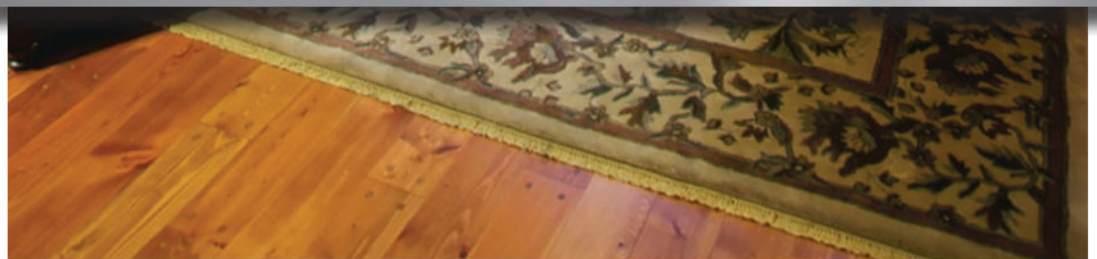




CARDINAL CG
A CARDINAL GLASS INDUSTRIES COMPANY

ENGINEERING THE FUTURE OF COATED GLASS





When the weather turns frigid, Cardinal LoE-180™ glass is the perfect cold remedy. It keeps homes warmer and more comfortable by blocking heat loss to the exterior while letting the sun's warmth in. With a glass U-factor of only 0.26 and an SHGC of 0.69, LoE-180 is ideal for passive solar applications. It extends a warm welcome while achieving the highest ER values.

No matter where your home is located, it's extremely important to choose windows that offer you the highest level of comfort and energy savings year-round. And choosing the right glass for your windows is the most important factor in the decision. Go beyond ordinary low-E glass—choose Cardinal LoE-180, the ideal choice for passive solar designs.

In cold weather, the insulating effect of your windows has a direct impact on the temperature of your rooms. Typically, 75% of a window's exposed surface is glass, and the temperature of the internal pane directly affects the air temperature in the room. The better the insulation, the warmer your room will be.



When it's freezing outside,
It's comfortable
inside.

INTERIOR GLASS AND EXTERIOR TEMPERATURE

The table below compares the center room-side temperatures of different glass types against two different winter conditions.

GLASS TYPE AND COATING	OUTSIDE TEMPERATURES	
	VERY COLD OUTSIDE -20°F (-30°C)	COLD OUTSIDE 20°F (-10°C)
	INDOOR TEMPERATURES	
Single panel, transparent	0°F (-19°C)	31°F (-3°C)
Double panel, transparent	37°F (2°C)	51°F (9°C)
Regular Low-e (air-filled)	46°F (7°C)	57°F (13°C)
LowE-180 (air-filled)	48°F (9°C)	58°F (14°C)
LowE-180 (argon filled)	51°F (10°C)	60°F (15°C)

The superior insulating capacity of Cardinal LoE-180 is a key factor in building comfortable windows for cold climates. The dramatic improvement in window comfort with warm glass surfaces also means that indoor relative humidity can be properly controlled and maintained. Proper humidity levels (not too much, not too little) will improve comfort and promote a healthier living environment.



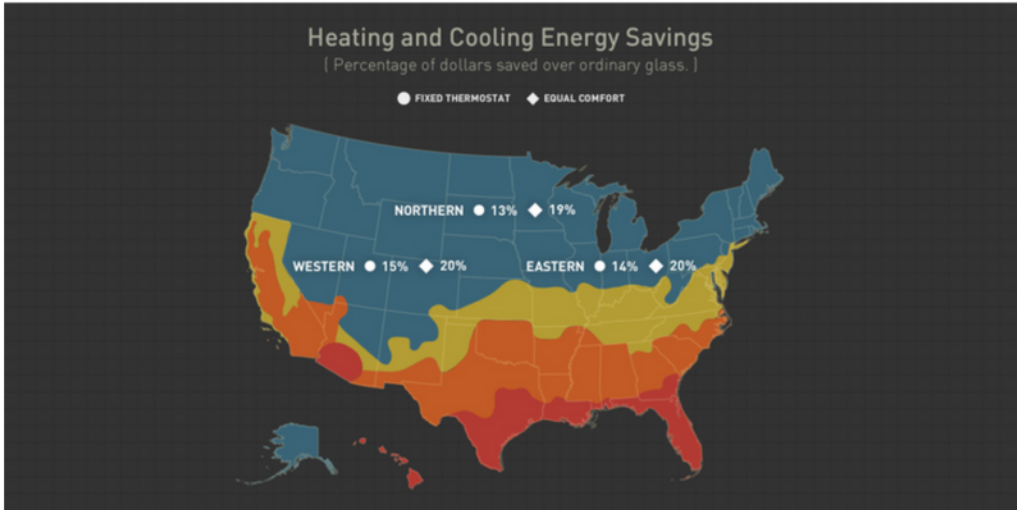
Cardinal LoE-180 offers exceptional cold weather performance – its insulation value is excellent with a low U-factor of 0.26. And with a SHGC of 0.69, it allows the warmth of the winter sun to pass into the home. It also blocks 71% of the sun’s harmful UV rays. While blocking the cold and UV rays, it lets daylight in – more light than ordinary low-E glass.

