCKED	NS	1.52
3-1/2 x 5-1/2 x 1/4	NS	STOCKED	NS	3.42
6-1/2 x 1/4 x 2 x 1/2	NS	NS	NS	3.86
7 x 4 x 1/4	NS	NS	NS	4.09
9 x 6 x 5/16	NS	NS	NS	6.80
9 x 6 x 7/16	NS	NS	NS	9.72

PLATE

EXTREN® pultruded plate is stocked in six thicknesses - see below. EXTREN® plate is a stocked item and is usually available on short notice. Stock size is 48" x 96".
60" wide plate is also available, non-stocked. Other sizes are available and will be quoted upon request.



Thickness in Inches	Series 500	Series 525	Series 625	Weight Lbs. Per Sq. Foot
1/8	STOCKED	STOCKED	STOCKED	1.20
3/16	STOCKED	NS	NS	1.71
1/4	STOCKED	STOCKED	STOCKED	2.34
3/8	STOCKED	STOCKED	NS	3.54
1/2	STOCKED	STOCKED	STOCKED	4.82
5/8	NS	NS	NS	5.79
3/4	STOCKED	STOCKED	STOCKED	7.24
1	NS	STOCKED	NS	8.50

All items are stocked in 20 foot lengths unless otherwise noted

* Also stocked in Series 525 yellow

■ Items are non-stocked items

Series 500 - Polyester resin, olive green

Series 525 - Polyester resin, flame retardant, slate gray

Series 625 - Vinyl Ester resin, flame retardant, beige

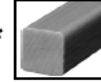
ROD AND BAR

THERMAL CURE ROD AND BAR is produced using all longitudinal reinforcements with low speed and high temperature, which provides a rich surface appearance. It has no surfacing veil, no pigment and is not fire retardant. On request, Strongwell can quote special formulations including resin type, fire retardant properties, etc. Because it maintains high electrical standards, thermal cure rod is most commonly specified for electrical applications. Normally stocked for prompt delivery. *Thermal cure rod and bar was not designed to be machined.*

ROUND ROD*



SQUARE BAR*



Sizes in Inches	Thermal Cure	Lbs. Per Lin. Ft.
1/4	STOCKED	0.04
5/16	STOCKED	0.07
3/8	STOCKED	0.10
1/2	STOCKED	0.17
5/8	STOCKED	0.27
3/4	STOCKED	0.39
13/16	NS	0.45
7/8	NS	0.53
1	STOCKED	0.69
1-1/8	NS	0.87
1-1/4	NS	1.03
1-1/2	NS	1.52
2	NS	2.78

Sizes in Inches	Thermal Cure	Lbs. Per Lin. Ft.
1/2	STOCKED	0.22
5/8	STOCKED	0.34
3/4	NS	0.49
1	STOCKED	0.87
1-1/4	NS	1.35
1-1/2	STOCKED	1.83






Sizes 3/4" diameter and smaller will be stocked in Chatfield, MN

SPECIAL COMPOSITE SHAPES

(Special Composite Design — Not EXTREN® Composite)

All Special Composite Shapes are Nonstocked items unless otherwise noted.

Tooling is available for the following special nonstocked items

	PE	PE/FR	VE/FR	Lbs. Per Lin. Foot
TOP RAIL 				
2 x 1/4 Modified Rd Tube	NS	NS	NS	1.29
FLIGHT CHANNEL 				
5-1/4 x 1/8 x 2-1/2 x 3/16	NS			1.33
7-1/8 x 1/8 x 2-1/2 x 3/16	NS			1.60
CHANNEL 				
3-1/2 x 2 x 7/32	NS	NS	NS	1.20
1.875 x .125 x 1.125 x .188**	NS			0.48
3.290 x .128 x 1.180 x .190**	NS			0.65
3.310 x .135 x 1.187 x .210**	NS			0.69
4.000 x .125 x 1.750 x .187**	NS			0.94
STRUT 				
1-5/8 x 1-5/8 x 5/32	NS	NS	NS	0.65
SQUARE TUBE/ROUND HOLE 				
1" Sq. with 3/4" Rd. Hole	NS	NS	NS	0.49

All items are stocked in 20 foot lengths unless otherwise noted
 Items are non-stocked items

* Special Composite Design - Not EXTREN® Composite
 ** Nonstocked item; standard color - orange

Fiberglass Rod & Nuts

Fiberglass Threaded Rod and Nuts



Fiberglass threaded rod and nuts are ideal for applications requiring mechanical fasteners that must be strong, non-corrosive and/or non-conductive. They are widely used as a replacement for steel or other metal fasteners in chemical process equipment, air pollution and water pollution control equipment, marine applications and in applications requiring all non-metallic materials. The threaded rod is stocked in 4 foot lengths but is available in other lengths by request.

DESCRIPTION	3/8"-16	1/2"-13	5/8"-11	3/4"-10	1"-8
THREADED ROD PART #	UNC-16	UNC-13	UNC-11	UNC-10	UNC-8
SQUARE NUT PART #	UNC-16N	UNC-13N	UNC-11N	UNC-10N	UNC-8N
THREADED ROD LENGTH	4'	4'	4'	4'	4'

NOTE: Technical information available upon request.

Applications:

- Scrubber units for chlorine plants
- Marine applications
- Replacement for 316 stainless steel fasteners
- Applications requiring non-conductivity
- Wastewater treatment facilities
- Packaging
- Chemical manufacturing facilities

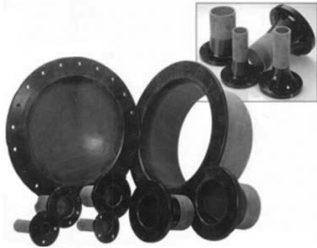
Features:

- Corrosion resistant
- Easy to fabricate
- Structurally strong
- Low maintenance
- Non-conductive
- Can use standard six point socket wrench
- Color blends with most structural materials



Fabco GR-KOR® Pressure Pipe

FABCO's Fiberglass Reinforced Plastic (FRP) laminates are manufactured with thermosetting polyester or vinylester resins and various types of glass fibre reinforcing. Materials are carefully selected for each specific application. The fiberglass reinforcement is thoroughly saturated with catalyzed resin to form a dense laminate with the required physical and chemical resistant properties. In general, the glass reinforcing provides the strength to the laminate and the resin binder provides the chemical resistance. All laminates are designed to meet the specific application requirements.



LAMINATE CONSTRUCTION

FABCO manufactures FRP pipe and fitting laminates with a variety of liner and structural wall constructions. In order to achieve optimum chemical resistance, all laminates are composed of an **Inner Surface**, an **Interior Layer**, a **Structural Layer** and an **Outer Surface Layer**. The combination of Inner Surface and Interior Layer is often referred to as the **Liner** or **Corrosion Barrier** and is generally considered to contribute structural strength as well as corrosion resistance to the laminate.

Inner Surface - This surface is exposed to the corrosive environment and is composed of resin reinforced with "C" glass veil or a synthetic veil such as Nexus®. This layer is 10 to 20 mils thick and has approximate 90/10 resin to glass ratio by weight for maximum corrosion resistance.

Interior Layer - This portion of the laminate is composed of multiple layers of chopped strand fiberglass reinforcement. Standard construction utilizes two layers of 1-1/2 ounce per square foot chopped strand fiberglass saturated with resin and produces a thickness of 85 to 95 mils with 22% to 32% glass content. Aggressive environments may dictate the use of more than the standard two layers. Liner thicknesses of 180 to 250 mils are often used in bleach towers, chlorine headers and other environments where chemical attack is anticipated. In these situations, a portion of the liner should be considered sacrificial and non-structural.

Structural Layer - This layer is the primary structural portion of the laminate and is designed to withstand the loads caused by pressure, wind, seismic and other conditions. It consists of alternating layers of chopped strand and 24 ounce per square yard woven roving to the required thickness. The glass content in these layers will be 30-45% depending on the amount of woven roving used. This layer may also be composed of filament

wound continuous strand fiberglass reinforcement which is typically helically wound onto the mandrel and has a glass content of 55-70% by weight.

Outer Surface Layer - This surface is a resin coating formulated to be non air-inhibited and fully cured. When exposed to the environment, this coating contains ultraviolet absorbers or pigments to minimize ultraviolet degradation. If the outer surface of a laminate is to be exposed to a corrosive environment, a veil layer or a chopped strand layer may be added over the structural layer for exterior protection. The outer surface can be pigmented for colour designation if required.

MANUFACTURING METHODS FRP PIPING

FABCO offers two standard types of FRP laminate construction for piping systems. **Filament Wound**, and **Contact Molded** (hand lay up).



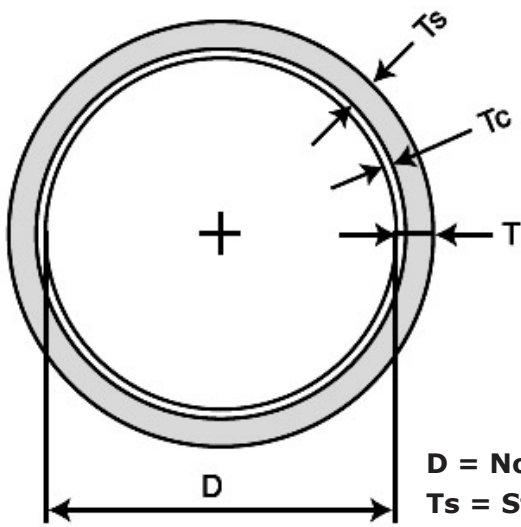
Filament Wound Construction - This process utilizes continuous glass strand roving that is pre-saturated in a resin bath and is then helically wound around a rotating mandrel at a specified winding angle. The winding process is continued in bi-directional layers until the desired wall thickness is achieved. FABCO's pressure piping is made with a 54 3/4° winding angle, which provides the theoretical optimum 2 to 1 hoop to axial strength ratio required for pressure piping. Vacuum piping will normally be wound at greater winding angles, such as 65°, to increase the hoop strength.



Contact Molded Construction - This method of laminate construction uses multiple layers of fiberglass chopped strand, woven roving and non-woven glass fabrics saturated with resin and built up to the desired thickness. Each glass layer is layed on the mold and resin is applied. Hand pressure rolling saturates the glass and removes entrapped air to provide a strong, dense laminate. Physical properties will vary with the amount of woven roving, unidirectional roving and/or fabric used.

FRP Pressure Pipe

Technical Information

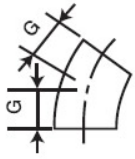


Fabco GR-Kor® FRP Spooled Piping Components

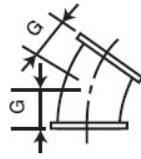
D = Nominal Inside Diameter
Ts = Structural Wall Thickness
Tc = Corrosion Liner
T (Total) = Tc + Ts

NOMINAL PIPE SIZE		LINER THICKNESS		HAND LAY UP						FILAMENT WOUND					
D		Tc		T (TOTAL)						T (TOTAL)					
				75 PSI		100 PSI		150 PSI		75 PSI		100 PSI		150 PSI	
IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
1/2	15	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
3/4	20	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
1	25	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
1-1/4	32	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
1-1/2	40	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
2	50	0.1	2.54	0.187	4.75	0.187	4.75	0.187	4.75						
2-1/2	65	0.1	2.54	0.187	4.75	0.187	4.75	0.25	6.35						
3	90	0.1	2.54	0.187	4.75	0.187	4.75	0.25	6.35						
4	100	0.1	2.54	0.187	4.75	0.25	6.35	0.25	6.35	0.19	4.83	0.19	4.83	0.19	4.83
5	125	0.1	2.54	0.25	6.35	0.25	6.35	0.375	9.53	0.19	4.83	0.19	4.83	0.19	4.83
6	150	0.1	2.54	0.25	6.35	0.25	6.35	0.375	9.53	0.19	4.83	0.19	4.83	0.19	4.83
8	200	0.1	2.54	0.25	6.35	0.313	7.95	0.438	11.13	0.19	4.83	0.24	6.1	0.28	7.11
10	250	0.1	2.54	0.313	7.95	0.375	9.53	0.5	12.7	0.24	6.1	0.24	6.1	0.28	7.11
12	315	0.1	2.54	0.375	9.53	0.438	11.13	0.625	15.88	0.24	6.1	0.28	7.11	0.33	8.38
14	355	0.1	2.54	0.375	9.53	0.5	12.7	0.75	19.05	0.24	6.1	0.28	7.11	0.37	9.4
16	400	0.1	2.54	0.438	11.13	0.563	14.3	0.813	20.65	0.28	7.11	0.28	7.11	0.42	10.67
18	450	0.1	2.54	0.5	12.7	0.625	15.88	0.938	23.83	0.28	7.11	0.33	8.38	0.46	11.68
20	500	0.1	2.54	0.5	12.7	0.688	17.48	1	25.4	0.28	7.11	0.33	8.38	0.46	11.68
24	600	0.1	2.54	0.625	15.88	0.813	20.65	1.25	31.75	0.33	8.38	0.42	10.67	0.55	13.97
26	650	0.1	2.54	0.688	17.48	0.875	22.22	1.313	33.35	0.33	8.38	0.42	10.67	0.6	15.24
28	700	0.1	2.54	0.75	19.05	0.938	23.83	1.438	36.51	0.37	9.4	0.46	11.68	0.64	16.25
30	755	0.1	2.54	0.75	19.05	1	25.4	1.5	38.1	0.42	10.67	0.46	11.68	0.64	16.25
32	810	0.1	2.54	0.813	20.65	1.063	27	1.625	41.27	0.42	10.67	0.5	12.7	0.68	17.27
34	860	0.1	2.54	0.875	22.22	1.125	28.58	1.75	44.45	0.42	10.67	0.5	12.7	0.73	18.54
36	910	0.1	2.54	0.938	23.83	1.25	31.75	1.813	46.05	0.46	11.68	0.55	13.97	0.78	19.81
38	960	0.1	2.54	1	25.4	1.313	33.35	1.937	49.2	0.46	11.68	0.55	13.97	0.78	19.81
42	1050	0.1	2.54	1.063	27	1.438	36.51	2.125	53.97	0.5	12.7	0.6	15.24	0.86	21.84

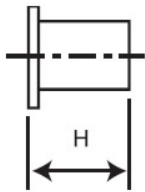
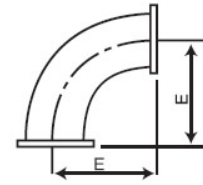
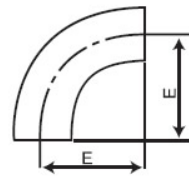
Fabco GR-KOR® FRP Piping Components



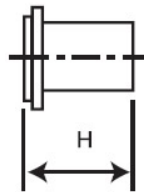
45° ELBOW



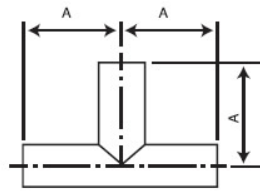
90° ELBOW



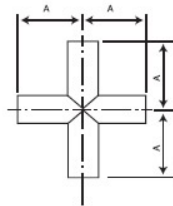
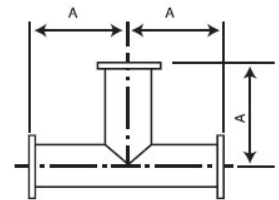
STUB FLG.



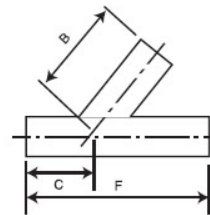
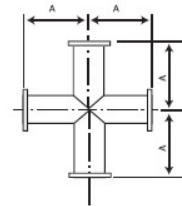
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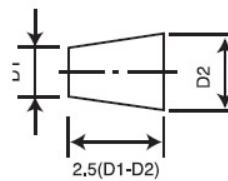
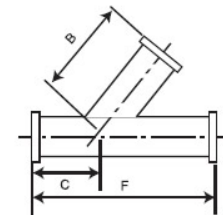
TEE



CROSS

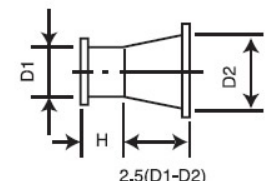


45° LATERAL

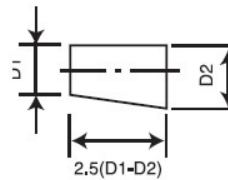


2.5(D1-D2)

CONCENTRIC REDUCERS

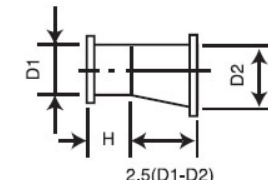


2.5(D1-D2)



2.5(D1-D2)

ECCENTRIC REDUCERS



2.5(D1-D2)

DIMENSIONS (INCHES)

D	A	B	C	E	F	G	H
1	3	8	6	1-3/4	14	3/4	6
1-1/2	4	10	6	2-1/2	16	1	6
2	6	10	6	4	16	1-5/8	6
3	7	12	6	6	18	2-1/2	6
4	8	14	6	6	20	2-1/2	6
6	10	16	8	9	24	3-3/4	8
8	12	20	10	12	30	5	8
10	14	24	10	15	34	6-1/4	10
12	16	26	12	18	33	7-1/2	10
14	18	30	12	21	42	8-3/4	12
16	20	32	14	24	46	10	12
18	21	36	14	27	50	11-1/4	12
20	22	38	16	30	54	12-1/2	12
24	24	42	18	36	60	15	12
26	26	46	18	39	64	16-1/4	15
28	28	48	20	42	68	17-1/2	15
30	30	52	20	45	72	18-5/8	15
32	31	54	20	48	76	20	15
34	32	58	22	51	80	21-1/4	15
36	33	62	22	54	84	22-1/2	15
38	34	64	22	57	88	23-1/4	15
42	36	72	24	63	96	26	15

STUB FLANGES

Adapted from American Standard for Stub Ends, B-16.9-1958

ELBOWS

Adapted from American Standard Steel Butt Weld Fittings B-16.9-1958. (Long Radius Elbows)

Exceptions are 2", & 3" Elbows where E=2XD

45° ELBOWS

1 1/2", 2", 3", 4" Sizes cannot be Flanged

* FLANGE DRILLING PATTERNS AVAILABLE

- ANSI B16.5 150 LBS.
- JIS 10K
- DIN 2051 PN10

Thermoplastic Lined FRP Piping

Armourplastics® Thermoplastic Lined FRP Piping

Fabricated Plastic's Armourplastics® are manufactured with machine made thermoplastic liners which are chemically/mechanically bonded to structural over wrap. Liner materials are carefully selected for each specific application.

Thermoplastic liner materials are machine made, offering a corrosion liner that is homogeneous, uniform in thickness and having proven mechanical properties. The thermoplastic liner when properly bonded to the FRP armoring creates a dual laminate that exhibits the best properties of both materials combined in the Armourplastic®.

ARMOURPLASTIC® CONSTRUCTION

Fabricated Plastics manufactures Armourplastics® pipe and fittings with a variety of liner and structural wall construction.

Inner Liner Surface – The liner most suitable for the chemical service is selected, Fabricated Plastics offers:

- GrayKor®- PVC-U (Unplasticized Polyvinyl Chloride)
- GrayKor®-L - PVC-U-L (Unplasticized low calcium Polyvinyl Chloride)
- GrayKor®-R - PVC-U (Unplasticized Polyvinyl Chloride)
- OrangeKor® - CPVC/PVC-C (Chlorinated Polyvinyl Chloride)
- BlueKor® - PP (Polypropylene)
- KemKor® - PVDF (Polyvinylidene-Fluoride)
- Haline® - ECTFE (Ethylene Chlorotrifluoroethylene)

as liner materials. Each liner is specifically treated chemically or mechanically prior to FRP armoring. Liner thickness is not taken into consideration for structural requirements of the Armourplastic® system.

Structural Layers – This layer is the primary structural portion of the laminate and is designed to withstand the loads caused by pressure, wind, seismic and other conditions. It consists of alternating layers of chopped strand and 24 ounce per square yard woven roving to the required thickness. The glass content in these layers will be 30-45% depending on the amount of woven roving used. This layer may also be composed of filament wound continuous strand fiberglass reinforcement, which is typically helically wound onto the mandrel and has a glass content of 55 – 70% by weight.

Outer Surface Layer – This surface is a resin coating formulated to be non-air inhibited and fully cured. When exposed to the environment, this coating contains ultraviolet absorbers or pigments to minimize ultraviolet degradation. If the outer surface of a laminate is to be exposed to a corrosive environment, a veil layer or a chopped strand layer may be added over the structural layer for exterior protection. The outer surface can be pigmented for colour designation if required.

MANUFACTURING METHODS

Fabricated Plastics offers two standard types of FRP laminate construction as over wrap for thermoplastic piping systems. Filament Wound, and Contact Molded (hand lay up).

Liner Preparation – The Thermoplastic liner undergoes various surface preparations dependent on the liner material.

- i) GrayKor® PVC, GrayKor®-L PVC-L, GrayKor®-R PVC and OrangeKor® CPVC liner is cleaned, abraded and a proprietary bonding resin is applied to achieve a chemical bond between the thermoplastic (PVC / CPVC) and the FRP.
- ii) BlueKor® Polypropylene liner is cleaned and a bonding cloth is mechanically embedded into the surface under controlled heat conditions. Proprietary bonding resin is applied to achieve a mechanical bond between the thermoplastic and the FRP.
- iii) KemKor® PVDF liner is chemically etched, cleaned and proprietary bonding resin is applied to achieve a chemical bond between the PVDF and the FRP.
- iv) Haline® ECTFE, Tefline®-P PFA, Tefline®-F FEP, Tefline®-M MFA, Tefline®-E ETFE liner is cleaned and a bonding cloth is mechanically embedded into the surface under controlled heat conditions. Proprietary bonding resin is applied to achieve a mechanical bond between the thermoplastic and FRP.



Filament Wound Construction – This process utilizes continuous glass strand roving that is pre-saturated in a resin bath and is then helically wound around a rotating mandrel at a specified winding angle. The winding process is continued in bi-directional layers until the desired wall thickness is achieved. Fabricated Plastics' pressure piping is made with a 54 3/4° winding angle, which provides the theoretical optimum 2 to 1 hoop to axial strength ratio required for pressure piping. Vacuum piping will normally be wound at greater winding angles, such as 65°, to increase the hoop strength.



Contact Molded Construction – This method of laminate construction uses multiple layers of fiberglass chopped strand, woven roving and non-woven glass fabrics saturated with resin and built up to the desired thickness. Each glass layer is layed on the mold and resin is applied. Hand pressure rolling saturates the glass and removes entrapped air to provide a strong dense laminate. Physical properties will vary with the amount of woven roving, unidirectional roving and /or fabric used.

Thermoplastic Lined FRP Piping

TYPICAL THERMOPLASTIC PROPERTIES

	BLUEKOR® PP		GRAYKOR® PVC-U	ORANGEKOR® CPVC PVC-U	KEMKOR® PVDF		HALINE® ECTFE
	HOMOPOLYMER	COPOLYMER (UNFILLED)			HOMOPOLYMER	COPOLYMER	
DENSITY G/CM ³	0.91	0.88-0.91	1.38	1.5	1.75-1.79	1.76-1.79	1.88
MECHANICAL PROPERTIES							
TENSILE BREAK STRENGTH, ASTM D638, MP _a (ksi)	31-41 (4.5-6.0)	27.6-38.0 (4.0-5.5)	41-52 (6.0-7.5)	47-62	31-48 (4.5-7.0)	24-41 (3.5-6.0)	46-54 (6.6-7.8)
TENSILE MODULUS, ASTM D638, MP _a (ksi)	1139-1553 (165-225)	897-1242 (130-180)	2415-4140 (350-600)	2353-3278 (341-475)	1380-5520 (200-800)		1656 (240)
ELONGATION, ASTM D638, %	100-600	200-500	40-80	4-100	12-600		200-300
YIELD STRENGTH, ASTM D638, MP _a (ksi)	31-37 (4.5-5.4)	20.7-29.7 (3.0-4.3)	41-45 (5.9-6.5)	41-55 (6-8)	20-57 (2.9-8.3)	20-38 (2.9-5.5)	31-34 (4.5-4.9)
THERMAL PROPERTIES							
HDT AT 0.46 MP _a , ASTM D648, °C	107-121	54-60	57	102-119	132-150	93-110	90
HDT AT 66 PSI, ASTM D648, °F	225-250	130-140	158	215-247	270-300	200-230	194
LINEAR COEFFICIENT OF EXPANSION, ASTM D696, PER °C (°F) X 10 ⁻⁵	14.6-18.0 (8.1-10)	12.2-17.1 (6.8-9.5)	5.0-10.0 (2.7-5.6)	11.2-14.0 (6.2-7.8)	12.6-25.6 (7.0-14.2)		14.4 (8)
THERMAL CONDUCTIVITY, ASTM C177, W/m-K	0.1	0.16	0.16-0.18	0.12	0.09-0.11	0.16	0.14
THERMAL CONDUCTIVITY, ASTM C177, BTU/FT ³ -HR °F/IN.	0.7	1.1	1.1-1.23	0.81	0.59-0.76	1.11	0.97

NOTE: PROPERTIES ARE AT ROOM TEMPERATURE UNLESS OTHERWISE STATED. PROPERTIES ARE TYPICAL VALUES AND ARE NOT TO BE USED FOR DESIGN PURPOSES.

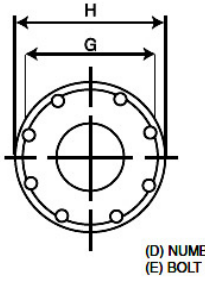
PIPE LINER MATERIALS AND SERVICE CONDITIONS

LINER MATERIAL DESIGN	ASTM MATERIAL SPECIFICATIONS	LINER COLOR	BACKING MATERIAL	INSTALLATION METHOD	LINER JOINING METHODS	MAXIMUM OPERATING TEMPERATURE
GreyKor® PVC-U PVC-L PVC-R	D 1784 Cell 12454, D 1593, D 1927, D 2241, and D 1785	Dark Grey Dark Grey Red	None	Chemical Bond	Solvent Cement or Butt Fusion	170°F (77°C)
OrangeKor® CPVC PVC-C	D 1784 Cell 23447B	Dark Grey Light Grey	None	Chemical Bond	Solvent Cement or Butt Fusion	210°F (99°C)
BlueKor® PP	D 4101 Group 1, Class 1, Grade 1 or Group 2, Class 1, Grade 1	Tan/Grey	Glass	Mechanical Bond	Butt Fusion	220°F (105°C)
KemKor® PVDF	D3222	Natural White	None/ Glass	Chemical/ Mechanical Bond	Butt Fusion	220°F (105°C)
Haline® ECTFE	D3275	Natural Beige	Glass	Mechanical Bond	Butt Fusion	250°F (128°C)

*OPERATING TEMPERATURE IS USUALLY DICTATED BY THE FRP RESIN'S MAXIMUM SERVICE.

Thermoplastic Lined FRP Piping

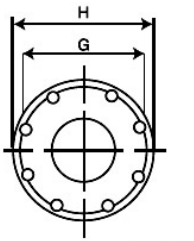
Fabco Armo • Ershigs' FRP duct can be provided with contact molded or filament wound construction.



FLANGE Contact Molded Duct

- Thicknesses shown include a 100 mil structural corrosion liner.
- Pressure ratings for contact molded duct are based on a 10 to 1 safety factor.

- Pressure ratings for filament wound duct are based on a strain of .001 in./in.
- Vacuum ratings are based on a 5 to 1 safety factor.
- Thicknesses shown are recommended minimum. Systems should be designed for actual operating conditions.



VANSTONE FL WITH C.S. BACK

- * FLANGE DRILLING
- ANSI B16.5 150
- JIS 10K
- DIN 2051 PN10

NOMINAL PIPE SIZE

	1/2	3/4	1
A	5	5	6
B	4	4	4
C	1	1	1
D	4	4	4
E	5/8	5/8	5/8
F	6	6	6
G	2	2	3
H	3	3	4
J	10	11	12
K	5	5	6
L	7	9	10
M	4	5	6

Dia	Thk	Wt	Vac	Press
4	.14	1.3	329	1744
6	.14	1.9	97	1162
8	.14	2.6	41	872
10	.14	3.2	21	697
12	.14	3.8	12	581
14	.14	4.5	7	498
16	.14	5.1	5	436
Stiffeners on 10 ft centers are placed on 18 in. dia and larger duct.				
18	.14	5.7	6	732
20	.14	6.4	5	658
24	.18	9.8	7	705
26	.18	10.7	7	651
28	.18	11.5	6	605
30	.18	12.3	5	564
36	.18	14.7	5	470
42	.22	21.0	6	493
48	.22	24.0	5	431
54	.22	27.0	4	383
60	.22	30.0	3	345

Dimensions are in inches.
Pressure and vacuum ratings are in inches water gauge.
Weights are in lb per ft and are based on a laminate density of .06 lb/in.³.

Filament Wound Duct

Dia	Thk	Wt	Vac	Press
4	.21	2.3	3394	49
6	.21	3.4	1005	32
8	.21	4.5	424	24
10	.21	5.7	217	19
12	.21	6.8	125	16
14	.21	7.9	79	14
16	.21	9.0	53	12
Stiffeners on 10 ft centers are placed on 18 in. dia and larger duct.				
18	.21	10.1	54	10
20	.21	11.2	46	9
24	.21	13.4	35	8
26	.21	14.5	31	7
28	.21	15.6	28	7
30	.21	16.7	25	6
36	.21	20.1	19	5
42	.26	29.0	26	5
48	.26	33.1	21	5
54	.26	37.2	18	4
60	.26	41.3	15	4

Dimensions are in inches.
Pressure and vacuum ratings are in inches water gauge.
Weights are in lb per ft and are based on a laminate density of .07 lb/in.³.



FRP Duct

FRP Pipe

- Ershings' FRP duct can be provided with contact molded or filament wound construction.
- Thicknesses shown include a 100 mil structural corrosion liner.
- Pressure ratings for contact molded duct are based on a 10 to 1 safety factor.
- Pressure ratings for filament wound duct are based on a strain of .001 in/in.
- Vacuum ratings are based on a 5 to 1 safety factor.
- Thicknesses shown are recommended minimums. Systems should be designed for actual operating conditions.

Contact Molded Duct

Dia	Thk	Wt	Vac	Press
4	.14	1.3	329	1744
6	.14	1.9	97	1162
8	.14	2.6	41	872
10	.14	3.2	21	697
12	.14	3.8	12	581
14	.14	4.5	7	498
16	.14	5.1	5	436
Stiffeners on 10 ft centers are placed on 18 in. dia and larger duct.				
18	.14	5.7	6	732
20	.14	6.4	5	658
24	.18	9.8	7	705
26	.18	10.7	7	651
28	.18	11.5	6	605
30	.18	12.3	5	564
36	.18	14.7	5	470
42	.22	21.0	6	493
48	.22	24.0	5	431
54	.22	27.0	4	383
60	.22	30.0	3	345

Dimensions are in inches.
 Pressure and vacuum ratings are in inches water gauge.
 Weights are in lb per ft and are based on a laminate density of .06 lb/in.³.

Filament Wound Duct

Dia	Thk	Wt	Vac	Press
4	.21	2.3	3394	4941
6	.21	3.4	1005	3294
8	.21	4.5	424	2470
10	.21	5.7	217	1976
12	.21	6.8	125	1647
14	.21	7.9	79	1411
16	.21	9.0	53	1235
Stiffeners on 10 ft centers are placed on 18 in. dia and larger duct.				
18	.21	10.1	54	1098
20	.21	11.2	46	988
24	.21	13.4	35	823
26	.21	14.5	31	760
28	.21	15.6	28	705
30	.21	16.7	25	658
36	.21	20.1	19	549
42	.26	29.0	26	582
48	.26	33.1	21	585
54	.26	37.2	18	453
60	.26	41.3	15	407

Dimensions are in inches.
 Pressure and vacuum ratings are in inches water gauge.
 Weights are in lb per ft and are based on a laminate density of .07 lb/in.³.



Belco Fiberglass Dampers

Belco Fiberglass Dampers are manufactured to meet the needs of the odor control and corrosive HVAC industries by providing a corrosion-resistant FRP Damper that is used to regulate a gas flow or shut off and isolate a system. The operating conditions for the dampers are designed to match the operating conditions of the duct system. Premium vinyl ester resins are used throughout the damper. Fire-retardant resins are also available for a Class 1 flame spread.

BELCO MANUFACTURING CO., INC. PROVIDES SEVEN DAMPER MODELS:

- Model 201: Used to control airflow for balancing a system. Model 201 is less expensive and has a shaft seal, but does not have a blade seal.
- Model 202: Used to control airflow for balancing a system. Model 202 has a shaft seal and full circumferential blade stop.
- Model 203: Used for isolating a system with low leakage. Model 203 has a shaft seal, blade seal, and a full circumferential blade stop. Designed for up to 30".
- Model 204: Used for isolating a system, and has a PTFE encapsulated O-ring to provide a factory-tested watertight seal. Each model 204 damper is tested watertight before shipping.

BELCO BACKDRAFT DAMPERS

Designed to prevent air from flowing back into the system when the fan is turned off. Backdraft Dampers are sometimes referred to as check valves.

- Model 301 & 302 (Vertical): Designed to open under air flow and close when air flow stops. Counterweight design for vertical run installation. Model 301 is for upward flow and Model 302 is for downward flow.
- Model 401 (Horizontal): Designed to close in the event of an interruption in air flow. Model 401 Backdraft dampers utilize a gravity operated counterweight to move the blade into a "closed" position when air flow stops. Model 401 Backdraft dampers have shaft seals but no blade seal.

DAMPER NAMES

Dampers are often referred to by many different industry names. The chart below may be used as a guide to determine the BELCO Damper model(s) you require.

INDUSTRY NAME	BELCO MODEL EQUIVALENT
Check Valves	301, 302, 401
Control Dampers	201, 202
Volume Dampers	201, 202
Butterfly Dampers	201, 202, 203, 204
Shut-off Valves	203, 204
Isolation Valves	203, 204
Watertight Dampers	204 - Watertight

Certified Ratings Authorized by AMCA

BELCO Manufacturing Company, Inc. certifies that the Standard Model 203 & 204 Dampers shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air leakage and air performance ratings only.

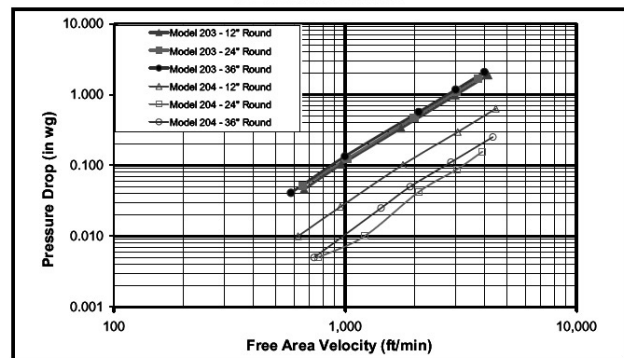
- 1.) Test method per AMCA Standard 500-89
- 2.) Torque: 1049 in-lbs for 48" damper. 67.35 in-lbs for 6" damper
- 3.) Air leakage is based on operation between 50°F & 104°F

MODEL 203 ROUND DAMPERS		MODEL 204 ROUND DAMPERS	
DAMPER DIAMETER	6" - 48"	DAMPER DIAMETER	10" - 60"
AMCA LEAKAGE CLASS		AMCA LEAKAGE CLASS	
CLASS 1A 1" wg	CLASS 1 4"wg, 8"wg, 12"wg	CLASS 1A 1" wg	CLASS 1 4"wg, 8"wg, 12"wg

PRESSURE CLASS	LEAKAGE, L/s/m ² (ft ³ /min/ft ²)			
	REQUIRED RATING		EXTENDED RANGE (OPTIONAL)	
	0.25 kPa (1" wg)	1.0 kPa (4" wg)	2.0 kPa (8" wg)	3.0 kPa (12" wg)
1A	15.2 (3)	N/A	N/A	N/A
1	20.3 (4)	40.6 (8)	55.9 (11)	71.1 (14)
2	50.8 (10)	102 (20)	142 (28)	178 (35)
3	203 (40)	406 (80)	569 (112)	711 (140)

Contact BELCO Manufacturing Company, Inc. for tested leakage rates.

AIR PERFORMANCE FOR BELCO MODEL 203 & 204 DAMPERS FULL OPEN POSITION



Summary of testing as of 06-29-10.xls.

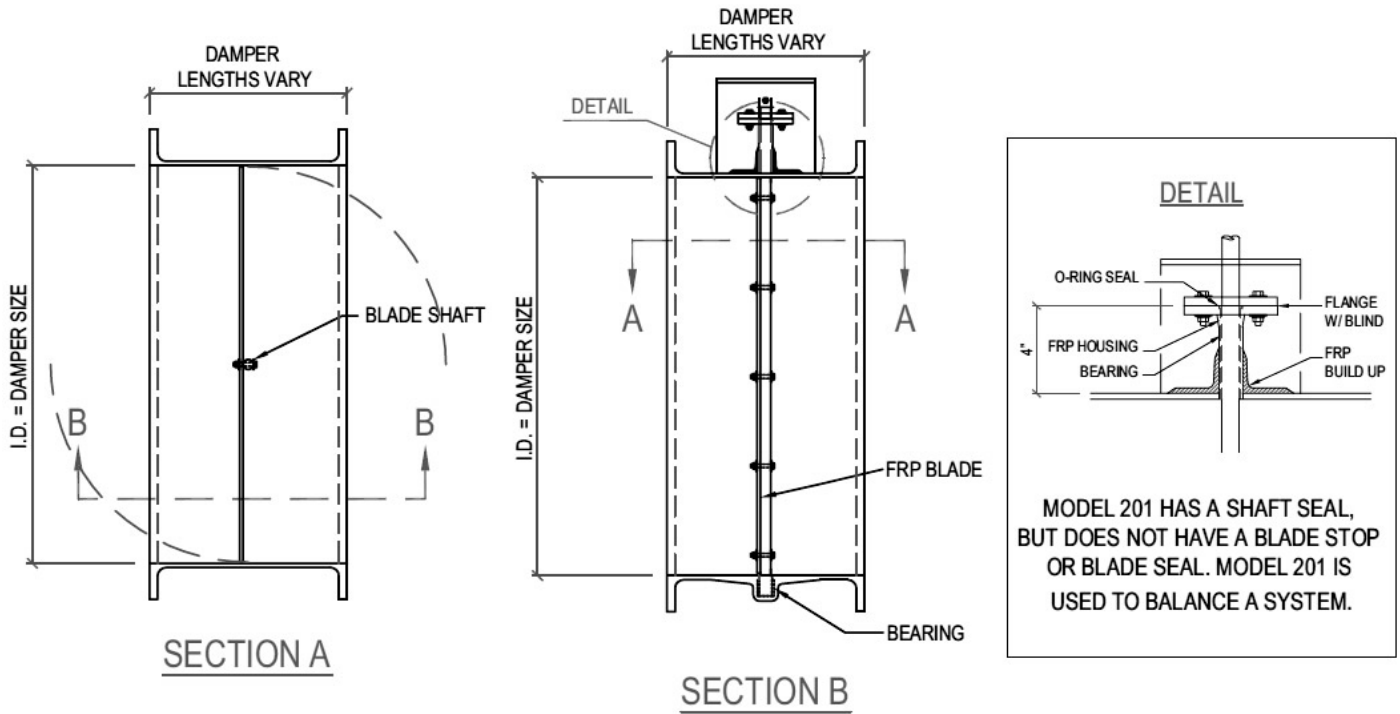
WARRANTY

BELCO Fiberglass Dampers are warranted for eighteen (18) months from the date of shipment to be free from defects in manufacturing, materials, or workmanship. Liability shall not exceed the purchase price of the damper and, at BELCO's option, is limited to repair or replacement. BELCO Manufacturing Co., Inc. shall not be liable for any costs incurred either directly or indirectly other than repair or replacement of the product.

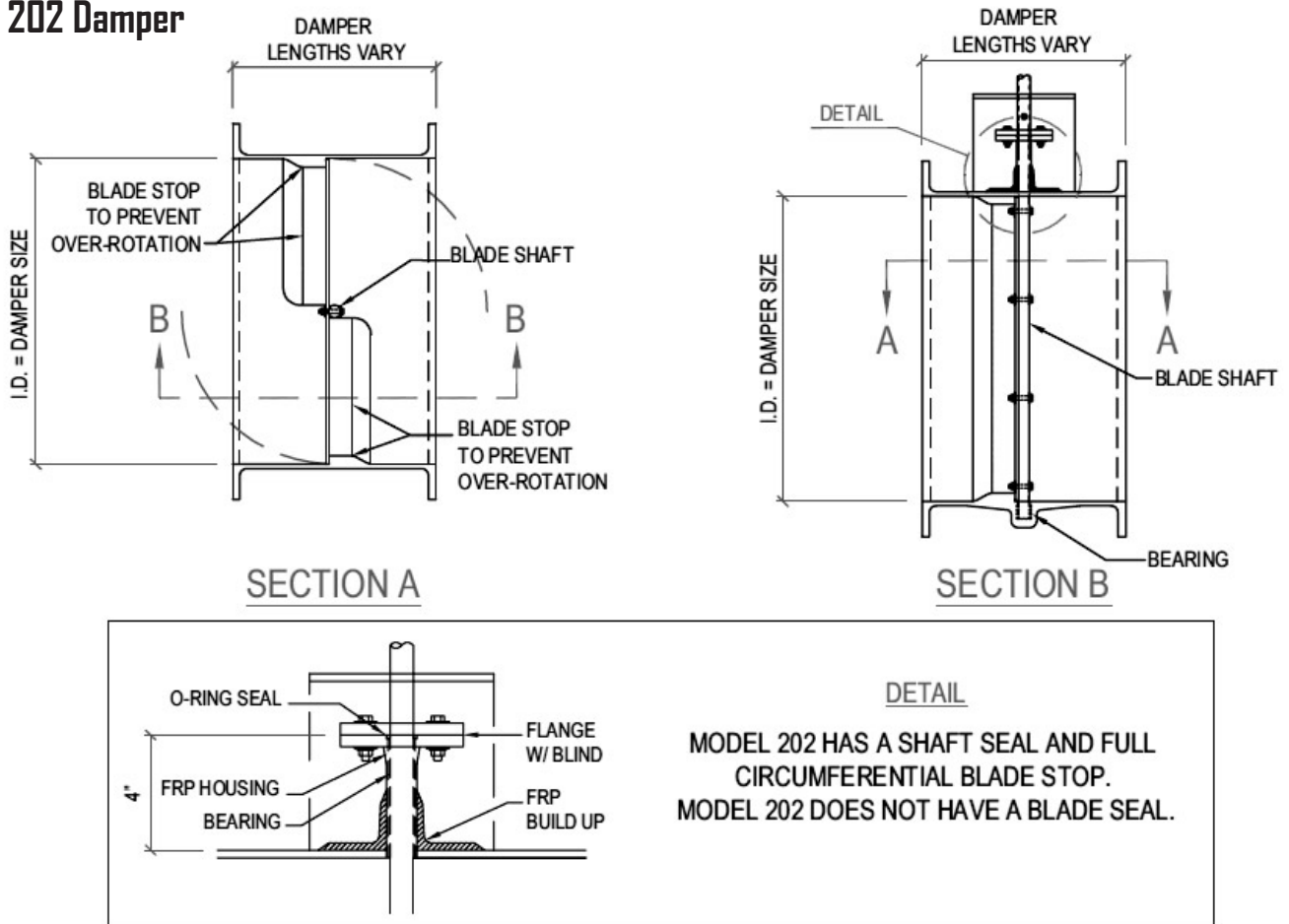


Fiberglass Dampers

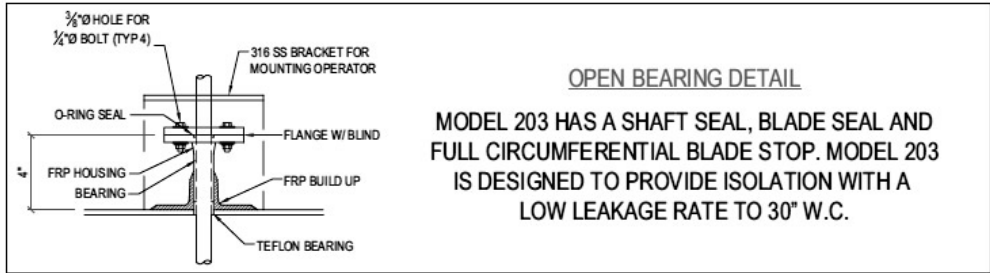
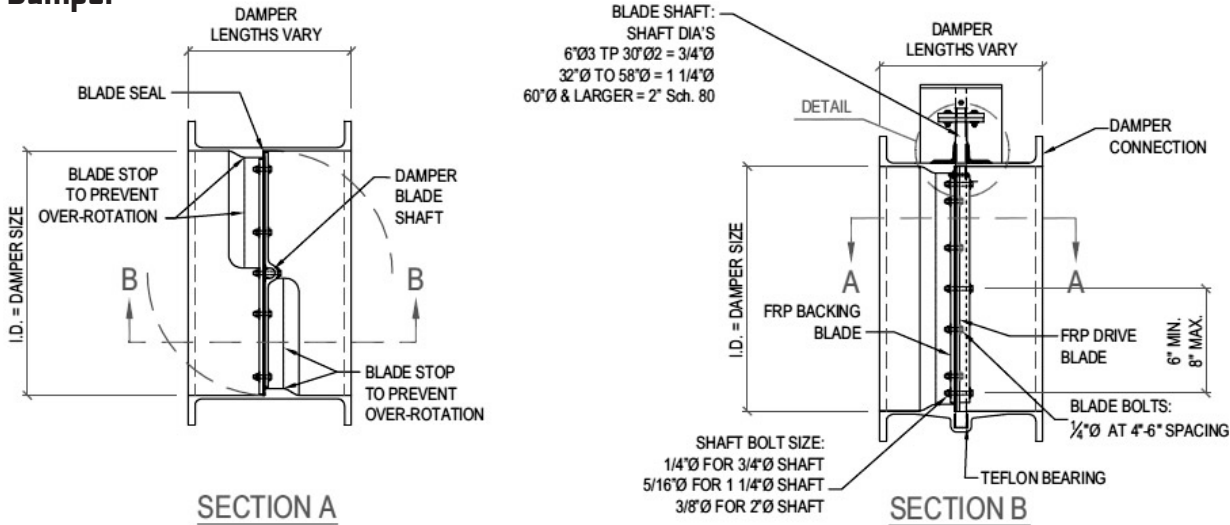
Model 201 Damper



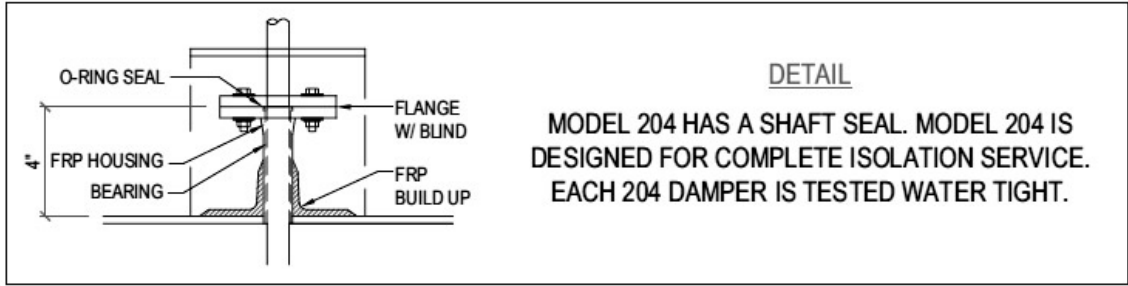
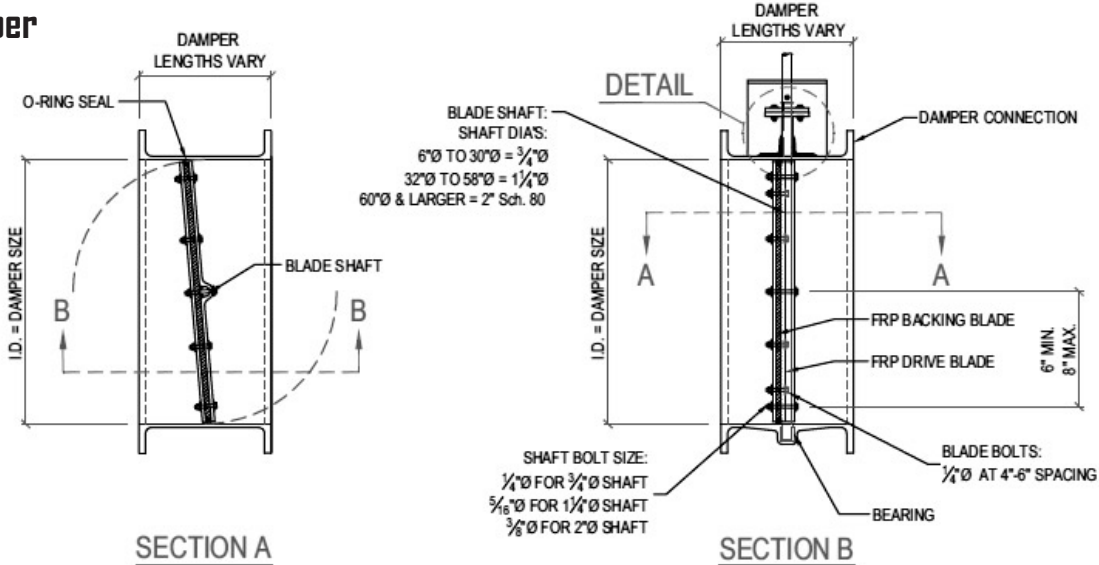
Model 202 Damper



Model 203 Damper



Model 204 Damper



FRP - FIBER REINFORCED PLASTIC & GRATING



Tanks and Vessels

FRP Tanks and Vessels

*Tanks
and
Vessels
for all
Applications
and
Budgets*

No Vessel Too Large:

Process and store large volumes of corrosive liquids in field-fabricated structures which are 120 feet in diameter or more. Or select from standard shop manufactured tank and vessel diameters up to 20 feet in diameter. Proprietary construction methods result in super strong, super durable monolithic shells, free of vertical seams; and they eliminate sidewall deformation during lifting and setting. Double-wall and double-bottom configurations furnish secondary containment and simplified leak detection.

