EN

HASSLACHER NORICA TIMBER

From **wood** to **wonders.**

Glulam

High quality GLT according to ANSI A190.1.

01
Overview

Product standard/certification

ANSI A190.1, Standard for Wood Products – Structural Glued Laminated Timber

Cross sections

Heights: 12 in. to 17¾ in. | 280 mm to 450 mm
Widths: 3¼ in. to 5½ in. | 80 mm to 140 mm
Lengths: up to 52½ ft. | 16 m; Standard lengths 40 ft. | 12 m and 45 ft. | 13.5 m
Smaller cross sections available upon request.

Strength classes

24F – 1.8E

Strength Class	Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)							Bending About Y-Y Axis (Loaded Parallel to Wide Faces of Laminations)						Axially Loaded		Fasteners
	Extreme Fiber in Bending (psi)		Compression Perpendicular to Grain (psi)	Shear Parallel to Grain (psi)	Modulus of Elasticity (10^6 psi)			Extreme Fiber in Bending (psi)	Compressional Perpendicular to Grain (psi)	Shear Parallel to Grain (psi)	Modulus of Elasicity (10^6 psi)			Tension Parallel to Grain (psi)	Compression Parallel to Grain (psi)	Specific Gravity for Fastener Design
	Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Tension or Compression Face													
	$F_{bx}+$	$F_{bx}-$[(a)]	$F_{c\perp x}$	F_{vx}[(b)]	$E_{x\ true}$	$E_{x\ app}$	$E_{x\ min}$	F_{by}	$F_{c\perp y}$	F_{vy}	$E_{y\ true}$	$E_{y\ app}$	$E_{y\ min}$	F_t	F_c	G
24F – 1.8E	2.400	2.400	430	265	1.9	1.8	0.95	1.450	430	230	1.7	1.6	0.85	1.100	1.050	0.42

Third-point loading full-scale beam bending tests according to ASTM D198
show a higher modulus of Elasticity of $E_{x\ true}$ =2.2 x 106 psi and $E_{x\ app}$ = 2.0 x 106 psi.

Wood species

Norway Spruce

Certification

The current certificates are available in the download area
of our website at HASSLACHER.COM.

Sustainability

The HASSLACHER group believes in careful use of wood as a resource. Our raw materials come from sustainable and controlled forestry. Our locations are certified according to the strict PEFC standards.

PEFC
PEFC/06-32-12
Promoting Sustainable Forest Management
www.pefc.org

02
Technical data

Bonding

Melamine resin adhesive with bright glue line, adhesive type I according to EN 301 approved for bonding loadbearing and non-loadbearing timber components, both indoor and outdoor.

Lamella thickness

Maximum lamella thickness: 1¾ in. | 45 mm

Moisture content

12 % ± 2.5 %

Density

For Norway Spruce approximately
26 lbf/ft³ | 420 kg/m³ to
31 lbf/ft³ | 500 kg/m³ in average.

Shrinkage and swelling behaviour

Perpendicular to the grain direction
$\alpha_{u,90}$ = 0.24 % per 1 % change in moisture content

Parallel to the grain direction
$\alpha_{u,0}$ = 0.01 % per 1 % change in moisture content

