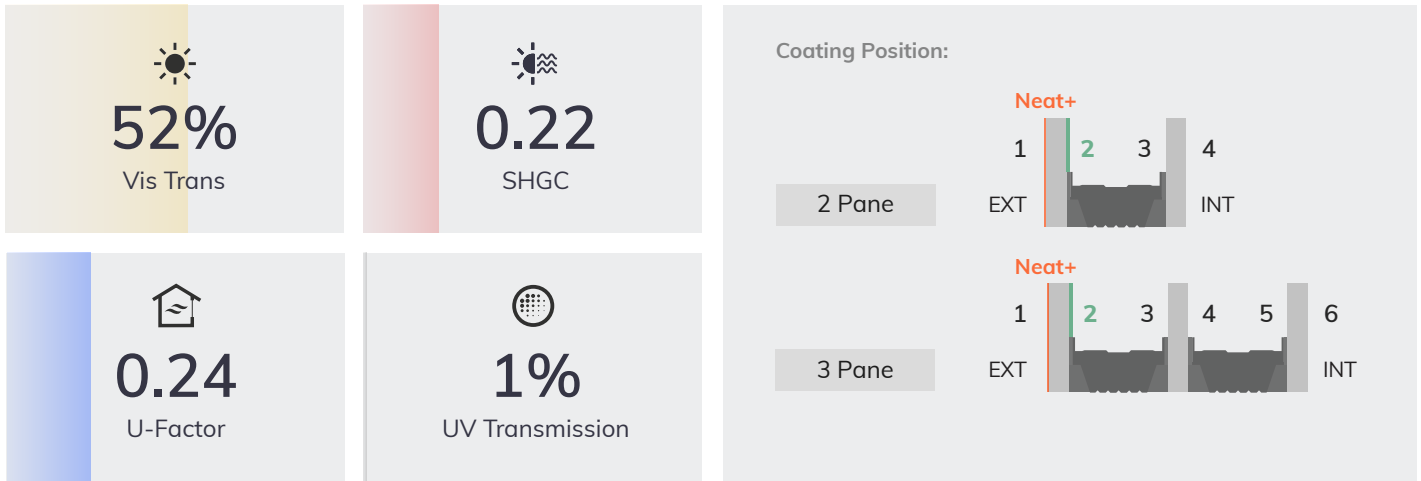




# Quad LoE-452+

The Winning Combination:  
Superior Performance and Naturally Cleaner Glass

Cardinal Quad LoE-452+™ glass offers an irresistible appeal when it comes to enhancing your home. The true four-layer silver coating has exceptionally low emissivity, 99% UV protection, low exterior reflection and superior solar control, all of which translates to excellent energy-efficient performance, superior fade protection, and some of the clearest views.



Data is produced using LBNL Window 7.8. 2-pane IG units have 13mm airspace and filled to 90% argon.

## Benefits of Quad LoE-452+ glass

- ✓ Superior Fade Protection
- ✓ Neutral Appearance
- ✓ Neat+ Coating Included
- ✓ Enhanced Energy Efficiency

The 4th layer of silver in Quad LoE-452+ glass enhances the grey to aid in a neutral appearance. It also includes the Neat+™ exterior surface coating that reacts to the sun's UV rays and breaks down greenhouse gases such as methane to further clean the window, saving homeowners time while requiring less water and chemicals, helping to reduce environmental impact.

- Laminated options
- Custom shapes & sizes
- Neutral color
- High Energy Efficiency
- Thicknesses: 2.2 to 6mm
- Max dimensions: 96" x 144"

**Note:** Quad LoE-452+ is available as annealed, heat-strengthened or tempered glass.

## ENERGY STAR 7.0

ENERGY STAR® is a program run by the U.S. Environmental Protection Agency (EPA) that promotes energy efficiency in consumer products, including windows. ENERGY STAR 7.0 is the latest version of the ENERGY STAR program's requirements for windows.

Quad LoE-452+ glass can be used to meet the criteria for the **North-Central**, **South-Central**, and **Southern** climate zones.

### Whole-Window Performance Criteria

	U-Factor	SHGC	
▶ Northern	≤0.22	≥0.17	Prescriptive
	=0.23	≥0.35	Equivalent Energy Performance
	=0.24		
	=0.25		
	=0.26		
▶ North-Central	≤0.25	≤0.40	
▶ South-Central	≤0.28	≤0.23	
▶ Southern	≤0.32	≤0.23	



3/4" Dual Pane with 3mm Glass • 1" Triple Pane with 3mm Glass • 90% Argon

### Center-of-Glass Performance

Dual Pane

Triple Pane

	VISIBLE LIGHT		FADING			U-FACTOR	
	Transmission	Exterior	UV	ISO	SHGC	Air Fill	Argon Fill
						IP / SI	IP / SI
▶ LoE-452+ / Clear	52%	10%	1%	33%	0.22	0.29 / 1.64	0.24 / 1.37
▶ LoE-452+ / LoE-i89	51%	10%	1%	32%	0.21	0.23 / 1.30	0.20 / 1.11
▶ LoE-452+ / Clear / LoE-180	46%	12%	1%	28%	0.19	0.16 / 0.90	0.13 / 0.72
▶ LoE-452+ / LoE-180 / LoE-i89	45%	12%	1%	27%	0.19	0.14 / 0.78	0.11 / 0.63

LBNL Window 7 per NFRC100 conditions. Quad LoE-452+ is intended for the 2nd surface on an insulating glass unit.



ENGINEERING THE FUTURE OF GLASS

Contact Cardinal CG to learn more about Quad LoE 452+ and other Cardinal glass products.

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