Thermaflect®

LOW "E" GLAZING SYSTEM

Balanced for optimum heating and cooling efficiency

Blocks 87% of damaging UV radiation

Lets in high levels of visible sunlight

CertainTeed Since 1904

Celebrating a Century of Building America

The Thermaflect® system is designed for optimum comfort, protection, and energy savings.

This formulation of Low "E" glass offers truly balanced performance.

This latest generation of CertainTeed's proprietary Low "E" glass was created to balance all the benefits of the Low "E" concept — saving heating and cooling costs, protecting against UV damage, and keeping the room bright. The exclusive Thermaflect coating formulation uses the most advanced double-layer soft-coat technology to continue to deliver top performance for heating. And now it delivers even better performance in cooling situations, as well.

Wherever you live, Thermaflect will help keep you more comfortable. And you'll save an average of more than $300 per year if you're replacing single pane aluminum windows.

Part of CertainTeed's total approach.

Thermaflect is not an isolated technical innovation. It was developed to further complement and enhance all the engineering advantages of CertainTeed windows as part of a total system that delivers optimum performance under the widest possible range of conditions.

It's an approach in which every detail counts, starting with the design basics. "Honeycomb" airspaces in the frame and sashes offer the high insulation value of dead air. Fusion welding makes the frames and sashes weather-tight. And an integral glazing seal plus double weatherstripping, resists both air and water infiltration.

The Thermaflect Glazing System is a double-pane insulated unit with the Low "E" coating on the inside surface. The unit is filled with heavier-than-air argon gas to increase its insulation value by reducing conduction and convection within the unit. Finally, the spacer between the two panes is made of low-conductance material to keep the interior glass temperature warmer and to significantly reduce condensation.

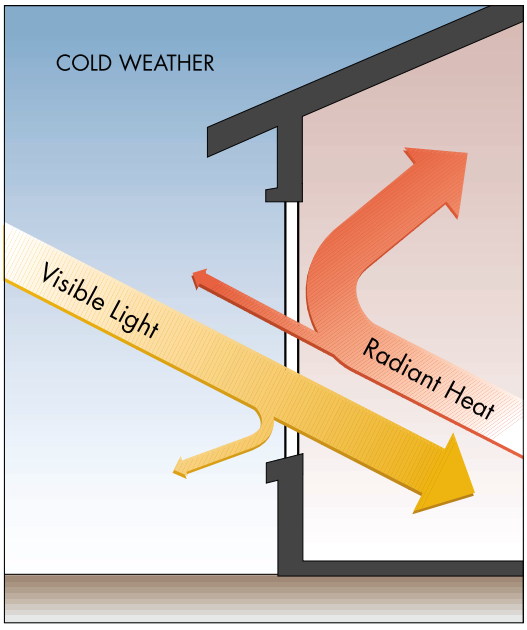
Indoor comfort.

Thermaflect Low "E" glass is designed not only to reduce energy costs but to make your home feel more comfortable as well.

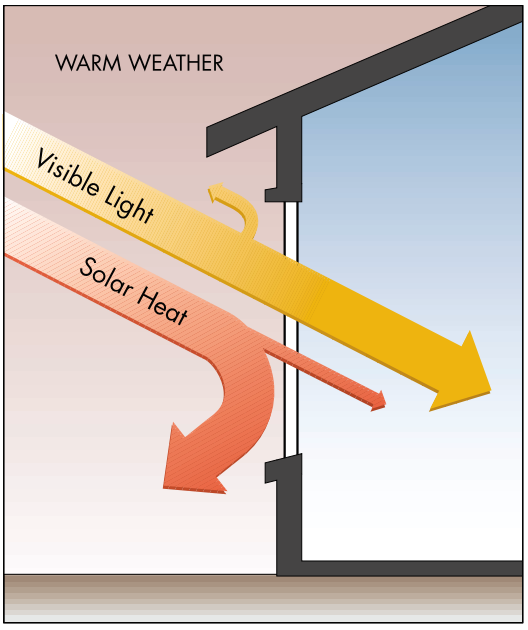
In winter, cold window glass makes you feel chilly because it actually draws the heat away from your body. Cold glass also can create uncomfortable drafts. With its low U-value and heat reflecting properties, Thermaflect creates a warmer glass temperature, and greater comfort.

In summer, strong direct sunlight entering a room can create overheating and discomfort. Thermaflect's low solar heat gain properties reduce the solar radiation coming through the glass, making the room temperature more comfortable. And, because the Thermaflect coating is spectrally selective, it is able to achieve this benefit

How the Thermaflect Low "E" system works.

