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TECHNICAL
GUIDE

A Product of
AFG INDUSTRIES, INC.



SUMMER

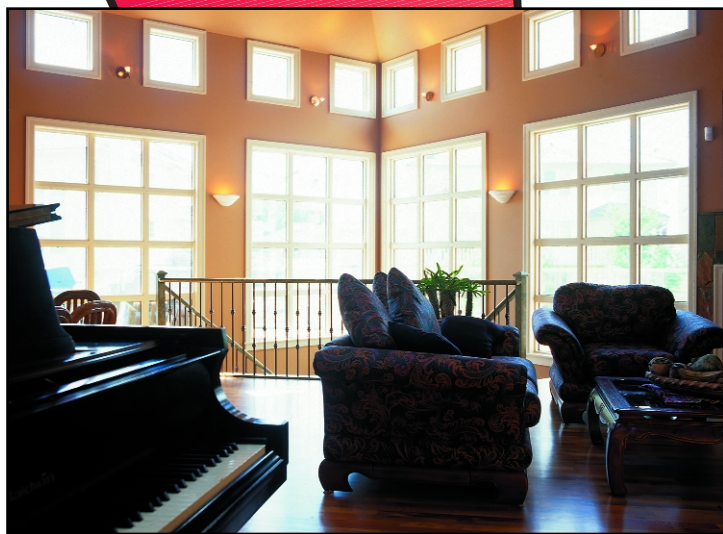
Few things enhance the beauty of a home as dramatically as windows. For those who demand more from their windows — enhanced style, greater versatility and high performance — there's Comfort E2™ glass



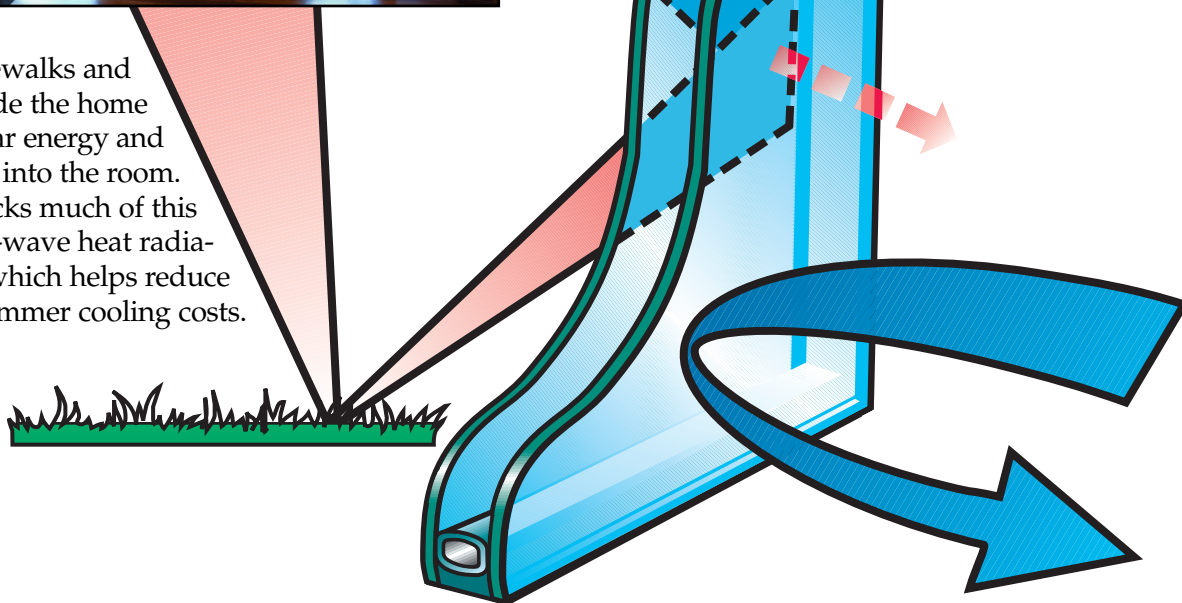
COMFORT E2™ HIGH PERFORMANCE, LOW EMISSIVITY GLASS HAS BEEN ENGINEERED FOR EFFICIENCY AND COMFORT, YEAR-ROUND.

In the summer, insulating glass units with Comfort E2 stop as much as 65% of re-radiated solar heat from entering the home, while the special coating reduces direct summer sun rays by as much as 13%.

