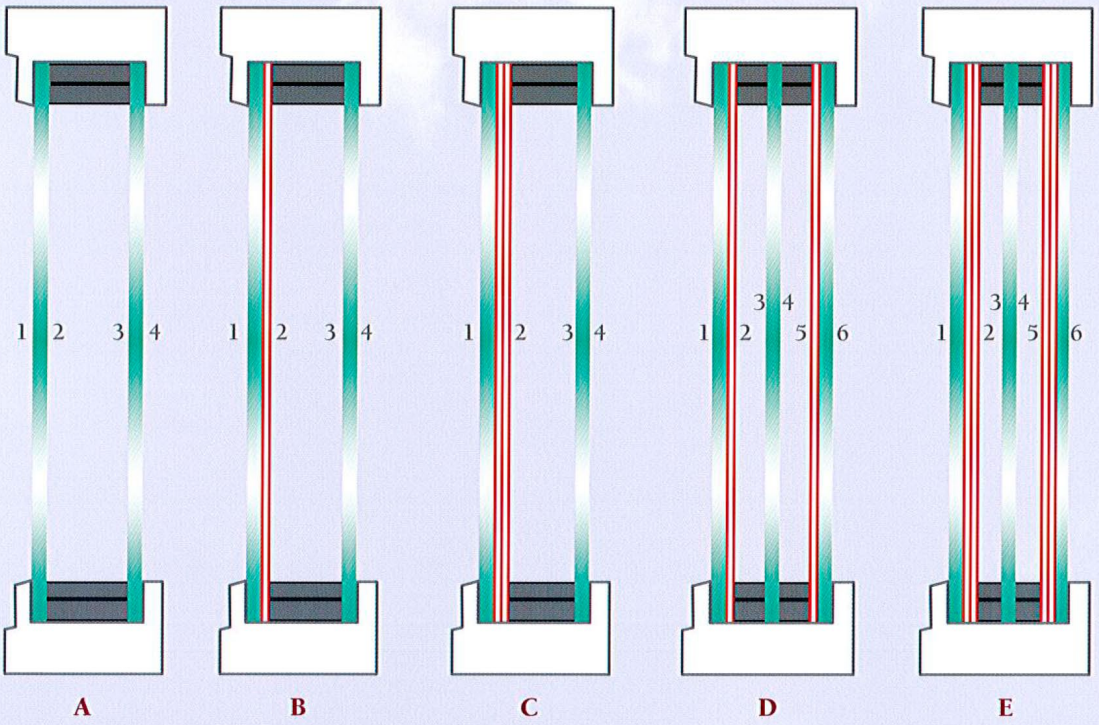
Alliance Window Systems' *Glazing Options*



A. Dual Insulated, both lites Clear, InnovativE® Spacer—Lowest Insulating Value

B. Dual Insulated Cardinal 270 LoE²—2 layers of LoE Coating (side 2) with argon fill, InnovativE® Spacer—Twice the Insulating Value of Clear

C. Dual Insulated Cardinal 366 LoE³—3 layers of LoE Coating (side 2) with argon fill, InnovativE® Spacer

D. Triple Cardinal 270 LoE²—4 layers of LoE Coating (sides 2 & 5) with argon fill, XL Edge® Spacer

E. Triple Cardinal 366 LoE³—6 layers of LoE Coating (sides 2 & 5) with argon fill, XL Edge® Spacer

The data clearly shows that the overall U-Factor and in turn heat loss are significantly reduced with Cardinal LoE²® and LoE³™ products over clear IG units.

	Clear/Clear	LoE²-270™/Clear	LoE³-366™/Clear	Triple Pane LoE²-270™/Clear/ LoE²-270™	Triple Pane LoE³-366™/Clear/ LoE³366™
Center of Glass U-value (Btu/hr/ft²/°F)	0.46	0.25	0.24	0.21	0.20

This table shows how Cardinal LoE coatings and argon filling improve center of glass U-value.
Above figures are tested center of glass U-values used for comparison between options.
Complete window U-values will vary and include other factors such as air infiltration rates and frame construction.

ALLIANCE® WINDOW SYSTEMS

Heat Transfer: *Summer Heat Gain*

Summer time heat gain is based on all three heat gain loads:

- Direct transmission of solar radiation
- Inward flowing fraction of absorbed solar radiation
- Air-to-air heat gain from high outdoor temperatures

SUMMER DAY SOLAR GAIN

Product	Total Energy Rejected (Btu/hr/ft²/°F)	Total Energy Gained (Btu/hr/ft²/°F)	Heat Gain Reductions Compared to Standard Double Pane Unit	SC	SHGC	Indoor Glass Temp °F
Double Pane Clear	55	200	—	0.89	0.78	90
Double Pane LoE²-270™	157	94	53%	0.42	0.37	83
Double Pane LoE³-366™	181	70	65%	0.31	0.27	83
Triple Pane LoE²-270™	170	81	60%	036	0.31	93
Triple Pane LoE³-366™	188	63	69%	0.28	0.24	92

1) Double Pane Configuration: 3 mm glass with 13 mm 90% argon filled cavity. Coatings on #2 surface.
2) Triple Pane Configuration: 2.2 mm glass with 6 mm 90% argon filled cavity. Coatings on #2 and #5 surfaces.

Heat Transfer: *Winter Heat Loss*

Heat transfer across the cavity of insulating glass units occurs by two separate mechanisms:

- Thermal radiation from glass surface to glass surface
- Conduction through the molecules of air

In a double-pane clear unit, over 60% of the total heat transfer is by the thermal radiation. Incorporating a low emissivity coating on one surface facing the air space blocks enough radiation transfer to reduce the total heat loss from 35 to 17 Btu/hr/ft². By adding the low emissivity coating, the heat loss by thermal radiation is now reduced to only 12% of the total heat transfer

WINTER NIGHT HEAT TRANSFER

Product	Radiative Heat Loss (Btu/hr/ft²/°F)	Conductive Heat Loss (Btu/hr/ft²/°F)	Total Heat Loss (Btu/hr/ft²/°F)	Heat Gain Reductions Compared to Standard Double Pane Unit	Indoor Glass Temp °F
Double Pane Clear	21	13	34	—	44
Double Pane LoE²-270™	2	16	18	47%	56
Double Pane LoE³-366™	1	16	17	50%	56
Triple Pane LoE²-270™	1	14	15	56%	58
Triple Pane LoE³-366™	0	14	14	59%	58

1) Double Pane Configuration: 3 mm glass with 13 mm 90% argon filled cavity. Coatings on #2 surface.
2) Triple Pane Configuration: 2.2 mm glass with 6 mm 90% argon filled cavity. Coatings on #2 and #5 surfaces.

MIDWAY WINDOWS & DOORS, INC.

www.midwaywindows.com • 6750 S. Belt Circle Drive, Chicago, IL 60638 • P: 708.594.2600 • F: 708.594.1508

05/2015