Dimensional tolerances

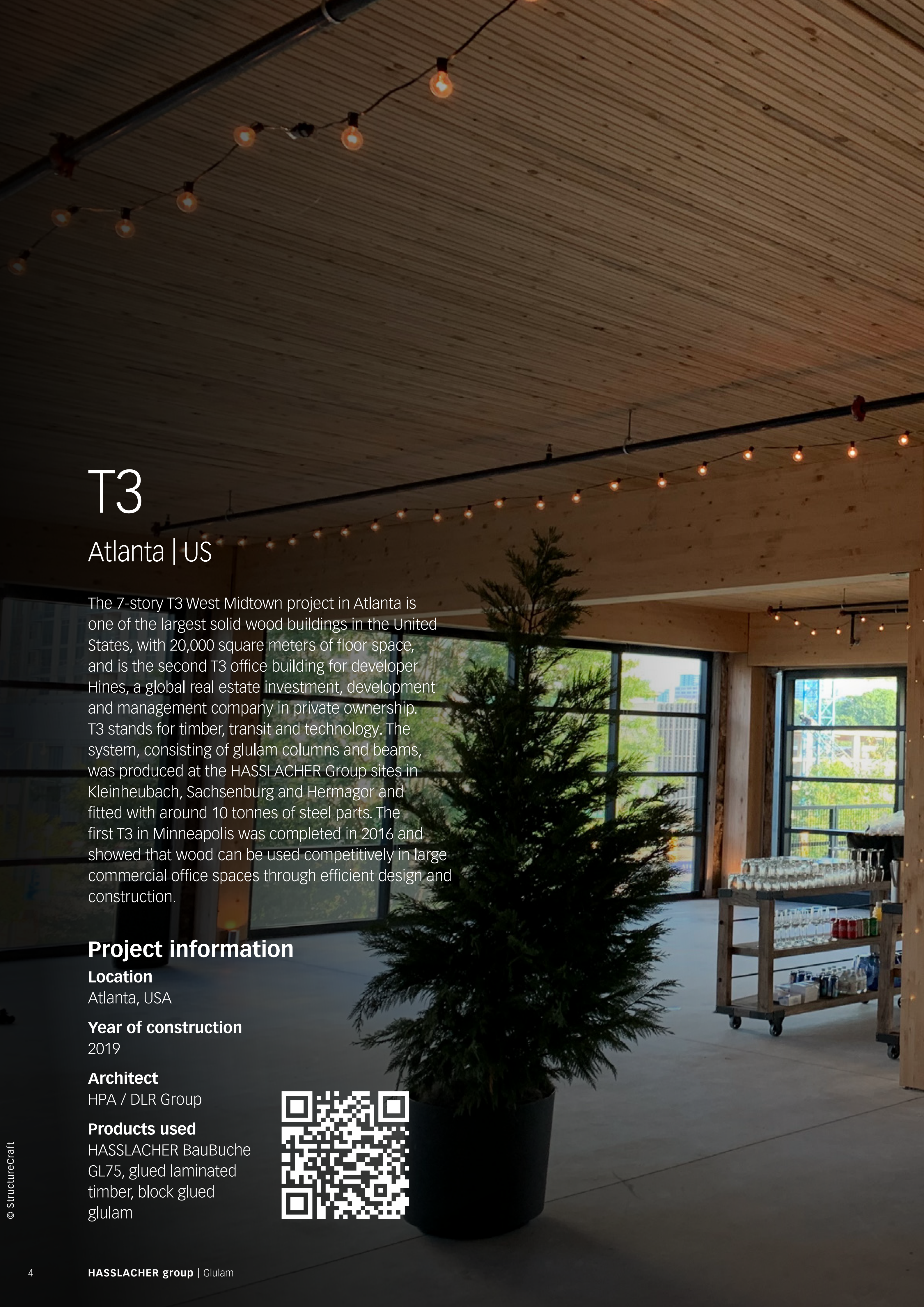
Maximum deviations from nominal sizes for glued laminated timber in accordance to EN 14080

Possibilities for further processing

CNC processing
Surface finish, such as paint and varnish
Installation of steel parts

Dimensional tolerances

		Maximum deviations
Width of cross section	for all widths	±1/13 in. | ±2 mm
Height *h* of cross section	*h* ≤ 15¾ in. | 400 mm	+1/6 in. | +4 mm to –1/13 in. | –2 mm
	h > 15¾ in. | 400 mm	+1 % to –0.5 %
Maximum deviation of the angles of the cross section from the right angle		1:50
Length *l* of a straight member	*l* ≤ 79 in. | 2 m	±1/13 in. | ±2 mm
	6½ ft. | 2 m ≤ *l* ≤ 65 ft. | 20 m	±0.1 %
Longitudinal warping measured as the maximum gauge over a length of 6½ ft. | 2.0 m disregarding precamber		1/6 in. | 4 mm



T3

Atlanta | US

The 7-story T3 West Midtown project in Atlanta is one of the largest solid wood buildings in the United States, with 20,000 square meters of floor space, and is the second T3 office building for developer Hines, a global real estate investment, development and management company in private ownership. T3 stands for timber, transit and technology. The system, consisting of glulam columns and beams, was produced at the HASSLACHER Group sites in Kleinheubach, Sachsenburg and Hermagor and fitted with around 10 tonnes of steel parts. The first T3 in Minneapolis was completed in 2016 and showed that wood can be used competitively in large commercial office spaces through efficient design and construction.

