

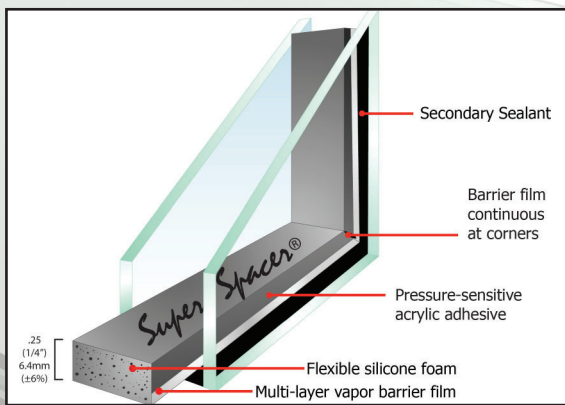
# ENERGY NORTH

## PUT THE SUN TO WORK FOR YOU!



### Designed for Optimum Energy-Efficiency in Northern Climate Zones

- Specially designed glass combination achieves Solar Heat Gain (SHGC) requirements in Energy Star's Northern Climate Zone
- Cardinal 180 Dual-Silver Low-E exterior pane matched with Cardinal i89 Low-E interior pane
- Excellent at taking advantage of passive solar heat
- Keeps homes comfortable in the winter by limiting heat loss
- Easy, no-worry cleaning courtesy of Cardinal i89 interior Low-E, which is scratch resistant and smooth to the touch
- Available for use with most Quaker window and door series



### Super Spacer & Butyl Secondary Seal

- Low thermal conductivity
- Substantially reduced perimeter condensation
- Excellent UV resistance and temperature performance
- Superior argon gas retention
- Enhanced environmental comfort
- Excellent durability for sustainable performance

### Commitment to Quality

Every window and door built with Low-E glass also comes filled with the optimal amount of Argon Gas using an automated process in our state-of-the-art Insulating Glass Facility.

Windows and doors that are going into higher elevation areas will automatically have a Capillary Tube.

Our commitment to quality extends to the glass that we source. Quaker's glass is supplied by Cardinal Industries, the preeminent glass manufacturer in North America.



Learn more about Quaker glass offerings at [www.quakerwindows.com](http://www.quakerwindows.com)

Quaker Windows & Doors | Freeburg & Eldon, MO  
800.347.0438 | [www.quakerwindows.com](http://www.quakerwindows.com)





# Energy Values For Quaker's Popular Products When Using Energy North

## TECHNICAL AND TEST DATA FOR CARDINAL LoE-180 & LoE-i89 GLASS:

Cardinal LoE-180	Cardinal LoE-i89
Process: Sputter	Process: Sputter
Coating: Silver	Coating: Indium Tin Oxide
Layers: 1	Layers: 1
Location: I.G. Surface #2	Location: I.G. Surface #4
Visual Aesthetics: Virtually Clear*	Visual Aesthetics: Virtually Clear*

(\*please note that viewing angle, sky conditions, colors of objects reflected, colors of materials behind the glass i.e. blinds/drapes, and viewing distance from the glass will impact perceived aesthetics)

Optical Properties of Insulating Glass Units									
IG Configuration Outboard Lite / Inboard Lite	Glass Thickness		Visible Light			Fading		SHGC	LSG
	mm	in	Trans.(%)	Refl. Out (%)	Refl. In (%)	UV Trans.	ISO-CIE Trans.		
Cardinal LoE-180 (#2) / LoE-i89 (#4)	3.0	1/8	77	15	14	27%	61%	0.62	1.24

Winter Day Solar Heat Gain Comparisons						
Insulating Glass Unit	U winter BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	SHGC	Solar Radiation Reflected BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Solar Radiation Transmitted BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Total Energy Rejected BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Total Energy Gained BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )
Cardinal LoE-180 (#2) / LoE-i89 (#4)	0.21 (0.19)	0.60	52 (164)	136 (429)	114 (360)	149 (470)

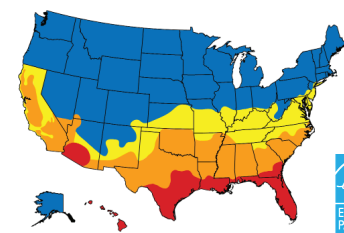
Summer Day Solar Heat Gain Comparisons						
Insulating Glass Unit	U summer BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	SHGC	Solar Radiation Reflected BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Solar Radiation Transmitted BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Total Energy Rejected BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )	Total Energy Gained BTU/(hr-ft <sup>2</sup> ) (W/m <sup>2</sup> )
Cardinal LoE-180 (#2) / LoE-i89 (#4)	0.18 (1.02)	0.62	52 (164)	136 (429)	94 (297)	157 (495)