On-Site Fabrication and Construction:

Our proven on-site processes are unmatched by anyone, anywhere. Tanks and vessels can be fabricated either in place or at a specially created manufacturing base nearby. On-site fabrication – available for even the largest structures – slashes transportation costs and installation time, and can be smoothly coordinated with the efforts of other site contractors.



No Vessel Too Small:

We manufacture hand lay-up, chop hoop, and helically wound vessels in diameters ranging from 12 inches to 20 feet for corrosive-service tanks. These high quality FRP structures are highly resistant to a variety of chemicals, corrosive environments, and ultra violet light.

Our broad experience meeting critical fluid system requirements encompasses pressure and vacuum applications; seismic loading; polyester, vinyl ester, C-veil, and nexus systems; and vertical, horizontal, flat-bottom, dish-bottom, and cone-bottom configurations.

Our Armourplastic (thermoplastic lined FRP) products incorporate thermoplastic materials such as PVC, CPVC, PP, PE, PVDF, ECTFE, ETFE, FEP & PFA with proven design, forming and welding techniques to provide superior systems which exceed the limitations of unlined FRP.

Our plants are qualified to meet the industry's most stringent quality standard (ASME RTP-1) for storage tanks and vessels.



Section 11: Tools

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Fabco CNC Machine ready to ship!

The automated CNC process precision cuts components to regular and irregular shapes that can then be used by themselves, or made part of more complex assemblies. CNC routing provides an economical solution for rapid turnaround of long and short runs of products fabricated from sheet plastic. Our machinists efficiently produce precision components from large stock and effectively respond to customer needs for high volume through-put.

COMMON MACHINED PLASTIC MATERIALS INCLUDE:

HDPE
PVC
CPVC
Acrylic
Polycarbonate
Polypropylene
UHMW

APPLICATIONS:

Signs
Letters
Aerospace
Medical
Oil & gas

Our in house drawing department can assist you creating one piece or several thousand.



REED Quick Release Pipe Cutter

Features:

- Quick Release™ is a Reed invention and still the industry standard.
- Features include quick release, quick advance, and manual advance along with the ball detent wheel pin.
- Simple cutter wheel change permits use on a wide variety of pipe/tubing types.



PART NUMBER	CAPACITY (ACTUAL O.D.)		CUTTER WHEEL	APPLICATION	LENGTH		WEIGHT	
	IN	MM			IN	MM	LBS	KG
TC3Q2558	3/8 - 3 1/2	10 - 90	R2558	Muffler Systems Tubing	11	279	2.5	1.1
TC6Q2558	4 - 6 5/8	102 - 168	R2558	Muffler Systems Tubing	15	381	3.9	1.8

REED Deburring Tool

1/4" - 4" Pipe



Part Number: DEB4

Features

- Suitable for PVC, CPVC, ABS and PP.
- Provides external chamfer/bevel on plastic pipe.
- Deburr and chamfer in the same rotation using DEB4.

Specifications

- Pipe Capacity nom.: 1-1/4", 1-1/2", 2", 2-1/2", 3", 4" nom.
- 42, 50, 63, 75, 90, 114 mm O.D. actual
- 3/32" 15° chamfer
- Application: PVC, CPVC, ABS, PP
- Weight: 0.7 lbs, 0.32 kg

1/2", 3/4" & 1" Pipe



Part Number: DEB1IPS

Features

- DEB1 offers knurled grip for slip-resistance and durable aluminum body for longevity.
- Deburr and chamfer in the same rotation.
- Suitable for PVC, CPVC, PE, ABS and PP.
- Three sizes of pipe accommodated per DEB1 tool.

Specifications:

- Pipe Capacity Nominal: 1/2", 3/4", 1" O.D.
- Application: PVC, CPVC, PE, ABS, PP
- Pipe Tubing: IPS
- Weight: 0.4lbs or 0.2kg

REED Cordless Power Beveler Kit



Features

- Deburrs, chamfers and bevels plastic pipe.
- Adjustable to create 0" to 5/8" long, 15° external bevel on pipes 2" diameter and larger.
- Carbide router bit with 4-flute design cuts smooth.
- Works exclusively with the Bosch® 18V cordless die grinder (included in kit).
- Additional Option: Replacement Carbide Router Bit RBIT1

Specifications:

- Description: Kit with CPB Beveler Attachment, Router Bit, Bosch® Die Grinder, Battery & Charger, 120 V, 60 Hz
- Bevel Length: RBIT1: Adjustable 1/8" - 5/8" (Add RBIT2 for bevel length of 7/16" - 1")
- Capacity: in-nom.: 2"-24" mm: 50
- Gross Weight: 11.9lbs or 5.4kg

Part Number: CPBKIT

Plastic Pipe Tools

Reed Plastic Pipe Tools

SOLUTIONS KITS



- 04155 TC3-636SK TC3QPVC, DEB4, & IC1SL
- 04156 TC4-636SK TC4QPVC, DEB4, & IC1SL
- 04157 TC2-PPSK TC2QPVC, DEB4 & DEB1IPS
- 04151 TC3-PPSK TC3QPVC, DEB4 & DEB1IPS
- 04162 TC-AQRSK TC2QPVC, TC4QPVC, DEB4 & DEB1IPS

DEBURRING TOOLS, MANUAL



- 04650 DEB1IPS IPS 1/2", 3/4", 1" nom.
- 04652 DEB1CTS CTS 1/2", 3/4", 1" nom.
- 04430 DEB4 1-1/4", 1-1/2", 2", 2-1/2", 3", 4" nom.
- 04654 DEB1-2IPS IPS 1-1/4", 1-1/2", 2" nom.
- 04656 DEB1-2CTS CTS 1-1/4", 1-1/2", 2" nom.

DEBURRING TOOLS, DRILL-POWERED



- 04651 PDEB1IPS IPS 1/2", 3/4", 1" nom.
- 04657 PDEB1-2IPS IPS 1-1/4", 1-1/2", 2" nom.
- Suitable for PVC, CPVC, PE, ABS and PP. Deburr and chamfer in the same rotation.

TRIPODS FOR PLASTIC PIPE



- 04456 R450PAL Tripod with Aluminum Legs for lighter weight jobs
- 04457 R450P Tripod with Dual-sided Rubber-Coated and Regular Jaws
- 99077 450PJ Pair of Dual-sided Replacement Rubber-Coated/Regular Jaws

CLEAN REAM EXTREME™ PLASTIC PIPE FITTING REAMERS



- 04521 PPR75 Reams 3/4"
 - 04522 PPR100 Reams 1"
 - 04524 PPR150 Reams 1-1/2"
 - 04525 PPR200 Reams 2"
 - 04526 PPR300 Reams 3"
 - 04527 PPR400 Reams 4"
- + Kits Available

CLEAN REAM EXTREME™ PLASTIC PIPE FITTING REAMERS



- 04517 CRP150 Reams 1-1/2"
- 04518 CRP200 Reams 2"

Clean Ream tools work for Sch. 40 PVC, CPVC and ABS Fittings.

CUTTER WHEELS FOR PVC



- 04184 1-2PVC Wheel for PVC, CPVC, PVDF
 - 64184 2PK-1-2PVC 2-PACK 1-2PVC Cutter Wheels
 - 04194 3-6PVC Wheel for 3" - 6" PVC; 4" Heavy Wall, CPVC
 - 64194 2PK-3-6PVC 2-PACK 3-6PVC Cutter Wheels
 - 04192 680PVC Wheel for Schedule 80 PVC, CPVC
- Reed also has wheels for PE, PEX, PP, ABS, CPVC, thick wall PE, and copper, aluminum, brass, and steel tubing.

CHAMFER TOOLS, DRILL-POWERED



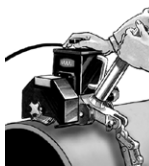
- 04660 PBKIT Kit with 2", 3" & 4" chamfer tool with case
- 04662 PB2 for 2" plastic pipe
- 04663 PB3 for 3" plastic pipe
- 04664 PB4 for 4" plastic pipe

INTERNAL PIPE CUTTER



- 04505 IC1SL Cuts 1-1/4" minimum I.D. using saw-toothed blade

UNIVERSAL PIPE CUTTER FOR PVC



- 07513 UPC616AP Pipe Diameter 6"-16" nom. PVC Sch. 40, C900/C905, CPVC
- Pneumatic powered and blades sold separately.

RATCHET & SCISSOR SHEARS



- 04175 RS1PLT Ratchet Shears with Plated Blade, 1-1/4" nom. IPS
- 04176 RS1 Ratchet Shears, 1-1/4" nom. IPS
- 04177 RS2 Ratchet Shears, 2" nom. IPS
- 04182 RS7290 Ratchet Shears, one-hand style, 2-3/8" for PE
- 04276 RSP1 Ratchet Shears with Pointed Blade, 1-1/4" nom. IPS
- 04277 RSP2 Ratchet Shears with Pointed Blade, 2" nom. IPS
- 04174 SC1 Scissor Shears, 1"
- 04178 SC125 Scissor Shears, 1-1/4"

PLASTIC PIPE SAWS



- 04510 PPS18 18" long, 4" nom. pipe capacity
- 04512 PPS12 12" long, 3" nom. pipe capacity
- 04720 PPS20 20" long, 6" nom. pipe capacity
- 04724 PPS24 24" long, 8" nom. pipe capacity
- Replacement blades are available for each saw.

LARGE DIAMETER PLASTIC PIPE BEVEL TOOLS



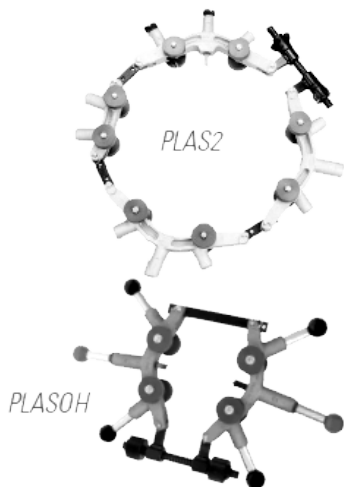
- 04395 BT1 Beveler, 1-1/2" - 8"
- 04398 BT2 Beveler, 1-1/2" - 12"

SHUT-OFF TOOLS



- 04300 PES01 PE Water Service Shut-Off Tool, 3/4"- 1" lines
- 04281 SSO1C PE Shut-off Tool, 30" Handles with Cast Jaws, 3/4"- 1" lines

PLAS IN-LINE ROTARY™ CUTTERS FOR LARGE DIAMETER PLASTIC PIPE

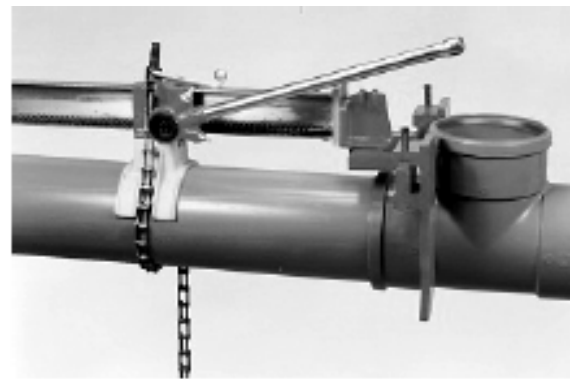


- 04470 PLAS1 Pipe Cutter for 6" - 12" PVC
- 04474 PLAS1PE Pipe Cutter for 6" - 12" PE
- 04475 PLAS2 Pipe Cutter for 14" - 18" PVC
- 04477 PLAS2PE Pipe Cutter for 14" - 18" PE
- 04480 PLAS3 Pipe Cutter for 14" - 24" PVC
- 04483 PLAS3PE Pipe Cutter for 14" - 24" PE
- 04485 PLAS4 Pipe Cutter for 14" - 28" PVC
- 04487 PLAS4PE Pipe Cutter for 14" - 28" PE

HAND-OVER-HAND MODELS

- 04463 PLASOH Pipe Cutter for 4" - 8" PVC, Built-in Handles
- 04464 PLASOHPE Pipe Cutter for 4" - 8" PE, Built-in Handles
- 04468 PLASOH12PE Pipe Cutter for 4" - 12" PE, Built-in Handles
- 04469 PLASOH12 Pipe Cutter for 4" - 12" PVC, Built-in Handles

PLASTIC PIPE JOINERS



- 04446 PPJ Pipe Joiner
- 04441 PPJVS Universal Saddles Only, Pair, 4" - 16"
- 04439 PPJFA Fitting Attachment + Saddles for Plastic Pipe Joiners
- 04442 PPJ4S 4.500" Actual, Pair
- 04444 PPJ6S 6.625" Actual, Pair
- 04447 PPJ8S 8.625" Actual, Pair
- 04448 PPJ10S 10.750" Actual, Pair
- 04449 PPJ12S 12.750" Actual, Pair

PE PIPE PEELERS



- 04631 PEPEEL6 Preps PE for electrofusion, 1-1/2" - 6" capacity
- 04632 PEPEEL12 6" - 12" capacity

Plastic Pipe Tools

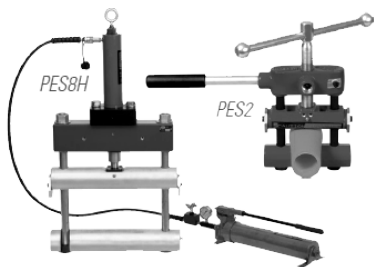
CORDLESS POWER PIPE BEVELER



- 04640 CPBKIT
Creates 15° external bevel, up to 5/8" long

Kit with CPB Beveler Attachment, Router Bit, Bosch® Die Grinder, Battery & Charger

PE SQUEEZE-OFF TOOLS



- 04290 PES1IPS/CTS
1/2" - 1" IPS/CTS
- 04302 PES2IPS
1/2" - 2" IPS
- 04304 PES2CTS
1/2" - 2" CTS
- 04306 PES4 2" - 4"
- 04313 PES6M 3" - 6", Manual
- 04308 PES8M 3" - 8", Manual

- 04309 PES8H 3" - 8", Hydraulic
- 04322 PES2-2IPS 1/2" - 2" CTS, Double-Bar Squeeze Points
- 04324 PES2-2CTS 1/2" - 2" IPS, Double-Bar Squeeze Points
- PES2, PES4, PES6, and PES8 also work for metric pipe, with the proper stops.

GUILLOTINE CUTTERS



- 04604 HPC4 2" - 4" capacity
 - 04608 HPC8 3" - 8" capacity
 - 04612 HPC12 4" - 12" capacity
- + Static Grounding Accessory and Discharge Alarms Available

PE FLARE TOOLS



- 04200 SFPE3/4
Flares 3/4" CTS Tubing
- 04202 SFPE1
Flares 1" CTS Tubing

DRILLING MACHINES

DMPVC COMPLETE



- 04402 DMPVC PVC Drilling Machine for 3/4" & 1" with Corp Adapters & Box Only
- 04404 DMPVCCOMPLETE DMPVCBASE, Corp Adapters & PVC Shell Cutters for 3/4" & 1" in a plastic case
- 09168 FTP2000UNIV Feed Tap™ Complete Kit for 3/4"- 2"

PEX CRIMPERS



- 04900 PXCR12S 1/2" capacity with 8-3/4" handle
- 04903 PXCR34S 3/4" capacity with 9" handle
- 04904 PXCR1M 1" capacity with 11-1/2" handle
- 04910 PXCR1234M 1/2" - 3/4" capacity with 11-1/2" handle
- 04920 PEXOH12 1/2" capacity, one hand style
- 04925 PEXOH34 3/4" capacity, one hand style

Reed Water Works Tools

UNIVERSAL PIPE CUTTER



Cut 6" - 48" nominal diameter (150-1300 mm actual O.D.) ductile iron, cast iron, clay, concrete, steel, PVC, or PE pipe.



UNDERGROUND WRENCHES



Dual Socket Ratchet Wrenches

- L2017 #02251 1 1/4" & 1 1/16"
- LHM2275 #02225 Hymax™ 3/4" + 7/8" - 19mm + 22mm



Deep Well Impact Sockets

- EDS17 #02626 1 1/16"
 - EDS18 #02628 1 1/8"
 - EDS20 #02630 1 1/4"
- Each heavy-duty socket features 1/2" drive and is 6" long.



Ratchet Wrenches & Sockets

- L515 #02285 Socket Set with Handle, 3/4" - 1 1/4" Corp Sockets
- L564 #02263 Adjustable Quick Release Handle
- L20 #02271 1 1/4" Socket



Pipe Wrenches

Pipe Capacity

- RW10 #02130 1 1/2"
- RW12 #02140 2"
- RW14 #02150 2"
- RW18 #02160 2 1/2"



Aluminum Pipe Wrenches

- ARW10 #02093 1 1/2"
- ARW14 #02095 2"
- ARW18 #02097 2 1/2"
- ARW24 #02099 3"



90° Aluminum Pipe Wrenches

- ARWO14 #02202 2", offset handle



One Hand Meter Wrenches

- MW3/4 #02289 3/4" fittings, 1" pipe
- MW11/4 #02281 1 1/4" fittings, 1 1/2" pipe



Hydrant Wrenches

- HW #02295 Forged Steel
- HWB #02283 Cast Ductile

Corp Stop Wrench

- RSPUD #02112 2 5/8" maximum actual opening

TOOLS FOR COPPER



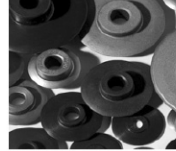
Tubing Cutters

- T15 #03485 3/16" - 1 1/4"
- T20 #03487 5/8" - 2 1/8"



Quick Release™ Tubing Cutter

- TC2Q #03420 1/4" - 2 5/8"



Cutter Wheel for Copper

- O #03660 12/pack Fits Reed T10, T15, T20, TC1Q, TC1.6Q, TC2Q, MC3

Also fits RIDGID® 10, 15, 20 Tubing Cutters



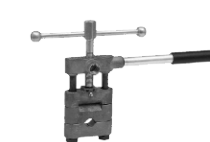
Hammer Flares

- HF3/4 #06071 3/4"
- HF1 #06072 1"



Brass Hammer

- HAM3 #06088 3 lbs.



Rerounders for Copper

- RCR3/4 #08226 3/4"
- RCR1 #08227 1"
- CSR2 #08220 1 1/2" & 2"



Copper Shut-Off Tool

- CSO1 #08200 3/4" & 1"

PVC AND PE PIPE TOOLS



Scissor Shears

- SC1 #04174 Scissor Shears, 1" capacity



Ratchet Shears

- RS1 #04176 1" cap. Ratchet Shears
- RS1B #94175 Replacement Blade for RS1



Plastic Pipe Saws

- PPS18 #04510 18" saw
 - PPS18B #94510 Blade for PPS18
 - PPS20 #04720 20" saw
 - PPS20B #94720 Blade for PPS20
 - PPS24 #04724 24" saw
 - PPS24B #94724 Blade for PPS24
- Larger Tools for PE and PVC are available



Strap Wrench

- SW18A #02249 5" Pipe, 6" Tube capacity



PE Water Service Shut-Off Tool

- PESO1 #04300 3/4" - 1" Shut-Off Tool



Standing Shut-Off Tool

- SSO1C #04281 3/4" - 1" Shut-Off Tool

Water Works Tools

CUTTERS FOR DUCTILE IRON, CAST IRON



Low Clearance Rotary™ Cutters

- LCRC4I #03306 2" - 4" Ductile/ Cast Iron
- LCRC8I #03308 6" - 8" Ductile/ Cast Iron
- RCI8-30 #03535 Cutter Wheel for LCRC8I

Other Sizes Available.

HINGED CUTTERS



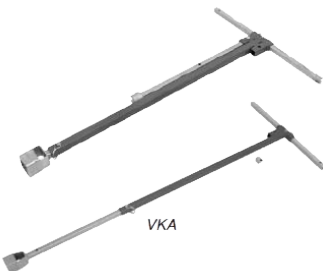
- H4S #03120 2" - 4" Cutter for Steel pipe
- H6S #03130 4" - 6" Cutter for Steel pipe

OTHER WATERWORKS TOOLS



Manhole Hooks

- MH26 #02301 26"
- MH30 #02302 90°, 30"
- MH36 #02303 36"



Valve & Curb Keys

- VK3CK1WHL #02353 Main Valve Key + 1" Curb Key + valve wheel 2 prong tool
- VKA #02340 Adjustable Valve Key for 2" Square Nut on Mains

Check with REED for the style you need, along with a complete list of options.

TAPPING MACHINES



- TM1100 Direct Tapping Machine
- TM1100 #09300 3/4" - 1"

ACCESSORIES - DIRECT TAPPING



Combination Drill Taps

- DT75 #04390 3/4" CC
- DT100 #04391 1" CC



Tapping Saddles

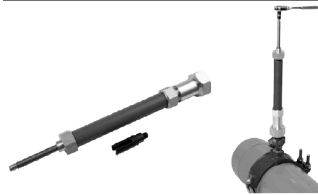
- TS6 #98439 6"
- TS8 #98440 8"

Other Sizes Available.

Tapping Compound

- TMTC #98425 16 oz.
- TMTC8 #99139 8 oz.

PVC DRILLING MACHINES



PVC Drilling Machine

- DMPVC3/4 #04418 3/4" w/cutter
- DMPVC1 #04420 1" w/cutter

DRILLING MACHINES FOR SADDLE TAPS



- DM1100 #09302 3/4' - 1" CC
- DM2100 #09312 3/4" - 2" CC
- DM2100CCNPT #09318 3/4" + 1"CC 1 1/2" + 2"NPT

Machines available to fit your applications and threads.

ACCESSORIES - DRILLING MACHINES



Drills for Ductile/Cast Iron

- D688 #04380 3/4"
- D938 #04382 1"



Heavy Duty Carbide Hole Saws for Ductile/Cast Iron

- HDHS1438 #04354 1 1/2" NPT & AWWA
- HDHS1875 #04356 2" AWWA



PVC Shell Cutters

- PL688 #04385 3/4"
- PL875 #04386 1"
- PL1438 #04387 1 1/2"
- PL1750 #04392 2"

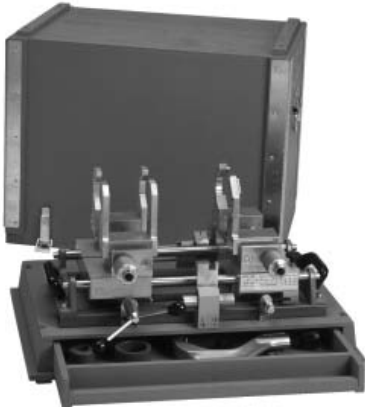
Ask REED for special tapping equipment needs.

Hand Held 1/2" to 4" Fusion Tool

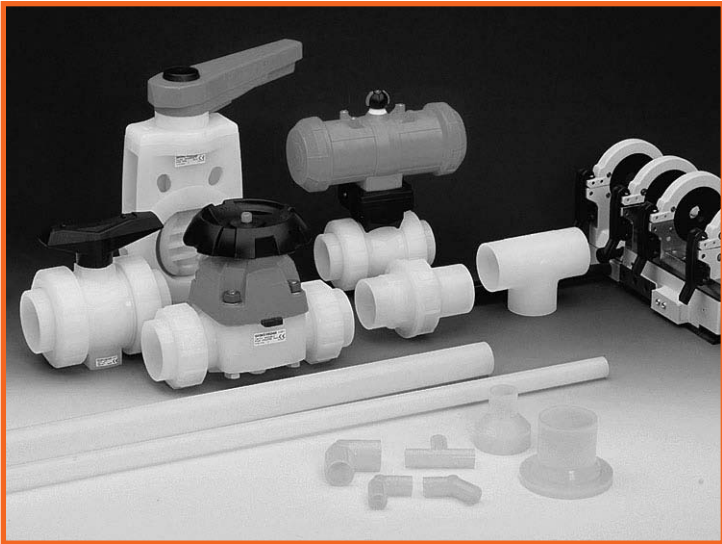


Each kit contains all of the components required for joining all sizes of socket fusion connections specified for that kit, including heating tool, male and female heat face sets with bolts, depth gauges, cold ring pipe clamp with inserts, pipe cutter, beveling tool, timer, thermal blanket, auxiliary handle, hex key wrenches, thermostat adjustment tool, joining instructions and rugged heavy duty tool box. Model C168860 is for pipe sizes 1/2"-2" and C169060 is for pipe size 3" to 4". Both models are 110 volts, single phase.

Model 75 1/2" - 2" Fusion Tool



The Model 75 Socket Fusion Tool is designed to join Polypropylene and PVDF (Kynar®) pipe, valves and fittings in 1/2" - 2" sizes. Two clamps hold the pipe and one clamp, with an insertion stop, holds the corresponding fitting or valve in the precise position for socket fusion. The basic machine comes in a steel carrying case with the heating tool, wrench, fixtures, clamping unit and joining instructions. The Socket Heat Face Sets are ordered separately. This tool weighs less than 75 lbs and is 110 volts, single phase, and 630 Watts. Model 3500 is available for pipe sizes from 1/2" to 4" and Model 3600 is available for pipe sizes from 4" to 6".



Molded of PE 100/4710/3408 Black

+GF+ Electro Plus® Fusion Machine



The Electro Plus® fusion machine can be used to join the following piping systems:

Fuseal 1½-12", Fuseal Squared 1½-12", Fuseal 25/50 1½-6" and PPro-Seal ½-3".

This complete machine includes:

Fusion Power Unit, Hand Held Unit and the Cable Assembly.

DESCRIPTION	PART NUMBER
Electro Plus	15000001

Advantages

- Intuitive user interface
- Multiple joint capability for speedy installations
- Integral carrying case for ease of transportation
- One-button repeat fusion cycle for same size joints
- Self-diagnostic error detection system
- Automatic compensation for ambient temperature

Technical Data

- Operating Temperature: 14°F(-10°C) to 113°F(45°C)
- Input Voltage: 100-130 V AC / 200-250 V AC
- Input Frequency: 50Hz - 60 Hz
- Output Voltage: 0 - 28.5 V AC
- Output Current: 0-50 Amps
- Power Consumption: 1200 Watts max.
- Power Cable Length: 5ft. (1.5m)
- Fusion Cable Length: 18ft. (5.5m)
- Remote Cable Length: 20ft. (6m)
- Dimensions (WxHxD): 22x14x10 inch
- Weight: 45lbs (20.5kg)



Laramy 30-10 Basic High Speed Torch



The basic Model 30-10 torch is a rugged, high-quality production tool. A lightweight, compact design makes the Model 30-10 easy on the operator and convenient for tight work areas. It is equipped with 12' of vinyl hose, regulator, gauge, torch rest, Laramy combination tip and your choice of 'Located Heat' element. Specify 250, 350, 450, or 550 watt element with order. The Model 30-10 is shipped in a plastic carrying case and includes a copy of Laramy's exclusive 56-page manual "Making Even Better Plastic Welds". Additional elements and accessories can be added at any time.

Laramy 30-102 Fabricating Torch



The Model 30-102 is the welding outfit for production and general shop use. The leading choice of fabricators, the Model 30-102 includes the basic torch, a new portable welding stand with combination regulator and filter, gauge, thermometer, Laramy combination tip and your choice of two 'Located Heat' elements. Specify 250, 350, 450 or 550 watt elements with order. The Model 30-102 is shipped in a plastic carrying case and includes a copy of Laramy's exclusive 56-page manual "Making Even Better Plastic Welds". Additional elements and accessories can be added at any time.

Laramy 30-200 Torch and Compressor



The Model 30-200 is the industry's first complete, production welding outfit with its own built-in air compressor. All you need is electrical power. The Model 30-200's built-in compressor is constructed of the highest quality components throughout for top performance and trouble-free operation with ample air supply for speed welding. The high quality, continuous duty, oil-less rotary compressor provides 2 1/2 cfm at 3 psi and comes equipped with factory wired ON-OFF switches for compressor and torch, interlocked to prevent operation of welder without compressor. The Model 30-200 includes the basic torch, intake filter/muffler, Laramy combination tip and your choice of two 'Located Heat' elements. Specify 250, 350, 450 or 550 watt elements with order. The Model 30-200 is shipped in a rugged metal tool case with vibration pads and includes a copy of Laramy's exclusive 56-page manual "Making Even Better Plastic Welds". Additional elements and accessories can be added at any time.

Welding Tips

Laramy Vari-FT/RS Self Contained Torch



The Model VARI-FT/RS provides its own air supply from the ambient atmosphere making it ideal for installation, repair and field work on hard and soft PVC and similar thermoplastics including plexiglass, polycarbonate, polyisobutylene, polystyrene, etc. The temperature can be steplessly regulated with an electronic controller and the self-contained supply of air comes from a built-in blower/motor. The Model VARI-FT/RS is equipped with an ON/OFF switch and comes with a universal round tip, ideal for work in tight corners and for short and tack welds. Laramy's exclusive 56-page manual "Making Even Better Plastic Welds" is included and additional welding tips and accessories can be added at any time.

The VARI-FT/RS now comes with a tool box and each comes with an adapter that allows all of the welding tips that fit the other Laramy torches to fit this one as well.

Laramy Universal High-Speed Tip

A one-hand welding tip that is 6 to 8 times faster than conventional tips. Cuts off rod as desired. Exclusive Laramy design pre-heats work and rod simultaneously. These tips save a great deal of welding time and should be used for any extensive work on maintenance and fabrication projects. Laramy has Universal High Speed Tips available for both round and triangular rod in the following sizes:

- NHS-1 - 1/8" and 5/32" diameter welding rod
- NHS-2 - 3/16" diameter welding rod
- NHS-3 - 1/4" diameter welding rod
- NST-1 - 1/8" triangular rod
- NST-2 - 3/16" triangular rod
- NST-3 - 1/4" triangular rod

The triangular rod tips are available in different profiles. Please contact us for details.



Round Cast Speed Tip



Triangular Cast Speed Tip



Round Welded Speed Tip



Triangular Welded Speed Tip

Laramy Custom Welding Tips

Laramy Custom Welding Tips are engineered stainless steel tips for all hot-air welding requirements. Choose from the most complete selection of tips in the plastics welding industry.



NCT-1 Combination Welding & Tacking Tip

A dual purpose design that eliminates the need for separate tips on maintenance and light fabrication work. Cuts the rod at the end of the weld.



NR-1 Universal Round Tip

A tip for tight-corner welding.



NT-1 Universal Tacking Tip

A tip used exclusively for tacking your plastic together before welding.

Wegener Spark Testers

AC - PST 100



The AC spark testers are typically used for testing the quality of plastic welds. A variety of "test kits" are available to suit most applications. AC powered units are also available for use within production processes for the automatic testing of porosity in non-conductive coatings. A wide assortment of electrodes and accessories are available for just about every need. Please contact customer service for assistance in selecting the most appropriate tester for your application.

WEG20 - High frequency spark tester to check welds, joints and surfaces for leaks and air holes in tanks and pipes made of plastics or rubber.

WEG21 - The WEG 21 high frequency spark tester is designed for the detection of flaws or "holidays" in joints or welds, heavy duty glass, rubber or anti-corrosive coatings of tanks, pipes, etc.

Wegener Airtherm Hot Air Welding Gun



Model Airtherm hot air welding gun with self-contained blower. Standard features include: electronically controlled temperature system which is adjustable from ambient to 1200°F in order to accommodate all types of thermoplastic materials, control board with built-in sensor to prevent heating element burn-outs, plug-in type heating element for easy replacement, motor brushes can be easily checked or changed without opening the gun.

Includes a 110V/1300W heating element. Suitable for connection to a standard 110V AC electrical outlet. Unit is supplied with adaptor nozzle to accommodate WEGENER welding tips. Nozzles for overlap welding also available.

Wegener Duratherm Hot Air Welding Gun



Model Duratherm hot air welding gun with electronic output control incorporated in the handle to ensure continuous adjustment of the welding air temperature without alteration of air volume.

Standard features include: control board with built-in sensor to prevent heating element burn-outs, temperature adjustable from ambient to 1200°F to accommodate all types of thermoplastic materials, insulating tube for protection of element, back plate can be rotated 360°.

Includes 120V/1000W heating element. Suitable for connection to blower model DT 1 or DT 2.

Extrusion Welders

Wegener Exweld Mini-F Extrusion Welder



- Power Supply: 120V AC
- Power Consumption: 1680W MAX
- Maximum Output: 0.7 Kg/hr (1.5 lbs/hr)
- Weight: 3 Kg (approx 6.5 lbs)
- Length: 19"
- Rod Size: 4mm (5/32")
- Suitable for welding PE and PP up to 3/8" thick (Mini SHF/SHF-C required for UHMW or PVDF)
- Barrel temperature controlled by state-of-the-art temperature regulator
- Electronically controlled drive motor with variable welding speed
- Self-contained preheater eliminates need for external air supply
 - Solid, durable construction
 - Easy to operate
- Exchangeable PTFE welding shoes can be easily machined to determine weld size and configuration
- Optional heavy-duty shipping case available

Wegener Exweld Alpha2 EC Extrusion Welder



- Power Supply: 230V Single-Phase
- Power Consumption: 3960W max.
- Maximum Output: PE -(5.7 lbs/hr), PP -2.2 Kg/hr (4.8lbs/hr)
- Weight: 5.9 Kg (approx. 13 lbs)
- Rod Size: PP/PE 3, 4 or 5mm (1/8", 5/32" or 3/16")
- Suitable for welding PE, PP, PVDF and other thermoplastic materials
- Dual channel temperature controller for extrudate and preheat, cold start protection
- Unmatched relation between welding capacity, weight and price
- Electronically-controlled drive motor with variable welding speed
- Patented, trouble-free rod intake system
- Adjustable preheat extension, solid, durable construction, easy operation
- Exchangeable PTFE welding shoes can be easily machined to determine weld size and configuration
- Optional heavy-duty shipping/transport case with rollers
- Special model, ALPHA-P with corrosion-resistant components for PVC/CPVC

Wegener Exweld Beta2 EC Extrusion Welder



- Power Supply: 230V Single-Phase
- Power Consumption: 5360W MAX
- Maximum Output: PE 4.31 Kg/hr (9.5 lbs/hr), PP 4.08 Kg/hr (9.0 lbs/hr)
- Weight: 8.9 Kg (approx 20 lbs) excl. cable/hose
- Rod Size: up to 5mm (3/16")
- Suitable for welding PE, PP, PVDF and other thermoplastic materials. PVC optional.
- Temperature controller for extrudate with cold start protection and monitoring of set-point/actual temperatures
- Quick material changeover, lockable drive motor, and multi-position handle
- Sophisticated extrusion screw and aluminum melting chamber with cartridge/band heating system allows for smooth and optimum processing of extrudate
 - Trouble-free rod intake system Distance from end of preheat nozzle and material is fully adjustable
 - Streamline design with solid, durable construction Exchangeable PTFE welding shoes are easily machineable to determine weld size and configuration

Wegener Exweld Gamma2 EC Extrusion Welder

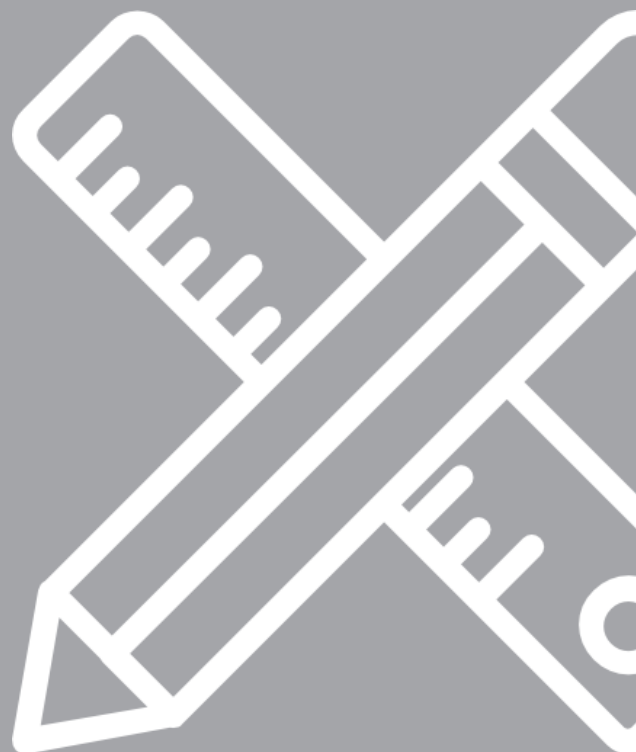


- Main Supply: 230V Single-Phase
- Power Consumption: 5760W MAX
- Maximum Output: PE 6.2 Kg/hr (13 lbs/hr), PP 5.6 Kg/hr (8.8 lbs/hr)
- Weight: 9.2 Kg (approx 22 lbs) – excl. cable/hose
- Rod Size: PE/PP 4 or 5mm (5/32" or 3/16")
- Suitable for welding PE, PP, PVDF and other thermoplastic materials. PVC optional.
- Temperature controller for extrudate with cold start protection and monitoring of set-point/actual temperatures
- Quick material changeover, lockable drive motor, and multi-position handle
- Sophisticated extrusion screw and aluminum melting chamber with cartridge/band heating system allows for smooth and optimum processing of extrudate
 - Patented, trouble-free rod intake system
 - Distance between end of preheat nozzle and base material is fully adjustable
 - Exchangeable PTFE welding shoes are easily machineable to determine weld size and configuration



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Plastic Material Digest

PVC

(Polyvinyl Chloride) conforming to ASTM D-1784 Class 12454-B, formerly designated Type 1 Grade 1, PVC is the most frequently specified of all thermoplastic materials. It has been used successfully for over 30 years in such areas as chemical processing, industrial plating, chilled water distribution, deionized water lines, chemical drainage, and irrigation systems. PVC is characterized by high physical properties and resistance to corrosion and chemical attack by acids, alkalies, salt solutions and many other chemicals. It is attacked, however, by polar solvents such as ketones, some chlorinated hydrocarbons and aromatics. The maximum service temperature of PVC is 140°F. With a design stress of 2,000 PSI, PVC has the highest long term hydrostatic strength at 73°F of any of the major thermoplastic being used for piping systems. PVC is joined by solvent cementing threading or flanging.

CPVC

(Chlorinated Polyvinyl Chloride) conforming to ASTM D-1784 Class 23447-B, formerly designated Type IV, Grade 1, CPVC has physical properties at 73°F similar to those of PVC, and its chemical resistance is similar to that of PVC. CPVC, with a design stress of 2,000 psi and maximum service temperature of 210°F has, over a period of about 25 years, proven to be excellent material for hot corrosive liquids, hot and cold water distribution and similar applications above the temperature range of PVC. CPVC is joined by solvent cementing, threading or flanging.

Polypropylene

(PP) Polypropylene homopolymer, conforming to ASTM D-4101 Class PP110 B67154, formerly designated Type 1, is a member of the polyolefin family of plastics. Although PP has less physical strength than PVC, it is chemically resistant to organic solvents as well as acids and alkalies. Generally, polypropylene should not be used in contact with strong oxidizing acids, chlorinated hydrocarbons and aromatics. Polypropylene has gained wide acceptance where its resistance to sulfur-bearing compounds is particularly useful in salt water disposal lines, crude oil piping, and low pressure gas gathering systems. Polypropylene has also proved to be an excellent material for laboratory and industrial drainage where mixtures of acids, bases and solvents are involved. Polypropylene is joined by the thermo-seal fusion process, threading or flanging.

PVDF (Kynar®)

(Polyvinylidene Fluoride) PVDF is a strong, tough, and abrasion resistant fluoro carbon material. It resists distortion and retains most of its strength to 280°F. It is chemically resistant to most acids, bases, and organic solvents and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other solid thermoplastic piping components can approach the combination of strength, chemical resistance and working temperatures of PVDF. PVDF is joined by the thermo-seal fusion process, threading or flanging.

FRP

FIBERGLASS REINFORCED PLASTICS commonly manufactured by hand lay up (HLU) in accordance with CGSB-41-GP-22 in Canada and NBS PS 15-69 in the United States. Also manufactured according to ASTM D-3299 for machine made Filament Wound (FW) construction. FRP constructions are on a custom designed basis allowing the designer to select many different resin systems and laminate constructions. As an engineered system FRP generally displays higher physical properties than thermoplastics with a wide chemical and temperature resistance. Joining methods are by Flanging, Butt and Strap joined or bell and spigot connection.

FRP Reinforced Thermoplastics

These plastics commonly referred to as thermoplastic lined FRP such as PVC, CPVC, PP, PVDF, FEP, ECTFE chemically or mechanically bonded to an FRP structural overlay. This custom engineered system offers the unique properties of the thermoplastic liner with the superior physical properties of the FRP. Joining methods include Flanging, Fusion and Solvent Cementing of the LINER and OVERLAYING WITH FRP.