Project information

Location
Atlanta, USA

Year of construction
2019

Architect
HPA / DLR Group

Products used
HASSLACHER BauBuche GL75, glued laminated timber, block glued glulam

Glued laminated timber

High-quality glued laminated timber is characterised by the high load-carrying capacity, dimensional stability and formability of the timber components. Glued laminated timber is available in straight and curved shapes, thereby opening the door to virtually limitless design freedom in timber construction.

03

Mechanical Properties

Reference Design Values

Strength Class	Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)							Bending About Y-Y Axis (Loaded Parallel to Wide Faces of Laminations)						Axially Loaded		Fasteners
	Extreme Fiber in Bending (psi)		Compression Perpendicular to Grain (psi)	Shear Parallel to Grain (psi)	Modulus of Elasticity (10^6 psi)			Extreme Fiber in Bending (psi)	Compres-sional Perpendicular to Grain (psi)	Shear Parallel to Grain (psi)	Modulus of Elasicity (10^6 psi)			Tension Parallel to Grain (psi)	Compressi-on Parallel to Grain (psi)	Specific Gravity for Fastener Design
	Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Tension or Compression Face													
	$F_{bx}+$	$F_{bx}-$[a]	$F_{c\perp x}$	F_{vx}[b]	$E_{x\ true}$	$E_{x\ app}$	$E_{x\ min}$	F_{by}	$F_{c\perp y}$	F_{vy}	$E_{y\ true}$	$E_{y\ app}$	$E_{y\ min}$	F_t	F_c	G
24F – 1.8E	2.400	2.400	430	265	1.9	1.8	0.95	1.450	430	230	1.7	1.6	0.85	1.100	1.050	0.42

Third-point loading full-scale beam bending tests according to ASTM D198 show a higher modulus of Elasticity of $E_{x\ true}$ =2.2 x 106 psi and $E_{x\ app}$ = 2.0 x 106 psi.

HASSLACHER Beam Properties 24F - 1.8E

3–1/8-Inch width									
Depth (in.)	6	7–1/2	9	10–1/2	12	13–1/2	15	16–1/2	18
Beam Weight (lbf/ft)	4.6	5.7	6.8	8.0	9.1	10.3	11.4	12.5	13.7
A (in.2)	18.75	23.44	28.13	32.81	37.50	42.19	46.88	51.56	56.25
S (in.3)	18.75	29.30	42.19	57.42	75.00	94.92	117.20	141.8	168.80
I (in.4)	56.25	109.9	189.80	301.5	450.00	640.7	878.90	1170	1519.00
EI (106 lbf-in.2)	101.3	197.8	341.7	542.6	810,0	1153	1582.0	2106	2734.0
Moment Capacity (lbf-ft)	3750	5859	8438	11480	15000	18980	23440	28360	33750
Shear Capacity (lbf)	3313	4141	4969	5797	6625	7453	8281	9109	9938

3–1/2-Inch width									
Depth (in.)	6	7–1/2	9	10–1/2	12	13–1/2	15	16–1/2	18
Beam Weight (lbf/ft)	5.1	6.4	7.7	8.9	10.2	11.5	12.8	14.0	15.3
A (in.2)	21.00	26.25	31.50	36.75	42.00	47.25	52.50	57.75	63.00
S (in.3)	21.00	32.81	47.25	64.31	84.00	106.3	131.3	158.8	189.0
I (in.4)	63.00	123.0	212.60	337.6	504.0	717.6	984.4	1310	1701
EI (106 lbf-in.2)	113.4	221.5	382.7	607.8	907.2	1292	1772	2358	3062
Moment Capacity (lbf-ft)	4200	6563	9450	12860	16800	21260	26250	31760	37800
Shear Capacity (lbf)	3710	4638	5565	6493	7420	8348	9275	10200	11130

5–1/8-Inch width									
Depth (in.)	6	7–1/2	9	10–1/2	12	13–1/2	15	16–1/2	18
Beam Weight (lbf/ft)	14.9	16.8	18.7	20.6	22.4	24.3	26.2	28.0	29.9
A (in.2)	61.50	69.19	76.88	84.56	92.25	99.94	107.6	115.3	123.0
S (in.3)	123.0	155.7	192.2	232.5	276.8	324.8	376.7	432.4	492.0
I (in.4)	738.0	1051	1441	1919	2491	3167	3955	4865	5904
EI (106 lbf-in.2)	1328	1891	2595	3453	4483	5700	7119	8757	10630
Moment Capacity (lbf-ft)	24600	31130	38440	46510	55350	64960	75340	86480	98400
Shear Capacity (lbf)	10870	12220	13580	14940	16300	17660	19010	20370	21730