This reduces total heat gain, making it easier to cool the home in the summer. And Comfort E2 blocks many of the sun's fabric-fading ultraviolet rays, which helps protect valuable carpets and upholstery.



The ground, sidewalks and other areas outside the home can absorb solar energy and reflect heat into the room. Comfort E2 blocks much of this unwanted long-wave heat radiation, which helps reduce summer cooling costs.

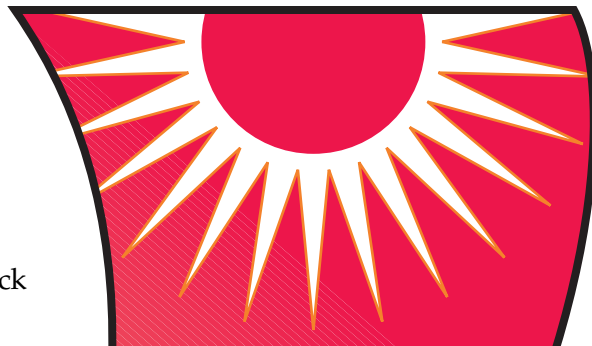


from AFG Industries. Comfort E2 delivers the quality and performance you'd expect from a pioneer in the development of low-emissivity technology and a worldwide leader in the glass industry.

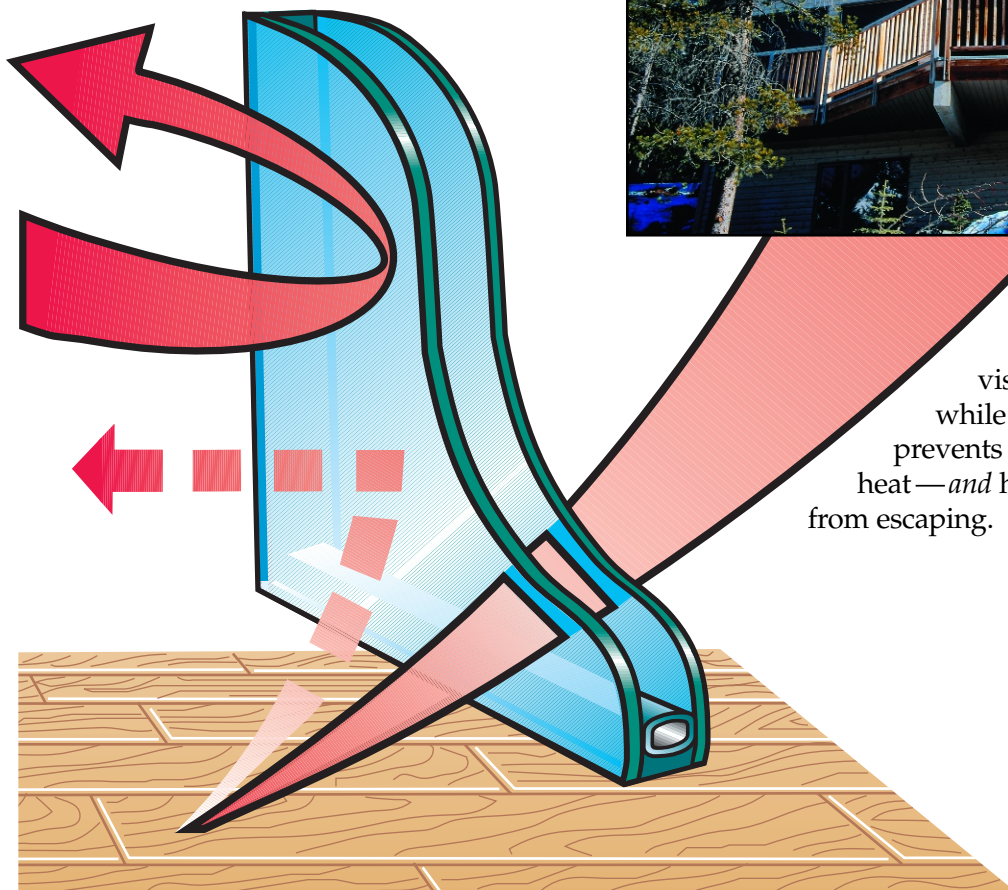
WINTER

In the winter, Comfort E2 insulating glass units reflect heat back into the room, blocking as much as 71% of the heat that can escape through conventional glass.