FPM (Viton® or Florel®)

(Fluoroelastomer) FPM is inherently compatible with a broad spectrum of chemicals. Because of extensive chemical compatibility which spans considerable concentration and temperature ranges, fluorocarbons have gained wide acceptance as a material of construction for butterfly valve O-rings and seats. Fluorocarbons can be used in most applications involving mineral acids (with the exception of HCl), salt solutions, chlorinated hydrocarbons and petroleum oils.

EPDM (EPT)

EPDM is a terpolymer elastomer made from ethylene-propylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attack by oils and is not recommended for applications involving petroleum oils, strong acids (with the exception of HCl), or strong alkalines.

Teflon®

PTFE (Polytetrafluoroethylene) has outstanding resistance to chemical attack by most chemicals and solvents. PTFE has a temperature rating of -200°F to +500°F. PTFE, a self-lubricating compound, is used as a seat material in Fabco Ball Valves.

Neoprene® (CR)

Neoprene® was the first commercial synthetic rubber. It is a moderately oil-resistant material with good ozone-resisting properties. Neoprene is not recommended for use with aromatic hydrocarbons or chlorinated solvents. It is specifically recommended for use with higher concentrations of sodium hydroxide. It can be used in continuous service up to 180°F.

Thermoplastic Fabrication

INTRODUCTION

The preparation of thermoplastics for assembly by welding or other fastening methods is similar to the procedures used in metal fabrication. The pieces are laid out, cut, machined and joined with the same tools, equipment, and skills employed in the metal working trades. There are, however, special forming requirements for thermoplastics, not encountered in metal work. The degree of skill and the quality of preparatory work in layout and in various machining operations on components for fit up are very important in assuring accurate assembly and successful fabrication.

Fabrication of thermoplastics covers a wide field of operations on sheet, rod, tube, and special shapes in making them into finished products: cutting, sawing, machining, forming and joining or fastening together for the completed object. Machining may include beveling, routing, grinding, turning, milling, drilling, tapping, and threading. Once the different parts are shaped, they then may have to be joined.

Assembly techniques include use of self-tapping screws, threaded inserts, press fitting, snap fitting, cold heating, heat joining (like hotplate welding, hot-wire welding, induction heating, thermal-impulse heating, resistance-wire welding, or hot flaring, spin welding), cementing, and hot gas welding. Each operation requires its own tools and equipment.

CUTTING

Thermoplastic rods and shapes can be readily cut with an ordinary hand hacksaw, or power saws can be used. Using a circular power saw, a cutting speed of 6,000 rpm. Using hand pressure is recommended. With bandsaws, this should be reduced to 3,600 fpm with hand pressure. Under some circumstances a lathe can be used. Best results are obtained with fine-toothed saw blades (6 to 9 teeth per in.) and little or no set (maximum 0.025 in.).

THREADING

Thermoplastic pipe, rod and shapes can easily be threaded using either standard hand pipe stocks or power operated equipment. For optimum results in threading, use of new taps and dies is recommended; but in any case they should be clean and sharp and maintained in good condition. Power threading machines should be fitted with dies having 5° negative front rake and ground especially for this application, tapered guide sleeves are not required. For hand stocks, the dies should have a negative front rake angle of 5 to 10°. Dies which have been designed for use on brass or copper pipe may be successfully used. Carbide dies give longer service.

Taps should be ground with a 0 to 10° negative rake, depending upon the size and pitch of the thread. Die chasers should have a 33° chamfer on the lead: a 10° front or negative rake; and a 5° rake on the back of relief edge. Self-opening die heads and collapsible taps, power threading machines and a slight chamfer to lead the tap or dies will speed production, however,

taps and dies should not be driven at high speeds or with heavy pressure.

A tapered plug should be inserted into tubular ends when threading to hold the pipe round and to prevent the die from distorting or digging into the pipe wall. This insures uniform circumferential depth of threads. Pipe for threading should be held in a pipe vice since sawtooth jaws will leave marks. Thermoplastic materials are readily threaded without use of external lubricants. However, ordinary lubrication or cutting oil will be beneficial to the operation. In a pipe-threading machine, water soluble oil or plain cold water is used. Clearing of cuttings from the die is strongly recommended.

HEAT WELDING

The most important and most versatile of welding methods is hot gas and air welding which, in principle, is similar to oxyacetylene welding of metals, but with a difference in the technique involved. Specialized welding equipment has been developed in which the pressure and the rate and area of heating are precisely controlled in order to provide strong, tight bonds. Welding rods are available in different sizes to suit the individual jobs. Hot gas welding of thermoplastics is accomplished with a welding torch and tips or tools. It is divided into three basic types of welding: tack welding, hand welding and high speed welding. Each type requires different tips or high speed tools.

FUSION WELDING

Industrial thermoplastics such as PVC, PP, PE, and PVDF can be fusion welded using modern temperature and pressure controlled fusion equipment. This relatively simple equipment is available to fuse PIPE and Tube products to 24" diameter. SHEETS and Plates can also be fused using micro processor controlled fusion machines. Weld efficiency, when using modern equipment, will develop weld strength of up to 98% of the unwelded parent material.

SOLVENT CEMENT WELDING

Cementing is a convenient technique for bonding PVC and CPVC (High-Temp) stock. Surfaces to be cemented must be clean and dry. They should be cut square and smooth and wiped clean of dirt, grease, etc. with a small amount of Fabco Pipe Cleaner.

When solvent-cementing, it is important to have close clearances between the surfaces to be joined. Solvent-cement should be applied with an ordinary small paint brush to each member. (Do not use synthetic hair brushes). Then the cemented surfaces should immediately be pushed snugly together. After the cemented joint has been pressed together the initial set takes place within several minutes.

Handling strength, however, is not developed for approximately 30 minutes. Relative motion between the cemented surfaces during the initial set period is undesirable. It is good practice to apply no more than 10% of the rated stress for four hours. Full strength of the joint is developed after about 48 hours.

Thermoplastic Fabrication

FLANGING

One of the earliest methods of joining thermoplastics piping, flanging continues to be used extensively for process lines. Thermoplastic flanges and flanged fittings are available in a full size range and may be attached to pipe by solvent welding, by threading, or by thermal bonding, as required by the particular thermoplastics material.

MACHINING, CUTTING AND SAWING

Thermoplastics may be turned, threaded, grooved, milled, or polished to very close tolerances, with the same tools as are used for wood or metal.

The only requirement for machining of plastic that differs from metal machining is compensation for heating up of materials due to its poor heat-conductivity. The limitation of heat build-up is accomplished by use of sharp, high-speed tools, streams of air or water/soda cooling, and proper machine feeds.

In machining plastics on a lathe, tool bits should be sharpened as for machining brass. The tool should be ground with a front clearance of 10° , a 2° negative back-rake and no side rake. The tool should have a 10° side-clearance. Chips should be blown or washed away from the work to reduce frictional heat to a minimum.

The piece is set up in the lathe for turning or thread cutting as in metal work but with special protection provided for the plastic where it is held in the chuck jaws. The plastic should be wrapped in several heavy layers of heavy cardboard, held in place by masking tape, before being inserted into chuck.

A cutting speed of 200 fpm is recommended. Lathe speed for machining different diameters of plastic can be calculated as: 4 times the cutting speed (fpm) divided by the diameter of the plastic in inches. Example: With a plastic rod 1- in. diameter, the lathe speed would be

200 times 4 divided by 1 or 800 rpm. Light cuts are recommended - 0.030 to 0.060 in. cross-feed at a time.

In sawing plastic sheet, there is likely to be concentrated heat build-up in the saw blades. To allow for this, the blade used should be selected in accordance with the gauge of the material. The saw blade for cutting thicker materials should be heavier and should be hollow ground. The saw should make a slicing cut in the material: to do this, the teeth should have negative rake, with little or no set. The rate of feed should be very slow. The blade of a circular saw should just show through the material. If it extends too far through, it will increase the heat build-up, by increasing friction.

In cutting polyethylene and polypropylene on a circular saw, the saw blade required is different from that used in cutting PVC. PE and PP do not require a hollow ground blade and are cut by a well-set saw blade. Shears can be used for cutting of light gauge thermoplastic sheets. All shearing should be accomplished at room temperature. A cold sheet will crack or shatter. A 1/8-in. sheet of Type 1 PVC can be sheared easily. Heavier-gauge Type 1 PVC will tend to cut off-square and also show stress marks. Type 2 PVC, PP, PE and modified high impact PVC shear better and to a higher gauge than Type 1 PVC. In drilling plastics, the same problems are experienced as in drilling metal. The non-conducting characteristics of the material and the heat concentration in the tool must be allowed for. This is accomplished by grinding the drill differently than for drilling metals. If the holes are to be drilled in the fabrication at hand, the drill should be reground to a negative rake and the lip angle increased for 59° to 70° . The margin on the drill should be smooth and highly polished to reduce friction. Drilling speeds should be reduced: 50 to 150 rpm is a safe range, with 120 rpm being optimum. Very slow feeds should be used.



Guidelines For Processing and Machining Plastics

General Remarks

- Non-reinforced thermoplastics can be machined with cutting tools of highspeed steel. For reinforced materials, hard metal tools are required.
- In all cases, only properly sharpened tools are to be used.
- Due to the poor thermal conductivity of plastics, provision has to be made for good heat dissipation. Heat is best dissipated via the chips.

Dimensional Stability

- Dimensional stability of parts is conditional on stress-relieved, semi-finished materials which have to be annealed. The heat generated by the cutting tool otherwise inevitably leads to the release of processing stresses and deformation of the part. In the case of high material removal volumes, intermediate heating may be necessary after the main machining operation so as to remove the arising thermal stresses.
- Materials with high moisture absorption (e.g. polyamides) may require conditioning before machining.
- Plastics require larger finishing tolerances than metals. Furthermore, allowance has to be made for the many times greater thermal expansion.

Machining Operations

1. Turning

Guide values for cutting tool geometry are given in the table. For particularly high quality surface finishes, the tip is to be shaped as a broad-nosed finishing tool as shown in Figure 1.

For cutting off, the tool should be ground to the profile shown in Figure 2 so as to avoid a remaining stump.

On thin walled and particularly flexible workpieces, on the other hand, it is better to work with tools that are ground to a knife-like cutting geometry. Figures 3 and 4.

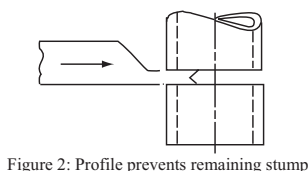
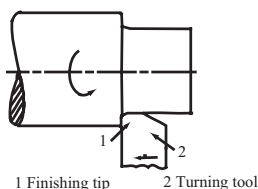


Figure 2: Profile prevents remaining stump

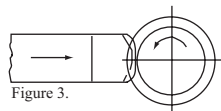


Figure 3.

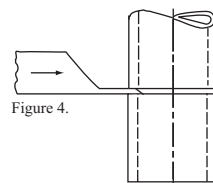


Figure 4.

2. Milling

For plane surfaces, face milling is more economical than peripheral milling. For peripheral milling and profiling, the cutting tools should not have more than two cutting edges so that vibrations due to the number of teeth are kept to a minimum and chip widths are sufficiently large.

Optimum removal rates and surface finish are obtained with single-point tools.

3. Drilling and boring

As a general rule it is possible to use twist drills; these should have an angle of twist of 12-16° and very smooth helical flutes for good chip removal. Larger diameters should be rough-drilled or produced by trepanning or internal turning.

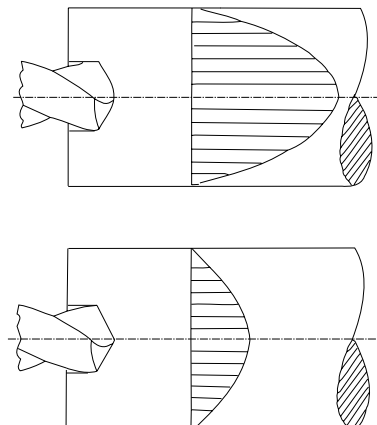
On drilling into solid material, care must be taken to ensure that the tools are properly sharpened; otherwise, the developing compressive strain can build up and cause the material to split.

Reinforced plastics possess higher residual processing stresses with lower impact strength than unreinforced plastics and are thus particularly susceptible to cracking. Where possible, these should be heated to about 120°C before drilling or sawing (heating time approximately 1 hour per 10 mm cross-section). This procedure is also recommended in the case of polyamide 6/6.

4. Sawing

Unnecessary generation of heat by friction is to be avoided, since sawing is generally used to cut off thickwalled parts with relatively thin tools. Well-sharpened and heavily crossed sawblades are therefore advised.

Note: The information is only to assist and advise you on current technical knowledge and is given without obligation or liability. All trade and patent rights should be observed. All rights reserved.



RAW MATERIAL GROUP	TURNING			MILLING			DRILLING AND BORING			SAWING			SPECIAL MEASURES						
	a	y	X	V	S	a	y	a	y1	b	V	S		a	y	a	y	t	
MACHINING OPERATIONS	α Clearance angle (°) γ Rake angle (°) X Side angle (°) V Cutting speed ft/min S Feed The angle of twist β of the drill bit should be approximately 12 to 16°. Clearance angle (°) y1 Rake angle (°) b Side angle (°) V Cutting speed ft/min S Feed mills/rev The angle of twist β of the drill bit should be approximately 12 to 16°.																		
POLYCARBONATE	5-10	6-8	45-60	950	4-20	10-20	5-15	950	8-10	20	90	150-300	8-12	30	15-	5-8	950	115-310	In the case of fluid cooling only use pure water
ABS (ACRYLONITRILE-BUTADIENE-STYRENE)	5-15	25-30	15	650-1600	8-20	5-10	0-10	950-1600	8-12	30	90	150-650	8-12	30	15-	0-5	950	75-310	In the case of fluid cooling only use pure water
PPS (POLYPHENYLENE SULFIDE)	6-8	2-8	45-60	500-650	4-20	15-30	6-10	250-350	6	5-10	120	250-300	4-12	30	15-	10-	600-950	115-195	Preheat to 240°F before drilling or sawing
POLYSULFONE	6	0	45-60	1150-1300	4-12	2-10	1-5	800-1600	3-10	20	90	50-250	4-12	30	15-	0-4	1600	75-195	Preheat to 240°F before drilling or sawing
PVDF (POLYVINYLIDENE FLUORIDE)	10	5-8	10	500-1600	4-12	5-15	5-15	800-1600	10-16	5-20	130	500-650	4-12	30	20-	5-8	950	75-195	
NYLON 6/6	6-10	0-5	45-60	800-1600	4-20	10-	5-15	800-1600	5-15	20	90	150-500	4-12	30	20-	2-5	1600	115-310	
ACETAL	6-8	0-5	45-60	950-1950	4-16	5-15	5-15	800-1600	5-10	30	90	150-650	4-12	30	20-	0-5	1600-2600	75-195	
PET (POLYETHYLENE TEREPHTHALATE)	5-10	0-5	45-60	950-1300	8-16	5-15	5-15	950	5-10	20	90	150-300	8-12	30	15-	5-8	950	115-310	Preheat to 240°F before drilling or sawing
ACETAL HOMOPOLYMER (DELRIN®)	6-8	0-5	45-60	950-1950	4-16	5-15	5-15	800-1600	5-10	30	90	150-650	4-12	30	20-	0-5	1600-2600	75-195	
PPO (POLYPHENYLENE OXIDE) (NORYL®)	5-10	6-8	45-60	950	4-20	10-	5-15	950	8-10	20	90	150-300	8-12	30	15-	5-8	950	115-310	In the case of fluid cooling only use pure water
POLYETHERETHERKETONE (PEEK)	6-12	5	45-60	950	15	5-15	5-15	550-750	12	20	118	400	2-8	30	15-	10-	600-950	115-195	Preheat to 240°F before drilling or sawing
POLYETHERIMIDE (ULTEM®)	15	5	5	1000-2000	5-20	15	5	650-1300	5-10	90	70-	300	5-15	30	15-	5-10	3000-5000	100	In the case of fluid cooling only use pure water
REINFORCED ENGINEERING PLASTICS*	6-8	2-8	45-60	500-650	4-20	15-	6-10	250-350	6	5-10	120	250-300	4-12	30	15-	10-	600-950	115-195	Use hard metal cutting tools

Instaduct® Specifications

1. MATERIALS

1.1 PVC Composed: The PVC used will possess minimum property values equivalent to that designated by ASTM-D-1784-81.

1.2 Rigid Sheets: Rigid PVC sheets used in the fabrication of ductwork and accessories, shall be manufactured from the basic compounds as specified in paragraph 1.1. The manufactured sheet products shall be equivalent to the requirements of ASTM D1927-81

1.3 Extruded ducts and Shapes - Extruded material, where used, shall be manufactured from the basic compounds as specified in paragraph 1.1

2. DUCT SIZES AND TOLERANCES

2.1 Wall Thickness: The minimum nominal wall thickness shall be as specified. The allowable tolerance on the minimum thickness of the duct wall shall be minimum 15% of the specified nominal thickness.

2.2 Round Duct: a.) Extruded round duct up to 24" diameter shall be determined by the nominal inside diameter and wall thickness are indicated herein. Tolerances on extruded duct including out of roundness shall generally be governed by the requirements of ASTM D1785-83 but in any event tolerance will allow for proper joint fitment and cementing.

b.) Fabricated ducts larger than 24" in diameter shall be determined by the nominal inside diameter. The tolerance including out of roundness shall be the greater of 1% of the diameter or 3/16 of an inch.

2.3 Fittings: Wall thickness of mitered fittings shall be at least of duct of the same size.

2.4 Squareness of Ends: Individual sections and fittings shall maintain suitable tolerances such that field erection can be accomplished in a neat and workmanship like manner, and such as to maintain essentially airtight construction and structural integrity.

3. SOLVENT CEMENTING

Solvent cementing may be used as a method of joining PVC ducting. (This process joins the O.D. of the duct to the I.D. of the fitting). The solvents in the cement produce a surface reaction that dissolves the PVC. As the surfaces are placed in contact with each other, the solvents evaporate, the reaction stops and the PVC hardens to its original state. (This method is suitable only for applications where adequate surface-to-surface contact area exists.)

INSTADUCT is closely fitted to ensure uniform contact of the mating surface. When used with larger sizes of duct (over 12 inches diameter or width) particular care shall be exercised to insure that the solvent does not set up in any area prior to mating of the parts.

When performing solvent welding, care must be taken to follow FABCO's instructions precisely with respect to preparing the material to be joined, applying the cement and placing the materials into contact with each other.

4. LONGITUDINAL SEAMS

Thermally formed large diameter round duct sections shall be machine fusion welded the length of duct.

5. ELBOWS, ROUND DUCT

Unless otherwise specified in the design documentation, the centerline radius for standard elbows shall be 1 times the diameter.

6. OFFSETS

Unless otherwise specified in the design documentation, the centerline radii for standard offset shall be the same as for elbows.

7. TRANSITIONS AND REDUCERS

Minimum wall thickness and reinforcement of transitions shall be that required for the larger diameter or width of transition piece.

8. BRANCHES ENTERING MAIN

Branch ducts shall enter the main duct near the large end of the transitions, at an angle not exceeding 45° wherever possible. Branches shall not be positioned directly opposite one another on a main or a sub-main. The intersection of branches with mains and sub-mains shall be continuously welded.

9. TRANSVERSE JOINTS

Hand welded butt joints may be used for connections wherever desirable. For field connections, however, it is recommended that a bell and spigot or flexible connection be used.

10. BUTT JOINTS

A hand-welded butt joint shall have a tensile strength at last equal to 75% of the duct itself.

11. BELL AND SPIGOT INSTADUCT

Bell and spigot joints, are made by thermal forming of the end of round duct. The straight duct shall be inserted into the bell end a minimum of 2".

12. INSTADUCT COUPLING JOINT

The coupling joint is thermally formed of a thickness equivalent to or greater than that of the duct. The coupling is cemented to the duct section.

13. FLEXIBLE CONNECTIONS

Flexible connections shall be provided to form an anti-vibration barrier at the locations indicated on the design drawings and shall be fabricated from the flexible plasticized PVC material (not less than 3/32 inch thick) having corrosion resistance and temperature compatibility suitable for the environment. Longitudinal seams shall be sealed by machine fusion welding.

14. DUCT HANGER AND SUPPORTS

All horizontal ducts shall be supported. Duct shall also be supported independently at other locations and on both sides of an expansion or flexible joint. Hangers and supports shall be securely fastened to the building or structure. Care shall be taken to avoid creating conditions of stress on the finished material. Hanger materials and hardware shall be stainless steel or plastisol coated steel for corrosion resistance as necessary. Otherwise, mild steel or equal may be used.

15. FUME HOODS

Fume hoods will be properly designed and fabricated to suit the installations parameters.

16. VOLUME DAMPERS

Volume dampers shall be installed at the locations indicated on the project drawing for balancing and adjustment of the system. Volume dampers shall be constructed of PVC material and provided with suitable corrosion proof

attachments for permanently setting dampers in a fixed position after balancing.

17. DRAINS

The drains shall be full sized half couplings, preferably 2" in diameter and suitable for receiving standard IPS pipe connections. The fittings shall be continuously welded and trimmed flush with the interior surface of the duct.

18. AUXILIARY EQUIPMENT

Fans, scrubbers, filters, eliminators, sound traps and other such auxiliary equipment, can be incorporated into the system.

POLYVINYL CHLORIDE (PVC)

Whenever the term PVC resins and PVC compounds are used, they are generally understood to refer to materials made from one of the following:

- a) polyvinyl chloride
- b) chlorinated polyvinyl chloride
- c) polyvinyl chloride copolymers

The resin portion of the compound should contain at least 80 percent vinyl chloride according to ASTM D-1784-81. The compounding ingredients may consist of lubricants, stabilizers, non-poly (vinyl chloride) resin modifiers, and pigments essential for processing, property control and colouring.

PVC has the ability to be compounded for a wide range of applications. Use of PVC in air ventilating systems however, is primarily limited to the rigid material. The material in addition to being used for duct is also used for structures such as hoods, exhaust fans, and fume scrubbers.

PVC Solvent Cements - these cements are compounded with PVC resins or copolymers, a solvent, and an evaporation retardant. While clear amber cements can be produced, most commercial cements are colored grey with inert pigments. There are two grades of solvent pipe cement. One is designed for DWV; the other is of heavier consistency for Schedule 40, 80, and 120 m pipes. When cementing is applicable, the latter is suggested for structural fabrication. Cements are available from FABCO. Instaduct up to 24" diameter can be cemented following proper solvent cementing procedures. Duct and fittings over 24" diameter must be hand welded.

CORROSIVE RESISTANCE

Performance rating based solely on advertising data from the reference material, can be made meaningless by the presence of a contaminant. It is essential that close coordination with the manufacturer be maintained to ensure applicability. Corrosion attack is primarily the penetration of the corrosive environment into the surface of the plastic materials. This results in a weight gain of the PVC. Penetration of the corrosive environment onto the plastic proper also changes the physical properties. The degree of the weight gain, penetration and change in physical properties is the manner whereby thermoplastic corrosion is measured. Penetration either occurs relatively rapidly or does not occur at all. A 30-day immersion test is usually satisfactory to determine whether or not a thermoplastic material will handle the corrosive environment intended. Weight gain greater than 7% suggests unsuitability.

Borderline environments in liquid service are usually

satisfactory for fume exhaust systems, where condensation does not occur. Exhaust ducts with adequate drainage can be satisfactory where limited condensation occurs. Further, design of fume exhaust systems usually incorporates 9 to 12 parts of room air to one of fume, thereby diluting the fume concentration and reducing corrosive attack.

Changes in physical property occur with corrosion attack and are measured in terms of tensile strength, impact strength, and flexural strength. The degree of attack with organic solvents increases in order with the following common solvents: Alcohol, ketones, ester, aromatic and chlorinated solvents. A very distinct softening of the specimens and some solution occurs in most instances because of corrosive attack. Stress cracking can occur with some plastics. However, Type 1, Grade 1, rigid polyvinyl chloride has rather rare instance of stress cracking.

Higher temperature applications in corrosive environments will result in substantial increases in penetration and become apparent as temperatures approach the heat distortion point. The decreased corrosion resistance, as well as the upper physical operating temperatures compared to working stress, occur simultaneously.

FLAMMABILITY

Polyvinyl chloride (PVC), contains approximately 56% chlorine by weight, and in its rigid, unplasticized form, it is self-extinguishing when tested per ASTM-635. (Generally, the threshold for vinyl resin to be self-extinguishing is approximately 30% chlorine.) Some PVC ductwork is required to be furnished with internal sprinklers while systems without sprinklers are acceptable as long as the PVC does not exceed ¼" wall thickness, (thin walled PVC collapses from the heat of fire and interrupts flames spread by shutting off air flow) and does not contain other combustible deposits.

CONSTRUCTION OF PVC DUCT SYSTEMS

Designed systems normally include the following:

- A) Equipment list and system layout.
- B) Duct sizing information (diameter or width and height) for all ducts.
- C) Total system design CFM and all terminal CFM requirements.
- D) Frequency and/or location of access doors and test holes.
- E) Location and type of regulating dampers.
- F) Location and type of all fire and smoke protection devices and equipment as may be desired, or required by local codes and regulations.
- G) Location of flexible connections.
- H) Location of all expansion joints.
- I) Type of PVC material from which the duct is to be manufactured, and details of the duct to special requirements not in accordance with the reference manual.
- J) Pressure Classification: (positive or negative) to which each duct system (or each portion of a duct system where applicable) is to be constructed.
- K) Location and type of drain connections when required.
- L) Details and location of any acoustical treatment.

Thermoplastic Installation Instructions

SCOPE

One of the more important features of industrial thermoplastics is the ease with which they lend themselves to a variety of fabricating techniques. This versatility, plus the wide selection of piping components now available, make possible fast and economical installation, maintenance and modification of industrial piping systems. It is the objective of this section to provide detailed instructions on all known techniques of joining, maintaining and handling thermoplastics in order to permit maximum integrity of your piping system.

SOLVENT WELDING

The generally preferred method of joining rigid thermoplastics such as PVC and CPVC is solvent welding. This process gives a stronger joint than threading and is also considered faster and simpler. Additionally, solvent welding permits the use of thinner walls when compared to threaded connections for equivalent pressure ratings.

THERMO-SEALING (SOCKET FUSION)

Polypropylene (PP), a thermoplastic polyolefin and PVDF (Kynar), cannot be dissolved by even the strongest of organic solvents. Since solvent attack (or bite) by dissolution is necessary to effect a solvent cement bond with thermoplastics, it is not possible to join polypropylene or PVDF by solvent cementing. Therefore, polypropylene and PVDF pressure systems can only be joined using heat fusion techniques. A thermal sealing procedure is used when joining using heat fusion techniques. A thermal

sealing procedure is used when joining 1/2" through 4" sizes. When joining 6" polypropylene systems, which are recommended for drainage applications only, a fillet welding procedure is utilized.

THREADING

Threaded joints are sometimes used when a piping system must be dismantled for occasional cleaning or modifications. Since threading results in a reduction in the effective wall thickness of the pipe, the pressure rating of threaded pipe is reduced to one-half that of unthreaded pipe, ie. pipe joined by solvent cementing or thermal sealing. This reduction in wall thickness resulting from threading can seriously affect the pressure carrying capability and mechanical strength of Schedule 40 or lighter pipe and therefore, only Schedule 80 or heavier pipe should be threaded when the pipe is used for pressure applications. Also, threading is not recommended for plastic pipe above 4 inches in diameter nor is it recommended for pressure polypropylene piping systems.

FLANGING

One of the earliest methods for joining thermoplastic piping, flanging continues to be used extensively for process lines. Thermoplastic flanges and flanged fittings are available in a full size range and may be attached to pipe by solvent welding, by threading, or by thermal sealing, as required by the particular thermoplastic material.

Storage and Handling of Thermoplastic Piping Components

SCOPE

Industrial thermoplastic piping components are designed and manufactured for use in severe duty systems involving the transport of aggressive liquids. In order to ensure their integrity, once installed, they must be handled with reasonable care prior to installation.

STORAGE

1. Pipe - When pipe is received in standard lifts it should remain in the lift until ready for use. Lifts should not be stacked more than three high and should always be stacked wood on wood. Loose pipe should be stored on racks with a minimum support spacing of three feet. Pipe should be shaded but not covered when stored outside in high ambient temperatures. This will provide for free circulation of air and reduce the heat build-up due to direct sunlight exposure.
2. Fittings - Fittings should be stored in their original cartons to keep them free of dirt and reduce the possibility of damage. If possible, fittings should be stored indoors.
3. Solvent Cements and Primers - Solvent cements have a definite shelf life and each can and carton is clearly marked with a date of manufacture. Stock should be rotated to ensure that the oldest material is used first. Primer does not have a shelf life but it is good practice to rotate this stock also. Solvent

cements and primers should be stored in a relatively cool shelter away from direct sun exposure.

CAUTION: SOLVENT CEMENTS AND PRIMERS ARE COMPOSED OF VARIOUS SOLVENTS AND REQUIRE SPECIAL CONDITIONS FOR STORAGE. BECAUSE OF THEIR FLAMMABILITY THEY MUST NOT BE EXPOSED TO IGNITION, HEAT, SPARKS OR OPEN FLAMES.

HANDLING

1. Pipe and Fittings - Care should be exercised to avoid rough handling of thermoplastic pipe and fittings. They should not be dragged over sharp projections, dropped or have objects dropped upon them. Pipe ends should be inspected for cracks resulting from such abuse. Transportation by truck or pipe trailer will require that the pipe be continuously supported and all sharp edges on the trailer bed that could come in contact with the pipe must be padded.
2. Solvent Cements and Primers - Keep containers for solvent cements tightly closed except when in use. Avoid prolonged breathing of solvent vapors, and when pipe and fittings are being joined in partially enclosed areas use a ventilating device to attenuate vapor levels. Keep solvent cements, primers and cleaners away from all sources of ignition, heat, sparks and open flames. Avoid repeated contact with the skin by wearing proper gloves impervious to the

Solvent Welding Instructions

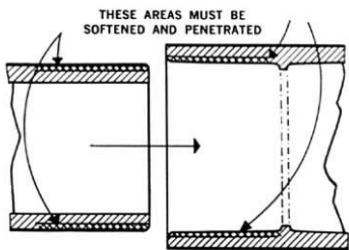
solvents. Application of the solvents or cements with rags and bare hands is not recommended; natural fiber brushes and other suitable applicators can produce satisfactory results.

DANGER: EXTREMELY FLAMMABLE. VAPOR HARMFUL. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE SKIN OR EYE IRRITATION.

Solvent Welding Instructions

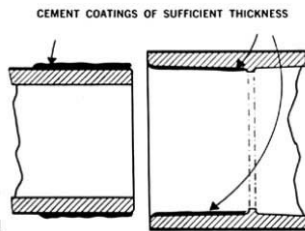
To make consistently good joints, the following points should be clearly understood.

1. The joining surfaces must be softened and made semifluid.
2. Sufficient cement must be applied to fill gap between pipe and fitting.
3. Assembly of pipe and fittings must be made while the surfaces are still wet and cement is still fluid.
4. Joint strength develops as the cement dries. In the tight part of the joint, the surfaces will tend to fuse together; in the loose part, the cement will bond to both surfaces.



FABCO recommends the use of a primer for all applications. A suitable primer will usually penetrate and soften the surfaces more quickly than cement alone. Additionally, the use of a primer can provide a safety factor for the installer, for he can know under various temperature conditions when sufficient softening has been achieved. For example, in cold weather more time and additional applications may be required.

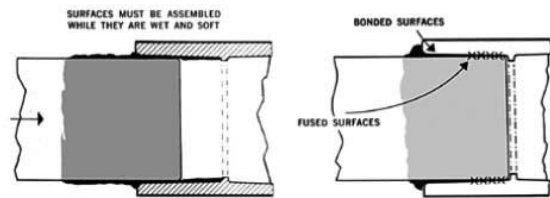
Sufficient cement to fill the loose part of the joint must be applied. Besides filling the gap, adequate cement layers will penetrate the surfaces and also remain wet until the joint is assembled. Prove this for yourself. Apply on the top surface of a piece of pipe two separate layers of cement.



First apply a heavy layer of cement; then along side it, apply a thin brushed out layer. Test the layers every 15 seconds or so by a gentle tap with your finger. You will note that the thin layer becomes tacky and then dries quickly (probably within 15 seconds); the heavy layer will remain wet much longer. A few minutes after applying these layers check for penetration. Scrape the surface of both with a knife. The thin layer will have achieved little or no penetration; the heavy one will have achieved

much more penetration.

If the cement coatings on the pipe and fittings are wet and fluid when assembly takes place, they will tend to flow together and become one cement layer. Also, if the cement is wet, the surfaces beneath them will still be soft and these softened surfaces in the tight part of the joint will tend to fuse together. As the solvent dissipates, the cement layer and the softened surfaces will harden with a corresponding increase in joint strength. A good joint will take the required working pressure long before the joint is fully dry and final joint strength is obtained. In the tight (fused) part of the joint, strength will develop more quickly than in the looser (bonded) part of the joint. Information about the development of bond strength of solvent welded joints is available in this manual.



SOLVENT WELDING WITH PRIMER

1. Assemble proper materials for the job (proper primer, cement, if necessary - cleaner, and applicator for the size of pipe and fittings to be assembled).
2. Pipe must be cut as square as possible. Use a miter box saw or power saw. Check the end of the pipe with a square to make sure it has been cut squarely. A diagonal cut reduces bonding area in the most effective and critical part of the joint.



3. Plastic tubing cutters may also be used for cutting plastic pipe; however, some produce a raised bead at the end of the pipe. This bead must be removed with a file or deburring tool, as it will scrape the cement away when pipe is inserted into the fitting.



Solvent Welding Instructions



4. Remove inside diameter burrs or raised beads with an internal deburring tool or knife. Remove the burrs or raised beads on the outside diameter of the pipe by using a file or external deburring tool that will produce a 3/32", 10-15° chamfer (bevel). Burrs can scrape channels into pre-softened surfaces or create hang-ups across the inside fitting diameter.



5. With a clean-dry rag, remove any dirt, grease, shavings or moisture from the inside and outside of the pipe and fitting. A thorough wipe is usually sufficient. (Moisture will retard cure and dirt, grease, or any foreign material can prevent proper fusion).



6. Check pipe and fittings for dry fit before cementing. For proper interference fit, fitting should go over end of pipe easily but become tight about 1/3 to 2/3 of the way on. Too tight a fit is not desirable; you must be able to fully bottom the pipe in the socket during assembly. If the pipe and fittings are not out of round, a satisfactory joint can be made if there is a "net" fit, that is, the pipe bottoms in the fitting socket with no interference, but without slop. A quick, dry fit "slop" test: Hold a short length of pipe vertically with a fitting "bottomed" on the pipe. If the fitting falls off the end of the pipe, do not start assembly. Contact your pipe or fitting supplier. Measure the fitting socket length and mark this distance on the pipe OD to insure the fitting has been fully inserted, add a couple inches to this distance and make a second check mark on the pipe, as the primer and cement will remove the first mark. All pipe and fittings must conform to ASTM or other recognized product standards.



7. Use the right applicator for the size of pipe or

fittings being joined. The applicator size should be approximately 1/2 the pipe diameter. It is important that a satisfactory size applicator be used to help ensure that sufficient layers of cement are applied.



8. Priming; the purpose of a primer is to penetrate and soften the surfaces so they can fuse together. The proper use of a primer and checking its softening capability provides assurance that the surfaces are prepared for fusion in a wide variety of conditions. Check the penetration or softening on a piece of scrap pipe before you start the installation or if the weather changes during the day.



Using a knife or other sharp object, drag the edge over the coated surface. Proper penetration has been made if you can scratch or scrape a few thousandths of the primed surface away. Because weather conditions do affect priming and cementing action, repeated applications to both surfaces may be necessary. In cold weather more time is required for proper penetration.

NOTE: WITHOUT HESITATION, COMPLETE STEPS 9 THROUGH 16.

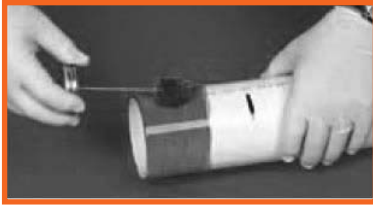
FOR PIPE DIAMETERS OF 6" AND LARGER, THE SIZE OF THE JOINING CREW SHOULD BE INCREASED (SEE JOINING LARGE DIAMETER PIPE AND FITTINGS).

9. Using the correct applicator (as outlined in step #7), aggressively apply the primer into fitting socket, keeping the surface and applicator wet until the surface has been softened. More applications may be needed for hard surfaces and cold weather conditions. Re-dip the applicator in primer as required. When the surface is primed, remove any puddles of primer from the socket.



10. Next, aggressively apply the primer to the end of the pipe to a point 1/2" beyond the depth of the fitting socket.

Solvent Welding Instructions



11. Apply a second application of primer to the fitting socket. Do not allow primer to run down the inside of the fitting or pipe.



12. With the proper size and type of applicator, while surfaces are still wet, immediately apply the appropriate Weld-On® cement.

PLEASE NOTE: THE ADDING OF PRIMERS, CLEANERS OR OTHER THINNERS TO THIN THE VISCOSITY OF SOLVENT CEMENT IS NOT RECOMMENDED.

13. Cementing: (Stir or shake the cement before using.) Aggressively apply a full, even layer of cement to the pipe-end equal to the depth of the fitting socket – do not brush it out to a thin paint type layer, as this will dry too quickly.



14. Aggressively apply a medium layer of cement into the fitting socket; avoid puddling cement in the socket. On bell-end pipe do not coat beyond the socket depth or allow cement to run down into the pipe beyond the bell.



15. Apply a second, full even layer of cement on the pipe. Most joint failures are caused by insufficient application of cement.



16. Immediately, while cement is still wet, assemble the pipe and fittings. If not completely wet, recoat parts before assembly. If cement coatings have hardened, cut pipe, dispose of fitting and start over. Do not assemble partially cured surfaces. While inserting, twist 1/8 to 1/4 turn until reaching socket bottom. Do not continue to rotate after the pipe has reached the socket bottom.



17. Hold the pipe and fitting together for a minimum of 30 seconds to eliminate movement or pushout.



18. After assembly, a joint should have a ring or bead of cement completely around the juncture of the pipe and fitting. If voids (gaps) in this ring are present, sufficient cement was not applied and the joint may be defective.



19. Using a rag, remove the excess cement from the pipe and fitting, including the ring or bead around the socket entrance, as it will needlessly soften the pipe and fitting, and does not add to joint strength. Excess cement around the socket entrance will also extend the cure time. Avoid disturbing or moving the joint.



20. Handle newly assembled joints carefully until initial set has taken place. Follow Weld-On® set and cure times before handling or hydro-testing piping system.

Joining Large Diameter Pipe and Fittings

6" Diameter and Larger

As pipe diameter increases, so does the difficulty in installing it. The professional installer should be able to successfully assemble large diameter pipe and fittings by following the Weld-On Solvent Welding with Primer instructions listed in the beginning of this guide along with the following additional recommendations.

1. Use of proper size applicators is even more necessary to ensure enough cement is applied to fill the larger gap that exists between the pipe and fittings.
2. Of equal importance is the use of the applicable cement for the size of pipe and fittings being installed. We recommend the following:
 - up to 12" PVC Sch 40 or Sch 80 - Weld-On 711™ & 717™
 - up to 30" PVC Sch 40 or Sch 80 - Weld-On 719™
 - up to 12" CPVC - Weld-On 714™ & 724™
 - up to 24" CPVC Duct - Weld-On 729™

3. End of pipe must be cut square and chamfered (beveled). (See photo beside)

4. Increase size of joining crew:
 - 6"- 8": 2-3 people per joint
 - 10"- 30": 3-4 people per joint

It is important in large diameter joining that the primer and cement be applied simultaneously to the pipe and fittings.

5. Make sure to apply a second, full layer of cement to



the pipe.

6. Because of the short sockets in many large diameter fittings, IT IS VERY IMPORTANT TO HAVE PIPE BOTTOMED INTO THE FITTING. Large diameter pipe is heavy and can develop significant resistance during insertion, before reaching socket bottom. It is for this reason that we recommend above 4" diameter the use of a pipe-puller such as the one pictured. (Available at FABCO PLASTICS).



7. Large diameter pipe and fittings require longer set and cure times. *(In cold weather, a heat blanket may be used to speed up the set and cure times.)
8. Prefabricate as many joints as possible.
9. If pipe is to be buried, make as many joints as possible above ground, then after joints have cured, carefully lower into trench.
10. Never bury empty cans, brushes, or anything else containing wet cement, primer, or cleaner next to the pipe.

*Contact FABCO PLASTICS for further information.

Solvent Welding Chemical Applications

Installations of plastic pipe and fittings for chemical applications requires a higher degree of skill than other installations; joint failures in these systems could be life threatening. It is for this reason we recommend the following tips for these applications.

Tips for Installation:

1. Installers should attend a Weld-On® Installation Seminar.
2. Allow at least two to three times the normal set and

cure times on page 22.

3. Flush system before putting into operation.
4. Installers should use extra care during assembly to ensure proper installation of system.
5. Make sure the proper cement for the specific application is used.
6. If there is any doubt about compatibility of materials (pipe, fittings or cement) with chemicals in system, manufacturers of materials should be contacted.

Solvent Welding Repairs

Taking into consideration the cost of materials, time involved and labor costs, in most cases the installer is better off cutting out the defective joint, replacing it with new materials and taking greater care in the joining process.

If the joint cannot be cut out, the following repair is somewhat successful. This repair is for leaks only, not cases where pipe has separated from fitting. Leak area should be dry and clean of debris, oil or grease.

1. Apply Weld-On® 810™/811™ to area to be repaired. Let the adhesive set.
2. Cut a fiberglass mat or tape, providing sufficient coverage/wrap to the leak area. Saturate mat/tape with adhesive.
3. Cover or wrap repair area with saturated mat/tape. Work air bubbles out of the fiberglass mat/tape.
4. Let repaired area cure before pressurizing. Although not a guaranteed fix, this process has proven very successful in most applications.

Solvent Welding Instructions

Joining Plastic Pipe in Hot Weather

There are many occasions when solvent welding plastic pipe at 95°F (38°C) temperatures and above cannot be avoided. If special precautions are taken, problems can be avoided.

Solvent cements for plastic pipe contain high strength solvents which evaporate faster at elevated temperatures. This is especially true when there is a hot wind blowing. If the pipe is stored in direct sunlight, the pipe surface temperatures may be from 20°F to 30°F (10°C to 15°C) higher than the ambient temperature. Solvents attack these hot surfaces faster and deeper, especially inside a joint. Therefore, it is very important to avoid puddling the cement inside the fitting socket and to wipe off any excess cement outside the joint.

By following our standard instructions and using a little extra care, as outlined below, successful solvent cemented joints can be made in even the most extreme hot weather conditions.

Tips to Follow when Solvent Welding in High Temperatures:

1. Store solvent cements and primers in a cool or shaded area prior to use.
2. If possible, store fittings and pipe or at least the ends to be solvent welded, in a shady area before cementing.
3. Cool the surfaces to be joined by wiping with a damp rag. Make sure that surface is dry prior to applying solvent cement.
4. Try to do the solvent welding during the cooler morning hours.
5. Make sure that both surfaces to be joined are still wet with cement when putting them together. With large diameter pipe, more people on the crew may be necessary.
6. Using a primer and a heavier, high viscosity cement will provide a little more working time. Vigorously shake or stir the cement before using.

As you know, during hot weather there can be a greater expansion-contraction factor. We suggest you follow the advice of the pipe manufacturer regarding this condition. Anchored, and final connections should be made during the cooler hours of the day.

By using Weld-On® products as recommended and by following these hot weather tips, making strong, leakproof joints even during very hot weather conditions can be achieved.

Joining Plastic Pipe in Cold Weather

Working in freezing temperatures is never easy. But sometimes the job is necessary. If that unavoidable job includes solvent welding plastic pipe, you can do it successfully with Weld-On® Solvent Cements.

By following our standard instructions and using a little extra care as outlined below, successful solvent welded joints can be made at temperatures even as low as -15°F (-26°C). In cold weather, solvents penetrate and soften the plastic pipe and fitting surfaces more slowly than in warm weather. Also the plastic is more resistant to solvent attack. Therefore it becomes even more important to pre-soften surfaces with an aggressive primer. And, because of slower evaporation, a longer cure time is necessary. Our cure schedules allow a margin for safety, but for colder weather more time should be allowed.

Tips to Follow in Solvent Welding during Cold Weather:

1. Prefabricate as much of the system as is possible in a heated work area.
2. Store cements and primers in a warmer area when not in use and make sure they remain fluid. If possible, store the fittings & valves the same way.
3. Take special care to remove moisture including ice and snow from the surfaces to be joined, especially from around the ends of the pipe.
4. Use the most aggressive Weld-On Primer available to soften the joining surfaces before applying cement. More than one application may be necessary.
5. Vigorously shake or stir cement before using. Allow a longer cure period before the system is tested and used.
*A heat blanket may be used to speed up the set and cure times.
6. Read and follow all of our directions carefully before installation. All Weld-On cements are formulated to have well balanced drying characteristics and to have good stability in subfreezing temperatures.

For all practical purposes, good solvent welded joints can be made in very cold conditions with proper care and a little common sense.