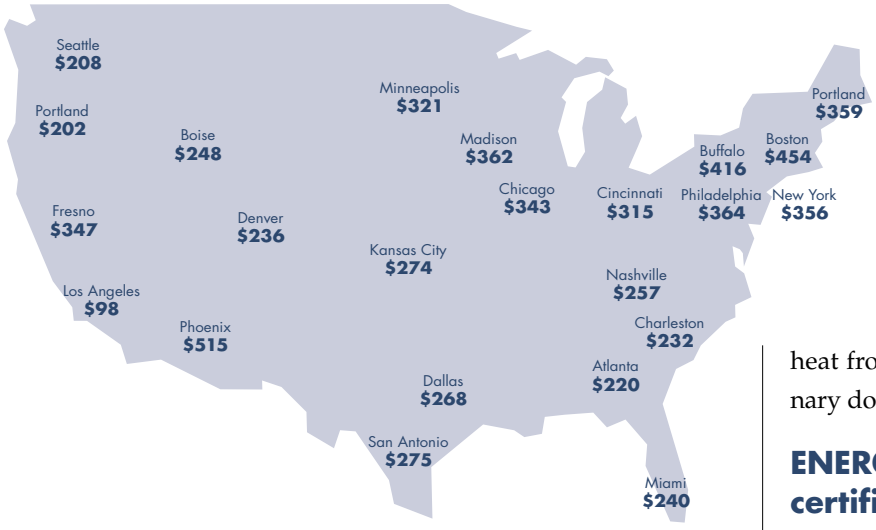


In cooler conditions, the Thermaflect coating reflects heat back into your rooms, while allowing a high level of visible light to pass through and be absorbed to add desirable extra heat to the room.



In warmer conditions, the Thermaflect coating reflects away both solar radiation (direct from the sun) and absorbed heat energy (as from a driveway), yet still allows visible light to pass through.

Thermaflect can help save energy costs, wherever you are.*



Whether your winters are snowy and long, or the sun rides high every day, Thermaflect's balanced performance can help reduce the cost of keeping your home comfortable. The map shows the calculated savings in energy costs for an average home in which the windows have been changed from aluminum windows with single-pane glass to vinyl windows with the Thermaflect® glazing system.

with minimal loss in visible light, unlike tinted glass.

Highest protection from UV damage.

Thermaflect blocks 87% of the ultraviolet radiation that can fade and degrade carpets, drapes, upholstery, and other household furnishings.

Twice as efficient for heating.

The ability of a window to prevent heat flow through the glass and retain the heat in a room is measured as U-value. Compared to an ordinary double-pane glass unit, Thermaflect is twice as efficient at retaining heat.

*These calculations are based on a 2400 ft² two-story frame house, with 432 ft² of window area, R-19 walls, R-30 roof and equal distribution of glazing in the four cardinal directions.

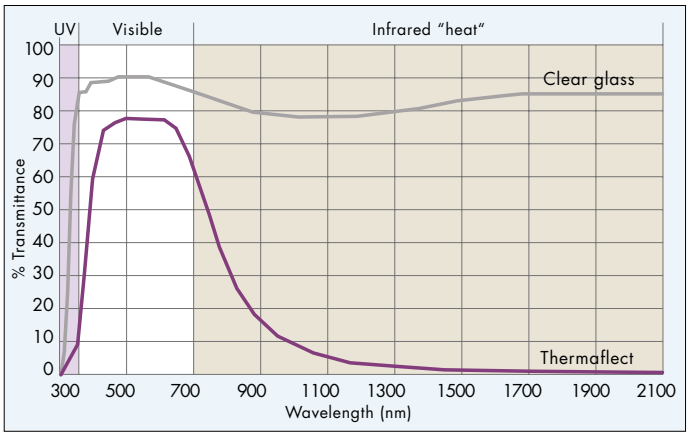
Three times as efficient for cooling.

The ability to block the sun's heat is measured as Solar Heat Gain Coefficient. Thermaflect blocks nearly three times as much infrared heat from the sun as ordinary double-pane glass.

ENERGY STAR certified.

CertainTeed also participates in the ENERGY STAR® program, created by the Department of Energy (DOE) and the Environmental Protection Agency (EPA) to designate products that meet certain energy performance criteria for three U.S. climate zones. All CertainTeed windows with the Thermaflect glazing system meet the ENERGY STAR® guidelines for energy efficiency in all climate zones.

Thermaflect is spectrally selective.



Source: Cardinal Glass

The Thermaflect coating formulation is highly selective. While it transmits a high level of visible light, it simultaneously blocks unwanted UV and long-wave infrared "heat" energy. Its effectiveness shows up dramatically when you compare its spectral profile to the profile for clear glass.

Understanding Low "E".

Low "E" (low-emissivity) glass is coated with microscopically thin metal or metal oxide layers that allow visible light to pass through, while blocking ultraviolet and infrared solar energy, and reflecting away long-wave room-side heat energy.

Not all Low "E" glass is the same.

There are different formulations that offer varying levels of performance throughout the range of climate conditions.

Hard-coat Low "E".

One of the earliest coating types, hard-coat reduces heat loss versus clear glass, and allows a high level of solar heat gain. It is most appropriate in climates where solar heat gain is desired.