Comfort E2's unique coating also allows free solar energy to enter from the outside. By keeping the temperature of the glass warmer, cold spots and drafts are minimized throughout the house. The result—greater comfort, even at lower thermostat settings.



During winter, Comfort E2 allows both solar energy and visible light to enter the room, while Comfort E2's special coating prevents much of this free solar heat—and heat generated by a furnace—from escaping.



COMFORT E2™ PERFORMS FOR HOMEOWNERS.

Comfort E2™ high performance, low emissivity glass provides homeowners throughout the world with real advantages like:

- ▶ Free solar heat in the winter. Comfort E2's coating allows the sun's rays to enter the room—a source of free solar energy.
- ▶ Lower winter heat loss. Comfort E2 reflects both solar and furnace heat back into the room, greatly increasing heating efficiency.
- ▶ Greater comfort. Comfort E2's special coating helps keep the temperature of the glass higher—minimizing cold spots and drafts throughout the house.
- ▶ Less condensation. In the winter, Comfort E2's

warmer inside glass temperature virtually eliminates condensation and fogging.

- ▶ Lower summer heat gain. Comfort E2 blocks long-wave reflected heat from the outside, making it much easier to cool the home in the summer.
- ▶ Fewer damaging UV rays. Ultraviolet rays can fade and damage expensive carpet and upholstery. Comfort E2 blocks many of these rays, protecting your valuables.
- ▶ Unlimited options. Windows made with Comfort E2 glass are so efficient, homeowners can have larger windows—and more of them—than ever before. The applications and possibilities are limitless.