AVERAGE INITIAL SET SCHEDULE FOR WELD-ON PVC/CPVC SOLVENT CEMENTS*

TEMPERATURE RANGE	1/2" TO 1 1/4" (20-40MM)	1 1/2" TO 2" (50-63MM)	2 1/2" TO 8" (75-200MM)	10" TO 15" (250-380MM)	15"+ (380MM+)
60-100°F / 16 - 38°C	2 min.	5 min.	30 min.	2 hrs.	4 hrs.
40-60°F / 5 - 16°C	5 min.	10 min.	2 hrs.	8 hrs.	16 hrs.
0-40°F / -18 - 5°C	10 min.	15 min.	12 hrs.	24 hrs.	48 hrs.

Note: Initial set schedule is the necessary time to allow before the joint can be carefully handled.

In damp or humid weather, allow 50% more set time.

*These figures are estimates based on our laboratory tests. These figures should be used as a general guide only.

Solvent Welding Instructions

AVERAGE JOINT CURE SCHEDULE FOR WELD-ON PVC/CPVC SOLVENT CEMENTS*

RELATIVE HUMIDITY 60% OR LESS	PIPE SIZES							
	1/2" TO 1-1/4" (20-40MM)		1-1/2" TO 2" (50-63MM)		2-1/2" TO 8" (75-200MM)		10" TO 15" (250-380MM)	15"+ (380MM+)
TEMPERATURE RANGE DURING ASSEMBLY AND CURE PERIODS	UP TO 160 PSI (11 BAR)	160 TO 370 PSI (11-26 BAR)	UP TO 160 PSI (11 BAR)	160 TO 315 PSI (11-22 BAR)	UP TO 160 PSI (11 BAR)	160 TO 315 PSI (11-22 BAR)	UP TO 100 PSI (7 BAR)	UP TO 100 PSI (7 BAR)
60°-100°F	15 min.	6 hrs.	30 min.	12 hrs.	1 1/2 hrs.	24 hrs.	48 hrs.	72 hrs.
40°-60°F	20 min.	12 hrs.	45 min.	24 hrs.	4 hrs.	48 hrs.	96 hrs	6 days
0°-40°F	30 min.	48 hrs.	1 hr.	96 hrs.	72 hrs.	8 days	8 days	14 days

Note: Joint cure schedule is the necessary time to allow before pressurizing system.
In damp or humid weather allow 50% more cure time.

AVERAGE NUMBER OF JOINTS/QUART (1KG) OF WELD-ON® CEMENT*

PIPE DIAMETER	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	15"	18"
NUMBER OF JOINTS	300	200	125	90	60	40	30	10	5	2-3	1-2	3/4	1/2

For Primer: Double the number of joints shown for cement. Note: 1 Joint = 1 Socket

*These figures are estimates based on our laboratory tests. These figures should be used as a general guide only.

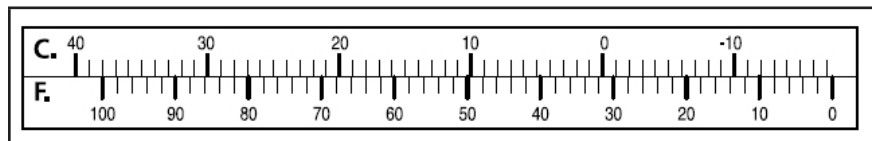
PIPE SIZE EQUIVALENT CHART - INCHES/MILLIMETERS

INCHES	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	14	18	24	30
MILLIMETERS	20	25	32	40	50	63	75	90	110	160	200	250	315	355	450	600	800

PRODUCT SHELF LIFE

WELD-ON PRODUCT	SHELF-LIFE
Primers/Cleaners	3 years
PVC Solvent Cement	3 years
CPVC Solvent Cement	2 years
ABS Solvent Cement	3 years

FAHRENHEIT TO CELSIUS CONVERSION CHART



Solvent Welding Helpful Hints

We are all aware that a properly cemented joint is a most critical part of the installation of plastic pipe and fittings. And no matter how many times we join pipe and fittings, it's very easy to overlook something. So, we just want to remind you of a few things you may already know.

1. Have you reviewed all of the instructions on the cement container label or in ASTM D-2855?
2. Are you using the proper cement for the job – for the type and size of pipe and correct fittings being joined?
3. Do you need to take special precautions because of unusual weather conditions?
4. Do you have sufficient manpower? Do you need more help to maintain proper alignment and to bottom pipe in fitting?
5. Do you have the proper tools, applicators and sufficient quantities of Weld-On® cements and primer and is cement in good condition?

Please Note: The adding of primers, cleaners or other thinners to thin the viscosity of solvent cement is not recommended.

6. Remember, primer is NOT to be used on ABS pipe

or fittings.

7. Be sure to use a large enough applicator to quickly spread cement generously on pipe and fittings. Then assemble immediately.
8. Avoid puddling excess primer and cement inside the fitting socket, especially on thin wall, bell-end PVC pipe.
9. Do NOT allow primer or cement to run through a valve-socket into the valve body. The solvents can cause damage to interior valve components and cause valve malfunction.
10. Be aware at all times of good safety practices. Solvent cements for pipe and fittings are flammable, so there should be no smoking or other sources of heat, spark or flame in working or storage areas. Be sure to work only in a well ventilated space and avoid unnecessary skin contact with all solvents. More detailed safety information is available from us.
11. Take advantage of our free literature on joining techniques. We offer DVDs/CDs on joining PVC/CPVC pipe and fittings, and individual bulletins.

Solvent Welding Instructions

Solvent Welding Special Precautions

WELD-ON® SOLVENT CEMENTS MUST NEVER BE USED IN A PVC OR CPVC SYSTEM USING OR BEING TESTED BY COMPRESSED AIR OR GASES!

Do not use any type of dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with PVC and CPVC solvent cements and primers (including their vapors) may result in a violent chemical reaction if a water solution is not used. It is advisable to purify lines by pumping chlorinated water into the piping system – this solution will be nonvolatile. Furthermore, dry granular calcium should not be stored or used near solvent cements and primers. All systems should be flushed before start-up to remove excess fumes from piping system.

New or repaired potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652.

CAUTION:




- USE CEMENTS AND PRIMERS ONLY IN WELL VENTED AREAS
- SEE MSDS SECTION II (AVAILABLE ON REQUEST) FOR EXPOSURE LIMITS AND FIRST AID INSTRUCTIONS
- CEMENTS AND PRIMERS ARE VOLATILE, KEEP AWAY FROM ANY SOURCE OF IGNITION

Solvent Welding Storage and Handling

Store in the shade between 40°F and 110°F (5°C and 44°C) or as specified on label. Keep away from heat, spark, open flame and other sources of ignition. Keep container closed when not in use. If the unopened container is subjected to freezing, it may become extremely thick or jelled. This cement can be placed in a warm area, where after a period of time, it will return to its original, usable condition. But such is not the case when jelling has taken place because of actual solvent loss – for example, when the container was left open too long during use or not properly sealed after use. Cement in this condition should not be used and should be properly discarded.

Weld-On® solvent cements are formulated to be used “as received” in original containers. Adding thinners or primers to change viscosity is not recommended. If the cement is found to be jelly-like and not free flowing, it should not be used. Containers of cement should be shaken or stirred before using. Do not shake primers.

Solvent Welding Listings and Standards

Weld-On products are  ,  , and/or  listed and meet one or more of the following ASTM Standards: D-2235, D-2564, D-2846, D-3122, D-3138, F-493, F-656.



Thermo-Sealing (Socket Fusion) Instructions For Polypropylene and PVDF Pressure Piping Systems

SCOPE

The socket fusion joining method which is detailed herein applies to all FABCO polypropylene and PVDF pressure piping systems including molded socket fittings, and socket type valve connections. This procedure involves the application of regulated heat uniformly and simultaneously to pipe and fitting mating surfaces so that controlled melting occurs at these surfaces.

All recommendations and instructions presented herein for socket fusion are based upon the use of a Thermo-Seal fusion tool for applying uniform heat to pipe and fittings.

Joining Equipment and Materials

- Cutting tools
- Cotton rags
- Deburring tool
- Thermo-Seal tool
- Electric Model NA with 1/2" - 2" tool pieces or
- Electric Model NB with 1/2" - 4" tool pieces
- Vise

TYPES OF JOINING TOOLS

ELECTRIC MODEL tools are available for making socket fusion joints. They are the preferred socket fusion tools because the thermostatically controlled heat source automatically maintains fusion temperatures within the recommended range.

1. Electric Model NA. This tool which is electrically heated and thermostatically controlled, is used to join polypropylene and PVDF pipe, and valves and fittings in sizes 1/2" through 2". This unit operates on 110 VAC (6.7 amps; 800 watts) electrically and is fitted with ground wires.
2. Electric Model NB. This tool is also electrically heated and thermostatically controlled and is used to join polypropylene pipe and fittings in sizes 1/2" through 4". This unit operates on 110 VAC (1.38 amps; 1650 watts) electrically and is fitted with ground wires.

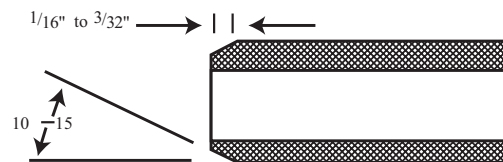
CAUTION: SOCKET FUSION AND FILLET WELDING INVOLVE TEMPERATURES IN EXCESS OF 540°F. SEVERE BURNS CAN RESULT FROM CONTACTING EQUIPMENT OR MOLTEN PLASTIC MATERIAL AT OR NEAR THESE TEMPERATURES.

PREPARATION FOR JOINING

1. Cutting - Polypropylene or PVDF can be easily cut with a power or hand saw, circular or band saw. For best results, use the fine-toothed blades (16-18 teeth per inch). A circumferential speed of about 6,000 ft/min. is suitable for circular saws; band saw speed should be approximately 3,000 ft/min. Carbide-tipped blades are preferable when large quantities of pipe are to be cut. It is important that the pipe ends be cut square. To ensure square end

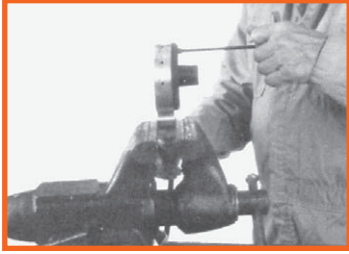
cuts, a miter box, hold down or jig must be used. Pipe or tubing cutters can also be used to produce square, clean cuts, however, the cutting wheel should be specifically designed for plastic.

2. Deburring and Beveling - All burrs, chips, filing, etc., should be removed from both the pipe I.D. and O.D. before joining. Use a knife, deburring tool or half-round, coarse file to remove all burrs. All pipe ends should be beveled to approximately the dimensions shown below for ease of socketing and to minimize the chances of wiping melt material from the I.D. of the fitting as the pipe is socketed. The beveling can be done with a coarse file or a beveling tool.

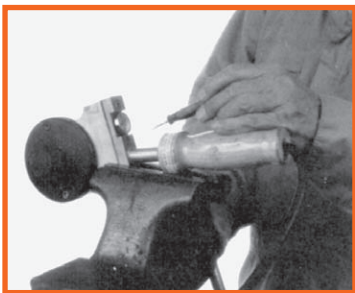


3. Cleaning - Using a clean, dry cotton rag, wipe away all loose dirt and moisture from the I.D. and O.D. of the pipe end and the I.D. of the fitting. DO NOT ATTEMPT TO SOCKET FUSE WET SURFACES.
4. Joint Sizing - In order to provide excess material for fusion bonding, polypropylene and PVDF components are manufactured to socket dimensions in which the socket I.D. is smaller than the pipe O.D. Therefore, it should not be possible to easily slip the pipe into the fitting socket past the initial socket entrance depth and in no case should it ever be possible to bottom the pipe in the socket prior to fusion. Before making socket fusion joints, fittings should be checked for proper socket dimensional tolerances, based on the above discussion, by attempting to insert the pipe into the fitting socket. If a fitting socket appears to be oversize, it should not be used.
5. Planning Construction - Socket fusion joints are more easily made when there is sufficient space to properly secure the Thermo-Seal tool and to maneuver pipe and fittings into the Thermo-Seal tool. Therefore, it is recommended that the piping system be prefabricated, as much as possible, in an area where there is sufficient room to work, and that as few joints as possible should be made in areas where there is limited working space. Mechanical joints such as flanges or unions may be considered in extremely tight areas.
6. Thermo-Seal Tool Set Up
 - a. Install the male and female tool pieces on either side of the Thermo-Seal tool and secure with set screws.

Thermo-Sealing Instructions



b. Insert the electrical plug into a grounded 110 VAC electrical source, and allow the tool to come to the proper operating temperature. The tool temperature is read directly from the mounted temperature gauge, and tool temperature can be adjusted by turning the thermostat adjustment screw with a screwdriver. (Counterclockwise) to raise the temperature and clockwise to lower the temperature.)



NOTE: One turn of the adjustment screw will give approximately a 25°F temperature change

IMPORTANT: Good socket fusion joints can be made only when the Thermo-Seal tool is operating at the proper temperature, and only when the length of time that the pipe and fittings remain on the heated tool pieces does not exceed those times recommended for the particular size of pipe and fitting to be joined. Please consult the user manual for your particular system.

Excessive temperatures and excessive heating times will result in excessive melting at and below the surfaces of the fitting socket I.D. and pipe O.D. When the pipe is inserted into the fitting socket, excessive melt material needed for socket fusion will be scraped from the socket wall and into the fitting waterway and the resulting joint will be defective. Low temperatures and insufficient heating times will result in a lack of or incomplete melting making it impossible to make a good socket fusion joint.

MAKING SOCKET FUSION JOINTS

1. Place the proper size depth gauge over the end of the pipe.



2. Attach the depth gauging clamp to the pipe by butting

the clamp up to the end of the depth gauge and locking it into place. Then remove the depth gauge.



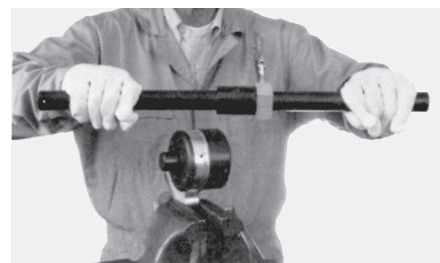
3. Simultaneously place pipe and fitting squarely and fully on heat tool pieces so that the I.D. of the fitting and the O.D. of the pipe are in contact with the heating surfaces. Care should be taken to insure that the pipe and fitting are not cocked when they are inserted on the tool pieces.



4. Hold the pipe and fitting on the tool pieces for the prescribed amount of time. During this time a bead of melted material will appear around the complete circumference of the pipe at the entrance of the tool piece.



5. Simultaneously remove the pipe and fitting from the tool pieces and immediately insert the pipe, squarely and fully and without purposeful rotation, into the socket of the fitting. Hold the completed joint in place and avoid relative movement between components for at least 15 seconds.



6. Once a joint has been completed the clamp can be removed and preparation for the next joint can be started.

Thermo-Sealing Instructions



7. The surfaces of the female and male tool pieces are Teflon coated to prevent sticking of the hot plastic. It is important that the tool pieces be kept as clean as possible. Any residue left on the tool pieces should be removed immediately by wiping with a cotton cloth. CAUTION: HOT PLASTIC MATERIAL CAN CAUSE SEVERE BURNS; AVOID CONTACT WITH IT.



Procedures for making good socket fusion joints can be summarized into five basic principles as follows:

1. The tool must be operated at the proper temperature.
2. The pipe end must be beveled.
3. The fitting must be slipped squarely onto the male tool while the pipe is simultaneously inserted into the female tool.
4. The fitting and pipe must not remain on the heat tool for an excessive period of time. Recommended heating times must be followed.
5. The pipe must be inserted squarely into the fitting socket immediately after removal from the heated tools.
6. The Thermo-Seal tool must be kept clean at all times.

PRESSURE TESTING

The strength of a socket fusion joint develops as the material in the bonded area cools. One hour after the final joint is made, a socket fusion piping system can be pressure tested up to 100% of its hydrostatic pressure rating.

CAUTION: AIR OR COMPRESSED GAS IS NOT RECOMMENDED AND SHOULD NOT BE USED AS A MEDIA FOR PRESSURE TESTING OF PLASTIC PIPING SYSTEMS.

FILLET WELDING

SCOPE

The joining procedure covered herein applies only to 6" polypropylene drainage or non-pressure systems. Fillet Welding is not recommended as a primary joining technique for pressure rated systems.

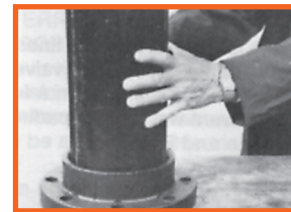
Joining Equipment and Materials

- Cutting and deburring tools
- Plastic welding gun with flexible hose, pressure regulator and gauge

- Welding and tacking tips
- Compresses air supply or bottled nitrogen (see note below)
- 1/8" welding rod
- Cotton rags

Joining

NOTE: Fillet welding of thermoplastics is quite similar to the acetylene welding or brazing process used with metals. The fundamental differences are that the plastic rod must always be the same basic material as the pieces to be joined; and heated gas, rather than burning gas, is used to melt the rod and adjacent surfaces. Because of its economy, compressed air is normally the gas of choice for most plastic welding. A welding gun which generates its own air supply is frequently desirable for field-made pipe joints where ultimate weld strength is not required. For welding guns which require compressed gas, nitrogen is preferable when the compressed plant air system does not contain adequate drying and filtration (Presence of moisture in the gas stream causes premature failure in the heater element of the welding gun. Impurities in the gas stream, particularly those in oil, may oxidize the plastic polymer, resulting in loss of strength. Polypropylene is known to be affected in this manner).



1. Insert pipe fully and squarely into the fitting after removing all dirt, oil, moisture and loose particles of plastic material from the welding surfaces by wiping with a clean cotton cloth.

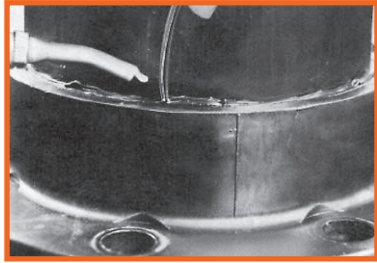


2. Adjust the nitrogen/air pressure between approximately 3 and 8 psi and further adjust the pressure as necessary to control both temperature and rate of welding.

NOTE: Tacking required prior to welding. 6" polypropylene joints require a slip fit. Therefore, they must be dry fitted and tack welded to prevent movement of the pipe and fitting prior to the application of welding rod. Special welding gun tips are required for tacking. A low strength bond is accomplished by pulling the heated tacking tip along while directly in contact with the interface of pipe and fitting at an angle of 75° to 80°. Initially, joints are tack-fused at four intervals.

Thermo-Sealing Instructions

Then at least one complete revolution around the joint is made to provide a uniform groove for subsequent rod welding.



3. Holding the polypropylene welding rod at an angle of 75° to the joint and while maintaining pressure on the rod, apply heat uniformly to the rod and the pipe and fitting with an arching motion of the welding torch.

The degree of heating can be controlled by regulating the nitrogen/air flow to the welding gun or by regulating the distance from the tip of the welding gun to the work. Too much heat will over melt the polypropylene material and cause it to splash. Too little heat will result in incomplete fusion. Lay three separate weld beads in the following manner for a full fillet weld:

- A. Pipe to fitting
- B. Pipe to bead
- C. Fitting to bead

When terminating each weld bead, the bead should be lapped on top of (never along-side) itself for a distance of 3/8" to 1/2" insights to hot gas welding see REPAIRING THERMOPLASTIC PIPE JOINTS.

FLANGED JOINTS

SCOPE

Flanging is used extensively for plastic process lines that require periodic dismantling. Plastic flanges are factory flanged valves and fittings in PVC, CPVC, PVDF and polypropylene are available in a full range of sizes and types for joining to pipe by solvent welding, threading or socket fusion as in the case with polypropylene with PVDF.

Gasket seals between the flange faces should be an elastomeric full flat faced gasket with a hardness of 50 to 70 durometer. FABCO can provide neoprene gaskets in the 1/2" through 12" range having an 1/8" thickness. For chemical environments too aggressive for neoprene another resistant elastomer should be used.

When it is necessary to bolt plastic and metal flanges - use flat face metal flanges - not raised face, and use recommended torques shown in table under "INSTALLATION TIPS".

DIMENSIONS

Bolt circle and number of bolt holes for the flanges are the same as Class 150 metal flanges per ANSI B16.5. Threads are tapered iron pipe size threads per ANSI B1.20.1. The socket dimensions conform to ASTM D-2467 which describes 1/2" through 8" sizes and ASTM D439 for Schedule 80 CPVC which gives dimensional data for 1/2" through 6". Internal Fabco specifications have been established for the 10" and 12" PVC patterns and 8"

CPVC design, as well as socket designs for polypropylene and PVDF.

PRESSURE RATING

As with all other thermoplastic piping components, the maximum non-shock operating pressure is a function of temperature.

Maximum pressure rating for FABCO valves, unions and flanges is 150 psi. Above 100°F refer to the TEMPERATURE CORRECTION FACTOR CHART HEREIN.

SEALING

The faces of flanges are tapered back away from the orifice area at a 1/2 to 1 degree pitch so that when the bolts are tightened the faces will be pulled together generating a force in the water way area to improve sealing.

INSTALLATION TIPS

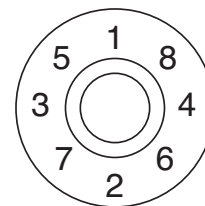
Once a flange is joined to pipe, the method for joining two flanges together is as follows:

1. Make sure that all the bolt holes of the mating flanges match up. It is not advisable to twist the flange and pipe to achieve this.
2. Use flat washers under bolt heads and nuts.
3. Insert all bolts. (Lubricate bolts.)
4. Make sure that the faces of the mating flanges are not separated by excessive distance prior to bolting down the flanges.
5. The bolts on the plastic flanges should be tightened by pulling down the nuts diametrically opposite each other using a torque wrench. Complete tightening should be accomplished in stages and the final torque values shown in the table should be followed for the various sizes of flanges. Uniform stress across the flange will eliminate leaky gaskets.

FLANGE SIZE	RECOMMENDED TORQUE*
1/2 - 1-1/2"	10 - 15 ft.lbs.
2 - 4"	20 - 30 ft.lbs.
6 - 8"	33 - 50 ft.lbs.
10"	53 - 75 ft.lbs.
12"	80 - 110 ft.lbs.

*For a well lubricated bolt with flat washers under bolt head and nut.

The following tightening pattern is suggested for the flange bolts.



6. If the flange is mated to a rigid and stationary flanged object, or a metal flange, particularly in a buried situation where settling could occur with the plastic pipe, the adjacent plastic pipe must be supported or anchored to eliminate potential stressing of the flange joint.

Thermoplastic Pipe Joint Repair

Thermoplastic Pipe Joint Repair

SCOPE

The most common method for repairing faulty and leaking joints is hot gas welding at the fillet formed by the junction of the fitting socket entrance and the pipe. Hot gas welding (which is similar to gas welding with metals except that hot gas is used for melting instead of a direct flame) consists of simultaneously melting the surface of a plastic filler rod and the surfaces of the base material in the fillet area while forcing the softened rod into the softened fillet. Welding with plastics involves only surface melting because plastics unlike metal must never be "puddled". Therefore, the resulting weld is not as strong as the parent pipe and fitting material. This being the case, fillet welding as a repair technique is recommended for minor leaks only. It is not recommended as a primary joining technique for pressure rated systems.

WELDING TOOLS AND MATERIALS

- Plastic welding gun with pressure regulator, gauge and hose.
- Filler rod
- Emery cloth
- Cotton rags
- Cutting pliers
- Hand grinder (optional)
- Compressed air supply of bottled nitrogen
- Source of compressed air

WELD AREA PREPARATION

Wipe all dirt, oil and moisture from the joint area. A very mild solvent may be necessary to remove oil.

CAUTION: MAKE SURE THAT ALL LIQUID HAS BEEN REMOVED FROM THE PORTION OF THE PIPING SYSTEM WHERE THE WELD IS TO BE MADE.

If backwelding is required, all residual cement, which is easily scorched during welding, must be removed from the fillet by using emery cloth. If the weld is to seal a threaded joint, a file can be used to remove threads in the weld area in order to provide a smooth surface.

WELDING BACK JOINTS

1. Remove residual solvent cement from the weld area using emery cloth. When welding threaded joints, a file can be used to remove threads in the weld area.



2. Wipe the weld area clean of dust, dirt and moisture.
3. Determine the amount for the correct filler rod necessary to make one complete pass around the joint by wrapping the rod around the pipe to be welded. Increase this length enough to allow for handling of the rod to the end of the pass.



4. Make about a 60° angular cut on the lead end of the filler rod. This will make it easier to initiate melting and will insure fusion of the rod and base material at the beginning of the weld.



5. Welding temperatures vary for different thermoplastic materials (500°F - 550°F for PVC and CPVC, 550°F - 600°F for PP, 575°F - 600°F for PVDF). Welding temperatures can be adjusted for the various thermoplastic materials as well as any desired welding rate, by adjusting the pressure regulator (which controls the gas flow rate) between 3 and 8 PSI.



CAUTION: For welding guns which require compressed gas, nitrogen is preferred when the compressed plant air system does not contain adequate drying and filtration. (Presence of moisture in the gas stream causes premature failure in the heater element of the welding gun. Impurities in the gas stream, particularly those in oil, may oxidize the plastic polymer, resulting in loss of strength. Polypropylene is known to be affected in this manner).

6. With air or an inert gas flowing through the welding torch, insert the electrical plug for the heating element into an appropriate electrical socket to facilitate heating of the gas and wait approximately 7 minutes for the welding gas to reach the proper temperature.



CAUTION: THE METAL BARREL OF THE WELDING TORCH HOUSES THE HEATING ELEMENT SO IT CAN ATTAIN EXTREMELY HIGH TEMPERATURES. AVOID CONTACT WITH THE BARREL AND DO NOT ALLOW IT TO CONTACT ANY COMBUSTIBLE MATERIALS.

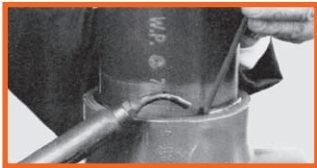
7. Place the leading end of the filler rod into the fillet formed by the junction of the pipe and fitting socket entrance. Holding the filler rod at an angle of 90° to the joint for PVC, CPVC and Kynar, 75° to the joint for polypropylene, pre-heat the surfaces for the rod and base materials at the weld starting point by holding the welding torch steady at approximately

ThermoPlastic Pipe Joint Repair

1/4 to 3/4 inches from the weld starting point and directing the hot gas in this area until the surfaces become tacky. While preheating, move the rod up and down slightly so that the rod slightly touches the base materials. When the surfaces become tacky, the rod will stick to the base material.



8. Advance the filler rod forward by applying a slight pressure to the rod. Simultaneously applying even heat to the surfaces of both the filler rod and base material by moving the torch with a fanning or arcing motion at a rate of about 2 cycles per second. The hot gas should be played equally on the rod and base material (along the weld line) for a distance of about 1/4 inch from the weld point.



IMPORTANT: If charring of the base or rod material occurs, move the tip of the torch back slightly, increase the fanning frequency or increase the gas flow rate. If the rod or base materials do not melt sufficiently reverse the previously discussed corrective procedures. Do not apply too much pressure to the rod because this will tend to stretch the weld bead causing it to crack and separate after cooling.

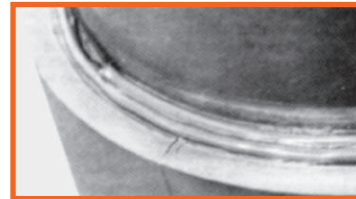
9. Since the starting point for a plastic weld is frequently the weakest part of the weld, always terminate a weld by lapping the bead on top of itself for a distance of 3/8 to 1/2 inches. Never terminate a bead by overlapping the bead side by side.



10. When welding large diameter pipe, three weld passes may be required. The first bead should be deposited at the bottom of the fillet and subsequent beads should be deposited on each side of the first bead. When making multiple pass welds, the starting points for each bead should be staggered and ample time must be allowed for each weld pass to cool before proceeding with additional welds.



11. Properly applied plastic welds can be recognized by the presence of small flow lines or waves on both sides of the deposited bead. This indicates that sufficient heat was applied to the surfaces of the rod and base materials to effect adequate melting and that sufficient pressure was applied to the rod to force the rod melt to fuse with base material melt. If insufficient heat is used when welding PVC, CPVC or PVDF, the filler rod will appear in its original form and can easily be pulled away from the base material. Excessive heat will result in a brown or black discoloration of the weld. In the case of polypropylene, excessive heat will result in a flat bead with oversized flow lines.



12. Always unplug the electrical connection to the heating element and allow the welding gun to cool before shutting off the gas or air supply to the gun.

WELDING PRINCIPLES

The procedures for making good thermoplastic welds can be summarized into four basic essentials:

1. Correct Heating – Excessive heating will char or overmelt. Insufficient heating will result in incomplete melting.
2. Correct Pressure – Excessive pressure can result in stress cracking when the weld cools. Insufficient pressure will result in incomplete fusion of the rod material with the base material.
3. Correct angle – Incorrect rod angle during welding will stretch the rod and the finished weld will crack upon cooling.
4. Correct speed – Excessive welding speed will stretch the weld bead and the finished weld will crack upon cooling.

Rod Size and Weld Passes

Filler rod size and the number of weld passes required to make a good plastic weld are dependent upon the size of the pipe to be welded as presented below. Do not use filler rod larger than 1/8" in diameter when welding with CPVC. Also, when welding CPVC, the number of passes for pipe sizes 1" through 2" should be increased to three.

PIPE SIZE	ROD SIZE	NUMBER OF PASSES
1/2" - 3/4"	3/32"	1
1" - 2"	3/32"	1 or 3
2-1/2" - 4"	1/8"	3
6" - 8"	1/8" or 5/32"	3
10" - 12"	5/32" or 3/16"	3

Pressure Testing

The strength of a plastic weld develops as it cools. Allow ample time for the weld to cool prior to 100% pressure testing.

CAUTION: Air or compressed gas is not recommended and should not be used as a media for pressure testing of plastic piping systems.

Thermoplastic Pipe Threading Instructions

SCOPE

The procedure presented herein covers threading of all IPS Schedule 80 or heavier thermoplastic pipe. The threads are National Pipe Threads (NPT) which are cut to the dimensions outlined in (ANSI) B1.20.1 and presented in the table on the following page.

THREADING EQUIPMENT AND MATERIALS

- Pipe Dies
- Pipe Vise
- Threading ratchet or power machine
- Tapered plug
- Cutting lubricant (soap & water)
- Strap wrench
- Teflon tape
- Cutting and Deburring tools

Pipe Preparation

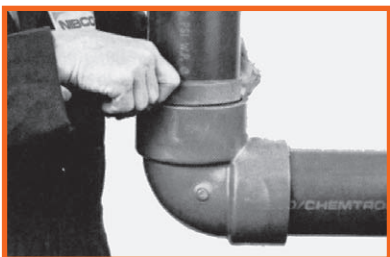
Plastic pipe can be easily cut with a handsaw, power hacksaw, circular or band saw. For best results, use a finetoothed blade (16-18 teeth per inch) with little or no set (maximum 0.025"). A circumferential speed of about 6,000 ft./ min. is suitable for circular saws; band saw speed should be approximately 3,000 ft./min. Carbide-tipped blades are preferable when quantities of pipe are to be cut. To ensure square-ends, a miter box hold-down or jig should be used. Pipe or tubing cutters can be used for smaller diameter pipe when the cutting wheel is specifically designed for plastic pipe.

Threading Dies

Thread cutting dies should be clean, sharp and in good condition, and should not be used to cut materials other than plastics. Dies with a 5° negative front rake are recommended when using power threading equipment and dies with a 5° to 10° negative front rake are recommended when cutting threads by hand.

Threading and Joining

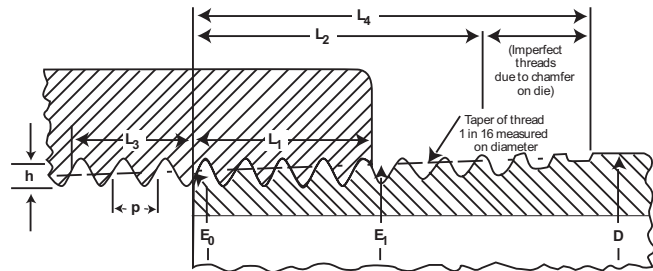
1. Hold pipe firmly in a pipe vise. Protect the pipe at the point of grip by inserting a rubber sheet or other material between the pipe and vise.



2. A tapered plug must be inserted in the end of the pipe to be threaded. This plug provides additional support and prevents distortion of the pipe in the threaded area. Distortion of the pipe during the threading operation will result in eccentric threads, non-uniform circumferential thread depth or gouging and tearing of the pipe wall. See the following Table for approximate plug O.D. dimensions.



DO NOT THREAD SCHEDULE 40 PIPE



REINFORCING PLUG DIMENSIONS

PIPE SIZE	PLUG O.D.*
1/2"	.526
3/4"	.722
1"	.935
1-1/4"	1.254
2"	1.913
2-1/2"	2.289
3"	2.864
4"	3.786

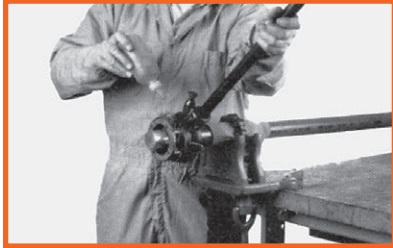
*These dimensions are based on the median wall thickness and average outside diameter for the respective pipe sizes. Variations in wall thicknesses and O.D. dimensions may require alteration of the plug dimensions.

3. Use a die stock with a proper guide that is free of burrs or sharp edges, so the die will start and go on square to the pipe axis.

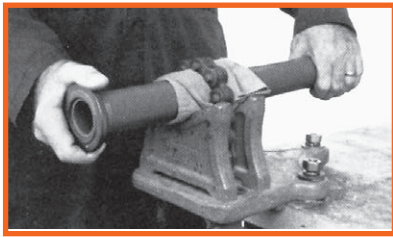


Threading Instructions

- Push straight down on the handle, avoiding side pressure that might distort the sides of the threads. If power threading equipment is used, the dies should not be driven at high speeds or with heavy pressure. Apply an external lubricant liberally when cutting the threads. Advance the die to the point where the thread dimensions are equal to those listed in Table No. 1. Do not over thread.



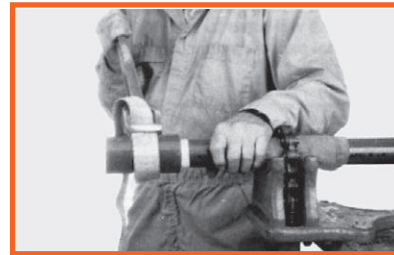
- Periodically check the threads with a ring gauge to ensure that proper procedures are being followed. Thread dimensions are listed in Table 1 and the gauging tolerance is $\pm 1\text{-}1/2$ turns.



- Brush threads clean of chips and ribbons. Then starting with the second full thread, and continuing over the thread length, wrap TFE (Teflon) thread tape in the direction of the threads. Overlap each wrap by one half of the width of the tape. FABCO does not recommend the use of any thread lubricant/sealant other than TFE (Teflon) tape.



- Thread the fitting onto the pipe and tighten by hand. Using a strap wrench only, further tighten the connection an additional one or two threads past hand tightness. Avoid excessive torque as this may cause thread damage or fitting damage.



PRESSURE TESTING

Threaded piping systems can be pressure tested up to 100% of the hydrostatic pressure rating as soon as the last connection is made.

CAUTION: AIR OR COMPRESSED GAS IS NOT RECOMMENDED AND SHOULD NOT BE USED AS A MEDIA FOR PRESSURE TESTING OF PLASTIC PIPING SYSTEMS.

PIPE AND FITTING THREADS AMERICAN STANDARD TAPER PIPE THREAD, NPT (EXCERPT FROM ANSI B1.20.1) IN INCHES

NOMINAL SIZE	OUTSIDE DIAMETER D	NUMBER OF THREADS PER IN. N	PITCH OF THREAD P	NORMAL ENGAGEMENT BY HAND L1	NORMAL ENGAGEMENT BY HAND L2	WRENCH MAKEUP LENGTH FOR INTERNAL THREAD L3	TOTAL LENGTH: END OF PIPE TO VANISH POINT L4	PITCH DIAMETER AT BEGINNING OF EXTERNAL THREAD E0	PITCH DIAMETER AT BEGINNING OF INTERNAL THREAD E1	HEIGHT OF THREAD (MAX) H
1/4	0.54	18	.05556	.228	.4018	.1667	.5946	.47739	.49163	.04444
1/2	0.84	14	.07143	.32	.5337	.2143	.7815	.75843	.77843	.05714
3/4	1.05	14	.07143	.339	.5457	.2143	.7935	.96768	.98887	.05714
1	1.315	11 1/2	.08696	.400	.6828	.2609	.9845	1.21363	1.23863	.06957
1 1/4	1.660	11 1/2	.08696	.420	.7068	.2609	1.0085	1.55713	1.58338	.06957
1 1/2	1.900	11 1/2	.08696	.420	.7235	.2609	1.0252	1.79609	1.82234	.06957
2	2.375	11 1/2	.08696	.436	.7565	.2609	1.0582	2.26902	2.29627	.06957
2 1/2	2.875	8	.12500	.682	1.1375	.2500	1.5712	2.71953	2.76216	.10000
3	3.500	8	.12500	.766	1.2000	.2500	1.6337	3.34062	3.38850	.10000
4	4.500	8	.12500	.844	1.3000	.2500	1.7337	4.33438	4.38712	.10000

(NOTE: Special dies for threading plastic pipe are available). When cutting threads with power threading equipment, self opening die heads and a slight chamfer to lead the dies will speed production.

Flow Capacity and Friction Loss for Schedule 40 Thermoplastic Pipe per 100ft

Gals. Per Minute	1/4" Pipe	3" Pipe	1/2" Pipe	4" Pipe	3/4" Pipe	1" Pipe	1 1/4" Pipe	1 1/2" Pipe	2" Pipe	2 1/2" Pipe
1/2	1.73	4.90	2.12							
3/4	2.59	10.38	4.50							
1	3.45	17.88	7.66							
2	6.90	63.82	27.66							
5	17.26	348.29	150.83							
7										
10										
15										
20										
25	1.10	.17	.07							
30	1.32	.24	.11							
35	1.54	.32	.14							
40	1.77	.41	.18							
45	1.99	.51	.22							
50	2.21	.61	.26							
60	2.65	.86	.37							
70	3.09	1.15	.50							
75	3.31	1.30	.56							
80	3.53	1.47	.64							
90	3.97	1.82	.79							
100	4.41	2.22	.96							
125	5.52	3.35	1.45							
150	6.62	4.70	2.04							
175	7.72	6.25	2.71							
200	8.83	8.00	3.47							
250	11.03	12.10	5.24							
300	13.24	16.96	7.35							
350	15.45	22.56	9.78							
400										
450										
500										
750										
1000										
1250										
1500										
2000										
2500										
3000										
3500										
4000										

Flow Capacity and Friction Loss for Schedule 80 Thermoplastic Pipe per 100ft

Gals. Per Minute	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe	1" Pipe	1 1/4" Pipe	1 1/2" Pipe	2" Pipe	2 1/2" Pipe
	Velocity (Feet per Second)	Friction Head (Feet)	Friction Loss (PSI)	Velocity (Feet per Second)	Friction Head (Feet)	Friction Loss (PSI)	Velocity (Feet per Second)	Friction Head (Feet)	Friction Loss (PSI)
1/4	1.28	3.57	1.55						
1/2	2.57	12.88	5.58						
3/4	3.85	27.29	11.83						
1	5.14	46.49	20.15						
3	15.41	355.60	154.20						
5									
7									
10									
15									
20									
25									
30									
35									
40									
45									
50									
60									
70									
75									
80									
90									
100									
125									
150									
175									
200									
250									
300									
350									
400									
450									
500									
750									
1000									
1250									
1500									
2000									
2500									
3000									
3500									
4000									

Temperature Rating of Fabco Products

Since the strength of plastic pipe is sensitive to temperature, the identical test method is used to determine the material strength at elevated temperature levels. The correction factor for each temperature is the ratio of strength at that temperature level to the basic strength at 73° F. Because the hoop stress is directly proportional to the internal pressure, which created that pipe stress, the correction factors may be used for the temperature correction of pressure as well as stress. For pipe and fitting applications above 73° F, refer to the table below for the Temperature Correction Factors. To determine the maximum non-shock pressure rating at an elevated temperature, simply multiply the base pressure rating obtained from the table in the preceding column by the correction factor from the table below. The allowable pressure will be the same as the base pressure for all temperatures below 73° F.

TEMPERATURE CORRECTION FACTORS

OPERATING TEMPERATURE (°F)	FACTORS			
	PVC	CPVC	PP	PVDF
70	1.00	1.00	1.00	1.00
80	0.90	0.96	0.97	0.95
90	0.75	0.92	0.91	0.87
100	0.62	0.85	0.85	0.80
110	0.50	0.77	0.80	0.75
115	0.45	0.74	0.77	0.71
120	0.40	0.70	0.75	0.68
125	0.35	0.66	0.71	0.66
130	0.30	0.62	0.68	0.62
140	0.22	0.55	0.65	0.58
150	N.R.	0.47	0.57	0.52
160	N.R.	0.40	0.50	0.49
170	N.R.	0.32	0.26	0.45
180	N.R.	0.25	*	0.42
200	N.R.	0.18	N.R.	0.36
210	N.R.	0.15	N.R.	0.33
240	N.R.	N.R.	N.R.	0.25
280	N.R.	N.R.	N.R.	0.18

* Recommended for intermittent drainage pressure not exceeding 20 psi.
N.R. = Not Recommended.

Pressure Rating of Fabco Products

The pressure carrying capability of any pipe at a given temperature is a function of the material strength from which the pipe is made and the geometry of the pipe as defined by its diameter and wall thickness. The following expression, commonly known as the ISO equation, is used in thermoplastic pipe specifications to relate these factors:

$$P = 2S / (Do/t - 1)$$

where: P = maximum pressure rating, psi
S = maximum hydraulic design stress (max. working strength), psi
Do = average outside pipe diameter, in.
t = minimum wall thickness, in.

The allowable design stress, which is the tensile stress in the hoop direction of the pipe, is derived for each material in accordance with ASTM D 2837, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials, at 73° F. The pressure ratings below were calculated from the basic Hydraulic Design Stress for each of the materials.

Pipe and Fittings

In order to determine the pressure rating for a product system, first find the plastic material and schedule of pipe and fittings in the heading of the Maximum Non-Shock Operating Pressure table below. Then, locate the selected joining method in the subheading of the table and go down the column to the value across from a particular pipe size, listed in the far left column. This will be the maximum non-shock operating pressure at 73° F for the defined product system.

MAX. NON-SHOCK OPERATING PRESSURE (PSI) AT 73°F

SCHEDULE 40 PVC & CPVC		SCHEDULE 80 PVC & CPVC	
NOM. PIPE SIZE	SOCKET END	SOCKET END	THREADED END
1/2	600	850	420
3/4	480	690	340
1	450	630	320
1 1/4	370	520	260
1 1/2	330	470	240
2	280	400	200
2 1/2	300	420	210
3	260	370	190
4	220	320	160
6	180	280	N.R.
8	160	250	N.R.
10	140	230	N.R.
12	130	230	N.R.

SCHEDULE 80 POLYPROPYLENE		SCHEDULE 80 PVDF		
NOM. PIPE SIZE	THERMO SEAL	THERMO SEAL		
	JOINT	THREADED	JOINT	THREADED
1/2	410	20	580	290
3/4	330	20	470	230
1	310	20	430	210
1 1/4	260	20	—	—
1 1/2	230	20	326	160
2	200	20	270	140
2 1/2	—	—	—	—
3	190	20	250	N.R.
4	160	20	220	N.R.
6	140	N.R.	190	N.R.

N.R. = Not Recommended.

1. For more severe service, an additional correction factor may be required.
2. 8" CPVC Tee, 90° ELL and 45° ELL rated at 1/2 of value shown. Pressure rating of 175 psi can be obtained by factory overwrapping with glass and polyester. Consult Customer Service for delivery information.
3. Recommended for intermittent drainage pressure not exceeding 20 psi.

Valves, Unions, and Flanges

The maximum pressure rating for valves, flanges, and unions, regardless of size, is 150 psi at 73° F. As with all other thermoplastic piping components, the maximum non-shock operating pressure is related to temperature. Above 100° F refer to the chart below.

MAXIMUM NON-SHOCK OPERATING PRESSURE (PSI) VS. TEMPERATURE

TEMPERATURE (° F)	PVC	CPVC	PP	PVDF
100	150	150	150	150
110	135	140	140	150
120	110	130	130	150
130	75	120	118	150
140	50	110	105	150
150	N.R.	100	93	140
160	N.R.	90	80	133
170	N.R.	80	70	125
180	N.R.	70	50	115
190	N.R.	60	N.R.	106
200	N.R.	50	N.R.	97
250	N.R.	N.R.	N.R.	50
280	N.R.	N.R.	N.R.	25

N.R. = Not Recommended.

Fabco Products in Vacuum or Collapse Loading Situations

Thermoplastic pipe is often used in applications where the pressure on the outside of the pipe exceeds the pressure inside. Suction or vacuum lines and buried pipe are examples of this type of service. As a matter of practical application, gauges indicate the pressure differential above or below atmospheric pressure. However, scientists and engineers frequently express

pressure on an absolute scale where zero equals a theoretically perfect vacuum and standard atmospheric pressure equals 14.6959 psia.