Single-layer soft-coat Low "E".

This type of coating is applied in a "sputter coating" process, in which one layer of silver is sandwiched between layers of metal oxide. It offers better U-values than hard-coat Low "E" and moderate levels of solar heat gain.

Thermaflect Low "E".

This is CertainTeed's proprietary formulation, based on the next generation of sputter coatings. Two layers of silver are sandwiched between layers of metal oxide. Thermaflect's multi-layer coating has been formulated to be "spectrally selective" — to select very specific kinds of light and heat waves to block or allow inside. This makes it much more effective at reducing heat loss in the winter and heat gain in the summer, while maintaining high levels of visible light.

You get the best balance of performance attributes and optimum energy savings for a wide range of climate conditions.

Thermaflect's unique design gives you the best balance of performance attributes.[1]

	U-Value[2]		R-Value		E-Value[4]	Visible Light Transmittance	UV Block[5]	Shading Coefficient[6]	Solar Heat Gain Coefficient[7]
	Center of Glass	Total Unit[3]	Center of Glass	Total Unit[3]					
Standard Double-Pane	0.49	0.46	2.04	2.17	0.84	82%	43%	0.90	0.77
Low "E" (Hard-Coat)/ Argon/Low-Conductance Spacer[7]	0.29	0.33	3.45	3.03	0.15	75%	55%	0.83	0.72
Single-Layer (Soft-Coat)/ Argon/Low-Conductance Spacer[7]	0.27	0.31	3.70	3.23	0.08	78%	77%	0.67	0.58
Thermaflect®/Argon/ Low-Conductance Spacer	0.25	0.30	4.00	3.33	0.04	71%	87%	0.44	0.38

NOTE: Numbers shown for Visible Light Transmittance, UV Block, Shading Coefficient, and Solar Heat Gain Coefficient measure the performance of the glass only. On NFRC window labels, the numbers shown for Visible Light Transmittance and Solar Heat Gain Coefficient measure the performance of the total window (glass and frame).

1. Data based on 3 mm double-strength, double-pane glass with a ½" airspace. If single-strength glass is used results may vary slightly. Calculations performed using Lawrence Berkeley Labs Window 4.1 computer program.
2. U-value based on ASHRAE Standards of 0° F outside air temperature, 70° F indoor air temperature, a 15 mph outdoor air velocity, and 90% argon fill rate.
3. Total unit U-values based on window size of 36" x 48" and vinyl frame from Window 4.1.
4. E-value — Hemispherical Emissivity.
5. Based on UV transmission from 300 to 380 nm.
6. Summertime performance based on ASHRAE Standards of a solar heat gain factor of 200 BTU/hr/ft² and outdoor air temperature 14° F warmer than indoor temperature.
7. Low "E" hard coat and single-layer soft coat numbers shown for comparative purposes.

Glossary of high performance glazing terms.

Low "E": Low-emissivity glass is coated with microscopically thin metal or metal oxide layers that allow visible light to pass through, while blocking ultraviolet and infrared solar energy and reflecting away long-wave room-side heat energy. Different types of Low "E" coatings offer varying levels of performance for each of these tasks.

U-Value: The rate of heat flow through a glazing system; the lower the value, the better the insulating quality. U-value can be compared to R-value by dividing 1 by the U-value. (Thus, a U-value of 0.5 equals an R-value of 2.)

R-Value: The resistance of a material to heat flow. This common measurement is the reciprocal of the U-value. R-value can be compared to U-value by dividing 1 by the R-value. (Thus, an R-value of 2 equals a U-value of 0.5.)

E-Value: The comparative ability of a material to absorb and reflect long-wave heat energy; the lower the value, the better the insulating quality of the material.

Visible Light Transmittance: Measures the amount of visible light that is transmitted through the glass.

UV Block: Measures the amount of damaging ultraviolet light that is blocked from being transmitted through the glass.

Shading Coefficient: Measures how much a glazing material transmits heat gain compared to ⅛" clear glass, which is given a value of 1. Thermaflect's rating of 0.44 means that Thermaflect reduces unwanted radiation by 56% versus a single pane of ⅛" clear glass.

Solar Heat Gain Coefficient: The amount of direct solar radiation that enters through the glass into the home as heat. The smaller the number, the better the glazing is at preventing solar heat gain.

CertainTeed. Leading in value since 1904.

CertainTeed has long stood for innovation and value in the building materials industry. Our commitment to the principles of "Quality made *certain*, satisfaction guaran*teed*" has made CertainTeed a name you can choose with confidence.

CHANGE FOR THE BETTER WITH ENERGY STAR

CertainTeed windows with the Thermaflect® glazing system meet the ENERGY STAR® guidelines for thermal efficiency in all climate regions.

CertainTeed®

Quality made certain. Satisfaction guaranteed.™

A Quality Brand of CertainTeed Corporation

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