



- Window Frame
- Layers glass (Dual or Tripane)
- LowE Type (LowE vs LowER)
- U-Factor/Value
- Solar Heat Gain Coefficient (SHGC)
- CR (Condensation Ratings)

Total Window Performance (JWWPG Plant)

Vinyl ES7000	Dual			Dual Low E			Dual Low E w/ argon			Dual Low ER			Dual Low ER w/ argon		
	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR
Casement	.41	.52	45	.29	.28	60	.27	.28	60	.31	.43	56	.29	.43	58
Fixed	.43	.61	44	.30	.33	56	.27	.33	59	.31	.51	55	.29	.51	57
Picture	.45	.68	45	.30	.36	57	.27	.36	59	.30	.56	55	.30	.56	58
Awning	.41	.52	47	.29	.28	58	.27	.28	60	.31	.43	54	.29	.43	57

Vinyl ES7000	Tripane			Tripane Low E			Tripane Low E w/ argon			Tripane 2Low E			Tripane 2Low E w/ argon		
	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR
Casement	.29	.48	60	.24	.26	67	.22	.26	69	.20	.24	74	.18	.24	77
Fixed	.30	.56	60	.23	.30	67	.21	.30	69	.19	.28	73	.17	.28	76
Picture	.31	.62	60	.23	.33	67	.21	.33	69	.18	.31	74	.16	.31	76
Awning	.29	.48	60	.23	.26	68	.22	.26	69	.19	.24	73	.18	.24	76

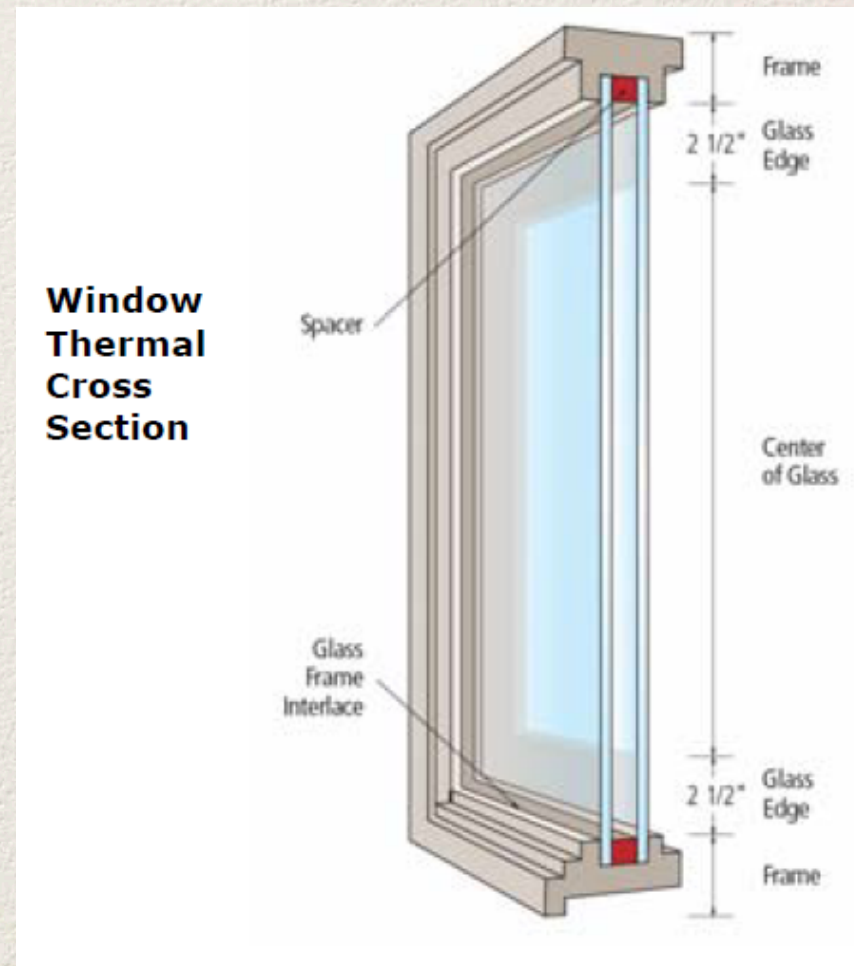
Vinyl ES7000	Tripane Low ER			Tripane Low ER w/ argon			Tripane 2Low ER			Tripane 2Low ER w/ argon		
	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR	U-factor	SHGC	CR
Casement	.24	.40	66	.23	.40	68	.21	.38	72	.19	.38	74
Fixed	.24	.47	66	.23	.47	68	.20	.44	71	.18	.45	73
Picture	.24	.52	66	.22	.52	68	.19	.49	72	.17	.49	74
Awning	.24	.40	67	.23	.40	68	.21	.38	71	.19	.38	74

- Vinyl
 - ES3500 (sliders)
 - ES7000 (Cas/Pic/Awn)
- Clad Wood
 - Metal Clad on Wood
 - Wood exterior

- ES3500 (sliders)
 - Dual LowE and LowER
 - LowER (Cardinal 179)
 - LowE (Cardinal 272)
- ES7000 (cas/pic/awn)
 - Dual & Tripane LowE and LowER
 - LowER (Cardinal 179)
 - LowE (Cardinal 272)

- Insulated (Dual) and Tripane
- LowE366 is standard LowE (Cardinal)
- Other LowE glass options are available
 - See Cardinal Res Tech Guide
- Tripane cannot exceed 60" to 2 directions (please submit custom product request if req larger)
- Single Pane Option still available

- The ratings take in effect the total window – the frame, the edge of glass and the center of glass based on specific product sizes



- The heat flow rate through a given construction is expressed in Btu/hr/ft²/F.
- The lower the U-Value, the less heat is transmitted through the glazing material

- A materials resistance to heat flow is called its Resistance-Value (R-Value)
- The higher the R-Value, the more effective the insulation. For example, heat flows through an R-8 wall twice as fast as through an R-16 Wall
- R-Value's in windows literature are for center of glass performance only (not whole window)
- Try to refrain from discussing R-Value

- U-Factor measures the rate of heat transfer (or loss) while R-Value measures the resistance to heat loss.
- R-Value is a measure of conductivity. A product with high conductivity will transfer heat quickly (hot pan on a stove or single pane glass).
- U-Factor takes in account more than conductivity. It is affected by airflow around the window and the emissivity of glass

- R-Value is the reciprocal of U-Value,
 $R=1/U$
 - Example:
U-Value .18
 $R= 1 \text{ divided by } .18 = 5.56$

- Measures the fraction of incident solar heat transferred through a window – (center of glass, edge of frame) which enters the building as heat
- Varying between 0 and 1, the smaller the number, the better the window is at blocking heat
 - IE SHGC of .24 blocks more heat than .48

- Measure how well a product will resist the formation of condensation and is expressed as a number between 1 and 100.
- The higher this number is the better the window will resist the formation of condensation. This rating is useful for the comparing of window products and is not meant to indicate when the condensation will actually occur.

- JWWPG Vinyl Spacer
 - S-Class Super Spacer (silicone)
- Custom Wood Spacer
 - XL Edge (Stainless Steel)