Solvent cemented or thermo-sealed joints are particularly recommended for vacuum service. In PVC, CPVC, PP, or PVDF vacuum systems, mechanical devices such as valves and transition joints at equipment will generally represent a greater intrusion problem than the thermoplastic piping system will. Experience indicates that PVC vacuum systems can be evacuated to pressures as low as 5 microns with continuous pumping. However, when the system is shut off, the pressure will rise and stabilize around 10,000 microns or approximately 10 mm of Mercury at 73° F. The following chart lists the allowable collapse loading for plastic pipe at 73° F. It shows how much greater the external pressure may be than the internal pressure. (Thus, a pipe with 100 psi internal pressure can withstand 100 psi more external pressure than a pipe with zero psi internal pressure.) For temperatures other than 73° F, multiply the values in the chart by the correction factors listed in the temperature correction table on the preceding page. The chart also applies to a vacuum. The external pressure is generally atmospheric pressure, or 0.0 psig, while the internal pressure is normally identified as a vacuum or negative gauge pressure. However, this negative value will never exceed -14.7 psig. Therefore, if the allowable pressure listed in the chart (after temperature correction) is greater than the difference for internal-to-external pressure, the plastic system is viable.

PIPE SIZE	SCH. 40 PVC	SCH. 80 PVC	SCH. 80 CPVC	SCH. 80 PP	SCH. 80 PVDF
1/2	450	575	575	230	391
3/4	285	499	499	200	339
1	245	469	469	188	319
1 1/4	160	340	340	136	—
1 1/2	120	270	270	108	183
2	75	190	190	76	129
2 1/2	100	220	220	—	—
3	70	155	155	62	105
4	45	115	115	46	78
6	25	80	80	32	54
8	16	50	50	—	—
10	12	43	—	—	—
12	9	39	—	—	—

Pressure Losses in a Piping System

Piping Calculations

As a fluid flows through a piping system, it will experience a headloss depending on, among other factors, fluid velocity, pipe wall smoothness and internal pipe surface area. The Tables on pages 9 and 10 give Friction Loss and Velocity data for Schedule 40 and Schedule 80 thermoplastic pipe based on the Williams and Hazen formula.

$$H=0.2083 \times (100/C)^{1.852} \times (q^{1.852}/d^{4.8655})$$

Where: H = Friction Head Loss in Feet of Water/100 Feet of Pipe

C = Surface Roughness Constant (150 for all thermoplastic pipe)

q = Fluid Flow (gallons/min.)

d = Inside Diameter of Pipe

Fittings and valves, due to their more complex configurations, contribute significant friction losses in a piping system. A common method of expressing the losses experienced in fittings is to relate them to pipe in terms of equivalent pipe length. This is the length of pipe required to give the same friction loss as a fitting of the same size. Tables are available for the tabulation of the equivalent pipe length in feet for the various sizes of a number of common fittings. By using this Table and the Friction Loss Tables, the total friction loss in a plastic piping system can be calculated for any fluid velocity.

For example, suppose we wanted to determine the pressure loss across a 2" Schedule 40, 90° elbow, at 75 gpm. From the lower table we find the equivalent length of a 2" 90° elbow to be 5.5 feet of pipe. From the Schedule 40 Pipe Table we find the friction loss to be 3.87 psi per 100 feet of pipe when the flow rate is 75 gpm. Therefore, the solution is as follows:

$$5.5 \text{ Feet}/90^\circ \text{ Elbow} \times 3.87 \text{ psi}/100 \text{ Feet} \\ = 0.21 \text{ psi Pressure Drop}/90^\circ \text{ Elbow}$$

which is the pressure drop across a 2" Schedule 40 elbow. But, what if it were a 2" Schedule 80 elbow, and we wanted to know the friction head loss? The solution is similar, except we look for the friction head in the Schedule 80 Pipe Table and find it to be 12.43 feet per 100 feet of pipe when the flow rate is 75 gpm. The solution follows:

$$5.5 \text{ Feet}/90^\circ \text{ Elbow} \times 12.43 \text{ Feet}/100 \text{ Feet} \\ = 0.68 \text{ Feet Friction Head}/90^\circ \text{ Elbow}$$

which is the friction head loss across a 2" Schedule 80 elbow.

For a copy of the tables mentioned in this section, please contact customer service.

Valve Calculations

As an aid to system design, liquid sizing constants (Cv values) are shown for valves where applicable. These values are defined as the flow rate through the valve required to produce a pressure drop of 1 psi. To determine the pressure drop for a given condition the following formula may be used:

$$P=(Q^2S.G.)/(Cv^2)$$

Where: P = Pressure drop across the valve in psi

Q = Flow through the valve in gpm

S.G. = Specific gravity of the liquid (Water=1.0)

Cv = Flow coefficient

See the solution of the following example problem. For Cv values for specific valves, contact customer service or consult the manufacturers catalog.

EXAMPLE:

Find the pressure drop across a 1 1/2" PVC ball check valve with a water flow rate of 50 gpm. The Cv is 56.

$$P=(50^2 \times 1.0)/56^2$$

$$P=(50/56)^2$$

$$P=0.797 \text{ psi}$$

Hydraulic Shock

Hydraulic shock is the term used to describe the momentary pressure rise in a piping system which results when the liquid is started or stopped quickly. This pressure rise is caused by the momentum of the fluid; therefore, the pressure rise increases with the velocity of the liquid, the length of the system from the fluid source, or with an increase in the speed with which it is started or stopped. Examples of situations where hydraulic shock can occur are valves which are opened or closed quickly or pumps which start with an empty discharge line. Hydraulic shock can even occur if a highspeed wall of liquid (as from a starting pump) hits a sudden change of direction in the piping, such as an elbow.

The pressure rise created by the hydraulic shock effect is added to whatever fluid pressure exists in the piping system and, although only momentary, this shock load can be enough to burst pipe and break fittings or valves.

Proper design when laying out a piping system will limit the possibility of hydraulic shock damage.

The following suggestions will help in avoiding problems:

1. In a plastic piping system, a fluid velocity not exceeding 5 ft./sec. will minimize hydraulic shock effects, even with quickly closing valves, such as solenoid valves. (Flow is normally expressed in GALLONS PER MINUTE—GPM. To determine the fluid velocity in any segment of piping the following formula may be used:

$$V=(0.4085 \times \text{GPM})/Di^2$$

Where: v = fluid velocity in feet per second
 D_i = inside diameter
 GPM = rate of flow in gallons per minute

Flow Capacity Tables are available for the fluid velocities resulting from specific flow rates in Schedule 40 and Schedule 80 pipes. The upper threshold rate of flow for any pipe may be determined by substituting 5 ft./sec. Fluid velocity in the above formula and solving for GPM. Upper Threshold Rate of Flow (GPM) = 12.24 D_i^2

- Using actuated valves, which have a specific closing time, will eliminate the possibility of someone inadvertently slamming a valve open or closed too quickly. With air-to-air and air-to-spring actuators, it will probably be necessary to place a flow control valve in the air line to slow down the valve operation cycle, particularly on valve sizes greater than 1 1/2".
- If possible, when starting a pump, partially close the valve in the discharge line to minimize the volume of liquid that is rapidly accelerating through the system. Once the pump is up to speed and the line completely full, the valve may be opened.
- A check valve installed near a pump in the discharge line will keep the line full and help prevent excessive hydraulic shock during pump start-up. Before initial start-up the discharge line should be vented of all air. Air trapped in the piping will substantially reduce the capability of plastic pipe withstanding shock loading.

Shock Surge Wave

Providing all air is removed from an affected system, a formula based on theory may closely predict hydraulic shock effect.

Where: p = maximum surge pressure, psi
 v = fluid velocity in feet per second.
 C = surge wave constant for water at 73° F.
 *SG = specific gravity of liquid, *if SG is 1,
 then $p = vC$

EXAMPLE:

A 2" PVC Schedule 80 pipe carries a fluid with a specific gravity of 1.2 at a rate of 30 gpm and at a line pressure

of 160 psi. What would the surge pressure be if a valve were suddenly closed?

From table: $c = 24.2 v = 3.35$

$$p = (3.35) (26.6) = 90 \text{ psi}$$

Total line pressure = 90 + 160 = 250 psi

Schedule 80 2" PVC has a pressure rating of 400 psi at room temperature. Therefore, 2" Schedule 80 PVC pipe is acceptable for this application.

SURGE WAVE CONSTANT(C)

PIPE	PVC		CPVC		PP	PVDF
	SCH.40	SCH.80	SCH.40	SCH.80	SCH.80	SCH.80
1/4	31.3	34.7	33.2	37.3	—	—
3/8	29.3	32.7	31.0	34.7	—	—
1/2	28.7	31.7	30.3	33.7	25.9	28.3
3/4	26.3	29.8	27.8	31.6	23.1	25.2
1	25.7	29.2	27.0	30.7	21.7	24.0
1 1/4	23.2	27.0	24.5	28.6	19.8	—
1 1/2	22.0	25.8	23.2	27.3	18.8	20.6
2	20.2	24.2	21.3	25.3	17.3	19.0
2 1/2	21.1	24.7	22.2	26.0	—	—
3	19.5	23.2	20.6	24.5	16.6	18.3
4	17.8	21.8	18.8	22.9	15.4	17.0
6	15.7	20.2	16.8	21.3	14.2	15.8
8	14.8	18.8	15.8	19.8	—	—
10	14.0	18.3	15.1	19.3	—	—
12	13.7	18.0	14.7	19.2	—	—
14	13.4	17.9	14.4	19.2	—	—

CAUTION: The removal of all air from the system in order for the surge wave analysis method to be valid was pointed out at the beginning of this segment. However, this can be easier said than done. Over reliance on this method of analysis is not encouraged. Our experience suggests that the best approach to assure a successful installation is for the design to focus on strategic placements of air vents and the maintenance of fluid velocity near or below the threshold limit of 5 ft./sec.

Expansion and Thermal Contraction of Plastic Pipe

Calculating Dimensional Change

All materials undergo dimensional change as a result of temperature variation above or below the installation temperature. The extent of expansion or contraction is dependent upon the coefficient of linear expansion for the piping material. These coefficients are listed below for the essential industrial plastic piping materials in the more conventional form of inches of dimensional change, per ° F of temperature change, per inch of length. They are also presented in a more convenient form to use. Namely, the units are inches of dimensional change, per 10° F temperature change, per 100 feet of pipe.

EXPANSION COEFFICIENT

MATERIAL	C(IN/IN/°F x 10 ⁻⁵)	Y(IN/10° F/100 FT)
PVC	3.0	.360
CPVC	3.8	.456
PP	5.0	.600
PVDF	7.9	.948

The formula for calculating thermally induced dimensional change, utilizing the convenient coefficient (Y), is dependent upon the temperature change to which the system may be exposed – between the installation temperature and the greater differential to maximum or minimum temperature – as well as, the length of pipe run between directional changes or anchors points.

Also, a handy chart is presented below, which

approximates the dimensional change based on temperature change vs. pipe length.

$$L = Y \times (T_1 - T_2) / 10 \times L / 100$$

L = Dimensional change due to thermal expansion or contraction (in)

Y = Expansion coefficient (See table above) (in/10°/100 ft)

(T₁-T₂) = Temperature differential between the installation temperature and the maximum or minimum system temperature, whichever provides the greatest differential (° F).

L = Length of pipe run between changes in direction (ft.)

EXAMPLE 1:

How much expansion can be expected in a 200 foot straight run of 3 inch PVC pipe that will be installed at 75° F when the piping system will be operated at a maximum of 120° F and a minimum of 40° F?

$$L = (120 - 75) / 10 \times 200 / 100 = 0.360 \times 4.50 \times 2.0 = 3.24 \text{ in.}$$

TEMP T(°F)	LENGTH OF PIPE TO CLOSEST ANCHOR POINT (FT.)									
	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'
10°	0.04	0.07	0.11	0.14	0.18	0.22	0.25	0.29	0.32	0.36
20°	0.07	0.14	0.22	0.29	0.36	0.43	0.50	0.58	0.65	0.72
30°	0.11	0.22	0.32	0.43	0.54	0.65	0.76	0.86	0.97	1.08
40°	0.14	0.29	0.43	0.58	0.72	0.86	1.00	1.15	1.30	1.44
50°	0.18	0.36	0.54	0.72	0.90	1.08	1.26	1.44	1.62	1.80
60°	0.22	0.43	0.65	0.86	1.08	1.30	1.51	1.73	1.94	2.16
70°	0.25	0.50	0.76	1.01	1.26	1.51	1.76	2.02	2.27	2.52
80°	0.29	0.58	0.86	1.15	1.44	1.73	2.02	2.30	2.59	2.88
90°	0.32	0.65	0.97	1.30	1.62	1.94	2.27	2.59	2.92	3.24
100°	0.36	0.72	1.08	1.44	1.80	2.16	2.52	2.88	3.24	3.60
110°	0.40	0.79	1.19	1.58	1.98	2.38	2.77	3.17	3.56	3.96
120°	0.43	0.86	1.30	1.73	2.16	2.59	3.02	3.46	3.89	4.32

Note: Temperature change (T) from installation to the greater of maximum or minimum limits.

To determine the expansion or contraction for pipe of a material other than PVC, multiply the change in length given for PVC in the table above by 1.2667 for the change in CPVC, by 1.6667 for the change in PP, or by 2.6333 for the change in PVDF.

Calculating Stress

If movement resulting from thermal changes is restricted by the piping support system or the equipment to which it is attached, the resultant forces may damage the attached equipment or the pipe itself. Therefore, pipes should always be anchored independently at those attachments. If the piping system is rigidly held or restricted at both ends when no compensation has been made for thermally induced growth or shrinkage of the pipe, the resultant stress can be calculated with the following formula.

$$St = EC (T_1 - T_2)$$

$$St = \text{Stress (psi)}$$

E = Modulus of Elasticity (psi) (See table below for specific values at various temperatures)

C = Coefficient of Expansion (in/in/ ° F x 105)

(see physical property chart on for values)
(T₁-T₂) = Temperature change (° F) between the installation temperature and the maximum or minimum system temperature, whichever provides the greatest differential.

MODULUS OF ELASTICITY

	73°F	90°F	100°F	140°F	180°F	210°F	250°F
PVC	4.20	3.75	3.60	2.70	N/A	N/A	N/A
CPVC	4.23	4.00	3.85	3.25	2.69	2.20	N/A
PP	1.79	1.25	1.15	.72	.50	N/A	N/A
PVDF	2.19	1.88	1.74	1.32	1.12	.81	.59

N/A - Not Applicable

The magnitude of the resulting longitudinal force can be determined by multiplying the thermally induced stress by the cross sectional area of the plastic pipe.

$$F = St \times A$$

$$F = \text{FORCE (lbs)}$$

$$St = \text{STRESS (psi)}$$

$$A = \text{CROSS SECTIONAL AREA (in}^2\text{)}$$

EXAMPLE 2:

What would be the amount of force developed in 2" Schedule 80 PVC pipe with the pipe rigidly held and restricted at both ends? Assume the temperature extremes are from 70° F to 100° F.

$$St = EC (T_1 - T_2)$$

$$St = EC (100 - 70)$$

$$St = (3.60 \times 105) \times (3.0 \times 10^{-5}) (30)$$

$$St = 324 \text{ psi}$$

The Outside and Inside Diameters of the pipe are used for calculating the Cross Sectional Area (A) as follows: (See the Pipe Reference Table for the pipe diameters and cross sectional area for specific sizes of schedule 80 Pipes.)

$$A = \pi / 4 (OD^2 - ID^2) = 3.1416 / 4 (2.375^2 - 1.913^2) = 1.556 \text{ in}^2$$

The force exerted by the 2" pipe, which has been restrained, is simply the compressive stress multiplied over the cross sectional area of that pipe.

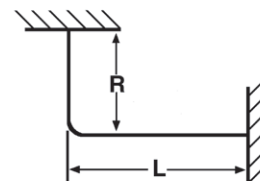
$$F = St \times A$$

$$F = 324 \text{ psi} \times 1.556 \text{ in}^2$$

$$F = 504 \text{ lbs.}$$

Managing Expansion/Contraction in System Design

Stresses and forces which result from thermal expansion and contraction can be reduced or eliminated by providing for flexibility in the piping system through frequent changes in direction or introduction of loops as graphically depicted on this page.



Normally, piping systems are designed with sufficient directional changes, which provide inherent flexibility, to compensate for expansion and contraction. To determine if adequate flexibility exists in leg (R) (see Fig. 1) to accommodate the expected expansion and contraction in the adjacent leg(L) use the following formula:

$$R = 2.877\sqrt{D L} \text{ SINGLE OFFSET FORMULA}$$

Where: R = Length of opposite leg to be flexed (ft.)
 D = Actual outside diameter of pipe (in.)
 L = Dimensional change in adjacent leg due to thermal expansion or contraction (in.)

Keep in mind the fact that both pipe legs will expand and contract. Therefore, the shortest leg must be selected for the adequacy test when analyzing inherent flexibility in naturally occurring offsets.

EXAMPLE 3:

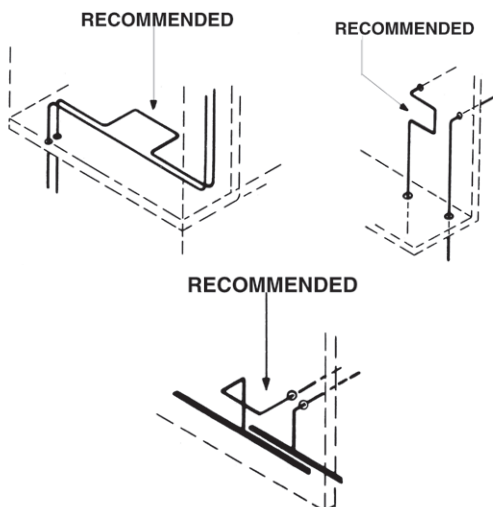
What would the minimum length of a right angle leg need to be in order to compensate for the expansion if it were located at the unanchored end of the 200 ft. run of pipe in Example 1 from the previous page?

$$R = 2.877\sqrt{3.500 \times 3.24} = 9.69 \text{ ft.}$$

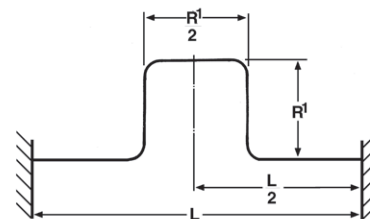
Flexibility must be designed into a piping system, through the introduction of flexural offsets, in the following situations:

1. Where straight runs of pipe are long.
2. Where the ends of a straight run are restricted from movement.
3. Where the system is restrained at branches and/or turns.

Several examples of methods for providing flexibility in these situations are graphically presented below. In each case, rigid supports or restraints should not be placed on a flexible leg of an expansion loop, offset or bend.



An expansion loop (which is fabricated with 90° elbows and straight pipe as depicted in Fig. above) is simply a double offset designed into an otherwise straight run of pipe.



The length for each of the two loop legs (R'), required to accommodate the expected expansion and contraction in the pipe run (L), may be determined by modification of the SINGLE OFFSET FORMULA to produce a LOOP FORMULA, as shown below:

$$R' = 2.041\sqrt{D L} \text{ LOOP FORMULA}$$

EXAMPLE 4:

How long should the expansion loop legs be in order to compensate for the expansion in Example 1 from the previous page?

$$R' = 2.041\sqrt{3.500 \times 3.24} = 6.87 \text{ ft.}$$

Minimum Cold Bending Radius

The formulae above for Single Offset and Loop bends of pipe, which are designed to accommodate expansion or contraction in the pipe, are derived from the fundamental equation for a cantilevered beam – in this case a pipe fixed at one end. A formula can be derived from the same equation for calculating the minimum cold bending radius for any thermoplastic pipe diameter.

$$RB = DO (0.6999 E/SB - 0.5)$$

Where: RB = Minimum Cold Bend Radius (in.)
 DO = Outside Pipe Diameter (in.)
 E * = Modulus of Elasticity @ Maximum Operating Temperature (psi)
 SB * = Maximum Allowable Bending Stress @ Maximum Operating Temperature (psi)

*The three formulae on this page provide for the maximum bend in pipe while the pipe operates at maximum long-term internal pressure, creating maximum allowable hydrostatic design stress (tensile stress in the hoop direction). Accordingly, the maximum allowable bending stress will be one half the basic hydraulic design stress at 73° F with correction to the maximum operating temperature. The modulus of elasticity, corrected for temperature may be found in the table in the second column of the preceding page.

EXAMPLE 5:

What would be the minimum cold radius bend, which the installer could place at the anchored end of the 200 ft. straight run of pipe in Examples 1 and 3, when the maximum operating temperature is 100° F instead of 140°F?

$$RB = 3.500 (0.6999 \times 360,000 / 1/2 \times 2000 \times 0.62 - 0.5) = 1,420.8 \text{ in. or } 118.4 \text{ ft}$$

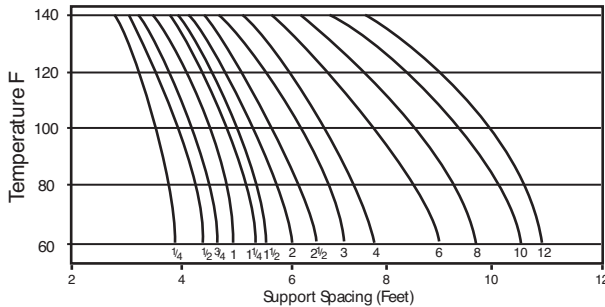
Pipe Support Spacing

Correct supporting of a piping system is essential to prevent excessive bending stress and to limit pipe "sag" to an acceptable amount. Horizontal pipe should be supported on uniform centers, which are determined for pipe size, schedule, temperature, loading and material. Point support must not be used for thermoplastic piping and, in general, the wider the bearing surface of the support the better. Supports should not be clamped in such a way that will restrain the axial movement of pipe that will normally occur due to thermal expansion and contraction. Concentrated loads in a piping system, such as valves must be separately supported.

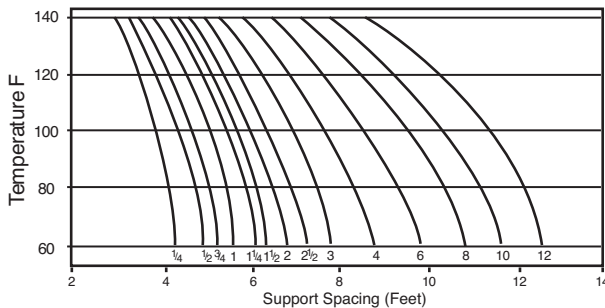
The graphs on this page give recommended support spacing for Chemtrol thermoplastic piping materials at various temperatures. The data is based on fluids with a specific gravity of 1.0 and permits a sag of less than 0.1" between supports. For heavier fluids, the support spacing from the graphs should be multiplied by the correct factor in the table below.

SPECIFIC GRAVITY	1.0	1.1	1.2	1.4	1.6	2.0	2.5
CORRECTION FACTOR	1.0	.98	.96	.93	.90	.85	.80

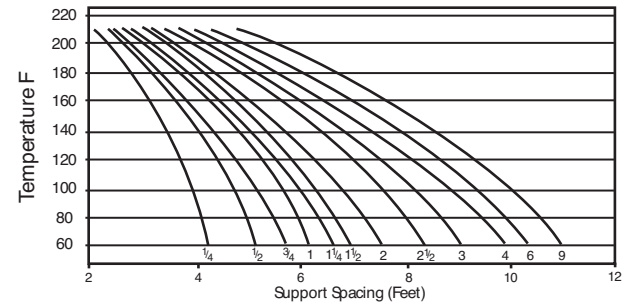
PVC Schedule 40



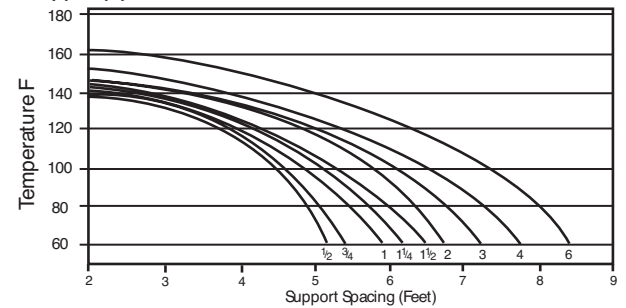
PVC Schedule 80



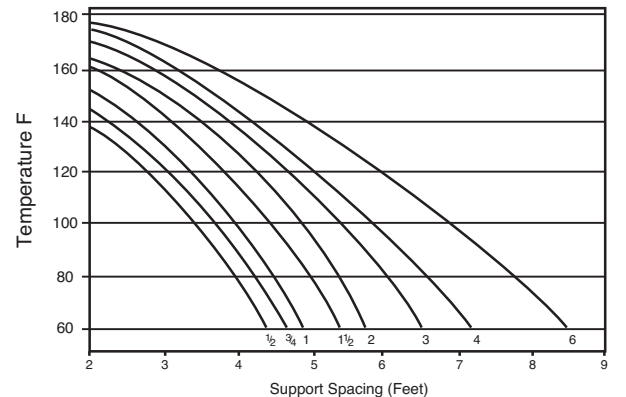
CPVC Schedule 80



Polypropylene Schedule 80



PVDF Schedule 80



The above data is for uninsulated lines. For insulated lines, reduce spans to 70% of graph values. For spans of less than 2 feet, continuous support should be used.

Plastic Piping Standards

Plastic Piping Standards

Many commercial, industrial and governmental standards or specifications are available to assist the design engineer in specifying plastic piping systems. Standards most frequently referred to and most commonly called out in plastic piping specifications are ASTM Standards. These standards also often form the basis of other standards in existence. Below is a list and description of those standards most typically applied to industrial plastic piping.

ASTM Standard D-1784

(American Society for Testing and Materials)

This standard covers PVC and CPVC compounds used in the manufacture of plastic pipe, valves, and fittings. It provides a means for selecting and identifying compounds on the bases of a number of physical and chemical criteria. Conformance to a particular material classification in this standard requires meeting a number of minimum physical and chemical properties.

ASTM Standards D-1785 and F-441

These standards cover the specification and quality of Schedule 40, 80 and 120 PVC (D-1785) and CPVC (F-441) pressure pipe. Outlined in these standards are dimensional specifications, burst, sustained and maximum operating pressure requirements and test procedures for determining pipe quality with respect to workmanship and materials.

ASTM Standards D-2464 and F-437

These standards cover PVC (D-2464) and CPVC (F-437) Schedule 80 threaded pressure fittings. Thread dimensional specifications, wall thickness, burst, material quality, and identification requirements are specified.

ASTM Standard D-2466

These standards cover Schedule 40 PVC (D-2466) threaded and socket pressure fittings. Stipulated in the standard are thread and socket specifications, by lengths, wall thickness, burst material, quality and identification requirements.

ASTM Standards D-2467 and F-439

Standards D-2467 (PVC) and F-439 (CPVC) cover the specification of Schedule 80 socket type pressure fittings, including dimensions and physical requirements.

ASTM Standard D-4101

(Formerly D-2146)

This standard covers the specifications for propylene (PP) plastic injection and extrusion materials.

ASTM Standard D-3222

This standard covers the specifications for PVDF fluoroplastic molding and extrusions materials.

ASTM Standard D-2657

This standard covers the procedures for heat-fusion bonding of polyolefin materials.

ASTM Standards D-2564 and F-493

These standards set forth requirements for PVC (D-2564) and CPVC (F-493) Solvent Cement including a resin material designation and resin content quality standard. Also included in these standards are test procedures for measuring the cement quality by means of burst and lap shear tests.

ASTM Standard F-656

This standard covers the requirements for primers to be used for PVC solvent cemented joints of pipe and fittings.

ASTM Standard D-2855

This standard describes the procedure for making joints with PVC pipe and fittings by means of solvent cementing. The following are standards of other groups that are commonly encountered in industrial thermoplastic piping design.

ANSI B1.20.1 (was B2.1)

(American National Standards Institute)

This specification details the dimensions and tolerance for tapered pipe threads. This standard is referenced in the ASTM standard for threaded fittings mentioned above.

ANSI B16.5

This specification sets forth standards for bolt holes, bolt circle, and overall dimensions for steel 150# flanges.

NSF Standard 14

(National Sanitation Foundation)

This standard provides specifications for toxicological and organoleptic levels to determine the suitability of plastic piping for potable water use. It additionally requires adherence to appropriate ASTM Standards and specifies minimum quality control programs. To meet this standard, a manufacturer must allow third party certification by NSF of the requirements of this standard.

Technical assistance regarding standards, applications, product performance, design, and installation tips are available from FABCO.

FABCO is also able to provide:

- Material and Performance Certification Letters
- Returned Product Evaluation
- Product, Installation, and Design Seminars
- Technical Reports on a variety of Subjects

Chemical Resistance Guide

This chemical resistance guide has been compiled to assist the piping system designer in selecting chemical resistant materials. The information given is intended as a guide only. Many conditions can affect the material choices. Careful consideration must be given to temperature, pressure and chemical concentrations before a final material can be selected. Thermoplastics and elastomers physical characteristics are more sensitive to temperature than metals. For this reason, a rating chart has been developed for each.

MATERIAL RATING FOR THERMOPLASTICS & ELASTOMERS

- Temp. in °F = "A" rating, maximum temperature which material is recommended, resistant under normal conditions.
- B to Temp. in °F = Conditional resistance, consult factory.
- C = Not recommended.
- Blank = No data available.
-

MATERIAL RATINGS FOR METALS

- A = Recommended, resistant under normal conditions.
- B = Conditional, consult factory.
- C = Not recommended.
- Blank = No data available.

Temperature maximums for thermoplastics, elastomers and metals should always fall within published temp/pressure ratings for individual valves. THERMOPLASTICS ARE NOT RECOMMENDED FOR COMPRESSED AIR OR GAS SERVICE. This guide considers the resistance of the total valve assembly as well as the resistance of individual trim and fitting materials. The rating assigned to the valve body plus trim combinations is always that of the least resistant part. In the cases where the valve body is the least resistant, there may be conditions under which the rate of corrosion is slow enough and the mass of the body large enough to be usable for a period of time. Such use should always be determined by test before installation of the component in a piping system. In the selection of a butterfly valve for use with a particular chemical, the liner, disc, and stem must be resistant. All three materials should carry a rating of "A". The body of a properly functioning butterfly valve is isolated from the chemicals being handled and need not carry the same rating.

ABS — (Acrylonitrile-Butadiene-Styrene) Class 4-2-2 conforming to ASTM D1788 is a time proven material. The smooth inner surface and superior resistance to deposit formation makes ABS drain, waste, and vent material ideal for residential and commercial sanitary systems. The residential DWV system can be exposed in service to a wide temperature span. ABS-DWV has proven satisfactory for use from -40°F to 180°F These temperature variations can occur due to ambient temperature or the discharge of hot liquids into the system. ABS-DWV is very resistant to a wide variety of materials ranging from sewage to commercial household chemical formulations. ABS-DWV is joined by solvent cementing or threading and can easily be connected to steel, copper, or cast iron through the use of transition fittings.

CPVC — (Chlorinated Polyvinyl Chloride) Class 23447-B, formerly designated Type IV, Grade 1 conforming to ASTM D-1784 has physical properties at 73°F similar to those of PVC, and its chemical resistance is similar to or generally better than that of PVC. CPVC, with a design stress of 2000 psi and maximum service temperature of 210°F, has proven to be an excellent material for hot corrosive liquids, hot and cold water distribution, and similar applications above the temperature range of PVC. CPVC is joined by solvent cementing, threading or flanging.

P.P. (Polypropylene) — (PP) Type 1 Polypropylene is a polyolefin which is lightweight and generally high in chemical resistance. Although Type 1 polypropylene conforming to ASTM D-2146 is slightly lower in physical

properties compared to PVC, it is chemically resistant to organic solvents as well as acids and alkalis. Generally, polypropylene should not be used in contact with strong oxidizing acids, chlorinated hydrocarbons, and aromatics. With a design stress of 1000 psi at 73°F, polypropylene has gained wide acceptance where its resistance to sulfur-bearing compounds is particularly useful in salt water disposal lines, crude oil piping, and low pressure gas gathering systems. Polypropylene has also proved to be an excellent material for laboratory and industrial drainage where mixtures of acids, bases, and solvents are involved. Polypropylene is joined by the thermo-seal fusion process, threading or flanging. At 180°F, or when threaded, P.P. should be used for drainage only at a pressure not exceeding 20 psi.

PVC — (Polyvinyl Chloride) Class 12454-B, formerly designated Type 1, Grade 1. PVC is the most frequently specified of all thermoplastic materials. It has been used successfully for over 30 years in such areas as chemical processing, industrial plating, chilled water distribution, deionized water lines, chemical drainage, and irrigation systems. PVC is characterized by high physical properties and resistance to corrosion and chemical attack by acids, alkalis, salt solutions, and many other chemicals. It is attacked, however, by polar solvents such as ketones, some chlorinated hydrocarbons and aromatics. The maximum service temperature of PVC is 140°F. With a design stress of 2000 psi, PVC has the highest long term hydrostatic strength at 73°F of any of the major thermoplastics being used for piping systems. PVC is joined by solvent cementing, threading, or flanging.

Chemical Resistance Guide

PVDF — (KYNAR®) (Polyvinylidene Fluoride) is a strong, tough and abrasion resistant fluorocarbon material. It resists distortion and retains most of its strength to 280°F. It is chemically resistant to most acids, bases, and organic solvents and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other solid thermoplastic piping components can approach the combination of strength, chemical resistance and working temperatures of PVDF. PVDF is joined by the thermo-seal fusion process, threading or flanging.

EPDM — EPDM is a terpolymer elastomer made from ethylenepropylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attack by oils and is not recommended for applications involving petroleum oils, strong acids, or strong alkalines. It has exceptionally good weather aging and ozone resistance. It is fairly good with ketones and alcohols and has an excellent temperature range from -20°F to 250°F.

HYPALON® (CSM) — Hypalon has very good resistance to oxidation, ozone, and good flame resistance. It is similar to neoprene except with improved acid resistance where it will resist such oxidizing acids as nitric, hydrofluoric, and sulfuric acid. Abrasion resistance of Hypalon is excellent, about the equivalent of the nitriles. Oil and solvent resistance is somewhat between that of neoprene and nitrile. Salts have little if any effect on Hypalon. Hypalon is not recommended for exposure to concentrated oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons. Hypalon has a normal temperature range of -20°F to 200°F.

NEOPRENE (CR) — Neoprenes were one of the first synthetic rubbers developed. Neoprene is an all purpose polymer with many desirable characteristics and features high resiliency with low compression set, flame resistance, and is animal and vegetable oil resistant. Neoprene is principally recommended for food and

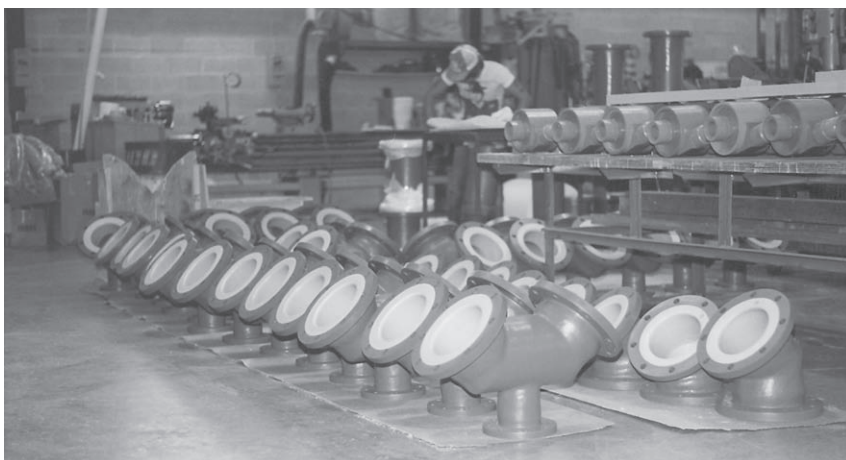
beverage service. Generally, neoprene is not affected by moderate chemicals, fats, greases, and many oils and solvents. Neoprene is attacked by strong oxidizing acids, most chlorinated solvents, esters, ketones, aromatic hydrocarbons, and hydraulic fluids. Neoprene has a moderate temperature range of -20°F to 160°F.

NITRILE (NBR) — (BUNA-N) is a general purpose oil resistant polymer known as nitrile rubber. Nitrile is a copolymer of butadiene and acrylonitrile and has a moderate temperature range of -20°F to 180°F. Nitrile has good solvent, oil, water, and hydraulic fluid resistance. It displays good compression set, abrasion resistance and tensile strength. Nitrile should not be used in highly polar solvents such as acetone and methyl ethyl ketone, nor should it be used in chlorinated hydrocarbons, ozone or nitro hydrocarbons.

FLUOROCARBON (FKM) (VITON®) (FLUOREL®) — Fluorocarbon elastomers are inherently compatible with a broad spectrum of chemicals. Because of this extensive chemical compatibility, which spans considerable concentration and temperature ranges, fluorocarbon elastomers have gained wide acceptance as a material of construction for butterfly valve O-rings and seats. Fluorocarbon elastomers can be used in most applications involving mineral acids, salt solutions, chlorinated hydrocarbons, and petroleum oils. They are particularly good in hydrocarbon service. Fluorocarbon elastomers have one of the broadest temperature ranges of any of the elastomers, -20°F to 300°F, however, are not suitable for steam service.

TEFLON® (PTFE) — Polytetrafluoroethylene has outstanding resistance to chemical attack by most chemicals and solvents. PTFE has a temperature rating of -20°F to 400°F in valve applications. PTFE, a self lubricating compound, is used as a seat material in ball valves.

VITON is a registered trademark of the DuPont Company
TEFLON is a registered trademark of the DuPont Company
HYPALON is a registered trademark of the DuPont Company
KYNAR is a registered trademark of the Pennwalt Company
FLUOREL is a registered trademark of the 3M Company



Chemical Resistance Chart

Chemical Resistance Chart for Valves and Fittings

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)								SEAL MATERIALS MAX TEMPERATURE (°F)								METAL										
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Acetaldehyde CH ₃ CHO	Conc.		C	140	C		C		350	B to 200	C	C	C	A	C	C	C	C	B	B	A			B	B	A		C
Acetamide CH ₃ CONH ₂									200	B to 200	B to 180	B to 200	C		A		A		A	A				A	A	A	A	
Acetic Acid CH ₃ COOH	25%	C	180	180	140		140	B to 73	350	176	C	70	C	A	C	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH ₃ COOH	50%					B to 140	B to 176		350	140	C	C	C	A	C	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH ₃ COOH	85%	C	C	120	73		73		350	70	C	C	C	A	C	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH ₃ COOH	Glacial	C	C	120	73	B to 104	B to 68		350					A	C	C	C	C	C	C	C	C	C	C	C	A	B	C
Acetic Anhydride (CH ₃ CO) ₂ O		C	C	73	C	C	73		350	C	C	B to 70	C	A	C	C	C	C	C	C	C	C	C	C	C	B	B	C
Acetone CH ₃ COCH ₃		C	C	B	C	B	C	C	350	B to 300	C	C	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetophenone C ₆ H ₅ COCH ₃									350	B to 176	C	C	C		C	C	C	C	C	C	C	C	C	C	C	C		C
Acetyl Chloride CH ₃ COCl		C	C		C	C			200	C	C	C	B		A	A	A	A	C	C	A		C		A	A	A	
Acetylene	Gas, 100%	73	C	73	C		73		250	B to 250	200	104	200		C	C	C	C	A	A	A	A	A	A	A	A	A	C
Acrylonitrile H ₂ C=CHCN			C		C		140		350	104	C	C	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Adipic Acid COOH(CH ₂) ₄ COOH	Sat'd.		180	140	140	B to 176	140		350	140	B to 220	B to 160	176						C	C	B		C		B to 200		A	
Allyl Alcohol CH ₂ =CHCH ₂ OH	96%		C	140	B to 73		C		250	B to 300	B to 180	B to 120	B to 70		A	A	A	A	A	A	A	A	A	A	A	A	A	
Allyl Chloride CH ₂ =CHCH ₂ Cl			C		C	140	C		350	C	B to 70	C	C								C							
Aluminum Acetate Al(C ₂ H ₃ O ₂) ₃	Sat'd.								350	176	C	C	C		C		C									A		
Aluminum Ammonium Sulfate (Alum) AlNH ₄ (SO ₄) ₂ ·12H ₂ O	Sat'd.		180	140	140		140		250	B to 200	B to 140	C	190	A	B	B	B	B			C				B	A		B
Aluminum Chloride (Aqueous) AlCl ₃	Sat'd.	160	180	180	140	B to 212	140		250	176	B to 200	B to 200	176	A	C	C	C	C	C	C	C	C	C	C	C	C	A	C
Aluminum Fluoride AlF ₃	Sat'd.	160	180	180	73	B to 212	140		250	B to 300	B to 200	B to 200	176	A	C	C	C	C	C	C	C	C	C	C	C	B	C	C
Aluminum Hydroxide Al(OH) ₃	Sat'd.	160	180	180	140	B to 212	140		250	176	160	B to 180	176		C	C	C	C	B	B	C		B	B	A	A	C	

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)						METAL										
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Aluminum Nitrate $Al(NO_3)_3 \cdot 9H_2O$	Sat'd.		180	180	140	B to 212	140		250	176	140	B to 200	B to 400	A	C	C	C	C	C	C	C	C			A	A	C	
Aluminum Potassium Sulfate (Alum) $AlK(SO_4)_2 \cdot 12H_2O$	Sat'd.	160	180	140	140	B to 212	140		400	B to 200	B to 200	B to 200	248	A	B	B	B	B			C			B	A		B	
Aluminum Sulfate (Alum) $Al_2(SO_4)_3$	Sat'd.	160	180	140	140	B to 212	140		250	B to 300	B to 300	B to 200	B to 390	A	C	C	C	C	C	C	C		C	C		B		
Ammonia Gas NH_3	100%	C	C	140	140		140		400	140	B to 140	140	140	C	A	B			C	A		A			A	A	B	
Ammonia Liquid NH_3	100%	160	C	140	C		140		400	212	70	B to 160		C	A	C	C	C	C		A			A	A	A	C	
Ammonium Acetate CH_3COONH_4	Sat'd.	120	180	73	140	B to 212	140		400	140	140	140				C	C	C	C						B			
Ammonium Bifluoride NH_4HF_2	Sat'd.		180	180	140		140		400	140	B to 140	C	140	A	C				C	C	C	C	C	C	C	B	B	B
Ammonium Carbonate $(NH_4)_2CO_3$	Sat'd.		180	212	140	B to 248	140		400	176	B to 200	B to 200	212		C			C			A to 140	C		B	B	B	B	
Ammonium Chloride NH_4Cl	Sat'd.	120	180	212	140	B to 212	140		400	300	B to 200	B to 212	250	A	C			C	C	C	C	C	C	C	C	B	C	
Ammonium Fluoride NH_4F	10%	120	180	212	140	B to 212	140		400	300	B to 200	B to 100	140	A	C			C			C				C		C	
Ammonium Fluoride NH_4F	25%	120	180	212	C		140		400	300	B to 120	B to 100	140	A	C			C			C				C		C	
Ammonium Hydroxide NH_4OH	10%	120	C	212	140		140		400	B to 300	200	200	B to 190	A	C	C		C			C			B	A	A	C	
Ammonia Hydroxide NH_4OH	Sat'd.								400	B to 300	C	200	B to 190	A	C	C					C			B to 70	A to 140		C	
Ammonium Nitrate NH_4NO_3	Sat'd.	120	180	212	140	B to 212	140		400	B to 300	200	200	176	A	C	C		C								A	C	
Ammonium Persulphate $(NH_4)_2S_2O_8$			180	140	140	B to 212	140		200	B to 70	C	70	B to 140		C	C	C	C	C	C	C	C	C	C	C	B	A	C
Ammonium Phosphate (Monobasic) $NH_4H_2PO_4$	All	120	180	212	140	B to 248	140		400	B to 200	200	B to 200	B to 180	A	C	C	C	C	B	B	C		B	A	A	A	C	
Ammonium Sulfate $(NH_4)_2SO_4$		120	180	212	140	B to 212	140		400	300	200	200	176	A	C	C	C	C	B	B	C	B	B	B	B	B	B	C
Ammonium Sulfide $(NH_4)_2S$	Dilute	120	180	212	140		140		350	B to 300	B to 180	B to 160	B to 70		C	C	C	C	C	C	C		C		B		C	
Ammonium Thiocyanate NH_4SCN	50 - 60%	120	180	212	140	B to 212	73			B to 300	B to 180	B to 200	B to 190		C	C	C	C	C	C	C		C		A	A	C	
Amyl Acetate $CH_3COOC_5H_{11}$		C	C	C	C	B 122	73		100	210	C	C	C		B	B	B	B	B	B	B	A	B	A	A	A		
Amyl Alcohol $C_5H_{11}OH$			C		C	B to 212	B to 140		400	B to 300	B to 180	B to 200	B to 212	A	A	A	A	A	B	B	B		B	A	A	A	A	

