



FLAT GLASS INDUSTRIES
SUPERIOR GLASS SOLUTIONS

Residential Glass Performance Guide

OptEma™ Double Glazing – Incorporating OptEma™ Low E Backing Glass (#3)

Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.		12mm Air	12mm Argon		
Float Glass										
4mm EnviroClear	4+12+4	80	12	54	26	47	1.68	1.40	0.60	0.70
5mm EnviroClear	5+12+5	79	12	51	24	43	1.68	1.40	0.59	0.67
6mm EnviroClear	6+12+6	79	12	50	23	41	1.67	1.39	0.58	0.68
4mm EnviroTone Grey	4+12+4	50	7	36	15	28	1.68	1.40	0.42	0.49
5mm EnviroTone Grey	5+12+5	42	7	30	12	17	1.68	1.40	0.37	0.43
6mm EnviroTone Grey	6+12+6	37	6	26	10	14	1.67	1.39	0.34	0.40
4mm Matlucent	4+12+4	80	12	52	21	47	1.69	1.40	0.60	0.70
6mm Matlucent	6+12+5	79	12	51	23	41	1.68	1.40	0.58	0.67
6mm Matlucent	6+12+6	79	12	48	18	41	1.68	1.39	0.58	0.68
6.5mm Silencia	6.5+12+5	79	11	49	20	<0.1	1.67	1.39	0.57	0.65
6.5mm Silencia	6.5+12+6	77	12	48	19	<0.1	1.68	1.37	0.53	0.62
6.38mm Protekta	6.38+12+5	79	11	49	20	<0.1	1.67	1.39	0.57	0.65
6.38mm Protekta	6.38+12+6	78	12	47	20	<0.1	1.66	1.38	0.53	0.62
7.52mm SecurView	7.52+12+5	79	12	48	18	<0.1	1.66	1.38	0.57	0.65
7.52mm SecurView	7.52+12+6	76	11	47	17	<0.1	1.64	1.38	0.52	0.61
6.38mm Protekta WhiteTrans	6.38+12+5	61	9	39	16	<0.1	1.67	1.39	0.46	0.53
6.38mm Protekta WhiteTrans	6.38+12+6	52	10	47	16	<0.1	1.66	1.38	0.44	0.51

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Residential Glass Performance Guide

KlymetControl™ Double Glazing – Incorporating Clear Float Backing Glass

Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.		12mm Air	12mm Argon		
Float Glass										
EnviroClear	3+12+3	80	14	69	12	56	2.7	2.6	0.76	0.87
	4+12+4	80	14	66	12	52	2.7	2.6	0.74	0.85
	5+12+5	79	14	63	11	45	2.7	2.5	0.72	0.83
	6+12+6	78	14	60	11	45	2.7	2.5	0.70	0.81
	8+12+6	77	13	57	10	42	2.7	2.5	0.67	0.78
	10+12+6	76	13	54	9	39	2.6	2.5	0.64	0.74
EnviroTone Grey	12+12+6	75	13	49	9	37	2.6	2.5	0.60	0.69
	4+12+4	49	8	46	29	2.7	2.7	2.6	0.57	0.65
	5+12+5	42	7	39	24	2.7	2.7	2.5	0.52	0.60
	6+12+6	37	7	35	20	2.7	2.7	2.5	0.48	0.55
	10+12+6	24	5	22	10	2.6	2.6	2.5	0.36	0.42
EnviroTone Green	12+12+6	17	4	18	8	2.6	2.6	2.5	0.33	0.38
	4+12+4	73	12	46	8	31	2.7	2.6	0.56	0.65
	5+12+5	70	12	38	7	28	2.7	2.5	0.50	0.58
	6+12+5	68	11	37	7	23	2.7	2.5	0.48	0.56
EnviroTone Bronze	10+12+6	56	9	24	6	11	2.6	2.5	0.37	0.43
	4+12+4	53	8	48	8	25	2.7	2.6	0.58	0.67
	5+12+5	47	8	41	7	18	2.7	2.5	0.53	0.61
EnviroTone Ocean Blue ³	6+12+5	45	7	3	6	16	2.7	2.5	0.49	0.57
	10+12+6	27	5	48	5	6	2.6	2.5	0.37	0.42
EnviroTone Ocean Blue ³	6+12+6	48	8	47	6	15	3.3	3.1	0.47	0.54
Protekta™ Laminated Glass										
Clear	6.38+12+6	76	13	57	10	<1	2.7	2.5	0.67	0.77
Grey	6.38+12+6	36	6	35	7	<1	2.7	2.5	0.49	0.56
Bronze	6.38+12+6	42	7	37	7	<1	2.7	2.5	0.50	0.58
Translucent	6.38+12+6	48	8	37	7	<1	2.7	2.5	0.50	0.58
Green+	6.38+12+6	59	11	28	7	<1	2.7	2.5	0.40	0.46



