Understanding Thermal Performance

Terminology:

U-Factor - a factor used in calculating the heating unit size necessary to heat a building. Defined as the heat flow rate through a given construction, expressed Btu/hr/ft^2/^{o}F. The lower the number, the less heat will escape a building.

Solar Heat Gain Coefficient (SHGC) - a factor used in calculating the A/C unit size necessary to cool a building. Defined as the fraction of incident solar radiation which enters a building as heat. Dimensionless, and varying from 0.00 to 1.00, the smaller the number, the better the glazing is at preventing heat from entering a building.

Visible Light Transmittance (VT) - the percentage of visible light transmitted through the fenestration. Higher VT = better daylighting potential.

Condensation Resistance (CR) - measures how well a product resists the formation of condensation (moisture). CR is expressed as a number between 1 and 100. The higher the number, the better a product is able to resist the formation of condensation. A CR value below 35 is generally unacceptable.

Reading the chart below.

1. All Insulating Glass Units (IGU) utilize Cardinal's XL Edge Stainless Steel, PIB primary seal, Silicone secondary seal Spacer System.

2. Inner Pane, Center Pane and Outer Pane refer to the Glass Panes of an IGU. The numbers 2, 4, 5 and 6 refer to the glass surfaces of the IGU which the Low Emissivity coatings are applied to. The glass sufaces are counted from outside in. The #2 surface is the roomside surface of the outer most pane of glass, and so on.

3. Clear indicates a pane of glass with no coating applied.

4. 90% gas concentration is the maximum allowable for reporting through the National Fenestration Rating Council (NFRC).

5. Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT) values below are shown with 3 numbers separated by a "/" for each IGU make-up. These numbers represent respective values with and without grids (Grills Between the Glass Panes) for each unit make-up. The 1st number is the value without grids, the 2nd number is the value with grids smaller than 1" in width and the 3rd number is the value with grids between 1" and 1 1/4".

Thermal Test Results

2-Pane Double Hung/2-Lt Slider

IGU Make-Up Outer Pane/Inner Pane	Gas Type/ Concentration	U-Value	Solar Heat Gain Coefficient (SHGC) Grids (None/<1"/>=1")	Visible Transmittance (VT) Grids (None/<1"/>=1")	CR
366 on #2/Clear	Argon/90%	0.30	0.20/0.18/0.16	0.45/0.40/0.35	60.00
366 on #2/i81 on #4	Argon/90%	0.27	0.18/0.16/0.14	0.40/0.36/0.31	49.00
366 on #2/i81 on #4	Krypton/90%	0.26	0.17/0.16/0.14	0.40/0.36/0.31	50.00

3-Pane Double Hung/2-Lt Slider

IGU Make-Up Outer Pane/Center Pane/Inner Pane	Gas Type/ Concentration	U-Value	SHGC Grids (None/<1"/>=1")	VT Grids (None/<1"/>=1")	CR
272 on #2/Clear/272 on #5	Argon/90%	0.22	0.25/0.22/0.20	0.40/0.35/0.31	63.00
366 on #2/Clear/366 on #5	Argon/90%	0.22	0.17/0.15/0.14	0.32/0.29/0.25	63.00
366 on #2/366 on #4/i81 on #6	Argon/90%	0.21	0.14/0.13/0.11	0.29/0.26/0.23	61.00
366 on #2/366 on #4/i81 on #6	Krypton/90%	0.19	0.14/0.13/0.11	0.29/0.26/0.23	62.00

2-Pane Casement

IGU Make-Up Outer Pane/Inner Pane	Gas Type/ Concentration	U-Value	Solar Heat Gain Coefficient (SHFC) Grids (None/<1"/>=1")	Visible Transmittance (VT) Grids (None/<1"/>=1")	CR
366 on #2/Clear	Argon/90%	0.30	0.20/0.18/0.16	0.45/0.40/0.35	60.00
366 on #2/i81 on #4	Argon/90%	0.27	0.18/0.16/0.14	0.40/0.36/0.31	49.00
366 on #2/i81 on #4	Krypton/90%	0.26	0.17/0.16/0.14	0.40/0.36/0.31	50.00

3-Pane Casement

IGU Make-Up Outer Pane/Center Pane/Inner Pane	Gas Type/ Concentration	U-Value	SHGC Grids (None/<1"/>=1")	VT Grids (None/<1"/>=1")	CR
272 on #2/Clear/272 on #5	Argon/90%	0.22	0.25/0.22/0.20	0.40/0.35/0.31	63.00
366 on #2/Clear/366 on #5	Argon/90%	0.22	0.17/0.15/0.14	0.32/0.29/0.25	63.00
366 on #2/366 on #4/i81 on #6	Argon/90%	0.21	0.14/0.13/0.11	0.29/0.26/0.23	61.00
366 on #2/366 on #4/i81 on #6	Krypton/90%	0.19	0.14/0.13/0.11	0.29/0.26/0.23	62.00