ENGINEERING INFORMATION

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)						METAL										
		ABS	C/PVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
n-Amyl Chloride CH ₃ (CH ₂) ₃ CH ₂ Cl		C	C	C	C		C		400	C	C	C	200		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aniline C ₆ H ₅ NH ₂		C	C		C	B to 68	C		200	B to 140	C	C	B to 70	A	C	C	C	C	B	B	C	B	B	A	A	A	C	
Aniline Hydrochloride C ₆ H ₅ NH ₂ •HCl	Sat'd.		C		C		140							C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Anthraquinone C ₁₄ H ₈ O ₂			180		140		C						C						C	C	C							
Anthraquinone Sulfonic Acid C ₁₄ H ₇ O ₂ •SO ₃ •H ₂ O			180	73	140		C																					
Antimony Trichloride SbCl ₃	Sat'd.		180	140	140	B to 140	140			C	70	B to 70	70	A	C	C	C	C	C	C	C	C	C	C	C	C	C	
Aqua Regia (Nitrohydrochloric Acid)		C	B to 73	C	C	C	C		200	C	C	C	B to 190	C	C	C	C	C	C	C	C	C	C	C		B		
Argon Ar	Dry								350	B to 400	250	B to 100	B to 500		A		A		A		A					A	A	A
Arsenic Acid H ₃ AsO ₄	80%		180	140	140	B to 248	140		400	B to 176	B to 200	B to 180	140	A	C	C	C	C	C	C	C	C		C	B	A	B	
Asphalt			C	73	C		73		350	C	C	C	212		A	A	A	A	A	A	A	A	A	A	A	A	A	
Barium Carbonate BaCO ₃	Sat'd.	120	180	140	140	B to 248	140		400	B to 300	140	B to 160	248		A	A	A	A	B	B	B	B	B	B	A	A	A	
Barium Chloride BaCl ₂ •2H ₂ O	Sat'd.	120	180	140	140	B to 212	140		400	B to 300	B to 200	B to 160	B to 400	A	A	A	A	A	B	B	C	B	B	B	A	A	A	
Barium Hydroxide Ba(OH) ₂	Sat'd.	73	180	140	140				400	B to 300	B to 220	B to 200	248		C	C	C	C	B	B	C		B	A	A	A		
Barium Nitrate Ba(NO ₃) ₂	Sat'd.	73	180	140	73		140		250	176	140	B to 200	248	A	C	C	C	C	A	A	A		A		A			
Barium Sulfate BaSO ₄	Sat'd.	73	180	140	140	B to 212	140		400	B to 300	B to 200	B to 200	B to 380	A	B	B	B	B	B	B	A		B	A	A	A		
Barium Sulfide BaS	Sat'd.	73	180	140	140				400	B to 310	B to 200	B to 200	B to 400		C	C	C	C	B	B	C		B	A	A	A	C	
Beer		120	180	180	140	B to 248	B to 140		300	120	B to 250	B to 140	B to 300		A	A	A	A	C	C	C		C	A	A	A	A	
Beet Sugar Liquors			180	180	140		73			B to 300	200	B to 180	B to 400				A		B	B	B				A	A		
Benzaldehyde C ₆ H ₅ CHO	10%	C	B to 73	73	B to 73		73		200	C	C	C		A	A	A	A	A	C	C	B		C	A	A	A	A	
Benzene C ₆ H ₆		C	C	C	C	C	B to 68	C	250	C	C	C	B to 140	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Benzene Sulfonic Acid C ₆ H ₅ SO ₃ H	10%		180	180	140		B to 73			C	C	B to 100	200		B	B	B	B	C	C	C		C	B	B	B		
Benzoic Acid C ₆ H ₅ COOH		160	180	73	140				350	C	C	B to 150	176		C	C	C	C	C	C		C	A	A	A	A		

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)					METAL													
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Benzyl Alcohol C ₆ H ₅ CH ₂ OH			C	120	C	B to 122	140		400	C	C	B to 70	B to 250		A	A	A	A	B	B	B		B	A	A	A	A
Bismuth Carbonate (BiO) ₂ CO ₃			180	180	140		140			70	70	70	B to 200														
Black Liquor	Sat'd.		180	140	140		120		225	220	140	70	212		C	C	C	C	B	B	B		B	B	A	B	
Bleach (Sodium Hypochlorite)	12% Cl	73	185	120	140		73																				
Blood								200	70	C	70	70		B		B		C	C			B		A	A		
Borax Na ₃ B ₄ O ₇ •10H ₂ O	Sat'd.	160	180	212	140		140			300	B to 200	B to 200	200		A	A	A	A	A	A	B	A	A	A	A	A	
Boric Acid H ₃ BO ₃	Sat'd.	160	180	212	140	B to 212	140			B to 300	B to 200	B to 200	185	A	B	B	B	B	C	C	B		C	B	A	B	
Brine	Sat'd.		180	140	140		140	400	B	B	B	B		A	A	A		C	C	C	B	C	B	A	B		
Bromic Acid HBrO ₃			180	C	140	B to 212	C		200	C	C	200		C	C	C	C									C	
Bromine Br ₂	Liquid	73	C	C	C	B to 248	C	300	C	C	C		B to 350	C	C	C	C	C	C	C	C	C	C	C	C	C	
Bromine Br ₂	Gas, 25%		180	C	140		C	200	C	C	C		B to 180	C	C	C	C	C	C	C	C	C	C	C	C	C	
Bromine Water	Sat'd.		180	C	140	B to 176	C	300	C	C	C		B to 210	C	C	C	C	C	C	C	C		C			C	
Butadiene H ₂ C=CHHC=CH ₂	50%		180	C	140		73		C	C	C	C	70		A	A	A	A	A	A	A	A	A	A	A	A	
Butane C ₄ H ₁₀	50%		180	140	140		140	73	350	C	B to 250	B to 200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	
Butyl Acetate CH ₃ COOCH ₂ CH ₂ CH ₂ CH ₃		C	C	C	C	C	C	175	C	C	C	C		B	B	B	B	B	B	B	B		B	A	A	A	
Butyl Alcohol CH ₃ (CH ₂) ₂ CH ₂ OH			C	180	140		140	300	B to 250	B to 190	140	B to 390	A	B	B	B				B		A	A	A	A	B	
Butyl Cellosolve			C		73			200	B to 300	C	C	C	A	A	A	A	A	A	A				A	A	A	A	
n-Butyl Chloride C ₄ H ₉ Cl		C	C					400	C	C	C	70		B	B	B	B	B	B	B	B		B	B	B	B	
Butylene © CH ₃ CH=CHCH ₃	Liquid			C	140		120	400	C	250	C		B to 400	A	A	A	A				A			A	A	A	
Butyl Phthalate C ₁₆ H ₂₂ O ₄			C	180		B 140			250	C	C	C															
Butyl Stearate					73			250	C	C	C		B to 400	A	A	A	A	B	B			B	A	A	A		
Butyric Acid CH ₃ CH ₂ CH ₂ COOH		C	C	180	73		73	300	C	C	C	C		A	A	A	A	C	C	C	C	C	C	B	A	A	
Calcium Bisulfide Ca(HS) ₂ •6H ₂ O			73		C		140	200	200		B to 140	140	140												A		

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)					METAL											
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Calcium Bisulfite Ca(HSO ₃) ₂			180	180	140		C		350	C	B to 200	B to 200	B to 400		C	C	C	C	C	C	C	C	C	C	B	A		
Calcium Carbonate CaCO ₃			180	180	140	B to 248	140		350	B to 210	B	140	248		C	C	C	C	B	B	B		B	A	A	A	A	
Calcium Chlorate Ca(ClO ₃) ₂ •2H ₂ O			180	180	140	B to 248	140		350	B to 200	B to 200	B to 200	B to 190	140	B	B	B	B	B	B	B	B	B	B	A		C	
Calcium Chloride CaCl ₂		120	180	180	140	B to 248	B to 176		350	B to 212	B to 200	B to 200	300	A	B	B	B	B	A	A	C		C	B	A	B	B	
Calcium Hydroxide Ca(OH) ₂		160	180	180	140		140		250	210	B to 200	B to 220	212		C	C	C	C	C	C	C		C	A	A	A	C	
Calcium Hypochlorite Ca(OCl) ₂	30%	160	180	140	140		140		200	B to 310	C	C	B to 400	90	C	C	C	C	C	C	C		C	B	B	B	C	
Calcium Nitrate Ca(NO ₃) ₂			180	180	140		140		200	B to 300	B to 200	B to 200	B to 390	C	B	B	B	B	B	B		B		A		B		
Calcium Oxide CaO			180		140		140			B	B to 200	B to 200	140					A	A	B				A	A			
Calcium Sulfate CaSO ₄		100	180	180	140	B to 212	140		200	B to 300	B to 176	B to 70	B to 212	A	A	B	B	B	A	A	B	A	A	A	A	A	A	
Camphor C ₁₀ H ₁₆ O		C		73	73		73		350	C	100	C	70		B	B	B	B	B	B	B		B	A	A	A		
Cane Sugar C ₁₂ H ₂₂ O ₁₁			180	180	140		140		400						A	A	A	A	A	A	A	A	A	A	A	A		
Caprylic Acid CH ₃ (CH ₂)COOH									350		C		B to 140					A	A	B		A		A				
Carbitol			C		73				200	B to 80	B to 80	C	C		B	B	B	B	B	B	B		B		B			
Carbon Dioxide CO ₂	Dry, 100%	160	180	140	140	B to 212	140		400	B to 250	200	B to 200	212	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Carbon Dioxide CO ₂	Wet	160	180	140	140		140		400	B to 250	140	C	212	A	A	A	A	A	B	B	B	B	B	A	A	A	A	
Carbon Disulfide CS ₂		C	C	C	C		B to 68		200	C	C	C	B to 400	A	B	B	B	B	A	A	A		A	A	A		C	
Carbon Monoxide CO	Gas		180	180	140	B to 140	140		400	B to 300	160	140	B to 400	A	A	A	A	A	A	A	B		A	A	A	A		
Carbon Tetrachloride CCl ₄		C	C	C	73	C	C	B to 73	350	C	C	C	B to 350	A	A	A	A	A	C	C	A		C	A	A	A	B	
Carbonic Acid H ₂ CO ₃	Sat'd.	185	180	140	140		140		350	B to 300	70	200	B to 400	A	C	C	C	C	B	B	B	B	B	A	A	A		
Castor Oil			C	140	140		73		350		212	200	B to 400	550	A	A	A	A	A	A	A	A	A	A	A	A	A	
Caustic Potash (Potassium Hydroxide) KOH	50%	160	180	180	140		140			200	B to 150	B to 70	B to 140															

Chemical Resistance Chart

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Caustic Soda (Sodium Hydroxide) NaOH	40%	160	180	180	140		140		B to 200	212	B to 200	80																
Cellosolve			C	73	73		C	200		C		C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Cellosolve Acetate CH ₃ COOCH ₂ CH ₂ OC ₂ H ₅			C	73	73			300	C	C	C	C		B		B			B								B	
Chloral Hydrate CCl ₃ CH(OH) ₂			180	C	140		120		B to 70	C	70	C																
Chloramine NH ₂ Cl	Dilute		C	73	73		73		70		B to 80	70		B	B	B	B	C	C	C							B	
Chloric Acid HClO ₃ •7H ₂ O	10%		180	73	140		73	140	212	C	B to 120	B to 120		C	C	C	C	C	C	C	C	C	C	C	C	C	B	C
Chloric Acid HClO ₃ •7H ₂ O	20%		185	73	140		73	140	212	C	70	C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chlorine Gas (Moisture Content < 150 ppm)								400	C	C	C	B	A	C	C	C	C	C	B	A*	A*	B	B	B	A		C	
Chlorine Gas (Moisture Content > 150 ppm)		C	C	C	C		C	400	C	C	C	C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chlorine	Liquid	C	C	C	C		C		C	C	C	B		B	B		B	C	C	C		C	C	C	C	C	C	
Chlorinated Water (< 3500 ppm)								400					73	B	B	C	C			C		C	B	A	A	C		
Chlorinated Water (> 3500 ppm)								400					73	C	C	C	C			C			C	A	B	C		
Chloroacetic Acid CH ₂ ClCOOH	50%	C	180	C	140		120	200	B to 175	C	C	C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chlorobenzene C ₆ H ₅ Cl	Dry	C	C	73	C		C	C	200	C	C	C	B to 400	A	A	A	A	A	C	C	B		C	A	A	A		
Chloroform CHCl ₃	Dry	C	C	C	C		C	C	200	C	C	C	B to 400	A	A	A	A	A	C	C	C		C	A	A	A		
Chlorosulfonic Acid ClSO ₂ OH			73	C	73		C	200	C	C	C	C		C	C	C	C	B	B	C	C	C	B	C	C	C	C	
Chromic Acid H ₂ CrO ₄	10%	73	180	140	140	B to 212	73	350	70	C	C	B to 400	C	C	C	C	C	C	C	C	C	C	C	B to 212	A to 70		C	
Chromic Acid H ₂ CrO ₄	30%	C	180	73	140	B to 212	73	350	70	C	C	B to 400	C	C	C	C	C	C	C	C	C	C	C	B to 212	B to 70		C	
Chromic Acid H ₂ CrO ₄	50%	C	C	73	C	B to 212	73	200	C	C	C	B to 400	C	C	C	C	C	C	C	C	C	C	C	C	B to 70		C	
Citric Acid C ₆ H ₈ O ₇	Sat'd.	160	180	140	140	B to 248	140	200						A	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Coconut Oil			C	73	140	B to 248	73	400	C	250	C	B to 390		B	B	B	B	C	C	B		C	B	A				
Coffee			180	140	140		140		B to 140	140	140	B to 200		A	A	A	A	C	C	C			A	A	A	A		
Coke Oven Gas				73	140		140	400	C	C	C	B to 390		B	B	B	B	A	A	A	A	A	A	A	A	A		

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINIUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER		
Copper Acetate Cu(C ₂ H ₃ O ₂) ₂ •H ₂ O	Sat'd.		73	73	73				350	B to 300	C	C	C		C	C	C	C	C	C	C			C	B	A			
Copper Carbonate CuCO ₃	Sat'd.		180		140		140		350	B to 210	C	70	B to 190												B	A			
Copper Chloride CuCl ₂	Sat'd.	73	180	140	140		140		350	B to 212	176	B to 210	B to 400	A	C	C	C	C	C	C	C	C	C	C	C	B	A		C
Copper Cyanide CuCN			180		140	B to 212	140		350	B to 300			B to 390		C	C	C	C	C	C	C	C	A	C	B	A		C	
Copper Fluoride CuF ₂ •2H ₂ O	2%		180	73	140		140			B to 250	80	140	B to 190	A															
Copper Nitrate Cu(NO ₃) ₂ •3H ₂ O	30%		180	140	140					B to 210	B to 230	B to 200	212	A	C	C	C	C	C	C	C	C		C	B	A		C	
Copper Sulfate CuSO ₄ •5H ₂ O	Sat'd.	120	180	120	140	B to 212	140			B to 300	B to 212	200	B to 212	A	C	C	C	C	C	C	C		C	A	A	A	A	C	
Corn Oil			C	73	140		120		400	C	250	C	B to 400		B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
Corn Syrup			185	140	140		140			200	200	C	212																
Cottonseed Oil		120	C	140	140		B to 140		400	B to 70	200	C	B to 400		B	B	B	B	B	B	B		B	A	A	A			
Creosote			C	73	C		140		350	C	B to 220	C	B to 400		B	B	B	B	A	A	A	A	A	A	A	A	A	A	B
Cresol CH ₃ C ₆ H ₄ OH	90%	C	C	B to 73	C	B to 68	73		200		C	C	B													B			
Cresylic Acid	50%		180		140		C		200	C	C	C	140		A	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Crude Oil			C	140	140	B to 212	C		400	C	B to 250	C	B to 300		C	C	C	C	C	C	B			A	A	A	A	C	
Cupric Sulfate CuSO ₄ •5H ₂ O	Sat'd.	100	180	73	140				250					A															
Cuprous Chloride CuCl	Sat'd.	70	180		140		140		350					A	C			C											C
Cyclohexane C ₆ H ₁₂		73	C	C	C	B to 248	C		300	C	250	C	B to 400		A	A	A	A	A	B	B	A		B	A	A	A		
Cyclohexanol C ₆ H ₁₁ OH		C	C	140	C	B to 104	73		250	C	B to 70	B to 70	B to 400						A	A				A	A	A	A		
Cyclohexanone C ₆ H ₁₀ O	Liquid	C	C	73	C	C	C	C	200	C	C	C	C		B	B	B	B	B	B	B	B		B	B	A			
Detergents (Heavy Duty)			C	180	140		B to 140								A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Dextrin (Starch Gum)	Sat'd.		180	140	140		140		200	176	B to 180	B to 200	212		A	A	A	A	A	B	B	B				A		A	
Dextrose C ₆ H ₁₂ O ₆			180	140	140		140		400	200	200	200	B to 400		A	A			A							A			
Diacetone Alcohol CH ₃ COCH ₂ C(CH ₃) ₂ OH			C	120	C				350	B to 300	C	C	C		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)							METAL											
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Dibutoxyethyl Phthalate C ₂₀ H ₃₀ O ₆			C		C									A	A	A	A	A	A	A		A		A			
Dibutyl Phthalate C ₆ H ₄ (COOC ₄ H ₉) ₂		C	C	73	C		73		350	B to 250	C	C	C		A	A	A	A	A	A					A		
Dibutyl Sebacate C ₄ H ₉ OCO(CH ₂) ₈ OCOC ₄ H ₉				73	73		73		350	C	C	C	C														
Dichlorobenzene C ₆ H ₄ Cl ₂		C	C	C	C		C			C	C	C	B						A	A			A		A		
Dichloroethylene C ₂ H ₄ Cl ₂			C	C	C		C		350	C	C	C	200			B				B						B	
Diesel Fuels			C	140	140		B to 212	73		350	C	B	C	C		A	A	A	A	A	A	A	A	A	A	A	A
Diethylamine C ₄ H ₁₀ NH		C	C		C	C	C		200	70	C	70	C	A	C	C	C	C	A	A	C			A	A	A	C
Diethyl Cellosolve C ₆ H ₁₄ O ₂																			A	A			A		A		
Diethyl Ether C ₄ H ₁₀ O		C	C	73	73		C		B to 73		C	C	C	C	A												
Diglycolic Acid O(CH ₂ COOH) ₂	Sat'd.		180	140	140		140		250	B to 300	200	B to 200	C														
Dimethylamine (CH ₃) ₂ NH				73	140	C	73			B to 140	C	C	C						C							A	
Dimethyl Formamide HCON(CH ₃) ₂		C	C	180	C		120	C	250	B to 122	C	C	C		B	B	B	B	B	B	B					A	
Diocetyl Phthalate C ₆ H ₄ (COOC ₈ H ₁₇) ₂		C	C	C	C		73		200	C	C	C	C		A	A	A	A	C	C	C						
Dioxane C ₄ H ₈ O ₂			C	C	C		140			B to 160	C	C	C	A	A	A	A	A	A	A	A					A	
Diphenyl Oxide (C ₆ H ₅) ₂ O	Sat'd.						73			C	C	C	B to 310		A	A	A	A	A								
Disodium Phosphate Na ₂ HPO ₄			180	140	140		140		400	B to 210	70	80	90	A	B	B	B	B	B	B						A	
Dow Therm A C ₁₂ H ₁₀ •C ₁₂ H ₁₀ O					C				212	C	C	C	B to 350	A	A	A	A	A	B	A	A		A	A	A	A	
Ether ROR		C	C	C	C		73			C	C	C	C		A	A	A		B	B	B	A	A	A	A	A	A
Ethyl Acetate CH ₃ COOCH ₂ CH ₃		C	C	C	C		73	C	200	B to 158	C	C	C		A	A	B		A	A	A			A	A	A	
Ethyl Acrylate CH ₂ =CHCOOC ₂ H ₅			C		C				350	C	C	C	C		A	A			A	A	A		A	A	A	A	
Ethyl Alcohol (Ethanol) C ₂ H ₅ OH			C	140	140		140	73	300	200	B to 200	158	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Benzene C ₆ H ₅ C ₂ H ₅				C	C				350	C	C	C	70		B	B			B	B	B		B		A		
Ethyl Chloride C ₂ H ₅ Cl	Dry		C	C	C		C		350	140	200	C	B to 400	A	A	A	B		A	A	A	A	A	A	A	A	

ENGINEERING INFORMATION

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM			NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Ethylene Bromide BrCH ₂ CH ₂ Br	Dry		C		C				350							A						A	A					A		
Ethylene Chloride (Vinyl Chloride) CH ₂ CHCl	Dry	C	C	C	C		C		350	C	C	C	200															A		
Ethylene Chlorohydrin ClCH ₂ CH ₂ OH			C	73	C				200	C	C	C	70	A									A							
Ethylene Diamine NH ₂ CH ₂ CH ₂ NH ₂		C		73	C		140			B to 300	80	B to 90	C		A	C		A	A	B					A	A	A	A		
Ethylene Dichloride C ₂ H ₄ Cl ₂	Dry	C	C	C	C		C		350	C	C	C	B to 400	A	A	A				A	A	A		A		A	A	A		
Ethylene Glycol OHCH ₂ CH ₂ OH		73	C	212	140	B to 212	B to 220		400	250	250	250	B to 250	A	A	A	A	A	A	A	A	A		A	A	A	A	A	A	A
Ethylene Oxide CH ₂ CH ₂ O			C	C	C		73		400	C	C	C	C		A	A				B	A	A		A		A				
Ethyl Formate										C	C	C	B to 400		A	A				A	A			A		A				
Fatty Acids R-COOH		160	73	120	140		120		400	C	B to 250	C	250	A	C	C	C	C	C	C	C	C	C		C		A			
Ferric Chloride (Aqueous) FeCl ₃	Sat'd.	120	180	140	140	B to 212	140		400	B to 300	B to 200	160	176	A	C	C	C	C	C	C	C	C	C		C	C	C	C	C	C
Ferric Hydroxide Fe(OH) ₃	Sat'd.	160	180	140	140		140		400	B to 210	B to 176	B to 200	B to 200							C	C			C		A		C		
Ferric Nitrate Fe(NO ₃) ₃ •9H ₂ O	Sat'd.	160	180	140	140	B to 212	140		400	B to 300	B to 176	B to 200	B to 400	A	C	C	C	C	C	C	C	C		C	B	A	A	C		
Ferric Sulfate Fe ₂ (SO ₄) ₃		160	180	140	140	B to 212	140		200	B to 280	B to 200	B to 200	176	A	C	C	C	C	C	C	C	C		C	B	A	A	C		
Ferrous Chloride FeCl ₂	Sat'd.	160	180	140	140	B to 212	140		400	210	B to 200	200	185	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Ferrous Hydroxide Fe(OH) ₂	Sat'd.	160	180	140	140		140		400	B to 200	B to 176	B to 200	212							C						A				
Ferrous Nitrate Fe(NO ₃) ₂		160	180	140	140		140		400	B to 210	B to 200	B to 200	212	A												A	A			
Ferrous Sulfate FeSO ₄		160	180	140	140	B to 212	140		400	B to 200	B to 200	B to 200	B to 200	A	C	C	B			C	C	C	C	C	C	A	A	A	B	
Fish Oil			180	180	140		140		300	C	250	B to 70	B to 400		A	A	C			B	A	A		A	A	A	A	A	A	
Flue Gas															A	A				A	A	A		A	A	A	A			
Fluoroboric Acid HBF ₄		73	73	140	140		140		350	70	C	70	140		B	B				C	C			C		A		C		
Fluorine Gas F ₂	Dry, 100%		73	C	73		C		C		C		C	B to 300	B	B				C	C	A				A	A			
Fluorine Gas F ₂	Wet	C	73	C	73		C		C		C		C	C	C	C				C	C	C				A	A			

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)							METAL								
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Fluorosilicic Acid (Hydrofluosilicic Acid) H ₂ SiF ₆	50%		73	73	140	B to 212			300	B to 300	160	158	185							C	C		C	B	B	B	C
Formaldehyde HCHO	Dilute	160	73	140	140	B to 176			300	212	140	150	C	A	A	A	B		C	C	B			A	A	A	
Formaldehyde HCHO	35%	160	C	140	140	B to 212	140	100	300	212	140	150	C	A	A	A	B		C		B			A	A	A	
Formaldehyde HCHO	50%		C		140		140		300	B to 140	C	B to 70	C	A	B	B	B		C		B			B	A	A	
Formic Acid HCOOH		C	C	140	73	B	140		300	210	C	B	B	A	C	C	B		C	C	C	B	C	A	A	A	
Freon ₁₁ CCl ₃ F	100%	C	73	C	140		73		300	C	B to 250	C	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon ₁₂ CCl ₂ F ₂	100%		73	73	140		73		C	B	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon ₂₁ CHCl ₂ F	100%			C	C		C		300	C	C	C	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon ₂₂ CHClF ₂	100%		73	73	C		C		C	140	C	250	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon ₁₁₃ C ₂ Cl ₂ F ₃	100%			C	140		73		300	C	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon ₁₁₄ C ₂ Cl ₂ F ₄	100%			C	140		73		300	B	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Fructose C ₆ H ₁₂ O ₆	Sat'd.	73	180	180	140		140		300										A	A			A	A	A	A	
Furfural C ₄ H ₃ OCHO		C	C	C	C		C		300	B to 160	C	C	C		A	A	A	A	A	A	A		A	A	A	A	A
Gallic Acid C ₆ H ₂ (OH) ₃ CO ₂ H+H ₂ O			73		140		73		300	C	C	C		B to 400	B	B	C		C	C	C		C	A	A	A	
Gasoline (Leaded)		C	C	C	B		73		200	C	190	C	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline (Unleaded)		C	C	C	B		73		200	C		C	190	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasohol		C	C	C	B		73		200					A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline (Sour)		C	C	C	B		C		200	C	250	C	B to 250	A	B	B			A	A	A		A	B	A	A	
Gelatin			180	180	140		140		300	200	200	200	212		C	C	B		C	C	C		C	C	C	A	
Glauber's Salt									200	B to 200	C	B to 200	B to 400		A	A		A	A	A			A	A	A	A	
Glucose C ₆ H ₁₂ O ₆ •H ₂ O		120	180	212	140		140		400	B to 212	200	200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
Glue				140	140		140		400	B	B	B	B		A	A	A	A	A	A	A	A	A	A	A	A	A
Glycerin C ₃ H ₅ (OH) ₃		140	180	212	140		140		B to 320	400	B to 200	B to 180	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glycol Amine															C	C	C		A	A	A		A	A			
Glycolic Acid OHCH ₂ COOH	Sat'd.		180	73	140		140		200	140	B	140	C		B	B			C	C	C		C		A		

Chemical Resistance Chart

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)		POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER		
Glyoxal OCHCHO						140									B	B	B		C	C	C		C		A	A				
Grease									C	100	C	140			C	C	C	C	A	A	A		A		A	A				
Green Liquor		160	180		140					B to 300	B to 200	B to 160	B to 400		C	C	C		A	A		A	A		A	A				
Gypsum	Slurry							350							A	A	B	B	A	A	B	A	A	A	A	A	A	A	A	
Heptane C ₇ H ₁₆		73	180	C	140		73	300	C	250	B to 200	200		A	A	A		A	A	A	A	A	A	A	A	A	A	A	A	
n-Hexane C ₆ H ₁₄		C	73	73	73			300	C	250	B to 140	B to 250		A	A	A		A	A	A	A	A	A	A	A	A	A	A	A	
Hexanol CH ₃ (CH ₂) ₄ CH ₂ OH			180		140		140	300	C	140	C	212		A	A	A		A	A	A		A	A	A	A	A	A	A	A	
Hydraulic Oil (Petroleum)					73		73	300	C	250	C	70	A	A	A	B		A	A	A		A	A	A	A	A	A	A	A	
Hydrazine H ₂ NNH ₂			C	73	C			250		C	C	C	A	C	C	C	C	C	C	C	C		C		A					
Hydrobromic Acid HBr	20%	73	73	140	140	B to 212	140	250	B to 300	C	C	200	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrobromic Acid HBr	50%	C		120		B to 140	140	250	200	C	C	200	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrochloric Acid HCl	10%	C	180	140	140	B to 212		73	250	176	B to 150	140	230	A	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	
Hydrochloric Acid HCl	30%	C	180	140	140	B to 212		250	B to 130	B to 70	B to 100	160		C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	
Hydrocyanic Acid HCN	10%	160	180	73	140	B to 248	140	250	B to 300	B to 200	C	B to 400		C	C	C	C	C	C	C	C	C	C	C	C	A	B	C		
Hydrofluoric Acid HF	Dilute	73	73	180	73	B to 212	140	300	212	B to 70	B to 185	212	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Hydrofluoric Acid HF	30%	C	73	140	73		140	300	B to 140	C		212	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Hydrofluoric Acid HF	50%	C	C	73	73	B to 212	120	300	B to 140	C	C	70	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Hydrofluosilicic Acid	50%							300	140	B to 220	C	B to 400		C	B	B			C	C	C		C		B	B	B	C		
Hydrogen H ₂	Gas		73	140	140	B to 248	140	300	200	B to 220	200	210		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen Peroxide H ₂ O ₂	50%		180	73	140	B to 212	140	300	B to 100	C	C	70	A	C	C	C	C	C	C	C	B	C	C	C	A	A	A	A	C	
Hydrogen Peroxide H ₂ O ₂	90%		180	C	140		73	30	B to 70	C	C	C	C	C	C	C	C	C	C	C	B	C	C	A	A	A	A	C		
Hydrogen Sulfide H ₂ S	Dry		180	150	140	B to 248	140		250	140	140	C	A	B					B		B					A	B			
Hydrogen Sulfide H ₂ S	Wet		180		140		140		130	C	70	C	A	C	C	C	C	C	C	C		C		C	C	A	C	C		



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Hydrogen Sulfite H ₂ SO ₃															C	C	C	C	C	C	C		C	C	A		C	
Hypochlorous Acid HOCl	10%	73	180	73	140	B to 212	140		300	104	C	C	120														C	
Inks				140			140		300	B	B	B	70		A	A	A		C	C	C		C		A			
Iodine I ₂	10%	C	73	73	C	B to 176	C		200	B to 160	80	B to 80	190	B to 70	C	C	C	C	C	C	C		C	C	C	C	C	
Iron Phosphate														A	C	C	C	C						B	A	A	A	C
Isobutane									140	C	250	C	250		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isobutyl Alcohol (CH ₃) ₂ CHCH ₂ OH		C	C	73			140		300	B to 300	C	160	B to 400													A		
Isooctane (CH ₃) ₃ CCH ₂ CH(CH ₃) ₂				C			73	73	300	C	250	C	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Acetate CH ₃ COOCH(CH ₃) ₂		C	C				73		200	B to 160	C	C	C	A	A				A	A	A		A	A	A	A	A	A
Isopropyl Alcohol (CH ₃) ₂ CHOH			C	212	140	C	140	B to 130	300	160	70	B to 120	170	550	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Ether (CH ₃) ₂ CHOCH(CH ₃) ₂			C	C	C		73		140	C	C	C	C		A	A		A	A	A	A	A	A	A	A	A	A	A
JP-3 Fuel									200	C	70	C	140		A	A	A	A	A	A	A	A	A	A	A	A	A	A
JP-4 Fuel			C	C	B		73		300	C	250	C	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A	A
JP-5 Fuel			C	C	B		73		300	C	250	C	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A	A
JP-6 Fuel									200	C	B to 120	C	70		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kelp Slurry															B	B	B	B	B	B	B		B	A	A	A		
Kerosene		73	B	C	B		C		250	C	250	C	B to 400	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ketchup					73				250	210	200	70	200		C	C	C		C	C	C		C	B	A	A		
Ketones		C	C	C	C		73		200	200	200	C	C	A	A	A	A		A	A	A		A	A	A	A	A	A
Kraft Liquors		73	180		140		120		250						C	C	C	C	C	C	C		C		A			
Lactic Acid CH ₃ CHOHCOOH	25%	73	180	212	140		140		300	212	80	70	B to 400	A	C	C	C	C	C	B	C		B	A	A	A		
Lactic Acid CH ₃ CHOHCOOH	80%	C	C	140	73		140		300	176	80	70	B to 400	A	C	C	C	C	C	B	C		B	A	A	A		
Lard Oil			C		140		C		300						C	C	C	C	B	B	B		B		A		C	
Latex				140			140		200	B to 200	200	160	160		A	A			A	A			A		A			
Lauric Acid CH ₃ (CH ₂) ₁₀ COOH			180	140	140		120		300	C	70	70	70						C	C			C		A			
Lauryl Chloride CH ₃ (CH ₂) ₁₀ CH ₂ Cl			73		140	B to 248	120		300										C	C			C		A			

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)					METAL													
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER			
Lead Acetate Pb(CH ₃ COO) ₂ •3H ₂ O	Sat'd.	180	180	140	B to 212	140		300	200	B to 140	B to 140	C		C	C				C	C	C		C				A			
Lead Chloride PbCl ₂		180	140	140		120		300	176	140	C	212	A																	
Lead Nitrate Pb(NO ₃) ₂	Sat'd.	180	140	140		120		300	B to 300	B to 220	200	212	A								A						A			
Lead Sulfate PbSO ₄		180	140	140		120		300	B to 210	B to 180	212	A		B	B				C	C	C		C				B			
Lemon Oil			C	C				B to 73	300	C	70	C	70						C	C			C	B	A	A				
Lime Sulfur		73	73	73		120			B to 300	B to 220	B to 180	B to 420		C	C	C	C	A	A	A		A			A		A			
Linoleic Acid		180	180	140				300	C	C	C	C		C	C	C	C	C	C	C	C		C	C	B	B	C			
Linseed Oil		73	C	140	140	B to 248	B to 73	300	C	200	B to 180	250		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Lithium Bromide LiBr				140	140	140	B to 212	300					A																	
Lithium Chloride LiCl				140	140	120			160	160	160	160	A	B	B	B		B	B	C		B			A					
Lithium Hydroxide LiOH				140		120			160	C	70	C		C	C	C	C	A	A			A			A		A			
Lubricating Oil (ASTM #1)		180	C	140	B to 248	73		350	C	180	150	70		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Lubricating Oil (ASTM #2)		180	C	140		73		350	C	B to 180	C	70-300		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Lubricating Oil (ASTM #3)		180	C	140		73		350	C	180	C	350		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Ludox														C	C	C	C	A	A	A		A			A					
Magnesium Carbonate MgCO ₃		120	180	212	140	B to 212	140	225	B to 300	140	B to 180	212		B	B				B	B	B		B		A	A	A			
Magnesium Chloride MgCl ₂	Sat'd.	120	180	140	140	B to 140	140	400	230	176	B to 200	185	A	A	A	B	B	C	C	C		C	C	C	C	C	C	C	A	
Magnesium Citrate MgHC ₆ H ₅ O ₇ •5H ₂ O		180		140		140		300	176	140		212																		
Magnesium Oxide MgO		160												A	A						A									
Magnesium Sulfate MgSO ₄ •7H ₂ O		160	180	212	140	B to 212	140	300	194	B to 230	B to 200	B to 390	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Maleic Acid HOOCCH=CHCOOH	Sat'd.	160	180	140	140	B to 140	140	250		C	C	140	A	C	C	B	C	C	C	C		C		C	B	A	B	B		
Manganese Sulfate MnSO ₄ •4H ₂ O		180	180	140		140		300	176	B to 200	B to 200	212	A	A	A	A		C	C	B		C			A					
Mercuric Chloride HgCl ₂		180	180	140		140		300	B to 210	B to 200	160	B to 300	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)							METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Mercuric Cyanide Hg(CN) ₂	Sat'd.		180	140	140	B to 212	140		300	B to 210	B to 160	B to 70	C		C	C	C	C	C	C	C		C			A		C
Mercuric Sulfate HgSO ₄	Sat'd.		180	140	140		140		300	70	70	B to 70	C	A	C	C	C	C										C
Mercurous Nitrate HgNO ₃ •2H ₂ O	Sat'd.		180	140	140		140		300	100	B to 90	90	C	A	C	C	C	C	C	C	C		C	A	A	A	A	C
Mercury Hg			180	140	140	B to 248	140		300	210	140	140	185	A	C	C	C	C	A	A	A		A	A	A	A	A	C
Methane CH ₄		C	73	73	140		140		300	C	B	B to 140	B		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methanol (Methyl Alcohol) CH ₃ OH			C	180	140		B to 140		300	B to 176	B to 160	160	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Acetate CH ₃ CO ₂ CH ₃		C	C	140	C		C		300	160	C	C	C		B	B			B	B	B		B	B	A			
Methyl Acetone														C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Amine CH ₃ NH ₂			C	C	C				300						C	C			A	A	B		A		A			
Methyl Bromide CH ₃ Br			C	C	C		C		300	C	C	C	185		C	C	B		C	C	B					B		
Methyl Cellosolve HOCH ₂ CH ₂ OCH ₃			C	73	C		C			C	C	C	C		A	A	B		B	B	B			A	A	A		
Methyl Chloride CH ₃ Cl	Dry	C	C	C	C		C		250	C	C	C	C		A	A	C	C	A	A	A	A	A	A	A	A	A	
Methyl Chloroform CH ₃ CCl ₃		C	C	C	C		C		200	C	C	C	C						A	A				A		A		
Methyl Ethyl Ketone (MEK) CH ₃ COC ₂ H ₅		C	C	73	C		C		200	B to 200	C	C	C	A	A	A	A	A	A	A	A		A	A	A	A	A	
Methyl Formate										B to 120	C	C	C		A	A	A		A	A	C		A	A	A	A		
Methyl Isobutyl Ketone (CH ₃) ₂ CHCH ₂ COCH ₃		C	C	73	C		73		200	B to 130	C	C	C	A					A						A	A		
Methyl Isopropyl Ketone CH ₃ COCH(CH ₃) ₂			C		C		73		150	C	C	C	C															
Methyl Methacrylate CH ₂ =C(CH ₃)COOCH ₃			C		73		140		150	C	C	C	C								C							
Methylene Bromide CH ₂ Br ₂			C	C	C		C		250	C	C	C	C															
Methylene Chloride CH ₂ Cl ₂			C	C	C		C		250	C	C	C	C		B	B	B		B	B	B				A	A		
Methylene Chlorobromide CH ₂ ClBr			C		C														A	A					A			
Methylene Iodine CH ₂ I ₂			C	C	C		C		200			C	70															
Methylsulfuric Acid CH ₃ HSO ₄			180	140	140					70	C	70	C															
Milk		160	180	212	140	B to 212	140		400	250	250	250	250		B	B	B	B	C	C	C		C	C	A	A	A	

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Chemical Resistance Chart

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER			
Mineral Oil		73	180	C	140	B to 212		B to 73	300	C	250	B to 200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Molasses			180	140	140		140		300	B to 212	200	200	212		A	A	A	A	A	A	A		A	A	A	A	A	A		
Monochloroacetic Acid CH ₂ ClCOOH	50%			140	140		140		200		C	70	C	A	C	C	C	C	C	C	C		C	C	C	C	C	C		
Monochlorobenzene C ₆ H ₅ Cl			C	73	C		C		200	C	C	C	C	A	A	A			A	A	A	A	A	A	A	A	A	A		
Monoethanolamine HOCH ₂ CH ₂ NH ₂					C				100	120	C	C	C	A			C		B	B	B		B		A					
Morpholine C ₄ H ₈ ONH				140			140		200	C	C	C	B to 70		B	B			B	B	B		B	B	B	B	B	B		
Motor Oil			180	C	140		B to 140		350	C	190	B to 70	190	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Muriatic Acid	37%								250						C	C	C	C	C	C	C	C	C	C	C	C	B	C		
Naphtha			73	73	140		B to 122		200	C	B to 250	C	B to 400		A	A	B		A	A	A	A	A	A	A	A	A	A		
Naphthalene C ₁₀ H ₈			C	73	C		73		250	C	C	C	176		A	A	B		A	A	A	A		A	A	A	A	A		
Natural Gas		73		73	140		140		300	C	250	140	250		A	A	A	A	A	A	A	A		A	A	A	A	A		
Nickel Ammonium Sulfate									250	70	70	70	B to 70		C	C	C	C	C	C	C					A				
Nickel Chloride NiCl ₂	Sat'd.	160	180	180	140		B to 212	140	406	176	176	B to 200	B to 400	A	C	C	B		C	C	C					A				
Nickel Nitrate Ni(NO ₃) ₂ •6H ₂ O	Sat'd.	160	180	180	140		B to 248	140	400	212		B to 200	B to 200	248	A	C	C			C	C	C				A	A	A		
Nickel Sulfate NiSO ₄	Sat'd.	160	180	180	140		B to 212	140	400	176	176	160	B to 400	A	C	C	B		C	C	C							A		
Nicotine C ₁₀ H ₁₄ N ₂			180		140		140				C	C	C													B	A			
Nicotinic Acid C ₅ H ₄ NCOOH			180		140		B to 212	140			B to 140	70	B to 200		B	B			C	C	C					B	B	B	A	
Nitric Acid HNO ₃	<10%	C	180	180	140		B to 212		250		B to 104	C	C	B to 185	A	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Nitric Acid HNO ₃	30%	C		B to 130	140	140	B to 212		250		C	C	B to 185	C	C	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Nitric Acid HNO ₃	40%	C		B to 120	73	140			250	C	C	C	70	C	C	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Nitric Acid HNO ₃	50%	C	110	C	100				250	C	C	C	70	C	C	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Nitric Acid HNO ₃	70%	C	100	C	73				250	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	C
Nitric Acid	Fuming								70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	C
Nitrobenzene C ₆ H ₅ NO ₂		C	C	C	C		B to 122	C	400	C	C	C	C	A	B	B			A	A	A						A			

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Chemical Resistance Chart

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Nitrogen N ₂	Gas								300	B to 350	B to 230	300	B to 400	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Nitroglycerin CH ₂ NO ₃ CHNO ₃ CH ₂ NO ₃					C		73	B to 73	70	70	C	70	C		B	B				B	B					A		
Nitrous Acid HNO ₂	10%		180	C	140		73		400	100	C	100	C		C	C	C	C	C	C	C				B	B	B	C
Nitrous Oxide N ₂ O			73	73	73		73	73	400	140	70	B to 80	C	A	B	B				C	B	B					A	
n-Octane C ₈ H ₁₈			C					B to 250	400	C	B to 200	C	B to 400	550	A	A	A	A	A	A	A	A			A	A	A	A
Oleic Acid		160	180	73	140	B to 248	C		250	C	B to 225	C	B to 212	A	B	B	A			B	B	C			B	A	A	A
Oleum (Sulfuric Acid) xH ₂ SO ₄ •ySO ₃	Fuming	C	C	C	C	C	C			C	C	C	C															
Olive Oil		160	C	73	140	B to 248	B to 68		350	C	250	C	250		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Oxalic Acid HOOC(=O)H•2H ₂ O	50%	160	180	140	140	B to 122	140		300	300	C	C	B to 400	A	C	C	C			C	C	C	C	C	C	B	A	A
Oxygen O ₂	Gas	160	180	C	140	B to 212	140		406		C		B to 190	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ozone O ₃			180	C	140		C		300	B	C	C	B	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Palm Oil				73			140		200	C	250	C	250		C	C				C	C	C			C		A	
Palmitic Acid CH ₃ (CH ₂) ₁₄ COOH	10%	73	73	180	140		120		300	C	220	C	400		B	B	B	A	B	B	B			B	B	A	A	A
Palmitic Acid CH ₃ (CH ₂) ₁₄ COOH	70%		73	180	73		120		300	C	220	C	400		B	B	B	A	B	B	B			B	B	A	A	
Parafin C ₃₆ H ₇₄		73	180	140	140	B to 212	C		250	C	250	C	400		A	A	A			B	A	A	B	B	A	A	A	A
Peanut Oil			C	140		B to 248			250	C	250	C	400		A	A				A	A			A		A		
n-Pentane CH ₃ (CH ₂) ₃ CH ₃		C	C	C	C		C		100	C	250	70	200		A	A	A	A	A	A	A	A	A	A	A	A	A	A
Peracetic Acid CH ₃ COOOH	40%	C		73	73			B to 73		C	C	70	C															
Perchloric Acid HClO ₄	10%					B to 212			250	B to 140	C	140	400	A						C							A	
Perchloric Acid HClO ₄	70%	73	180	C	73	B to 212	73			B to 140	C	70	400	C						C							B	
Perchloroethylene (Tetrachloroethylene) Cl ₂ C=CCl ₂		C	C	C	C	C	C	C	200	C	C	C	400		B	B				B	B	B			B	A	A	A
Perphosphate			73	140	73				250																			
Phenol C ₆ H ₅ OH		C	73	73	73		140	B to 140		C	C	C	B to 210	A	A	A	C			C	C	C			C	A	A	A