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Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.		12mm Air	12mm Argon		
EnviroTone+										
Green	4+12+4	65	12	36	8	13	2.7	2.6	0.47	0.54
	5+12+5	64	12	35	8	15	2.7	2.5	0.46	0.53
	6+12+6	58	11	27	7	11	2.7	2.5	0.39	0.46
Grey	4+12+4	15	4	11	4	3	2.7	2.5	0.26	0.30
	6+12+6	8	4	6	4	1	2.7	2.5	0.21	0.25
Blue	6+12+6	47	8	27	6	17	2.7	2.5	0.39	0.46
	10+12+6	36	7	17	5	10	2.6	2.5	0.31	0.36
KlymetShield™ Low E										
KlymetShield™ Clear (#2)	4+12+4	75	17	57	15	41	1.9	1.6	0.64	0.74
	6+12+6	73	16	52	14	36	1.9	1.6	0.61	0.71
KlymetShield™ Neutral (#2)	4+12+4	55	12	38	10	34	1.9	1.6	0.46	0.53
	6+12+6	56	12	36	10	30	1.9	1.6	0.45	0.52
KlymetShield™ Grey (#2)	4+12+4	45	9	38	9	18	1.9	1.6	0.46	0.53
	6+12+6	35	8	29	8	13	1.9	1.7	0.39	0.45
KlymetShield™ Green (#2)	4+12+4	68	15	41	10	25	1.9	1.7	0.49	0.56
	6+12+6	63	13	33	9	19	1.9	1.6	0.41	0.48
KlymetShield™ Green+ (#2)	4+12+4	61	13	32	8	15	1.9	1.6	0.39	0.45
	6+12+6	54	11	24	7	10	1.9	1.6	0.32	0.37
Sunergy²										
Clear (#2)	4+12+4	61	12	44	12	39	2.1	1.9	0.53	0.61
	6+12+6	60	12	41	11	34	2.1	1.9	0.51	0.59
	10+12+6	55	12	40	11	33	2.1	1.8	0.49	0.56
Green (#2)	6+12+6	49	10	23	7	13	2.1	1.9	0.33	0.38
Azur (#2)	6+12+6	49	10	26	7	20	2.1	1.9	0.35	0.41



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Residential Glass Performance Guide

KlymetControl™ Double Glazing – incorporating KlymetShield™ Clear Low E Backing Glass (#3)

Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.		12mm Air	12mm Argon		
Float Glass										
EnviroClear	3+12+4	74	17	57	16	44	1.9	1.6	0.71	0.81
	4+12+4	74	17	56	15	42	1.9	1.6	0.69	0.78
	5+12+5	72	17	53	14	39	1.9	1.6	0.66	0.76
	6+12+6	73	16	52	14	36	1.9	1.6	0.66	0.76
	8+12+6	72	16	50	13	34	1.9	1.6	0.63	0.73
	10+12+6	70	15	47	12	31	1.9	1.6	0.60	0.69
EnviroTone Grey	12+12+6	70	15	43	10	29	1.9	1.6	0.55	0.64
	4+12+4	45	9	38	10	23	1.9	1.6	0.51	0.59
	5+12+5	40	8	34	9	21	1.9	1.6	0.48	0.54
	6+12+6	35	7	30	8	16	1.9	1.6	0.43	0.49
	10+12+6	22	5	18	6	8	1.9	1.6	0.30	0.35
EnviroTone Green	12+12+6	16	5	15	5	6	1.9	1.6	0.27	0.31
	4+12+4	67	15	39	10	25	1.9	1.6	0.51	0.58
	5+12+5	65	14	33	8	23	1.9	1.6	0.46	0.53
	6+12+6	63	13	32	8	19	1.9	1.6	0.43	0.50
EnviroTone Bronze	10+12+6	52	10	21	6	9	1.9	1.6	0.31	0.36
	4+12+4	49	10	40	10	20	1.9	1.6	0.53	0.61
	5+12+5	45	9	35	9	15	1.9	1.6	0.48	0.55
	6+12+6	41	8	31	8	12	1.9	1.6	0.44	0.51
10+12+6	25	5	19	6	5	1.9	1.6	0.31	0.36	
Protekta™ Laminated Glass										
Clear	6.38+12+6	71	19	50	12	<1	1.9	1.6	0.64	0.73
Grey	6.38+12+6	34	7	31	8	<1	1.9	1.6	0.44	0.51
Bronze	6.38+12+6	40	8	32	8	<1	1.9	1.6	0.46	0.53
Green	6.38+12+6	58	12	42	10	<1	1.9	1.6	0.56	0.65
Translucent	6.38+12+6	45	9	33	8	<1	1.9	1.6	0.46	0.53
Green+	6.38+12+6	55	12	24	8	<1	1.9	1.6	0.35	0.40