5–1/2-Inch width									
Depth (in.)	6	7–1/2	9	10–1/2	12	13–1/2	15	16–1/2	18
Beam Weight (lbf/ft)	16.0	18.0	20.1	22.1	24.1	26.1	28.1	30.1	32.1
A (in.2)	66.00	74.25	82.50	90.75	99.00	107.3	115.5	123.8	132.0
S (in.3)	132.0	167.1	206.3	249.6	297.0	348.6	404.3	464.1	528.0
I (in.4)	792.0	1128	1547	2059	2673	3398	4245	5221	6336
EI (106 lbf-in.2)	1426	2030	2784	3706	4811	6117	7640	9397	11400
Moment Capacity (lbf-ft)	26400	33410	41250	49910	59400	69710	80850	92810	105600
Shear Capacity (lbf)	11660	13120	14580	16030	17490	18950	20410	21860	23320

Notes

a. Beam weight is based on density of 35 pcf.
b. Moment capacity must be adjusted for volume effect. The volume factor for various glulam sizes and simple spans, as well as the complete formula, is given in Appendix A.
c. Moment and shear capacities are based on a normal (10-year) duration of load and should be adjusted for the design duration of load per the applicable building code.

HASSLACHER Span Tables 24F - 1.8E

Width (in)	Height (in)		Span (ft)																	
			8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
3.5	7,5	Total Load (plf)	727.0	434.0	249.0	154.0	102.0	70.0	–	–	–	–	–	–	–	–	–	–	–	–
		Live Load (plf)	572.0	293.0	170.0	107.0	72.0	50.0	–	–	–	–	–	–	–	–	–	–	–	–
		Min . End Bearing (in .)	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–	–	–	–	–	–
3.125	9	Total Load (plf)	1048.0	668.0	433.0	270.0	179.0	123.0	88.0	–	–	–	–	–	–	–	–	–	–	–
		Live Load (plf)	989.0	506.0	293.0	184.0	124.0	87.0	63.0	–	–	–	–	–	–	–	–	–	–	–
		Min . End Bearing (in .)	3.2	2.6	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–	–	–	–	–
3.5	9.25	Total Load (plf)	1240.0	791.0	526.0	329.0	218.0	150.0	108.0	79.0	–	–	–	–	–	–	–	–	–	–
		Live Load (plf)	1202.0	616.0	356.0	224.0	150.0	106.0	77.0	58.0	–	–	–	–	–	–	–	–	–	–
		Min . End Bearing (in .)	3.3	2.7	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–	–	–	–
3.5	9.5	Total Load (plf)	1308.0	834.0	571.0	356.0	236.0	163.0	117.0	86.0	–	–	–	–	–	–	–	–	–	–
		Live Load (plf)	1302.0	667.0	386.0	243.0	163.0	114.0	83.0	63.0	–	–	–	–	–	–	–	–	–	–
		Min . End Bearing (in .)	3.5	2.9	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–	–	–	–
3.125	10.5	Total Load (plf)	1428.0	911.0	630.0	431.0	286.0	199.0	143.0	105.0	79.0	–	–	–	–	–	–	–	–	–
		Live Load (plf)		804.0	465.0	293.0	196.0	138.0	100.0	75.0	58.0	–	–	–	–	–	–	–	–	–
		Min . End Bearing (in .)	4.2	3.5	2.9	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–	–	–
3.5	11.25	Total Load (plf)	1836.0	1172.0	811.0	593.0	396.0	275.0	198.0	146.0	111.0	85.0	66.0	–	–	–	–	–	–	–
		Live Load (plf)		1107.0	641.0	404.0	270.0	190.0	138.0	104.0	80.0	63.0	50.0	–	–	–	–	–	–	–
		Min . End Bearing (in .)	4.8	3.9	3.3	2.9	2.3	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–
3.5	11.875	Total Load (plf)	2046.0	1306.0	904.0	661.0	467.0	325.0	234.0	173.0	131.0	101.0	79.0	–	–	–	–	–	–	–
		Live Load (plf)		1302.0	754.0	475.0	318.0	223.0	163.0	122.0	94.0	74.0	59.0	–	–	–	–	–	–	–
		Min . End Bearing (in .)	5.4	4.4	3.6	3.2	2.6	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–
3.125	12	Total Load (plf)	1866.0	1191.0	824.0	603.0	430.0	300.0	216.0	160.0	121.0	93.0	73.0	–	–	–	–	–	–	–