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Phenylhydrazine C ₆ H ₅ NHNH ₂			C	C	C	B to 104	C		B to 70	C	C	C	C																	
Phosphate Esters										250	C	C			C	C			C	C				C		A				
Phosphoric Acid H ₃ PO ₄	10%		180	212	140				300	B to 300	104	B to 206	B to 400	A	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C	
Phosphoric Acid H ₃ PO ₄	50%	73	180	212	140	B to 212	140		300	176	B to 104	171	212	A	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C	
Phosphoric Acid H ₃ PO ₄	85%		180	212	140		73		300	176	C	122	B to 185	A	C	C	C	C	C	C	C	C	C	C	C	B	A	B	C	
Phosphoric Anhydride P ₂ O ₅			73	73	73					200	B	B	B								C						A			
Phosphorus Pentoxide P ₂ O ₅			73	73	73		140									C					B						A			
Phosphorus Trichloride PCl ₃			C	73	C	C	120		300	70	C	C	70	A													A			
Photographic Solutions			180	140	140		140			B to 104	B to 70	B to 140	185								C						A			
Phthalic Acid C ₆ H ₄ (COOH) ₂				140	C		140			B to 100	C	B to 100		C	A	A	A			B	B	C			B	A	A	A		
Picric Acid C ₆ H ₂ (NO ₂) ₃ OH	10%	C	C	73	C	B to 212	73		200	B to 200	70	400		C	C	C	C	C	C	C	C	C	C	C	C	B	A		C	
Pine Oil			C	140			B to 73			C	70	C	70		C	C	B		B	B	B			B	A	A	A			
Plating Solutions (Brass)			180	140	140		140		300	70	B	140	140																	
Plating Solutions (Cadmium)			180	140	140		140		300	300	B to 180	B to 200	190																	
Plating Solutions (Chrome)			180	140	140		140		300	210	C	C	B to 400														A			
Plating Solutions (Copper)			180	140	140		140		300	B to 300	B to 190	B to 160	185																	
Plating Solutions (Gold)			180	140	140		140		300	B	B	B	B																	
Plating Solutions (Lead)			180	140	140		140		300	B to 300	B to 190	140	185																	
Plating Solutions (Nickel)			180	140	140		140		300	B to 300	B	B to 200	185	A		C	C										A		C	
Plating Solutions (Rhodium)			180	140	140		140		300	120	B to 200	80	B to 190																	
Plating Solutions (Silver)			180	140	140		140		300	B to 300	B to 180	B to 200	B to 190														A			
Plating Solutions (Tin)			180	140	140		140		300	210	B to 180	140	140																	
Plating Solutions (Zinc)			180	140	140		140		300	B to 300	B to 180	B	B to 190								B									

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)							METAL								
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Polysulfide Liquor									300						C	C	C	C	B	B			B	B		C	
Polyvinyl Acetate									350	B to 280	80	C	C		B	B	B		A	A	C		A	B	B	B	
Potassium Alum			180		140		140		400	176	B to 180	B to 200	212														
Potassium Aluminum Sulphate			180		140		140		400	176	B to 180	B to 200	212		B		C				C			B	A	B	
Potassium Bicarbonate KHCO ₃	Sat'd.		180	140	140		B to 212	140	400	200	200	200	212								A				A		
Potassium Bichromate K ₂ Cr ₂ O ₇	Sat'd.		180	140	140		B to 212		400	140	140	104	212	A		A		B			B			B	A		
Potassium Bisulfate KHSO ₄			180	212	140		B to 212	140	400	B	140	70	212	A	B	B	B		C	C	C	C	C	C	A		
Potassium Bromate KBrO ₃			180	212	140		B to 212	140	400	212	B to 70	B to 140	212						C	A	A		A		A		
Potassium Bromide KBr			180	212	140		B to 248	140	400	212	200	200	B to 212	A	B	B	B		C	C	C				A		
Potassium Carbonate (Potash) K ₂ CO ₃		73	180	180	140		C	140	400	B	200	200	B to 212	A	B	B	B	B	A	A	A	A	A	A	A	A	B
Potassium Chlorate (Aqueous) KClO ₃		160	180	212	140		C	140	400	B to 200	70	B to 200	B	C	B	B			A	A	A	A		A	A	A	B
Potassium Chloride KCl		160	180	212	140		B to 212	140	400	B	200	200	212			B	A	A	B	B	B	B	C	B	B	B	A
Potassium Chromate K ₂ CrO ₄			180	212	140			140	400	176	B to 140	140	B to 212	C	A	A	B		B	B	B		B		A	A	
Potassium Cyanide KCN			180	180	140		B to 212	140	400	B	200	200	200		C	C	C	C	B	B	B	B		A	A	A	C
Potassium Dichromate K ₂ Cr ₂ O ₇	Sat'd.		180	180	140			140	400	212	140	120	212	C	B	B	C		B	B	C			A	A	A	
Potassium Ferricyanide K ₃ Fe(CN) ₆			180	180	140		B to 248	140	400	70	C	70	B to 212		C	C			B	B	C				A		
Potassium Ferrocyanide K ₄ Fe(CN) ₆ •3H ₂ O			180	180	140		B to 248	140	400	140	C	70	140		B	B	C	C	C	C	C			B	A	C	
Potassium Fluoride KF			180	180	140		B to 212	140	400	200	B to 180	70	212	A											A		
Potassium Hydroxide KOH	25%	160	180	212	140		B to 140	248	300	320	B to 80	B to 212	80	A	C	C	C		B	B	B	B		A	A	A	
Potassium Hypochlorite KClO		160	180		140			120	400	70	C	B to 70	C		C	C					C				A		
Potassium Iodide KI			180	73	73		B to 212	140	400	70		70	B	A	B	B					B	B			A		
Potassium Nitrate KNO ₃		160	180	140	140			140	400	B	B to 200	B to 200	212	C	A	A	B	B	B	B	B	B		A	A	A	A

ENGINEERING INFORMATION

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)					METAL																					
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER								
Potassium Perborate KBO ₃			180	140	140		140		400	70	B to 70	70	B to 70	A																					
Potassium Perchlorate KCIO ₄			180	140	140		140		200	140	C	70	190																						
Potassium Permanganate KMnO ₄	10%		180	73	140		140		400	210	C	140	B to 212		B	B			A	A	A				A	A	A								
Potassium Permanganate KMnO ₄	25%		180	73	73	B to 212	140		400	200	C	140	B to 212		B	B			A	A	A				A	A	A								
Potassium Persulfate K ₂ S ₂ O ₈			180	140	140	B to 176	140		400	180	C	B	210																						
Potassium Sulfate K ₂ SO ₄		160	180	180	140	B to 212	140		200	176	B to 200	B to 200	212	A	A	A	B	B	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	
Potassium Sulfide K ₂ S			180	140		68	140		300	70		70	210		C	C	C	C	C	C	C	B			B	B	B	B	B	B	C				
Potassium Sulfite K ₂ SO ₃ •2H ₂ O			180	140			140		300	200	B to 150	B to 150	210		B	B	B		C	C	C										A				
Potassium Tetraborate									400					A						A	A		A		A										
Potassium Tripolyphosphate									300					A		B		A		A	A				A										
Propane C ₃ H ₈			73	73	140	B to 248	140		300	C	250	140	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propargyl Alcohol			C	140	140		140			140	70	70	140																						
Propionic Acid CH ₃ CH ₂ CO ₂ H		C	C	140		B to 140	140			200		C	C																			A		A	
Propyl Acetate									140	C	C	C	C					A			A					A	A	A							
Propyl Alcohol CH ₃ CH ₂ CH ₂ OH		73	C	140	140	B to 122	B to 140		350	B to 225	180	B to 176	B to 300		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
n-Propyl Bromide									300						B	B	B		B	B	B											A			
Propylene Glycol	<25%							180	300	200	180	70	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propylene Glycol	>25%							B to 180	300	200	180	70	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propylene Oxide CH ₃ CHCH ₂ O			C	73	C		140		150	C	C	C	C									A											A		
n-Propyl Nitrate									200	C	C	C	C						A	A					A							A			
Pyridine N(CH) ₄ CH			C	C	C	B to 68	73			C	C	C	C		B	B			B	B	B				B	C	B								
Pyrogalllic Acid C ₆ H ₃ (OH) ₃					73				150	C	B to 100	C	140		A	A			A	A	A				A	A	A	A	A	A	A	A	A	A	
Pyrrole										C	C	C	C		B	B			B	B	B				B		B								
Quinone C ₆ H ₄ O ₂				140			140			C	C	C	C						A	A								A		A					
Rosin									200	C	B to 200	200	B		C	C			C	C	C				C	A	A	A							

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)										SEAL MATERIALS MAX TEMPERATURE (°F)							METAL										
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER			
Salicylic Acid C ₆ H ₄ (OH)(COOH)				140	140	B to 212	140		300	300	C		300		B	B			C	C	C		C			A			
Selenic Acid H ₂ SeO ₄			180		140		140			70	C	70	C																
Silicic Acid SiO ₂ •nH ₂ O			180	140	140	B to 212	140		400	176	176	70	212																
Silicone Oil			180	212	73		73		350	140	212	212	400	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Silver Chloride AgCl		160	180	140	140					70	C	70	90	A	C	C	C	C	C	C	C		C	C	C	C	C	C	
Silver Cyanide AgCN			180	180	140	B to 212	140		350	70	C	70	140		C	C	C	C	C	C	C		C			A to 100		C	
Silver Nitrate AgNO ₃		160	180	180	140		B to 140		350	300	C	B to 200	185	A	C	C	C	C	C	C	C		C	B	A			C	
Silver Sulfate Ag ₂ SO ₄		160	180	140	140		140		350	176	140	70	212	A															
Soaps		73	180	140	140		B to 140		400						B	B	A		B	B	B		B	A	A	A			
Sodium Acetate CH ₃ COONa	Sat'd.		180	212	140	B to 212	140		400	212	C	C	B		A	A	B		B	B	C		B	B	A				
Sodium Aluminate Na ₂ Al ₂ O ₄	Sat'd.				140				300	B to 200	B to 180	140	B to 200		C	C	B		B	B	A		B		A				
Sodium Benzoate C ₆ H ₅ COONa			180	140	140		140		300	140	B to 140	B to 70	B to 140																
Sodium Bicarbonate NaHCO ₃		73	180	212	140	B to 212	140		400	212	B to 200	B to 200	212		A	A	B	B	A	A	C		A	A	A	A	A	A	A
Sodium Bichromate	Sat'd.								400	176	140	B to 70	B to 212	C	C	C										A	A	A	
Sodium Bisulfate NaHSO ₄		73	180	140	140		140			B to 200	B to 200	B to 200	212		C	C	C	C	C	C	C		C	B	A			C	
Sodium Bisulfite NaHSO ₃			180	140	140		140		400	176	160	B to 200	212		B	B			C	C	C		C		A				
Sodium Borate (Borax) Na ₂ B ₄ O ₇ •10H ₂ O	Sat'd.	160	180	180	140		140		300	B to 300	B to 220	B to 200	210	A	A	A			B	B			B	A	A	A			
Sodium Bromide NaBr	Sat'd.	120	180	140	140		140		300	140	C	70	B to 180	A	B	B			C	C	C		C		A				
Sodium Carbonate Na ₂ CO ₃		73	180	212	140	C	140	B to 73	400	176	B to 200	B to 200	212		A	A	B	B	A	A	A	A	A		A	A	C		
Sodium Chlorate NaClO ₃	Sat'd.		180	140	73	C	140		350	B to 200	B to 200	B to 200	B to 200		A	A	C		B	B	B		B	B	A	A			
Sodium Chloride NaCl		120	180	212	140		140		350	B to 212	160	120	212		B	A	A	A	B	B	B	B	B	C	A	B	B	A	
Sodium Chlorite NaClO ₂	25%		180	73	C		140		200	70	C		B to 140	C															

ENGINEERING INFORMATION

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Chemical Resistance Chart

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		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Sodium Chromate Na ₂ CrO ₄ •4H ₂ O		120	180	140		B to 176	140		140	140	70	140	C	A	A			B	B	B			B	A	A	A		
Sodium Cyanide NaCN			180	180	140	B to 212	140		350	176	B to 230	140	176	200	275	C	C	C	C	A	A	A	A		A	A	C	
Sodium Dichromate Na ₂ Cr ₂ O ₇ •2H ₂ O	20%		180	180	140		140		300	176	140	C	B to 212	C	C	C	C		B	B	B					A		
Sodium Ferricyanide Na ₃ Fe(CN) ₆ •2H ₂ O	Sat'd.		180	140	140		140		350	300	70	70	140		C	C			C	C						A		
Sodium Ferrocyanide Na ₃ Fe(CN) ₆ •10H ₂ O	Sat'd.		180	140	140		140		350	140	80	70	140													A		
Sodium Fluoride NaF		120	180	180	140	B to 212	140		350	140	100	140	140	A	A	A	B		C	C	C					A		
Sodium Hydroxide NaOH	< 5%					B to 68																						
Sodium Hydroxide NaOH	<10%								400	B to 200	212	B to 200	B to 140	A	A		A			A	A		B	A	A	A		
Sodium Hydroxide NaOH	30%	120	180	212	140	C	B to 140		350	B to 130	212	B to 200	80	A	A		B			B	B		B	A	A	A		
Sodium Hydroxide NaOH	50%	120	180	212	140		B to 140	194	350	B to 130	212	B to 200	B to 70	A	B	C	C	C	B	B	B	B	B	A	A	A	B	
Sodium Hydroxide NaOH	70%	120	180	212	140		B to 140		350	B to 130	B to 70	B to 200	B to 70	A	C	C	C	C	B	B	B	B	B	A	A	A	B	
Sodium Hypochlorite NaOCl•5H ₂ O		120	180	73	73		140	B to 190	350	C	C	C	70		C	C	C	C	C	C	C	C	C	C	C	C	C	
Sodium Metaphosphate (NaPO ₃) _n			180	120	140					300	220	150	B to 400	A	C	C	C		C	C	C					A		
Sodium Nitrate NaNO ₃	Sat'd.	160	180	180	140		B to 212	140	400	200	B to 171	B to 200	212	A	A	A	B	B	A	A	A	A	A	A	A	A	A	B
Sodium Nitrite NaNO ₂		160	180	73	140		B to 212	140	400	176	171	B to 140	212		A	A			B	B	B					A		
Sodium Perborate NaBO ₃ •4H ₂ O		120	180	73	140		73		350	140	C	B	140	A	C	C			B	B	B				A	A	A	
Sodium Perchlorate NaClO ₄			180	212	140		140		350	70	C	70	C															
Sodium Peroxide Na ₂ O ₂	10%		180		140		140		250	300	C	C	400	C	C	C	C	C	C	C	C	C			A	A	A	B
Sodium Phosphate NaH ₂ PO ₄	Acid	120	180	212	140		B to 140	140	400					A	B	B	B	B	B	B	B	B	B	A	B	A	A	B
Sodium Phosphate NaH ₂ PO ₄	Alkaline		120	180	212			140	400					A	B	B	B	B	B	B	B	B	B	A	B	A	A	B
Sodium Phosphate NaH ₂ PO ₄	Neutral		120	180	212				400					A	B	B	B	B	B	B	B	B	B	A	B	A	A	B
Sodium Silicate			180	140	140		140			B to 200	140	B to 200	212		C	C	B		A	A	A		A	A	A	A		

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Sodium Sulfate Na ₂ SO ₄	Sat'd.	160	180	212	140			400	B to 200	200	B to 200	212	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulfide Na ₂ S	Sat'd.	160	180	212	140		140	350	200	B to 200	B to 200	176		C	C	C	C	B	B	C	B	B	A	A	A	A	C	
Sodium Sulfite Na ₂ SO ₃	Sat'd.	160	180	212	140	B to 212	140	B to 73	350	200	B to 200	B to 200	140		A	A	C		B	B	B		B	B	A	A		
Sodium Thiosulfate Na ₂ S ₂ O ₃ •5H ₂ O			180	180	140		140	350	140		160	140		B	B	C		C	C	C		C		A				
Sour Crude Oil				140	140				C	C	C			C				A	A	A		B	A	A	A			
Soybean Oil				73			140	400	C	250	250	B to 400		A	A	B		A	A	B	A	A	A	A	A			
Stannic Chloride SnCl ₄	Sat'd.		180	140	140		140	350	300	220	C	B to 400	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Stannous Chloride SnCl ₂	15%	120	180	140	140		140	350	B to 210	B to 150	B to 140	B to 185	A	C	C	C	C	C	C	C	C	C		A				
Starch			180	140	140		140	300	176	B to 176	212	212		B	B	B	B	B	B	B		B	A	A	A			
Steam (Low Pressure)								400					A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Steam (Medium Pressure)								400						A	A	A	A	A	A	A	A	A	A	A	A	A		
Steam (High Pressure)								C						C	C	C	C	C	B	A	C	B	A	A	A	C		
Stearic Acid CH ₃ (CH ₂) ₁₆ COOH			180	73	140		120	350	C	B to 70	C	140	A	A	A	C	B	C	C	C	B	C	A	A	A	A		
Stoddard's Solvent			C		C		73		C	250	C	250		A	A			A	A	A		A		A	A			
Styrene C ₆ H ₅ CH=CH ₂				73			C	350	C	C	C	C		B	B	B		B	B	B		B		A				
Succinic Acid COOH(CH ₂) ₂ COOH			180	140	140		140	200	140	70	B to 70	B to 176		A	A			A	A	A		A	A	A	A			
Sugar C ₆ H ₁₂ O ₆			180		140		140	350						C	C					B	C		B	A	A	A		
Sulfamic Acid HSO ₃ NH ₂	20%		C	180	C				70	C	B to 150	C		B	B	B		C	C	C		C		A		A		
Sulfate Liquors (Oil)	6%		180	140	140			200	B to 250	B to 150	B to 150	170		C	C	C	C	B	A			A		A		C		
Sulfite Liquors	6%	73	180		140			350	B	C	B to 70	140									C	B			A			
Sulfur S			180	212	140			350	250	C	70	266	A	C	C	C	C	B	B	C	B	B	B	A		C		
Sulfur Chloride S ₂ Cl ₂				C				350	C	C	C	140	A	C	C	C	C	C	C	C	C	C	C	C	C	C		
Sulfur Dioxide SO ₂	Gas (Dry)	C	73	140	140		140	350	160	C	C	B to 250	A	A	B	A	A	A	A	A		A	A	A	A	A		
Sulfur Dioxide SO ₂	Gas (Wet)	C	C	140	73		120		140	C	C	B to 140	A	C	B	B	C						C	A	C	C		

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Sulfur Trioxide SO ₃	Gas		C		73		C			B to 120	C	C	B	C	C			C							C	B	B	C	
Sulfuric Acid H ₂ SO ₄	<30%	120	180	180	140	B to 248	B to 140	B to 73	250	212	B	158	248	A	C	C	C	C	C	C	C	C	C	C	C	C	A	B	C
Sulfuric Acid H ₂ SO ₄	50%	73	180	140	140	B to 212	B to 140		212	250	212	C	158	212	A	C	C	C	C	C	C	C	C	C	C	C	A	C	C
Sulfuric Acid H ₂ SO ₄	70%	C	180	73	140				200	140	C	C	180	212	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C
Sulfuric Acid H ₂ SO ₄	90%	C	150	73	73	B to 212			200	70	C	C	158	212	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sulfuric Acid H ₂ SO ₄	100%	C	C	C	C				200	C	C	C	158	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sulfurous Acid H ₂ SO ₃	Sat'd.		180	140	140	B to 212	140		350	C	C	C	C	A	C	C	C	C	C	C	C	C	C	C	C	B	A	A	C
Tall Oil			C	180	140		120		250	C	200	C	200		B	B	B		B	B	B		B	A	A	A			
Tannic Acid C ₇₆ H ₅₂ O ₄₆	10%	C	180	73	140	B to 212	140		250	200	200	B to 200	200		A	A			B	B	C	B	B	B	B	A	A		
Tanning Liquors		160	180	73	140		120		200	B to 200	70	200		A	A			B								A			
Tar			C		C				250	C	C	C	B		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tartaric Acid HOOC(CHOH) ₂ COOH		160	180	140	140	B to 248	140		250	C	200	158	B to 200	A	A	A	C	C	C	C	C	C	C	C	C	A	A	A	B
Tetrachloroethane CHCl ₂ CHCl ₂				C	C		C	C	400	C	C	C	200														A		
Tetrachloroethylene Cl ₂ C=CCl ₂		C	C	C	C		C		350	C	C	C	212																
Tetraethyl Lead Pb(C ₂ H ₅) ₄			73	73	73				350	C	C	C	120		A	A					B	B		A					
Tetrahydrofuran C ₄ H ₈ O		C	C	C	C		C	C		C	C	C	C																
Thionyl Chloride SOCl ₂			C	C	C	C	C	C		C	C	C	C	A															
Thread Cutting Oils			73	73	73			73	350						A				A	A	A				A	A	A		
Titanium Tetrachloride TiCl ₄				140	C		120			C	C	C	160	A	C	C					C					B			
Toluene (Toluol) CH ₃ C ₆ H ₅		C	C	C	C		C	C	200	C	C	C	B to 200		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tomato Juice			180	212	140		140		350	70	140	140	140		B				C	C	B					A	A		
Transformer Oil			180	73	140		C		300	C	B	C	300	A	A					A	A						A	A	
Transformer Oil DTE/30			180		140		B to 120		300					A	A					A	A						A	A	
Tributyl Phosphate (C ₄ H ₉) ₃ PO ₄			C	C	C		73		300	250	C	C	C		B	B	B		A	A	A					B	A		
Trichloroacetic Acid CCl ₃ COOH	50%			140	140	B to 104	140		200	C	C	C	C	A	B	C			C	C	C					C	B		

Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)							METAL											
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Trichloroethylene CHCl=CCl ₂		C	C	C	C	B to 176	C	C	200	C	C	C	200	A	A	A	A	A	B	B	B			A	A	A	A
Triethanolamine (HOCH ₂ CH ₂) ₃ N		C	73	140	73	C	73	B to 190		B	C	B	C		C	C			C	C	C	C		C	A		
Triethylamine (C ₂ H ₅) ₃ N				C	140		73	B to 73		160	140	B to 70	C		A	A											
Trimethylpropane (CH ₂ OH) ₃ C ₃ H ₅				140	73		C			C	C	C	70														
Trisodium Phosphate Na ₃ PO ₄ •12H ₂ O		73	180	140	140		140			350	212	C	C	B to 300	A	C	C		B	B		A			A	A	
Tung Oil											C	250	B to 120	250		B	B	B		B	B	B			B	A	A
Turpentine		C	C	C	140		C				C	250	C	B to 200		A	A	A	A	A	A	A	A		A	A	A
Urea CO(NH ₂) ₂			180	180	140		140									B	B			C	C	C				A	C
Urine		160	180	180	140		140			400	140	140	C	140					C	C	C				A	A	A
Varnish										350	C	C	C	B to 400		A	A	B	B	C	C	C			B	A	A
Vaseline (Petroleum Jelly)			C	140	C		120			300	C	140	140	140					A	A	A				A	A	A
Vegetable Oil			C	140	140	B to 248	B to 140			300	C	200	C	200		A	A			A	A				A	A	A
Vinegar		73	150	140	140		140			300	B to 210	C	C	200		C	C	C	C	C	C	C			A	A	A
Vinyl Acetate CH ₃ COOCH=CH ₂			C	73	C	C	140			350	C	C	C	C		B	B		B	B	B				A	A	
Water (Acid Mine) H ₂ O		160	180	140	140		140			400	200	B to 210	C	B to 190	A	C	C	C	C	C	C	C	C	C	A	A	A
Water (Deionized) H ₂ O		160	180	140	140		140			400	B to 140	B to 200	B to 150	B to 200	A	B	B	C	C	C	C	C		C	B	A	A
Water (Distilled) H ₂ O		160	180	212	140	B to 248	140			400	140	B to 210		250	A	A	A	B	B	C	C	C	B	C	A	A	A
Water (Potable) H ₂ O		160	180	212	140	B to 248	140			400					A	A	A	A	A	B	B	B	A	B	A	A	A
Water (Salt) H ₂ O		160	180	212	140		140			400	B to 250	B to 210	140	B to 200	A	B	B	B	C	C	C	C	B	C	B	A	B
Water (Sea) H ₂ O		160	180	212	140	B to 248	140			400	B to 250	B to 210	B to 140	212	A	B	B	B	C	C	C	C	B	C	B	B	A
Water (Soft) H ₂ O		160	180	212	140		140			400					A	A	A	A	B	C	C	B	B	C	A	A	A
Water (Waste) H ₂ O		73	180	212	140		140			400					A	B	B	B	B	B	B	B	B	B	B	A	B

ENGINEERING INFORMATION

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Chemical Resistance Chart

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)							METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLOROPRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER	
Whiskey			180	140	140	B to 212	140		350	200	200	140	B		C	C	B		C	C	C		C	B	A		A	
White Liquor		73	180		140					300	104	140	190		C	C	C		C	C	C		C		A			
Wine		73	180	140	140	B to 248	140		350	200	200	140	200		C	C			C	C	C		C	B	A			
Xylene (Xylol) C ₆ H ₄ (CH ₃) ₂		C	C	C	C	C	C	C	350	C	C	C	B to 200	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Zinc Acetate Zn(CH ₃ COO) ₂ •2H ₂ O			180							140	C	C	C		C	C	C	C	C	C	C		C		A			
Zinc Carbonate ZnCO ₃			180	140		B to 212	140			70	70	70	70		B	B										B		
Zinc Chloride ZnCl ₂		120	180	180	140		140		400	210	B to 200	194	212	A	C	C	C		C	C	C		C	C	B	B		
Zinc Nitrate Zn(NO ₃) ₂ •6H ₂ O		160	180	180	140		140			180	140	100	190	A												A	A	
Zinc Sulfate ZnSO ₄ •7H ₂ O		160	180	212	140		140		400	B to 300	B to 220	171	B	A	C	C	B		C	C	C	B	C	A	A	A	A	

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Glossary of Terms

Glossary of Terms

Adhesive – a substance capable of holding materials together by surface attachment.

Adhesive solvent – an adhesive having a volatile organic liquid as a vehicle. See Solvent Cement.

Aging – (1) The effect on materials of exposure to an environment for an interval of time. (2) The process of exposing materials to an environment for an interval of time.

Antioxidant – a compounding ingredient added to a plastic composition to retard possible degradation from contact with oxygen (air), particularly in processing or exposure to high temperatures.

Artificial weathering – the exposure of plastics to cyclic laboratory conditions involving changes in temperature, relative humidity, and ultraviolet radiant energy, with or without direct water spray, in an attempt to produce changes in the materials similar to those observed after long-term continuous outdoor exposure. Note: The laboratory exposure conditions are usually intensified beyond those encountered in actual outdoor exposure in an attempt to achieve an accelerated effect. This definition does not involve exposure to special conditions such as ozone, salt spray, industrial gases, etc.

Bell end – the enlarged portion of a pipe that resembles the socket portion of a fitting and that is intended to be used to make a joint by inserting a piece of pipe into it. Joining may be accomplished by solvent cements, adhesives, or mechanical techniques.

Beam loading – the application of a load to a pipe between two points of support, usually expressed in pounds and the distance between the centers of the supports.

Burst strength – the internal pressure required to break a pipe or fitting. This pressure will vary with the rate of build-up of the pressure and the time during which the pressure is held.

Cement – see adhesive and solvent, cement.

Chemical resistance – (1) The effect of specific chemicals on the properties of plastic piping with respect to concentrations, temperature and time of exposure. (2) The ability of a specific plastic pipe to render service for a useful period in the transport of a specific chemical at a specified concentration and temperature.

Cleaner – medium strength organic solvent such as methyl ethyl ketone to remove foreign matter from pipe and fitting joint surfaces.

Compound – the intimate admixture of a polymer or polymers with other ingredients such as fillers, softeners, plasticizers, catalysts, pigments, dyes, curing agents, stabilizers, antioxidants, etc.

Copolymer – see Polymer.

Creep – the time-dependent part of strain resulting from stress, that is, the dimensional change caused by the application of load over and above the elastic formation and with respect to time.

Deflection Temperature – the temperature at which a specimen will deflect a given distance at a given load under a prescribed conditions of test. See ASTM D648. Formerly called heat distortion.

Deterioration – a permanent change in the physical properties of a plastic evidenced by impairment of these properties. Note a. – Burst strength, fiber stress, hoop stress, hydrostatic design stress, long-term hydrostatic strength, hydrostatic strength (quick), long-term burst, ISO equation, pressure, pressure rating, quick burst, service factor, strength, stress and sustained pressure test are related terms.

Elasticity – that property of plastics materials by virtue of which they tend to recover their original size and shape after deformation. Note – if the strain is proportional to the applied stress, the material is said to exhibit Hookean or ideal elasticity.

Elastomer – a material which at room temperature can be stretched repeatedly to at least twice its original length and, upon immediate release of the stress, will return with force to its approximate original length.

Elevated temperature testing – tests on plastic pipe above 23° (73°F).

Environmental stress cracking – cracks that develop when the material is subjected to stress in the presence of specific chemicals.

Extrusion – a method whereby heated or unheated plastic forced through a shaping orifice becomes one continuously formed piece. Note – this method is commonly used to manufacture thermoplastic pipe.

Failure, adhesive – rupture of an adhesive bond, such that the plane of separation appears to be at the adhesive-adherend interface.

Fiber stress – the unit stress, usually in pounds per square inch (psi), in a piece of material that is subjected to an external load.

Filler – a relatively inert material added to a plastic to modify its strength, permeance, working properties, or other qualities, or to lower costs.

Fungi resistances – the ability of plastic pipe to withstand fungi growth and/or their metabolic products under normal conditions of service or laboratory tests simulating such conditions.

Heat joining – making a pipe joint by heating the edges of the parts to be joined so that they fuse and become essentially one pipe with or without the addition of additional material.

Hoop stress – the tensile stress, usually in pounds per square inch (psi), in the circumferential orientation in the wall of the pipe when the pipe contains a gas or liquid under pressure.

Hydrostatic design stress – the estimated maximum tensile stress in the wall of the pipe in the circumferential orientation due to internal hydrostatic pressure that can be applied continuously with a high degree of certainty that failure of the pipe will not occur.

Hydrostatic strength (quick) – the hoop stress calculated by means of the ISO equation at which the pipe breaks due to an internal pressure build-up, usually within 60 to 90 seconds.

Long-term burst – the internal pressure at which a pipe or fitting will break due to a constant internal pressure held for 100,000 hours (11.43 years).

Impact, Izod – a specific type of impact test made with a pendulum type machine. The specimens are molded or extruded with machined notch in the center. See ASTM D256.

ISO equation – an equation showing the inter-relations between stress, pressure and dimensions in pipe, namely:

$$S = \frac{P(ID + t)}{2t} \text{ or } S = \frac{P(OD - t)}{2t}$$

Where: S = stress

P = pressure

ID = average inside diameter

OD = average outside diameter

t = minimum wall thickness (Note a)

Reference: ISO R161–1960 Pipes of Plastics Materials for the Transport of Fluids (Outside Diameters and Nominal Pressures) Part I, Metric Series.

Joint – the location at which two pieces of pipe or a pipe and a fitting are connected together. The joint may be made by an adhesive, a solvent-cement or a mechanical device such as threads or a ring seal.

Long-term hydrostatic strength – the estimated tensile stress in the wall of the pipe in the circumferential orientation (hoop stress) that when applied continuously will cause failure of the pipe at 100,000 hours (11.43 years). These strengths

are usually obtained by extrapolation of log-log regression equations or plots.

Molding, injection – a method of forming plastic objects from a granular or powdered plastics by the fusing of plastic in a chamber with heat and pressure and the forcing part of mass into a cooler chamber where it solidifies. Note: this method is commonly used to manufacture thermoplastic fittings.

Outdoor exposure – plastic pipe placed in service or stored so that it is not protected from the elements of normal weather conditions, i.e., the sun's rays, rain, air and wind. Exposure to industrial and waste gases, chemicals, engine exhausts, etc. are not considered normal "outdoor exposure."

Permanence – the property of a plastic which describes its resistance to appreciable changes in characteristics with time and environment.

Plastic – a material that contains as an essential ingredient an organic substance of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or in its processing into finished articles, can be shaped by flow.

Plastics pipe – a hollow-cylinder of plastic material in which the wall thicknesses are usually small when compared to the diameter and in which the inside and outside walls are essentially concentric. See plastics tubing.

Plastics tubing – a particular size of plastics pipe in which the outside diameter is essentially the same as that of copper tubing. See plastics pipe.

Polypropylene plastics – plastics based on polymers made with propylene as essentially the sole monomer.

Poly (vinyl chloride) – a resin prepared by the polymerization of vinyl chloride with or without the addition of small amounts of other monomers.

Poly (vinyl chloride) plastics – plastics made by combining poly (vinyl chloride) with colorants, fillers, plasticizers, stabilizers, lubricants, other polymers, and other compounding ingredients. Not all of these modifiers are used in pipe compounds.

Pressure – when expressed with reference to pipe the force per unit area exerted by the medium in the pipe.

Pressure rating – the estimated maximum pressure that the medium in the pipe can exert continuously with a high degree of certainty that failure of the pipe will not occur.

Primer – strong organic solvent, preferably tetrahydrofuran, used to dissolve and soften the joint surfaces in preparation for and prior to the application of solvent cement. Primer is usually tinted purple.

Quick burst – the internal pressure required to burst a pipe or fitting due to an internal pressure build-up, usually within 60 to

90 seconds.

Schedule – a pipe size system (outside diameters and wall thicknesses) originated by the iron pipe industry.

Self-extinguishing – the ability of a plastic to resist burning when the source of heat or flame that ignited it is removed.

Service factor – a factor which is used to reduce a strength value to obtain an engineering design stress. The factor may vary depending on the service conditions, the hazard, the length of service desired, and the properties of the pipe.

Solvent cement – in the plastic piping field, a solvent adhesive that contains a solvent that dissolves or softens the surfaces being bonded so that the bonded assembly becomes essentially one piece of the same type of plastic.

Solvent cementing – making a pipe joint with a solvent cement. See Solvent Cement.

Stress – when expressed with reference to pipe the force per unit area in the wall of the pipe in the circumferential orientation due to internal hydrostatic pressure.

Sustained pressure test – a constant internal pressure test for 100 hours.

Thermoplastic – a plastic which is thermoplastic in behavior. Capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

Vinyl Chloride Plastics – plastics based on resins made by the polymerization of vinyl chloride or copolymerization of vinyl chloride with other unsaturated compounds, the vinyl chloride being in greatest amount by weight.

Weld-orKnit-line – a mark on a molded plastic formed by the union of two or more streams of plastic flowing together.

ABBREVIATIONS

ASA – American Standards Association

ASTM – American Society for Testing and Materials

CPVC – Chlorinated Poly (Vinyl Chloride) plastic or resin.

IAPMO – International Association of Plumbing and Technical Officials

ISO – International Standards Organization

NSF – National Sanitation Foundation

PP – Polypropylene plastic or resin

PPI – Plastic Pipe Institute

PS – Product Standard when references to a specification for plastic pipe and fittings. These specifications are promulgated by the U.S. Department of Commerce and were formerly known as Commercial Standards.

PSI – pounds per square inch

PVC – Poly (Vinyl Chloride) plastic or resin

SPI – The Society of the Plastics Industry, Inc.



HDPE Pipe and Fittings

HDPE General Specifications & Material Standards

REFERENCE SPECIFICATIONS

- ASTM F714: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on outside diameter.
- CSA B137.1: Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services.
- ASTM D3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- AWWA C901: Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. Through 3 in. for Water Service.
- ASTM D3035: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on Controlled Outside Diameter
- ISO 9001:2000: Model for Quality Assurance in Production and Installation.
- AWWA C906: Standard for Polyethylene (PE) Pressure Pipe and Fittings 4 in. Through 63 in., for Water Distribution.
- NSF 14, 61
- API 15LE

MATERIAL

The pipe shall be made from polyethylene resin compound with a minimum cell classification of PE 345464C for PE 3408 materials in accordance with ASTM D3350. This material shall have a Long Term Hydrostatic Strength of 1600 psi when tested and analyzed by ASTM D2837, and shall be a Plastic Pipe Institute (PPI) TR4 listed compound. The raw material shall contain a minimum of 2%, well dispersed, carbon black. Additives, which can be conclusively proven not to be detrimental to the pipe may also be used, provided that the pipe produced meets the requirements of this standard.

The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same specification and from the same raw material supplier.

Compliance with the requirements of this paragraph shall be certified in writing by the pipe supplier, upon request. Manufacturer's Quality System shall be certified by an appropriate independent body to meet the requirements of the ISO 9001:2000 Quality Management Program.

PIPE DESIGN

The pipe shall be designed in accordance with the relationships of the ISO-modified formula (see ASTM F714).

$$P = \frac{2S}{(D^o/t) - 1}$$

S = Hydrostatic Design Stress (psi)
P = Design Pressure Rating (psi)
D^o = ODavg for IPS Pipe
ODmin for ISO Pipe
t = Minimum Wall Thickness
D^o/t = Dimension Ratio

The design pressure rating P shall be derived using the formula, expressed in pounds per square inch. The Hydrostatic Design Basis for PE 3408 materials is 1600 psi.

The pipe dimensions shall be as specified in manufacturer's literature.

MARKING

The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5 feet:

- Name and/or trademark of the pipe manufacturer.
- Nominal pipe size.
- Dimension ratio.
- The letters PE followed by the polyethylene grade per ASTM D3350, followed by the Hydrostatic Design basis in 100's of psi e.g. PE 3408.
- Manufacturing Standard Reference e.g. ASTM F 714
- A production code from which the date and place of manufacture can be determined.

JOINING METHODS

Whenever possible, polyethylene pipe should be joined by the method of thermal butt fusion as outlined in ASTM D2657, Heat Joining Polyolefin Pipe and Fittings. Butt fusion joining of pipe and fittings shall be performed in accordance with the procedures recommended by the manufacturer. The temperature of the heater plate should be between 400°F and 450°F. Follow the recommendations of ASTM D2657 regarding interfacial pressures for pipe wall thickness less than or equal to 1.5". Follow the manufacturer's recommendations regarding interfacial pressures for pipe walls thicker than 1.5".

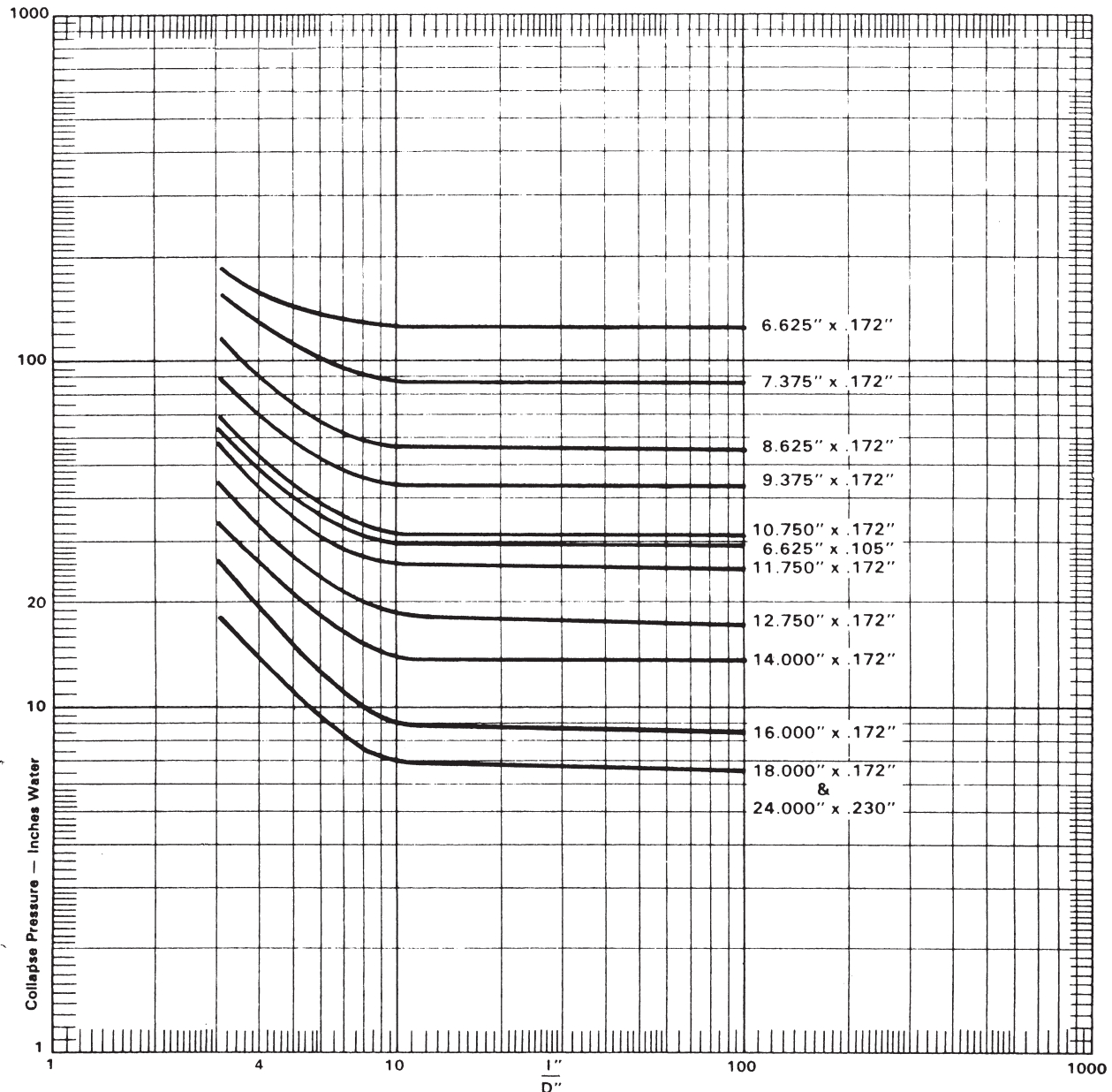
Polyethylene pipe may be connected to fittings or other piping systems by means of a flanged assembly consisting of a polyethylene flange adaptor or stub end, and a metal backup ring that has a bolting pattern meeting the dimensional requirements of Class 150, ANSI B16.1/B16.5 in sizes up through 24", and meeting Class 150 Series A, ANSI B16.47 or AWWA C207 Class B for larger sizes. Follow the manufacturer's recommendations regarding bolting techniques and the use of gaskets. Pipe or fittings may be joined by butt fusion only by technicians who have been trained and qualified in the use of the equipment.

GENERAL REQUIREMENTS

The pipe manufacturer shall provide, upon request, an outline of quality control procedures performed on polyethylene system components.

Collapse Pressure - PVC Duct

Graph I: Calculated Collapse Pressures with Safety Factor of 5, FABCO Type I Grade I PVC Seamless Duct (minimum wall) @ 70-75° F vs Length of Span/Nominal O.D.



The Sheet Metal & Air Conditioning Contractors' National Association (SMACNA) sponsored a physical testing program on both rectangular and round Type I Grade I PVC fabricated duct, as well as a theoretical analysis of the test work. Equations were developed for collapse pressures of varying I/D ratios (I = distance between reinforced stiffeners (inches) and D = OD (inches)) as well as for collapse of a very long tube. Round duct sizes ranged from 18" O.D. to 48" O.D. with wall thicknesses of .137" to .282". Test values correlated within a 10% range.

Fabco ran actual collapse tests on 4 sizes of extruded seamless duct from 6" through 12" with I/D ratios exceeding 10 which confirmed the values calculated

from the very long tube equation. (Note: Collapse values for all sizes with ratios exceeding 10 approach values for a very long tube).

This graph can be utilized to determine reinforcement spacing distance for higher negative pressures than shown in the SMACNA publication(1) for the sizes and minimum wall thicknesses shown.

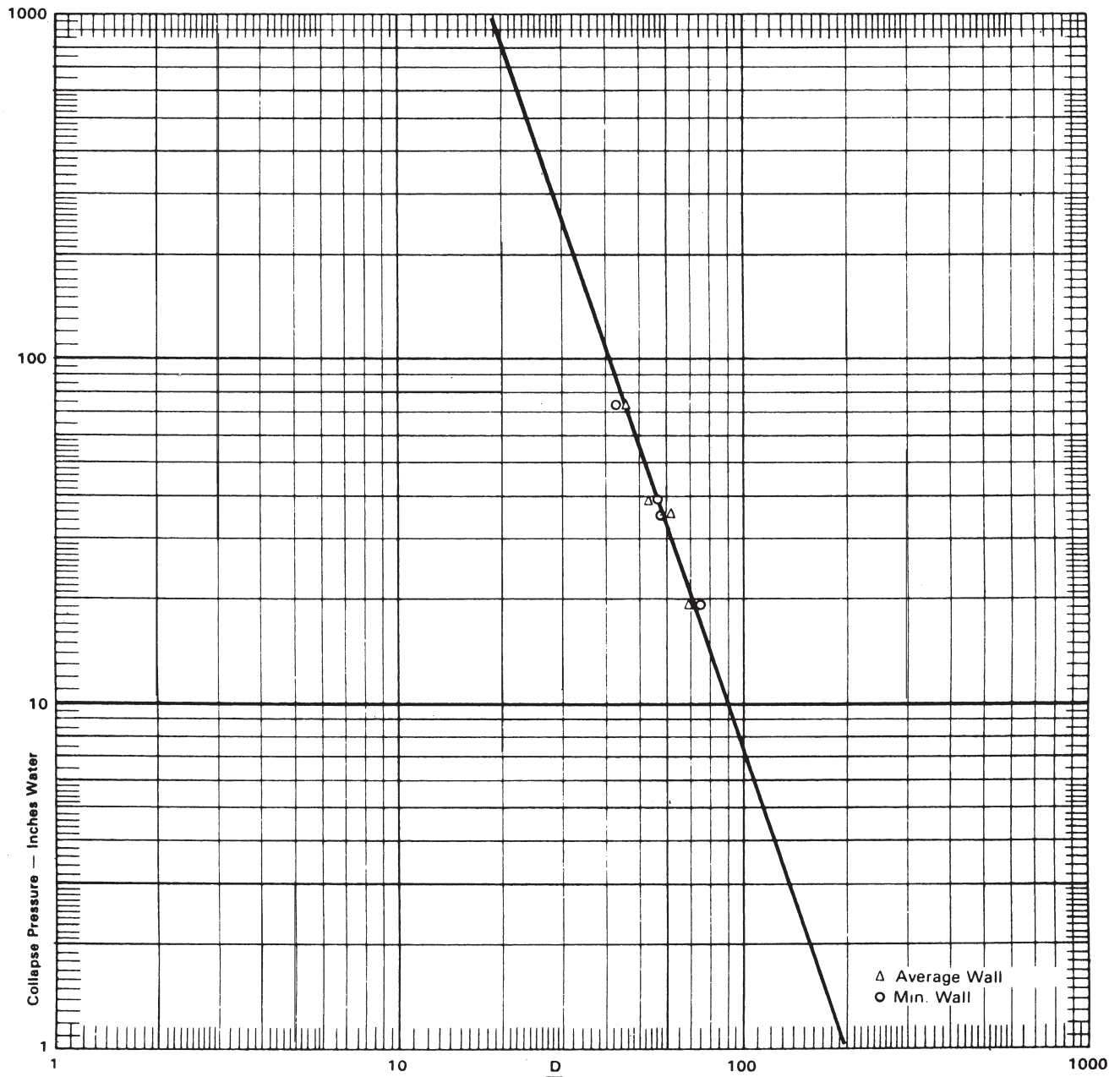
Example: 16" duct at 20" water I/D = 4

I = 16 x 4 = 64" between reinforcing stiffeners.