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Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.		12mm Air	12mm Argon		
EnviroTone+										
Green	4+12+4	60	14	31	9	11	1.9	1.6	0.41	0.47
	5+12+5	61	14	31	9	13	1.9	1.6	0.41	0.48
	6+12+6	54	13	24	8	9	1.9	1.6	0.34	0.39
Grey	4+12+4	14	4	10	4	2	1.9	1.6	0.20	0.24
	6+12+6	7	4	5	4	1	1.9	1.6	0.15	0.18
Blue	4+12+4	54	11	32	8	21	1.9	1.6	0.43	0.50
	6+12+6	43	9	23	7	13	1.9	1.6	0.34	0.39
KlymetShield™ Low E										
KlymetShield™ Clear (#2)	4+12+4	69	19	51	16	34	1.8	1.5	0.61	0.71
	6+12+6	67	19	47	15	29	1.8	1.5	0.59	0.68
KlymetShield™ Neutral (#2)	4+12+4	51	13	34	11	28	1.8	1.5	0.44	0.51
	6+12+6	52	13	32	11	24	1.7	1.5	0.43	0.50
KlymetShield™ Grey (#2)	4+12+4	42	10	33	10	15	1.8	1.5	0.43	0.50
	6+12+6	33	8	26	8	10	1.8	1.5	0.37	0.43
KlymetShield™ Green (#2)	4+12+4	63	17	37	11	20	1.8	1.5	0.46	0.53
	6+12+6	59	15	29	9	15	1.8	1.5	0.39	0.45
KlymetShield™ Green+ (#2)	4+12+4	57	14	28	9	12	1.8	1.5	0.37	0.43
	6+12+6	50	13	22	8	8	1.8	1.5	0.31	0.35
SolTech¹ Low E										
Grey (#2)	6+12+6	25	6	17	7	8	1.8	1.5	0.27	0.31
Sunergy² Low E										
Clear (#2)	4+12+4	61	12	44	12	39	2.1	1.9	0.53	0.61
	6+12+6	60	12	41	11	34	2.1	1.9	0.51	0.59
	10+12+6	55	12	40	11	33	2.1	1.8	0.49	0.56
Green (#2)	6+12+6	49	10	23	7	13	2.1	1.9	0.33	0.38
Azur (#2)	6+12+6	49	10	26	7	20	2.1	1.9	0.35	0.41

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SUPERIOR GLASS SOLUTIONS

Residential Glass Performance Guide

Single Glass – Monolithic and Laminated

Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.				
Float – Toughened and Annealed									
EnviroClear™	4	89	8	81	7	67	5.9	0.84	0.97
	5	88	8	79	7	63	5.9	0.83	0.95
	6	87	7	77	7	61	5.8	0.81	0.94
EnviroTone™ Grey	4	56	6	57	5	35	5.9	0.68	0.78
	5	48	5	51	5	31	5.8	0.64	0.74
	6	41	5	44	5	17	5.7	0.6	0.66
EnviroTone™ Green	4	81	7	55	6	38	5.9	0.67	0.77
	5	79	7	49	5	34	5.8	0.63	0.73
	6	76	7	45	5	29	5.8	0.60	0.70
EnviroTone™ Bronze	4	60	6	59	6	30	5.9	0.69	0.80
	5	55	6	52	5	23	5.8	0.65	0.75
	6	50	5	47	5	19	5.8	0.62	0.71
EnviroTone™+									
Green	6	65	8	33	6	13	5.7	0.51	0.58
Blue	6	53	6	33	5	23	5.8	0.52	0.60
Low Iron									
KristalClear™	4	91	8	90	8	73	5.8	0.91	1.05
	5	91	8	90	8	71	5.8	0.90	1.03
	6	91	8	89	8	70	5.7	0.90	1.03
	10	91	8	88	8	66	5.6	0.89	1.02
	12	91	8	87	8	64	5.5	0.88	1.01