		Live Load (plf)			694.0	437.0	293.0	206.0	150.0	113.0	87.0	68.0	55.0	–	–	–	–	–	–	–
		Min . End Bearing (in .)	5.6	4.5	3.8	3.2	2.6	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–	–	–
3.125	13.5	Total Load (plf)	2363.0	1508.0	1044.0	765.0	583.0	429.0	310.0	230.0	175.0	136.0	106.0	85.0	68.0	–	–	–	–	–
		Live Load (plf)			989.0	623.0	417.0	293.0	214.0	160.0	124.0	97.0	78.0	63.0	52.0	–	–	–	–	–
		Min . End Bearing (in .)	7.1	5.6	4.7	4.1	3.5	2.9	2.4	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–	–
3.5	14	Total Load (plf)	2846.0	1817.0	1258.0	921.0	703.0	537.0	388.0	289.0	220.0	170.0	134.0	107.0	86.0	70.0	–	–	–	–
		Live Load (plf)			1235.0	778.0	521.0	366.0	267.0	200.0	154.0	121.0	97.0	79.0	65.0	54.0	–	–	–	–
		Min . End Bearing (in .)	7.6	6.0	5.1	4.4	3.8	3.3	2.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–	–
3.125	15	Total Load (plf)	2918.0	1864.0	1291.0	945.0	721.0	567.0	428.0	319.0	243.0	189.0	149.0	119.0	96.0	78.0	64.0	–	–	–
		Live Load (plf)				854.0	572.0	402.0	293.0	220.0	170.0	133.0	107.0	87.0	72.0	60.0	50.0	–	–	–
		Min . End Bearing (in .)	8.8	7.0	5.7	5.0	4.4	3.9	3.3	2.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	–	–	–
3.5	16	Total Load (plf)	3696.0	2376.0	1646.0	1205.0	920.0	724.0	584.0	435.0	332.0	258.0	204.0	163.0	132.0	108.0	89.0	73.0	–	–
		Live Load (plf)				1161.0	778.0	546.0	398.0	299.0	230.0	181.0	145.0	118.0	97.0	81.0	68.0	58.0	–	–
		Min . End Bearing (in .)	9.8	8.0	6.7	5.7	5.0	4.4	3.9	3.3	2.7	2.4	2.3	2.3	2.3	2.3	2.3	2.3	–	–
3.125	16.5	Total Load (plf)	3458.0	2256.0	1563.0	1145.0	874.0	688.0	555.0	427.0	326.0	254.0	201.0	161.0	130.0	107.0	88.0	73.0	–	–
		Live Load (plf)				1137.0	762.0	535.0	390.0	293.0	226.0	177.0	142.0	116.0	95.0	79.0	67.0	57.0	–	–
		Min . End Bearing (in .)	10.3	8.5	7.1	6.0	5.3	4.7	4.2	3.6	3.0	2.6	2.3	2.3	2.3	2.3	2.3	2.3	–	–

Assumptions

1 . Span is the oncenter distance between supports and is valid for simplespan applications.
2 . These tables assume full lateral support of the compression side.
3 . The values represent the load carrying capacity of the beam in pounds per lineal foot (plf) of the beam length.
4 . The values are based on uniform loads and a deflection limit of L/360 under design live load and L/240 under design total load in dryuse conditions.
5 . The values are based on the design properties listed in ANSI 1172015 and are in addition to the beam weight (assumed 35 pcf).
6 . The designers must check both the total load and live load.
7 . Where the live load is blank, the total load governs the design.
8 . Do not use a product where designated without futher analysis by a design professional.

To Use

1 . Select the oncenter span required.
2 . Compare the design total load to the tabulated total load and compare the design live load to the tabulated live load.
3 . Select a product that meets or exceeds both the design total and live loads.

HASSLACHER
NORICA TIMBER
From **wood** to **wonders.**

HASSLACHER group
Feistritz 1 | 9751 Sachsenburg | Austria
T +43 4769 22 49-0 | F +43 4769 22 49-129
info@hasslacher.com | hasslacher.com

HNT PF Brettschichtholz BSH Glulam ANSI US NDL 24F-1.8E 20230406