Winter Night Airspace Heat Transfer				
Insulating Glass Unit	U winter BTU/(hr-ft <sup>2</sup> -F)(W/m <sup>2</sup> -K)	Radiative Heat Loss BTU/(hr-ft <sup>2</sup> )(W/m <sup>2</sup> )	Conductive Heat Loss BTU/(hr-ft <sup>2</sup> )(W/m <sup>2</sup> )	Total Heat Loss BTU/(hr-ft <sup>2</sup> )(W/m <sup>2</sup> )
Cardinal LoE-180 (#2) / LoE-i89 (#4)	0.21 (1.19)	2 (6)	13 (41)	15 (47)

Window U-Factor						
Glazing	Class 1		Class 2		Class 3	
	BTU/(hr-ft <sup>2</sup> -F)	(W/m <sup>2</sup> -K)	BTU/(hr-ft <sup>2</sup> -F)	(W/m <sup>2</sup> -K)	BTU/(hr-ft <sup>2</sup> -F)	(W/m <sup>2</sup> -K)
Cardinal LoE-180 (#2) / LoE-i89 (#4)	0.29	1.65	0.27	1.53	0.25	1.42

	U-Value	SHGC	VT	CR	Center Of Glass U-Value
Brighton Casement	0.29	0.42	0.51	44	0.21
Brighton Double Hung	0.28	0.43	0.53	43	0.21
Brighton Picture Window	0.26	0.48	0.59	45	0.21
Brighton Narrow Sliding Door	0.26	0.44	0.54	47	0.21
CityLine/CityVu C600 Casement	0.28	0.43	0.52	51	0.22
CityLine/CityVu/C600 Pict. Wdw.	0.25	0.55	0.68	51	0.22
E600 Project-Out Awning	0.33	0.39	0.47	44	0.22
E600 Picture Window	0.26	0.54	0.66	45	0.22
EdgeLine/H450 Casement	0.40	0.47	0.56	46	0.22
EdgeLine/H450 Pict. Wdw.	0.27	0.56	0.68	50	0.22
Manchester/V200/V250 Casement	0.25	0.41	0.50	47	0.21
Manchester Sliding Door	0.25	0.50	0.61	48	0.22
Manchester/V200/V250 Dbl. Hung	0.25	0.49	0.60	45	0.21
Manchester/V200/V250 Pict. Wdw.	0.23	0.52	0.63	46	0.21
Manchester/V200/V250 Sgl. Hung	0.26	0.49	0.60	46	0.21
ModernVu/M600 Casement	0.41	0.43	0.52	44	0.22
ModernVu/M600 Pict. Wdw.	0.27	0.53	0.32	47	0.21
ModernVu/M600 Sliding Door	0.36	0.48	0.59	43	0.22
TimberLine/TimberVu/W600 Casement	0.25	0.43	0.53	51	0.22
TimberLine/TimberVu/W600 Pic. Wdw.	0.24	0.55	0.68	51	0.22
VuPoint/V300 Casement	0.24	0.41	0.49	48	0.22
VuPoint/V300 Picture Wdw.	0.24	0.41	0.49	48	0.22

Test data for other Quaker products not listed can be found at quakerwindows.com. Values shown were achieved using standard glass pane thickness. Other thicknesses may cause test data to vary slightly.



## Energy Star Qualifications

Climate Zone	U-Value	SHGC	Wind Infiltration*
<b>Northern</b>	≤0.27	Any	≤0.30
<b>(Alternate #1)</b>	≤0.28	≥0.32	≤0.30
<b>(Alternate #2)</b>	= 0.29	≥0.37	≤0.30
<b>(Alternate #3)</b>	= 0.30	≥0.42	≤0.30
<b>North Central</b>	≤0.30	≤0.40	≤0.30
<b>South Central</b>	≤0.30	≤0.25	≤0.30
<b>Southern</b>	≤0.40	≤0.25	≤0.30

\*All Quaker Windows meet or exceed wind infiltration requirements necessary for Energy Star qualification