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Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.				
Low E Coatings									
KlymetShield™ Clear (#2)	4	82	10	66	10	54	3.7	0.70	0.83
	5	82	11	67	11	52	3.7	0.70	0.81
	6	81	10	65	10	48	3.7	0.70	0.81
KlymetShield™ Neutral (#2)	4	61	7	48	8	48	3.7	0.55	0.64
	6	60	7	46	7	46	3.7	0.54	0.62
KlymetShield™ Grey (#2)	4	50	7	45	7	21	3.7	0.53	0.62
	6	40	6	37	7	16	3.7	0.47	0.55
KlymetShield™ Green (#2)	4	75	10	49	8	30	3.7	0.56	0.65
	6	71	9	39	7	23	3.7	0.49	0.57
KlymetShield™ Green+ (#2)	4	68	9	37	7	18	3.7	0.47	0.54
	6	61	8	28	6	12	3.7	0.40	0.47
EVantage ¹ Clear (#2)	6	67	25	58	19	30	3.8	0.62	0.72
EVantage ¹ Blue Green (#2)	6	56	19	35	11	16	3.8	0.45	0.53
EVantage ¹ Grey (#2)	6	32	10	29	8	10	3.8	0.41	0.48
EVantage ¹ SuperBlue ¹ (#2)	6	39	12	23	8	10	3.8	0.36	0.42
EVantage ¹ SuperGreen ¹ (#2)	6	48	15	23	8	7	3.8	0.36	0.43
Sunergy ² Clear (#2)	4	69	9	56	10	40	4.3	0.62	0.71
	6	68	9	54	9	37	4.2	0.61	0.70
Sunergy ² Green (#2)	6	56	7	34	6	20	4.2	0.45	0.52
Sunergy ² Azure (#2)	6	56	7	31	6	12	4.2	0.42	0.48
Laminated Glass – Annealed									
Protekta™ Clear	6.38	87	8	72	7	<1	5.7	0.79	0.91
	10.38	86	8	66	7	<1	5.6	0.74	0.85
Protekta™ Translucent	6.38	66	7	56	6	<1	5.7	0.67	0.78
	10.38	64	7	51	6	<1	5.6	0.64	0.74
Protekta™ Grey	6.38	42	5	47	6	<1	5.7	0.61	0.71
	10.38	41	5	42	5	<1	5.7	0.59	0.67
Protekta™ Green	6.38	71	7	63	6	<1	5.7	0.72	0.83
	10.38	70	7	57	6	<1	5.6	0.69	0.79



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Product Name	Nominal Thickness	Visible Light		Solar Energy		UV Trans.	U-Value	SHGC	Shading Co.
		Trans.	Refl.	Trans.	Refl.				
KlymetShield™ L Clear (#4)	6.38	82	10	64	9	<1	3.6	0.68	0.79
	10.38	79	11	58	9	<1	3.6	0.64	0.74
KlymetShield™ L Neutral (#4)	6.38	59	7	42	7	<1	3.6	0.51	0.60
	10.38	62	8	40	7	<1	3.6	0.49	0.58
KlymetShield™ L Grey (#4)	6.38	37	6	27	6	<1	3.6	0.39	0.46
	10.38	38	6	26	6	<1	3.6	0.39	0.46
Sunergy ² (#4)	6.38	67	9	51	9	<1	4.1	0.58	0.67
Sunergy ² Grey (#4)	6.38	33	6	30	6	<1	4.1	0.44	0.51

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Notes

1. In the case of double glazing, the relevant thicknesses of either EnviroClear™ float glass, OptEma™ Low E float glass or KlymetShield™ Clear Low E float glass are used as the backing glass as indicated.
2. Values are calculated using both LBL Windows 5.2 software to NFRC-100 – 2001 and LBL Windows 6.3 software to NFRC 100-2010 conditions.
3. Where # appears next to the product name, this indicates the position of the coated surface of the glass.
4. Glass surfaces are counted from the exterior face of the building. For IGU's the first thickness indicated is the outer glass thickness, then 12 for the thickness of the air/argon space and then the relevant thickness of the inner panel.
5. The values given are centre of glass values. It is very important to note that the above listed glass performance will differ to that of a window assembly using these products.
6. The above information is, to the best of our knowledge, accurate. Flat Glass Industries Limited disclaims any liability for loss or damage arising from the use of such data.
7. It is recommended that a thermal assessment be carried out prior to specifying any type of performance glass to determine any risk of thermal breakage.

Definitions of Values

1. Visible Trans. – Percentage of visible light that can pass directly through the glass – the higher the value the more visible light that will pass through.
2. Visible Refl. – Percentage of visible light that is reflected off the exterior.
3. Solar Trans. – Percentage of solar energy and normal incident light passing through the glass.
4. Solar Refl. – Percentage of solar energy and normal incident light reflected out.
5. UV trans. – Percentage of UV light transmitted measured in the light range of 300 – 380nm. The lower the number the better.
6. U Value – Measured in watts per m² per degree Celsius (w/m²°C) and is a measure of the rate of heat gain or loss through the glass due to environmental differences between outdoor and indoor air.
7. Shading Co. – Shading coefficient is the ratio of solar heat gain through the glass relative to that through 3mm clear glass. The lower the number the better the performance.
8. SHGC – Solar Heat Gain Coefficient – The proportion of total solar radiation that is transferred through the glass at normal incidence, it comprises the direct solar transmission and part of the solar absorption dissipated inwards by radiation and convection. The lower the number the better the solar performance.

¹ – are trademarks of Viridian

² – are trademarks of AGC

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