Our unique coating stops heat loss.

Cardinal uses a state-of-the-art sputter coating process unmatched by any other glass manufacturer. The glass is coated with a microscopically thin, optically transparent layer of silver sandwiched between layers of anti-reflective metal oxide coatings. A protective coating is applied to ensure durability and long life. The coating is virtually invisible to the naked eye—it’s like looking through clear glass.

Glass is so smart, it controls comfort.

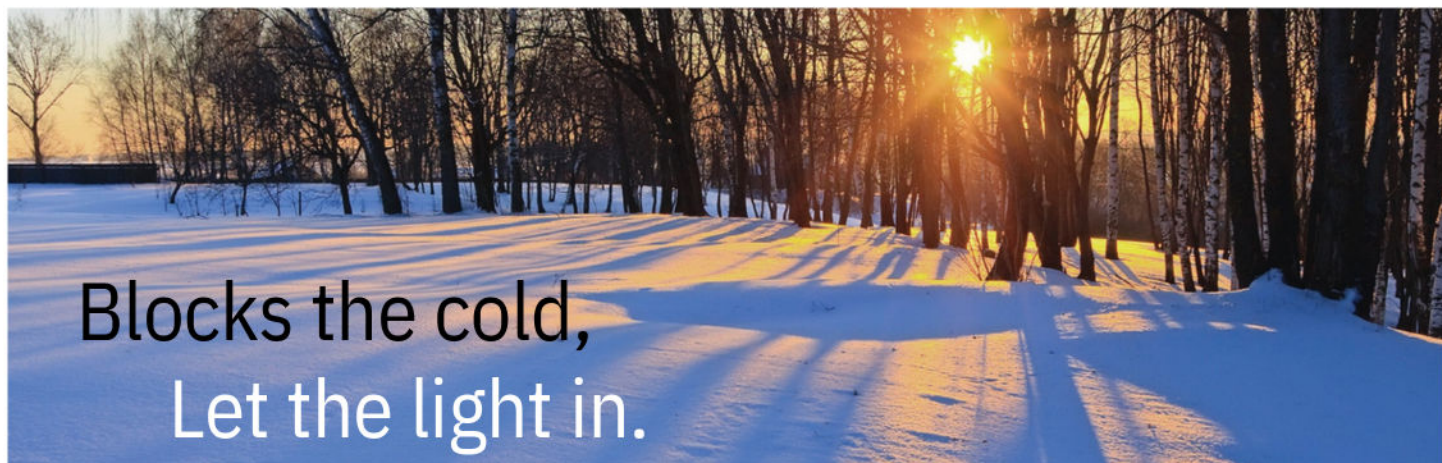
While windows offer beautiful views and wonderful natural light, they can also account for up to 50% of the heating and cooling energy used in a home. In winter, Cardinal LoE-180 helps your home stay warm by blocking heat loss from cold outdoor temperatures. Summer solar gain is about 10% lower than that of standard double-pane clear glass, and the low U-factor blocks heat gain from warm outdoor temperatures. In short, it can save energy year-round.



**Thermostat settings are the biggest variable in determining the potential for heating and cooling energy savings with window replacement. If you tolerate the discomfort of your current windows and don't change your thermostat settings based on weather conditions, consider the savings suggested in the "Fixed Thermostat" column. On the other hand, if you frequently adjust your thermostat, add space heaters to compensate for cold rooms, or close curtains or blinds to block the sun, consider the additional savings suggested in the "Equal Comfort" column.*

LENS COMPARISONS

GLASS TYPE AND COATING	VISIBLE LIGHT			TRANSMISSION WEAKENING		SOLAR	U-FACTOR	
	TRANSMISSION	EXTERNAL REFLECTION	INTERNAL REFLECTION	UV	ISO	HEAT GAIN COEFFICIENT	IP/SI AIR FILLING	ARGON FILLING IP/SI
Single panel, transparent	90%	8%	8%	0.71	0.84	0.86	1.04 / 5.91	—
Double panel, transparent	82%	15%	15%	0.58	0.75	0.78	0.48 / 2.73	—
Ordinary low-e	76%	17%	17%	0.50	0.68	0.72	0.34 / 1.93	0.30 / 1.70
LowE-180	79%	15%	15%	0.28	0.62	0.68	0.31 / 1.76	0.26 / 1.48



LoE-180 always exceeds expectations.



Cardinal I.Q. (Intelligent Quality Assurance Program) ensures the quality of every piece of glass. Using our proprietary patented inspection systems, we carefully examine the glass from start to finish.

LoE-180 is available in hurricane-resistant laminated glass and in a variety of shapes and sizes.

To learn more about LoE-180 and other Cardinal Glass products, contact your window manufacturer, contractor, or architect.

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