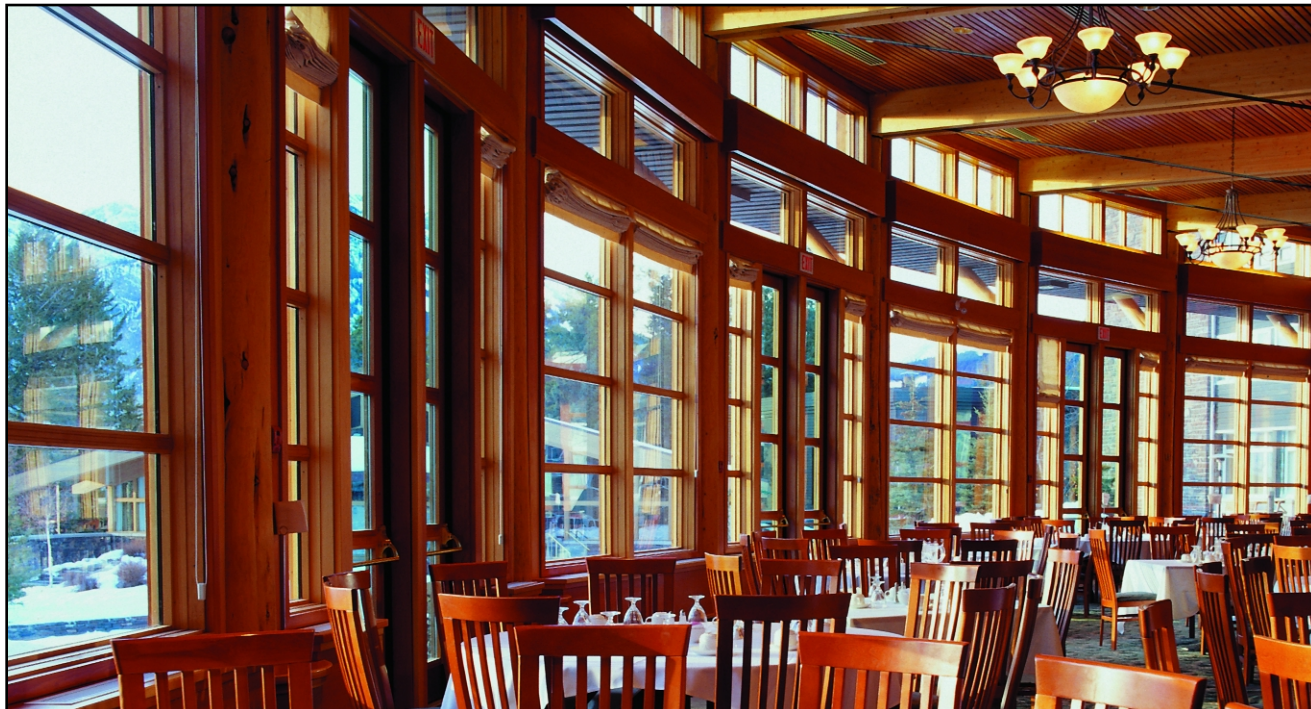


AFG MONOLITHIC COMFORT E2™ PERFORMANCE DATA*

Glass Thickness	Transmittance (%)			Reflectance (%)				U-Value (Btu/h/ft ² /°F) (Winter)	Shading Coefficient	Solar Heat Gain Coefficient
	Visible	Solar	Ultraviolet	Visible Rf	Solar Rb	Visible Rf	Solar Rb			
SGL	83	70	57	9	10	10	12	.77	.85	.73
1/8"	83	69	55	9	10	10	12	.77	.84	.72
5/32"	83	67	52	9	10	10	12	.76	.83	.71
3/16"	83	66	52	9	10	9	12	.76	.82	.71
1/4"	82	65	50	9	10	9	12	.75	.81	.70

*PERFORMANCE DATA CALCULATED USING LBL WINDOW 4.1. All calculations with coating on second surface.

COMFORT™



GLAZING PERFORMANCE COMPARISON DATA*

CENTER OF GLASS VALUES

Glass	% Transmittance Visible Solar		U-Value (Btu/h/ft²/°F) Air/Argon		R-Value (1 ÷ U-Value) Air/Argon		Solar Heat Gain Coefficient Air/Argon		Shading Coefficient Air/Argon		UV % Trans- mission	Interior Surface Glass Temperature(°F)(5) Air/Argon	
Monolithic Clear	90	85	1.11		0.90		.87		1.01		73	17	
Dual Glazed Clear & Clear	82	74	.49	.46	2.04	2.17	.78	.78	.90	.91	58	45	47
Triple Glazed Clr-Clr-Clr	75	64	.32	.29	3.13	3.45	.70	.70	.82	.82	48	54	55
Dual Glazed Clear with Comfort E2 (1)	76	60	.35	.30	2.86	3.33	.72	.73	.84	.84	44	52	54
Triple Glazed Clear-Clear w/ComfortE2 (2)	69	52	.24	.21	4.17	4.76 (4)	.65	.66	.76	.76 (4)	37	57	59
Triple Glazed Comfort E2 (3) w/Clear and Comfort E2 (2)	64	45	.20	.17	5.00	5.88 (4)	.56	.56	.65	.66 (4)	28	59	61

*PERFORMANCE DATA CALCULATED USING LBL WINDOW 4.1. (1/8" glass - 1/2" space)

(1) Comfort E2 installed on number three (3) surface.

(4) All airspaces Argon filled.

(2) Comfort E2 installed on number five (5) surface.

(5) Nighttime outside temperature of 0°F, inside temperature of 70° with 15 mph wind speed.

(3) Comfort E2 installed on number two (2) surface.



AFG COMFORT E2™ TYPICAL INSULATING GLASS PERFORMANCE**

Glass	Glass Thickness	% Transmittance Visible	% Transmittance Solar	Air Space Thickness	Winter U-Value Air/Argon		Shading Coefficient Air/Argon		Relative Heat Gain	UV % Trans-mission
Dual Glazed Comfort E2 w/AFG Bronze (1)	SS	62	49	1/4"	.46	.38	.70	.71	148	30
	SS	62	49	1/2"	.35	.31	.71	.71	147	30
	1/8"	57	44	1/4"	.46	.38	.65	.65	136	25
	1/8"	57	44	1/2"	.35	.30	.65	.65	134	25
	3/16"	49	36	1/4"	.45	.38	.56	.56	120	18
	3/16"	49	36	1/2"	.35	.30	.56	.56	117	18
	1/4"	45	32	1/4"	.45	.38	.52	.52	111	15
	1/4"	45	32	1/2"	.35	.30	.51	.51	108	15
Dual Glazed Comfort E2 w/AFG Gray (1)	1/8"	52	42	1/4"	.46	.38	.63	.63	132	24
	1/8"	52	42	1/2"	.35	.30	.62	.62	130	24
	3/16"	42	33	1/4"	.45	.38	.53	.52	112	19
	3/16"	42	33	1/2"	.35	.30	.52	.52	110	19
	1/4"	37	29	1/4"	.45	.38	.48	.48	104	16
	1/4"	37	29	1/2"	.35	.30	.47	.47	100	16
Dual Glazed Comfort E2 w/AFG Green (1)	1/8"	69	43	1/4"	.46	.38	.63	.63	133	28
	1/8"	69	43	1/2"	.35	.30	.63	.63	131	28
	3/16"	66	36	1/4"	.45	.38	.55	.55	118	22
	3/16"	66	36	1/2"	.35	.30	.55	.54	115	22
	1/4"	63	33	1/4"	.45	.38	.52	.51	111	19
	1/4"	63	33	1/2"	.35	.30	.51	.50	107	19