(1) Thermoplastic Duct (PVC) Construction Manual, SMACNA

PVC Duct Collapse Pressure

Graph II: Calculated Collapse Pressure with Safety Factory of 5, FABCO Type I Grade I PVC Seamless Duct @ 70-75°F vs Nominal O.D./Wall



This calculated collapse pressure graph with a safety factor of 5 for Type I Grade PVC duct has been experimentally confirmed for D/I ratios from 44-170. The 5-1 safety factor is believed to be sufficient for reasonable out of roundness due to storage and handling. Use of this graph for lower D/I ratios of Type I Grade I PVC pressure pipe should provide collapse pressures of greater than a 5-1 safety factor, since out of roundness will be appreciably less due to heavier walls of pipe produced under ASTM standards 1785 and 2241.

Use of minimum wall thicknesses as shown in Fabco's Specification for Duct and the ASTM Standards mentioned above are recommended when utilizing this graph for operating temperatures of 70° - 75° and below. Values of collapse pressures above 407" of water exceed a complete vacuum and should be considered as external collapse pressure. Conversion to PSI collapse pressure can be obtained by multiplying the inches of water by .0361; inches of water to inches of mercury by .07369.

Pump Data

I. STANDARDS FOR MEASURING HEADS AND CAPACITY.

Head is measured in feet, pounds per square inch (PSI), or in inches of mercury. However, so that a common means of head measurement is understood, it is recommended that all heads be expressed in feet of water. Measurement of liquid should be expressed in U.S. gallons.

II. ATMOSPHERIC PRESSURE.

At sea level it is 14.7 PSI. This will maintain a column of mercury 29.9 inches or a column of water 33.9 ft. high. This is the theoretical height of which water may be lifted by suction. The practical limit for cold water (60 F) is 25 feet.

III. SUCTION AND DISCHARGE HEAD.

Static Suction Lift – Is the vertical distance from the center line of the pump's suction inlet to the constant level of the water. This is added to discharge head to obtain total dynamic head.

Positive Suction Head – Is the vertical distance above the center line of the pump's suction to the constant level of the water. This is subtracted from the discharge head to obtain total dynamic head.

Dynamic Suction Head – Is the suction lift (or head) plus suction line friction loss. May be positive or negative.

Static Discharge Elevation – Is the vertical distance from the pump's discharge to the highest point in the discharge line.

TDH (Total Dynamic Head) – Is the total head and is the total of static suction lift (head), friction loss in suction line, static discharge elevation, friction loss in discharge line and fittings, plus discharge pressure, if any. To be hydraulically correct, we should not include "Static Head" in total dynamic head. Dynamic means "moving" and "Dynamic Head" only includes velocity head and friction loss. However, most pump people use TDH interchangeably with TH (Total Head).

Friction Head – Is the heat loss experienced by the movement of the liquid through the suction and discharge lines. Charts are available showing loss in feet of head at various flows through various pipe or hose sizes. Charts also show velocity in feet/sec, which is particularly important when pumping liquids with solids in suspension. Fittings, valves, etc. must be considered.

IV. NPSH.

Net Positive Suction Head is defined as head that causes liquid to flow through the suction line and enter the impeller eye. This head comes from either atmospheric pressure or from a static suction head plus atmospheric pressure. Two types of NPSH will be considered.

Required NPSH – Is a function of pump design. It varies between different makes, between different models, and with capacity of any one pump. This value is supplied by the manufacturer, if available. Refer to pump curves or contact the factory.

Available NPSH – Is a function of the system in which

pumps operate. Can be calculated for any installation. For a pump to operate properly, available NPSH should be greater than the required NPSH, plus 2 feet for safety factor, at a desired head and capacity. In simple terms, available NPSH is calculated by deducting from barometric pressure, in feet, the static suction head (+ or -), friction loss, and the vapor pressure (ft.) of liquid being pumped. Velocity heads should also be deducted. NPSH does not indicate the priming capabilities of self-priming centrifugal pumps. This capability is shown, generally on engine driven pumps, by respective "break-off" lines representing 10, 15, 20, 25' static suction lifts.

V. USEFUL FACTORS OR FORMULAS.

- a) Feet head x .433 = PSI (pounds per square inch).
- b) PSI (water) x 2.31 = Ft. Head
- c) Specific gravity of water (sp.gr.) = 1.0.
- d) PSI (water) x 2.31/sp.gr. = Ft. Head
- e) Weight of one U.S. gallon of water = 8.33 pounds
- f) One cubic foot (cu.ft.) of water contains 7.48 gallons.
- g) GPM = Gallons Per Minute.
- h) Imperial gallon x 1.2 = U.S. gallon; U.S. GPM x .833 = Imp. GPM.
- i) TDH = Total Head or total dynamic head.
- j) WHP = Water Horsepower.
- k) BHP = Brake Horsepower.
- l) EFF = Pump Efficiency.
- m) WHP = Ft. Head x GPM/3960
- n) BHP = WHP/EFF or BHP = Ft. Head x GPM/3960 x EFF (Pump)
- o) EFF = WHP/BHP x 100
- p) For liquids having different specific gravity other than 1.0.

$$\begin{aligned} \text{WHP} &= \text{Ft. Head} \times \text{GPM} \times \text{sp.gr.}/3960 \\ \text{BPH} &= \text{Ft. Head} \times \text{GPM} \times \text{sp.gr.}/3960 \times \text{EFF} \\ \text{BHP (for liquids other than water)} &= \text{BHP (for water)} \times \text{sp.gr.} \end{aligned}$$

VI. EFFECT ON CENTRIFUGAL PUMPS ON CHANGE OF SPEED OR CHANGE OF IMPELLER DIAMETER.

Three rules govern the operation of centrifugal pumps:

a) Capacity varies directly with changes of speed or of the impeller diameter.

$$\begin{aligned} \text{GPM1/GPM2} &= \text{RPM1/RPM2} \\ \text{or GPM1/GPM2} &= \text{Dia.1/Dia.2} \\ \text{GPM2} &= \text{GPM1/RPM1} \times \text{RPM2} \\ \text{and GPM2} &= \text{GPM1/Dia.1} \times \text{Dia.2} \end{aligned}$$

b) Head varies as the square of the speed or the impeller diameter.

$$\begin{aligned} \text{Head1/Head2} &= \text{RPM1}^2/\text{RPM2}^2 \\ \text{or Head1/Head2} &= \text{Dia.1}^2/\text{Dia.2}^2 \\ \text{Hd2} &= \text{Hd1/RPM1}^2 \times \text{RPM2}^2 \\ \text{and Hd2} &= \text{Hd1/Dia.1}^2 \times \text{Dia.2}^2 \end{aligned}$$

Pump Data

c) Power (BHP) varies as the cube of the speed or impeller diameter

$$\begin{aligned} \text{BHP1/BHP2} &= \text{RPM1}^3/\text{RPM2}^3 \\ \text{or BHP1} &= \text{Dia1}^3/\text{Dia2}^3 \\ \text{BHP2} &= \text{BHP1}/(\text{RPM1}^3/\text{RPM2}^3) \\ \text{and BHP2} &= \text{BHP1}/(\text{Dia1}^3/\text{Dia2}^3) \end{aligned}$$

VII. EFFECT OF ALTITUDE ON PUMPS

At elevations above sea level, suction lift should be reduced accordingly to insure that the same amount of water can get into the pump as would occur at an equivalent sea level lift. Lower atmospheric pressure reduces horsepower output of gas engines, thus causing a drop in speed which reduces pump performance. Enginepower will decrease 3.5% for each 1000 ft. above sea level and 1% for each 10°F above standard temperature at 60°F.

ATMOSPHERIC PRESSURE CONDITIONS ELEVATIONS ABOVE SEA LEVEL

ALTITUDE ABOVE SEA LEVEL	ATMOSPHERIC PRESSURE POUNDS/SQ.IN.	BAROMETER READING INS. OF MERCURY	EQUIVALENT HEAD OR WATER, FT.	REDUCTION TO MAX. PRACTICAL DYN.SUCTION LIFT
0	14.7	29.929	33.95	0 ft.
1000	14.2	28.8	32.7	1.2"
2000	13.6	27.7	31.6	2.3"
3000	13.1	26.7	30.2	3.7"
4000	12.6	25.7	29.1	4.8"
5000	12.1	24.7	27.9	6"
6000	11.7	23.8	27.0	6.9"
7000	11.2	22.9	25.9	8"
8000	10.8	22.1	24.9	9"

VIII. GUIDELINES FOR PUMPING WARM WATER

MAXIMUM PRACTICAL DYNAMIC SUCTION LIFT AND VAPOR PRESSURE

WATER CHARACTERISTICS

ALTITUDE ABOVE SEA LEVEL	ATMOSPHERIC PRESSURE POUNDS/SQ.IN.	BAROMETER READING INS. OF MERCURY	EQUIVALENT HEAD OR WATER, FT.	REDUCTION TO MAX. PRACTICAL DYN.SUCTION LIFT
0	14.7	29.929	33.95	0 ft.
1000	14.2	28.8	32.7	1.2"
2000	13.6	27.7	31.6	2.3"
3000	13.1	26.7	30.2	3.7"
4000	12.6	25.7	29.1	4.8"
5000	12.1	24.7	27.9	6"
6000	11.7	23.8	27.0	6.9"
7000	11.2	22.9	25.9	8"
8000	10.8	22.1	24.9	9"

IX. EFFECT OF SPECIFIC GRAVITY

The specific gravity of a substance is the ratio of the weight of a given volume to the weight of an equal volume of water at standard conditions.

1. A centrifugal pump will always develop the same head in feet no matter what the specific gravity of the liquid pumped; however, the pressure (in pounds per square inch) will be increased or decreased in direct proportion to the specific gravity.
2. The brake horsepower (BHP) of a pump varies directly with specific gravity. If the liquid has a specific gravity other than water (1.0), multiply the BHP for water by the sp.gr. of liquid handled.

X. VISCOSITY

The viscosity of a fluid is the internal friction or resistance to motion of its particles. The coefficient of viscosity of a fluid is the measure of its resistance to flow. Fluids having a high viscosity are sluggish in flow, for example: heavy oil or molasses. Liquids such as water or gasoline have relatively low viscosity and flow readily. Viscosity is a fluid property independent of specific gravity. Viscosities vary with temperature; as temperature increases, viscosity decreases. Pressure changes have negligible influence on viscosity. There are many types of viscometers and expressed in many terms. Commonly used is SSU (Seconds Saybolt Universal). This is actually the time in seconds required for a given quantity of fluid to pass through a standard orifice under standard conditions. Viscous liquids tend to reduce the capacity, head, and efficiency, and increase the BHP.

$$\begin{aligned} \text{Kinematic Viscosity (in Centistokes)} \\ &= \text{Absolute Viscosity (in centipoise)}/\text{Specific Gravity} \\ \text{Centistokes} &= \text{SSU}/4.64 \end{aligned}$$

This is an approximation for Viscosities greater than 250 S.S.U. The approximated performance for pumping fluids more viscous than water is determined from the following formula:

$$\text{BHP}_{\text{vis}} = \text{Q}_{\text{vis}} \times \text{H}_{\text{vis}} \times \text{S.G.}/3960/\text{E}_{\text{vis}}$$

HOW CENTRIFUGAL PUMPS WORK

Liquid is supplied to the inlet at the center of the pump head. Since centrifugal pumps are not self-priming, liquid must be supplied by gravity feed or the pump must be primed. The spinning impeller propels the liquid outward by centrifugal force, providing the motive force required to move the liquid. The specially shaped volute receives the liquid and converts the radial motion to a smooth pulseless flow. Easily adjust the flow rate by restricting the flow at the outlet.

CENTRIFUGAL PUMP TERMS

IMPELLER – A rotating vaned disk that provides the pumping force.

VOLUTE – The body of the pump that is shaped to receive liquid from the inlet and direct it through the outlet.

Liquid Pump Terminology

HEAD – The ability of a pump to push a column of water vertically in a pipe. As the column lengthens, the flow rate decreases until the column's weight just balances the pump's force and there is no flow. This height is the total head (usually expressed as feet of head).

FLOW RATE – Usually expressed in gallons per minute (GPM) for large-volume pumps; in gallons per hour (GPH) for small-volume pumps.

DYNAMIC SEAL – Seal located at the shaft end of the pump drive.

HECK VALVE – Allows liquid to flow in one direction only. Generally used in discharge line to prevent reverse flow.

DEAD HEAD – Ability of a pump to continue running without damage when discharge is closed off. Only recommended with centrifugal pumps.

DENSITY (specific weight of a fluid) – Weight per unit volume, often expressed as pounds per cubic foot or grams per cubic centimeter.

FLOODED SUCTION – Liquid flows to pump inlet from an elevated source by means of gravity. Recommended for centrifugal pump installations.

FLOW – A measure of the liquid volume capacity of a pump. Given in gallons per hour (GPH), gallons per minute (GPM), liters per minute (l/min), or milliliters per minute (ml/min).

FLUIDS – Include liquids, gases, and mixtures of liquids, solids, and gases. For the purposes of this catalog, the terms fluid and liquid are both used to mean a pure liquid or a liquid mixed with gases or solids that acts essentially like a liquid in pumping applications.

FOOT VALVE – A type of check valve with a built-in strainer. Used at point of liquid intake to retain liquid in system, preventing loss of prime when liquid source is lower than pump.

HEAD – A measure of pressure, expressed in feet of head for centrifugal pumps. Indicates the height of a column of water being moved by the pump, assuming negligible friction losses.

PRESSURE – The force exerted on the walls of a container (tank, pipe etc.) by a liquid. Normally measured in pounds per square inch (psi) for positive displacement and metering pumps.

PRIME – A charge of liquid required to begin pumping action when liquid source is lower than pump. May be held in pump by a foot valve on the intake line, or by a valve or chamber within the pump.

SEAL – A device mounted in the pump housing and/or on the pump

shaft, to prevent leakage of liquid from the pump. There are three types:

1. LIP – A flexible ring (usually rubber or similar material) with the inner edge held closely against the rotating shaft by a spring.
2. MECHANICAL – Has a rotating part and a stationary part with highly polished touching surfaces. Has

excellent sealing capability and long life, but can be damaged by dirt or grit in the liquid.

3. PACKED – Multiple flexible rings mounted around the pump shaft and packed together by tightening gland nuts; some leaking is essential for lubrication.

RELIEF VALVE – Usually used at the discharge of a positive displacement pump. An adjustable, spring-loaded valve opens when a preset pressure is reached. Used to prevent excessive pressure buildup that could damage the pump or motor.

SEALLESS (MAGNETIC DRIVE) – No seal is used; power is transmitted from motor to pump impeller by magnetic force.

SELF-PRIMING – Refers to pumps that draw liquid up from below pump inlet (suction lift), as opposed to pumps requiring flooded suction.

SPECIFIC GRAVITY – The ratio of the weight of a given volume of liquid to the same volume of pure water. Pumping heavier liquids (specific gravity greater than 1.0) will require more drive horsepower.

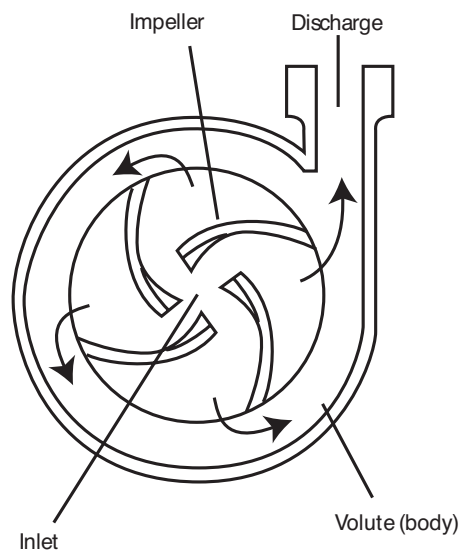
STATIC DISCHARGE HEAD – Maximum vertical distance (in feet) from pump to point of discharge with no flow.

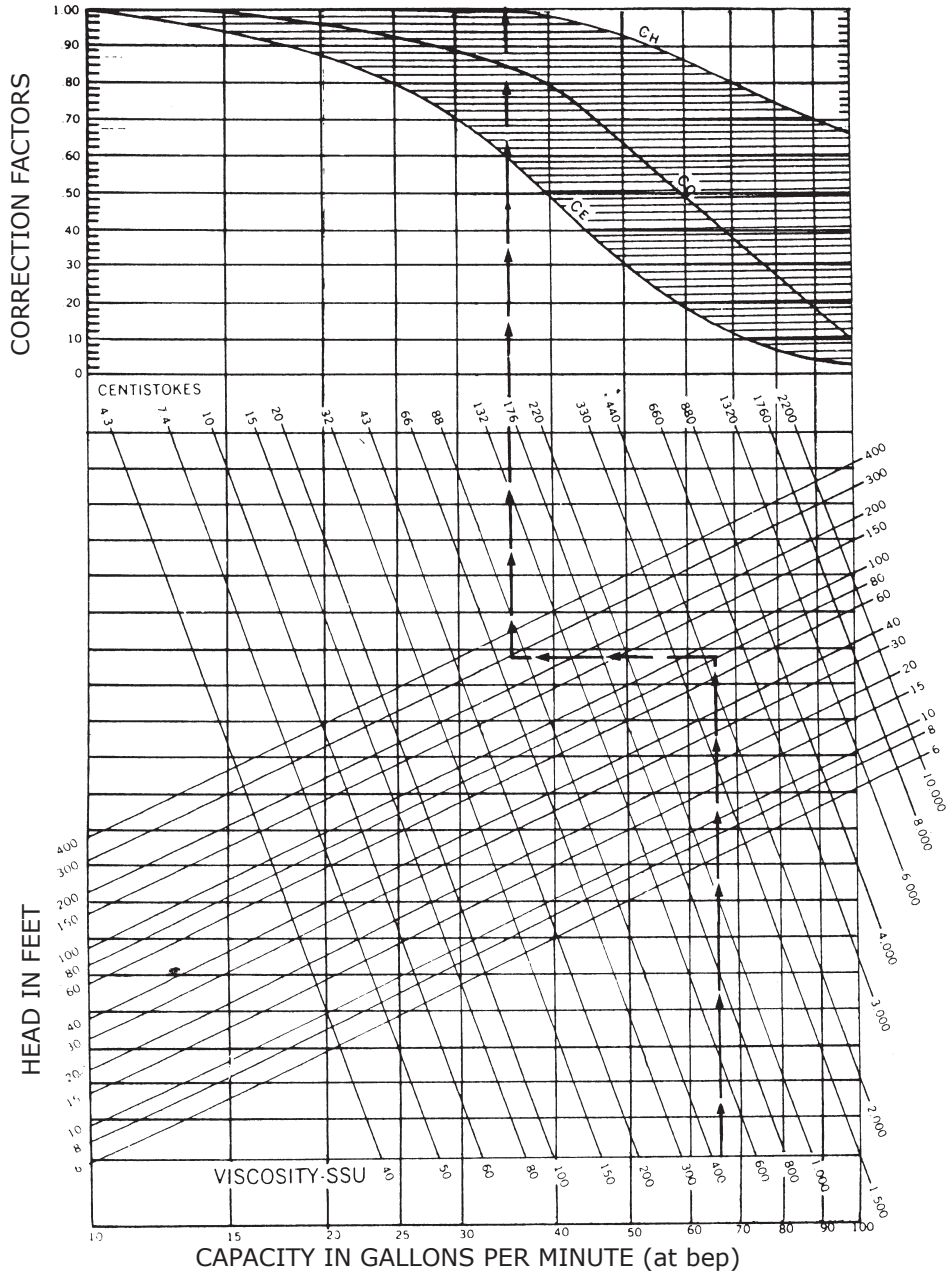
STRAINER – A device installed in the inlet of a pump to prevent foreign particles from damaging the internal parts.

SUMP – A well or pit in which liquids collect below floor level sometimes refers to an oil or water reservoir.

TOTAL HEAD – Sum of discharge head, suction lift, and friction loss.

VISCOSITY – The "thickness" of a liquid, or its ability to flow. Most liquids decrease in viscosity and flow more easily as they get warmer.





VISCOSITY CORRECTION CHART

Example - Viscosity

Determine BHP_{vis} when pumping 66 usgpm at 80 ft. of 50% NaOH with a pump at 48% Eff. with water.

*S.G. = 1.53 *Given from other tables

*Visc = 78cSt = 120 CP/1.53

Q_w = 66 usgpm

H.W. = 80 ft.

E.W. = 48% = .48

C_q = .84)

Ch = 1.00) From above chart

C_e = .58

Q_w x C_q = 66 x .84 = 55.44

H_w x Ch = 80 x 1.00 = 80.0

E_w x C_e = .48 x .58 = .2784

BHP_{vis} = 55.44 x 80.0 x 1.53/3960/0.2784 = 6.16 H.P.

WHERE

BHP_{vis} = Viscous brake horsepower

S.G. = Specific Gravity

3960 = Constant

Q_w = Capacity pumping water (USGPM)

C_q = Capacity correction factor (Fig 1)

Q_{vis} = Viscous Capacity (USGPM) = C_q X Q_w

H_w = Head pumping water (ft.)

Ch = Head correction factor (Fig 1)

H_{vis} = Viscous head (ft) = Ch X H_w

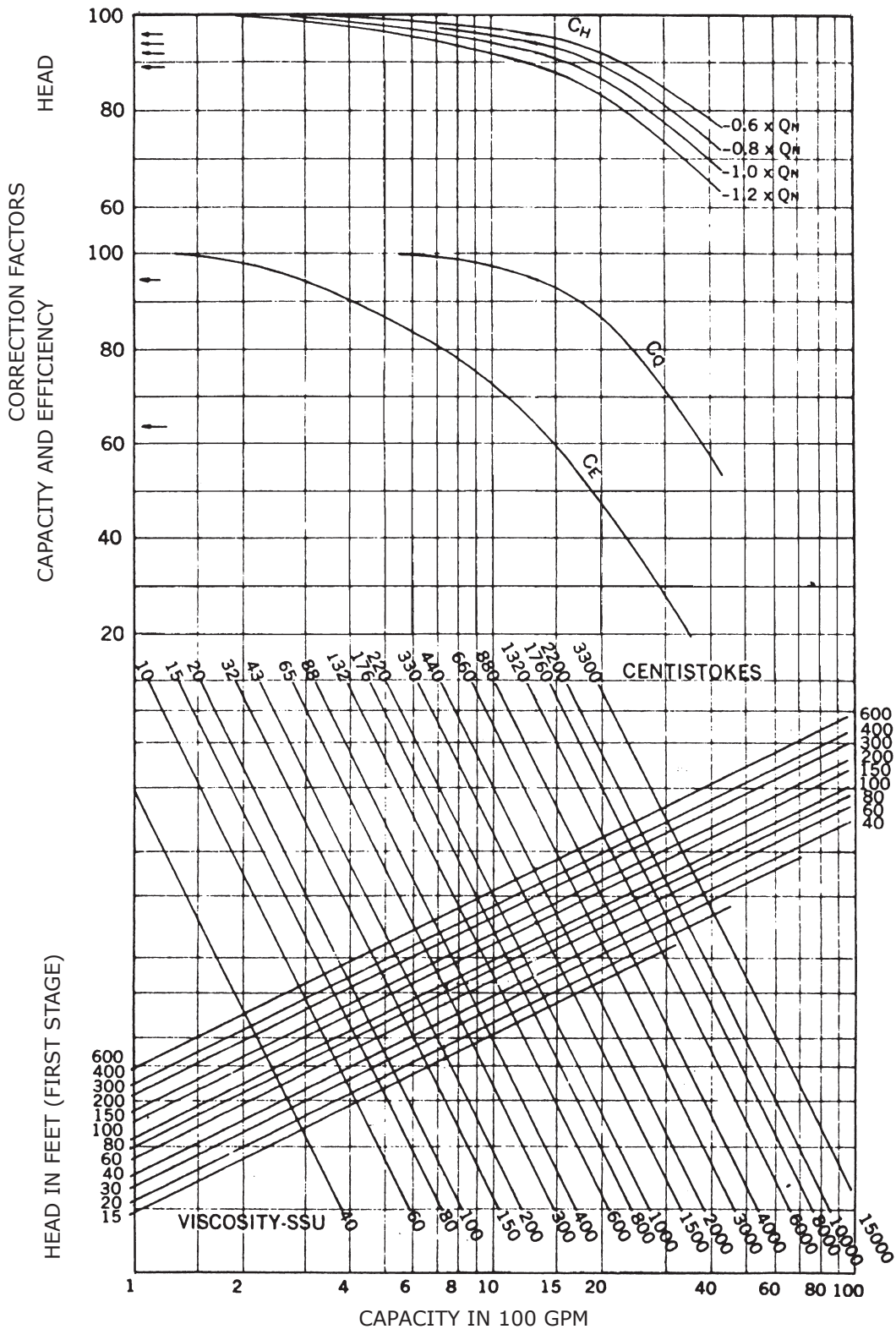
E_w = Efficiency pumping Water

C_e = Efficiency correction factor (Fig 1)

E_{vis} = Viscous Efficiency = C_e X E_w

BHP_{vis} = (c_q X Q_s) X (H_w X Ch) X S.G./3960/C_e/E_{vis}

PERFORMANCE CORRECTION CHART



Conversion Factors

Conversion Factors

- PHYSICAL DIMENSIONS - VOLUME						
U.S. CUSTOMARY UNITS					S.I. UNIT	OTHER METRIC UNIT
cubic inch (in. ³)	US gallon (US gal)	Imp.gallon (Imp gal)	cubic foot (ft. ³)	barrel* (bbl)	cubic meter (m ³)	liter (l)
1	0.00433	0.00360	0.000579	0.000103	0.00001639	0.01639
231	1	0.8327	0.1337	0.0238	0.003785	3.785
277.42	1.2009	1	0.1606	0.0286	0.004546	4.546
1728	7.481	6.229	1	0.1780	0.02832	28.32
9702	42	34.97	5.615	1	0.15897	158.97
61.024	264.17	220	35.31	6.2898	1	1000
61.024	0.2642	0.2198	0.0353	0.00630	0.001	1

*By trade custom, one barrel petroleum oil is equal to 42 US gal.

CONVERSION TABLE - CAPACITY							
U. S. CUSTOMARY UNITS					S.I. UNIT	OTHER METRIC UNITS	
Millions of US gallons per day (MGD)	US gallons per min (gpm)	Imp. gallons per min (lgpm)	cubic feet per sec (cfs)	*barrels per hr (bph)	cubic meters per sec (m ³ /s)	liters per min (l/min)	cubic meters per hr (m ³ /hr)
1	694.4	578	1.547	992	0.0438	2628	157.72
0.00144	1	0.8327	0.002228	1.4286	63.08x10 ⁻⁶	3.785	0.2271
0.00173	1.2009	1	0.00268	1.7156	75.77x10 ⁻⁶	4.5454	0.2728
0.64636	448.86	373.8	1	641.23	2.832 x 10 ⁻²	1699	101.952
0.00100	0.7000	0.5829	0.00156	1	44.166x10 ⁻⁴	2.6495	0.1590
22.824	15.852	13.188	35.316	22.643	1	60.000	3.600
0.000380	0.2642	0.2198	0.000586	0.3774	16.67x10 ⁻⁶	1	0.0600
0.00634	4.4028	3.666	0.00981	6.2898	2.777x10 ⁻⁴	16.667	1

*By trade custom, one barrel petroleum oil is equal to 42 US gal.
gpm = 0.1247 x lb/hr when w = density, lb/cu ft
w

CONVERSION TABLE-MASS, WEIGHT AND FORCE							
Definitions:							
1. Mass is absolute, the pound (lb) and kilogram (kg) are most commonly used units, the kilogram is the SI unit.							
U.S. CUSTOMARY UNITS (avoirdupois)					S.I. UNIT	OTHER METRIC UNITS	
grain (gr)	ounce (oz)	pound (lb)	short ton	long ton	kilogram (kg)	gram (g)	metric ton
1	0.002286	-	-	-	-	0.0648	-
437.5	1	0.0625	-	-	0.02835	28.35	-
7 000	16	1	-	-	0.4536	453.6	-
-	-	2 000	1	.8929	907.2	-	0.9072
-	-	2 240	1.12	1	1016	-	1.016
15 432	35.27	2.205	-	-	1	1 000	0.001
15.432	0.03527	0.002205	-	-	0.001	1	-
-	-	2205	1.102	0.9842	1000	1 000 000	1

CONVERSION TABLE-POWER					
U.S. CUSTOMARY UNITS			S.I. UNIT	OTHER METRIC UNITS	
foot-pounds per sec. (ft-lb/sec)	horsepower (hp)	British thermal units per sec (Btu/sec)	watts (W)	kilowatts (kW)	metric horsepower
1	0.00182	0.001285	1.356	0.001356	0.00184
550	1	0.7068	7.457 x 10 ²	0.7457	1.014
778.2	1.415	1	1.055 x 10 ³	1.055	1.434
0.7376	1.341 x 10 ⁻³	9.478 x 10 ⁻⁴	1	0.001	0.00136
737.6	1.341	0.9478	1000	1	1.360
542.5	0.9863	0.6971	7.355 x 10 ²	0.7355	1

CONVERSION TABLE-PRESSURE

Units and symbols:

pounds per square inch (psi)
pascal (Pa) = 1 N/m (SI unit)
kilograms per square centimeter (kg/cm²)
bar

1 psi = 0.0703 kg/cm² = 6894.76 N/m² = 6.894 kPa
1 kg/cm² = 14.22 psi = 9.80665 x 10⁴ N/m² = 98.0665 kPa
1 atmosphere = 14.7 psi = 1.0332 kg/m² = 10.13 x 10⁴ = 101.3 kPa
1 metric atmosphere = 98.0665 kPa
1 pascal = 1.45 x 10⁻⁴ psi = 1.02 x 10⁵ kg/cm³
1 bar = 10⁵ Pa = 100 kPa

Fabco Plastics Terms and Conditions

Notice to Buyers

PRICES

All prices shown are subject to change without notice and should be confirmed with FABCO. These prices do not constitute an offer to sell. All are based on standard domestic packaging and do not include special overseas packaging or other requirements. Dealer, Contractor and OEM discounts for volume orders are available for most product lines.

PLACING ORDERS

To expedite handling of your order, please use the combination of part number, size and brief description. Our minimum order is \$25.00 net.

SHIPPING

All shipments are FOB shipping point except those qualified materials which carry mill shipment freight allowances. The term FOB shipping point means the carrier accepts all responsibility upon accepting the shipment at our dock. Therefore, any claims for damage or loss must be settled between you and the carrier without delay.

EXPORT SHIPMENT

FABCO will be happy to handle your export order. We will offer prompt replies on your inquiry including Pro Forma Invoice, CIF Port of Unloading, and export crating on all our products. Terms and Letter of Credit drawn on a Canadian bank. Address your inquiry to "Export Dept." at our Maple, Ontario office.

CLAIMS & RETURNS

Claims for shortages or inaccurate filling of orders must be made to FABCO within ten days after receipt of goods. Include a copy of the invoice or shipper on which the goods were purchased. You will then receive a Returned Goods (RG) authorization number. There is a 25% restocking charge on any standard goods returned for credit or exchange, when the error is not ours, providing such goods that are returned are in new and saleable condition, are returned on a prepaid basis and the returned goods do not exceed ten percent of the original ordered quantities. Goods returned without the RG authorization will be refused. Any custom fabricated, hand fabricated or specially ordered products are non-returnable.

Condition of Sale Terms

INFORMATION

FABCO will endeavor to furnish such advice as it may be able to supply with reference to the use by buyer of any materials purchased, but FABCO makes no guarantees and assumes no obligation or liability for the advice given verbally or in print or the results obtained. Buyer assumes all risk and liability which may result from the use of any material, whether used singly or in combination with other products. No suggestion for product use shall be construed as a recommendation for its use in infringement on any existing patent.

PRODUCT WARRANTY

All products not manufactured by FABCO carry the original manufacturer's warranty. Copies are available on request. All products manufactured by FABCO will be free of defects in material and workmanship for a period of one year from shipment from FABCO. If found to be defective by us, we will repair or replace the nonconforming parts or goods at our option or return the purchase price at our option. Notice of a defective product must be given to FABCO in writing immediately upon the discovery of such defect and include a copy showing proof of purchase. FABCO will not be liable for special or consequential damages in any claim, suit or proceedings arising under this warranty, nor will FABCO accept any liability for claims for labor, loss of profit, repairs or other expenses incidental to replacement. The Product Warranty expressed above is our only warranty and may not be verbally changed or modified by any representative of FABCO. The offer to repair or replace nonconforming goods within warranty does not cover defects caused by shipping damages, damages caused by improper use or installation, or by the buyer's attempts to use the products beyond their mechanical, thermal or electrical capacity. All freight costs incurred in shipping parts to or from FABCO, or to the manufacturer if necessary, are at the expense of the customer. FABCO reserves the right of product substitution to meet market shortages

Credit Terms and Conditions

1. The Applicant hereby consents to Fabco Plastics obtaining, using, exchanging or investigating any personal or business information provided by the application for the purpose of evaluating, servicing and collecting on the accounts established pursuant to the granting of credit.
2. The Applicant agrees that every invoice and statement of account shall be deemed and treated as authorized and correct, unless a written notice to the contrary is received by Fabco Plastics within fifteen (15) days from the date of such invoice or statement.
3. The Applicant acknowledges that Fabco Plastics may, at its sole discretion, reduce, refuse or suspend all credit privileges on Applicant's account at any time for any reason.
4. The Applicant hereby agrees to pay all costs of collection and/or legal fees incurred by Fabco Plastics in connection with the collection or recovery of any amount owed by the Applicant.
5. If the Applicant is claiming tax exempt status, a tax exemption certificate must be provided and failure to provide such documentation may delay processing of the application.
6. Account are due and payable 30 days from the date of shipping unless otherwise different term agreed by Fabco Plastics.
7. Past due accounts will be charged interest of 2% per month, 24% per annum.
8. Accounts must be kept current all times; delinquent accounts will be refused further credit until the account status is current.

Name of the business: _____

Name of the authorized representative or owner: _____

I agree to all of the above Terms and Conditions: _____

(Signature)

Fabco Plastics Credit Application

Application for Credit

NAME: _____ DATE: _____
ADDRESS: _____ A/P CONTACT: _____
_____ A/P TELEPHONE: _____
EMAIL: _____ FAX: _____
AMOUNT OF CREDIT REQUESTED: _____
SALESTAX NUMBERS: GST: _____ PST: _____
LEGAL NAME OF COMPANY: _____ COMMECEMENT OF BUSINESS: _____
COMPANY OFFICERS: 1) _____ TITLE: _____
2) _____ TITLE: _____
OWNERSHIP: CORPORATION PARTNERSHIP SOLE PROPRIETOR

OUR TERMS OF PAYMENT ARE STRICTLY NET 30 DAYS. YOUR APPLICATION FOR CREDIT IS YOUR AGREEMENT TO ABIDE BY THESE TERMS. OWNERSHIP OF GOODS OR SERVICES PURCHASED SHALL REMAIN THE PROPERTY OF FABCO PLASTICS WHOLESALE (ONTARIO) LIMITED UNTIL PAID IN FULL.

TRADE REFERENCES: (SUPPLIERS WITH WHOM YOU ARE CURRENTLY DOING BUSINESS)

1) NAME: _____
ADDRESS: _____ PHONE: _____
EMAIL: _____ FAX: _____
2) NAME: _____
ADDRESS: _____ PHONE: _____
EMAIL: _____ FAX: _____
3) NAME: _____
ADDRESS: _____ PHONE: _____
EMAIL: _____ FAX: _____

BANK REFERENCE: NAME: _____
ADDRESS: _____
EMAIL: _____ PHONE: _____
CONTACT: _____ FAX: _____

I THE UNDERSIGNED HEREBY GIVE AUTHORITY TO RELEASE BANKING AND TRADE REFERENCE INFORMATION NECESSARY FOR THE APPROVAL OF CREDIT.

PRINT NAME: _____
SIGNATURE: _____ TITLE: _____

FOR OFFICE USE ONLY: DATE: _____ APPROVED BY: _____
CREDIT LIMITED: _____ CUSTOMER NUMBER: _____
TERRITORY CODE: _____ DISCOUNT CODE: _____ NAICS: _____



Company Profile

Fabco Plastics is a supplier of thermoplastic products designed for use in corrosion resistant fluid processing systems. Our product offering comes from some of the leading domestic and international manufacturers of industrial plastics. Our product line includes pipe, fittings, valves, pumps, tanks, sheet, tubing, fans, rod, ducting, filters, grating and other products. These products are available in PVC, CPVC, PP, PVDF, PE and other specialized plastic materials.

Fabco supplies new and innovative products to a growing list of industrial and commercial market segments. We are committed to staying on the industry's leading edge and continue to provide products and services that create simplicity and efficiency for our customers.

Terms and Conditions of Sale

PRODUCT WARRANTY

All products not manufactured by FABCO carry the original manufacturer's warranty. Copies are available on request. All products manufactured by FABCO will be free of defects in material and workmanship for a period of one year from shipment from FABCO. If found to be defective by us, we will repair or replace the nonconforming parts or goods at our option or return the purchase price at our option. Notice of a defective product must be given to FABCO in writing immediately upon the discovery of such defect and include a copy showing proof of purchase. FABCO will not be liable for special or consequential damages in any claim, suit or proceedings arising under this warranty, nor will FABCO accept any liability for claims for labor, loss of profit, repairs or other expenses incidental to replacement. The Product Warranty expressed above is our only warranty and may not be verbally changed or modified by any representative of FABCO. The offer to repair or replace nonconforming goods within warranty does not cover defects caused by shipping damages, damages caused by improper use or installation, or by the buyer's attempts to use the products beyond their mechanical, thermal or electrical capacity. All freight costs incurred in shipping parts to or from FABCO, or to the manufacturer if necessary, are at the expense of the customer. FABCO reserves the right of product substitution to meet market shortages

PRICES

All prices shown are subject to change without notice and should be confirmed with FABCO. These prices do not constitute an offer to sell. All are based on standard domestic packaging and do not include special overseas packaging or other requirements. Dealer, Contractor and OEM discounts for volume orders are available for most product lines.

PLACING ORDERS

To expedite handling of your order, please use the combination of part number, size and brief description. Our minimum order is \$25.00 net.

SHIPPING

All shipments are FOB shipping point except those qualified materials which carry mill shipment freight allowances. The term FOB shipping point means the carrier accepts all responsibility upon accepting the shipment at our dock. Therefore, any claims for damage or loss must be settled between you and the carrier without delay.

EXPORT SHIPMENT

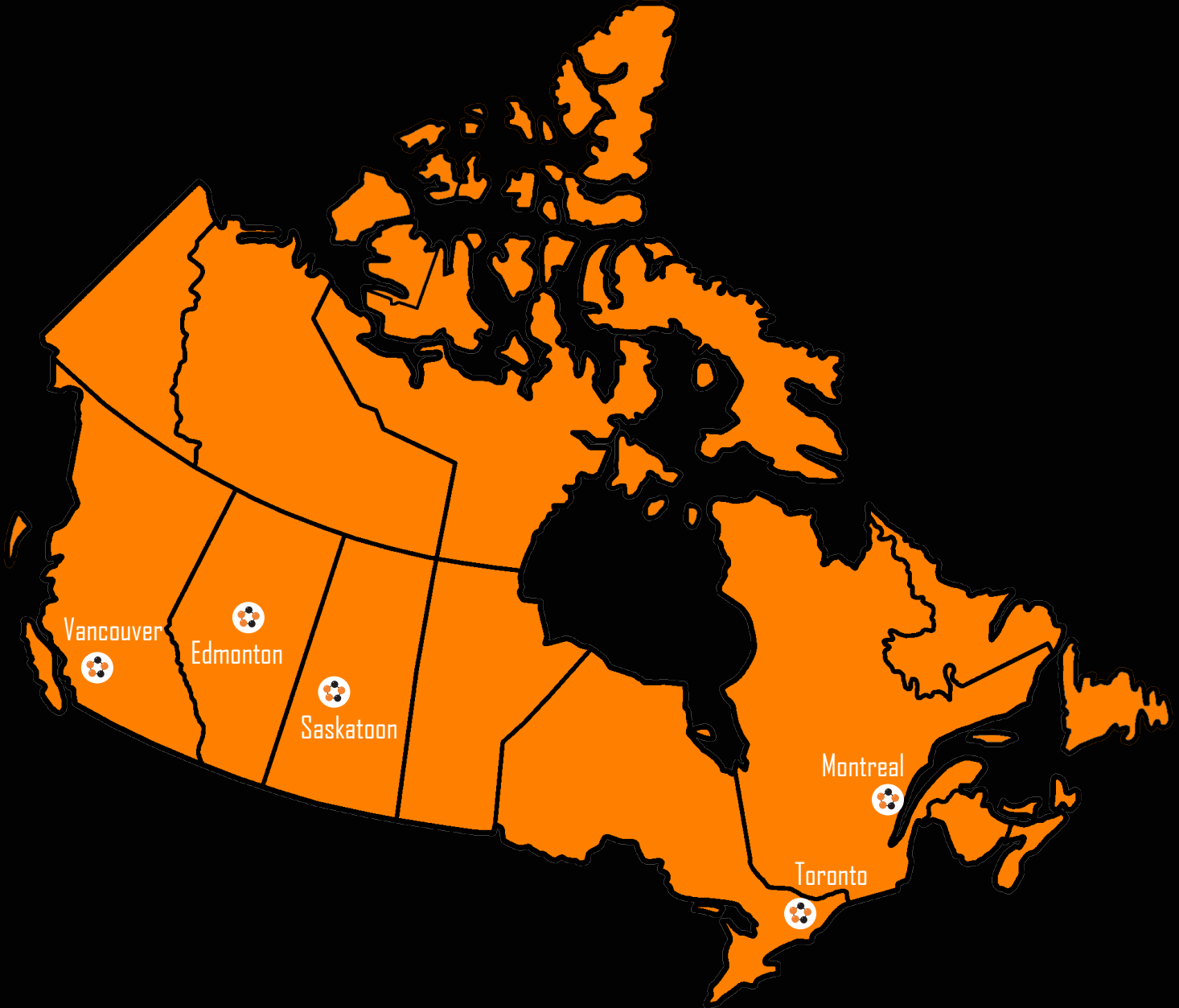
FABCO will be happy to handle your export order. We will offer prompt replies on your inquiry including Pro Forma Invoice, CIF Port of Unloading, and export crating on all our products. Terms and Letter of Credit drawn on a Canadian bank. Address your inquiry to "Export Dept." at our Maple, Ontario office.

CLAIMS & RETURNS

Claims for shortages or inaccurate filling of orders must be made to FABCO within ten days after receipt of goods. Include a copy of the invoice or shipper on which the goods were purchased. You will then receive a Returned Goods (RG) authorization number. There is a 25% restocking charge on any standard goods returned for credit or exchange, when the error is not ours, providing such goods that are returned are in new and saleable condition, are returned on a prepaid basis and the returned goods do not exceed ten percent of the original ordered quantities. Goods returned without the RG authorization will be refused. Any custom fabricated, hand fabricated or specially ordered products are non-returnable.

NOTICE TO BUYER

FABCO will endeavor to furnish such advice as it may be able to supply with reference to the use by buyer of any materials purchased, but FABCO makes no guarantees and assumes no obligation or liability for the advice given verbally or in print or the results obtained. Buyer assumes all risk and liability which may result from the use of any material, whether used singly or in combination with other products. No suggestion for product use shall be construed as a recommendation for its use in infringement on any existing patent.



MONTREAL

2750 RUE BERNARD-LEFEBVRE
LAVAL, QC H7C 0A5

450.687.2721
888.637.5278

SASKATOON

3926 ARTHUR ROSE AVE.
SASKATOON, SK S7P 0C9

306.955.6005

TORONTO - HEAD OFFICE

2175-A TESTON RD.
MAPLE ON L6A 1T3

905.832.0600
800.565.6189

EDMONTON

24790 - 117 AVE.
ACHESON, AB T7X 6C2

780.451.0238
800.661.7926

VANCOUVER

9511 - 194A ST.
SURREY, BC V4N 4G4

604.882.1564
800.232.2422