**PERFORMANCE DATA CALCULATED USING LBL WINDOW 4.1.

(1) Comfort E2 installed on number three (3) surface.

COMFORT E2™ PERFORMS FOR WINDOW MANUFACTURERS.

Leading window manufacturers are sold on Comfort E2™ advantages like:

- ▶Durability during handling. Comfort E2's pyrolitic coating resists scratches and chips, allowing the glass to be handled using standard techniques.
- ▶Easy tempering. The pyrolitic coating can be heat-strengthened or tempered.

▶Easy insulating. Comfort E2 can be used in sealed IG's as easily as ordinary glass since no edge deletion is needed.

▶Extended shelf life. Comfort E2's tough pyrolitic coating has a shelf life that's virtually unlimited.

▶Easy lamination. Comfort E2 can be laminated with polyvinyl butyl (PVB).



AFG COMFORT E2™ TYPICAL INSULATING GLASS PERFORMANCE**

Glass	Glass Thickness	% Transmittance		Air Space Thickness	Winter U-Value		Shading Coefficient		Relative Heat Gain	UV % Trans-mission
		Visible	Solar		Air/Argon		Air/Argon			
Dual Glazed Comfort E2 w/Clear (1)	SS	76	62	1/4"	.46	.38	.84	.85	176	47
	SS	76	62	1/2"	.35	.31	.86	.86	177	47
	1/8"	76	60	1/4"	.46	.38	.83	.83	172	44
	1/8"	76	60	1/2"	.35	.30	.84	.84	173	44
	3/16"	74	56	1/4"	.45	.38	.80	.81	167	40
	3/16"	74	56	1/2"	.35	.30	.81	.82	168	40
	1/4"	73	53	1/4"	.45	.38	.77	.78	162	39
	1/4"	73	53	1/2"	.35	.30	.79	.79	163	39
Dual Glazed Clear/Clear	SS	83	77	1/4"	.57	.52	.92	.93	193	63
	SS	83	77	1/2"	.50	.46	.93	.93	193	63
	1/8"	82	74	1/4"	.57	.52	.90	.90	189	58
	1/8"	82	74	1/2"	.49	.46	.90	.91	189	58
	3/16"	80	69	1/4"	.56	.51	.87	.87	182	51
	3/16"	80	69	1/2"	.49	.46	.87	.87	182	51
	1/4"	78	64	1/4"	.56	.51	.83	.84	176	50
	1/4"	78	64	1/2"	.48	.45	.84	.84	175	50

**PERFORMANCE DATA CALCULATED USING LBL WINDOW 4.1.

(1) Comfort E2 installed on number three (3) surface.

FOR MORE INFORMATION

To learn more about Comfort E2™, contact AFG Industries, Inc., or your glass distributor. And look for the Comfort E2 symbol on windows made with genuine Comfort E2 high performance, low emissivity glass.

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Canadian Sales
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TYPICAL WINDOW(1) U-VALUE USING COMFORT E2™ GLASS*

TYPE OF FRAME MATERIAL

Spacer Type	Vinyl	Wood	Thermally Broken Aluminum	Aluminum
Aluminum - Air	.37	.40	.56	.80
Argon	.35	.38	.53	.77
Stainless - Air	.36	.39	.55	.79
Steel - Argon	.33	.36	.52	.75
Butyl-Metal - Air	.34	.39	.54	.78
Argon	.32	.36	.51	.75
Insulating - Air	.34	.37	.53	.76
Argon	.31	.34	.49	.73

*PERFORMANCE DATA CALCULATED USING LBL WINDOW 4.1.

(1) Typical 24" x 48" casement window with insulated unit makeup - 1/8" clear - 1/2" airspace - 1/8" Comfort E2 on third surface.



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