15.0 Performance charts

Clear Glass

Substrate	Visible Properties Trans-mittance	Reflectance S1	Reflectance S2	Solar Properties Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
3mm	89	8	8	86	8	8	1.00	0.88	5.9	0.90
4mm	88	8	8	84	8	8	0.98	0.86	5.9	0.90
5mm	88	8	8	82	7	7	0.96	0.85	5.9	0.92
6mm	87	8	8	80	7	7	0.95	0.83	5.9	0.92
8mm	85	8	8	77	7	7	0.92	0.81	5.9	0.92
10mm	83	7	7	73	7	7	0.89	0.78	5.9	0.93
12mm	82	7	7	70	7	7	0.86	0.76	5.8	0.95
15mm	80	7	7	65	7	7	0.82	0.72	5.8	0.98
19mm	78	7	7	60	6	6	0.78	0.69	5.8	1.00
25mm	75	7	7	53	6	6	0.72	0.63	5.7	1.04

Body Tint Glass

Substrate	Visible Properties Trans-mittance	Reflectance S1	Reflectance S2	Solar Properties Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm Green	78	7	7	49	6	6	0.71	0.61	6.3	1.10
6mm Bronze	51	6	6	48	5	5	0.71	0.61	6.3	0.72
6mm Grey	43	5	5	47	5	5	0.69	0.59	6.3	0.62
6mm Evergreen	66	6	6	34	5	5	0.58	0.50	6.3	1.13
6mm Azurlite	71	7	7	33	5	5	0.58	0.50	6.3	1.22
6mm Panasap Dark Blue	58	6	6	43	5	5	0.67	0.57	6.3	0.87
6mm Arctic Blue	56	6	6	35	5	5	0.60	0.52	6.3	0.93
6mm Optigray	23	5	5	19	5	5	0.47	0.41	6.3	0.49
6mm Supergrey	8	4	4	8	4	4	0.39	0.33	6.3	0.21

Laminate - Single Interlayer

Substrate	Visible Properties Trans-mittance	Reflectance S1	Reflectance S4	Solar Properties Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6.38mm										
Clear	85	7	7	76	7	7	0.92	0.81	5.9	0.92
Grey	42	5	5	51	5	5	0.72	0.63	6.1	0.58
Green	69	6	6	64	6	6	0.82	0.72	6.0	0.63
Bronze	52	5	5	52	5	5	0.73	0.64	6.1	0.71
Cool Blue	69	6	6	69	6	6	0.86	0.76	5.9	0.80
8.38mm										
Clear	83	7	7	73	7	7	0.89	0.78	5.8	0.93
Grey	41	5	5	48	5	5	0.69	0.61	6.0	0.59

* Calculations are based on ASHRAE Standard Summer Conditions

Laminate - Single Interlayer (continued)

Substrate	Visible Properties			Solar Properties			Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4				
Green	67	6	6	61	6	6	0.80	0.70	5.9	0.84
Bronze	50	5	5	50	5	5	0.71	0.62	6.0	0.70
Cool Blue	67	6	6	67	6	6	0.86	0.76	5.9	0.78
10.38mm										
Clear	83	7	7	69	7	7	0.86	0.76	5.8	0.97
Grey	41	5	5	46	5	5	0.67	0.59	6.0	0.61
Green	67	6	6	58	6	6	0.77	0.68	5.9	0.87
Bronze	50	5	5	47	5	5	0.69	0.60	6.0	0.72
Cool Blue	67	6	6	64	6	6	0.81	0.71	5.9	0.83
12.38mm										
Clear	81	7	7	66	7	7	0.83	0.73	5.8	0.98
Grey	40	5	5	44	5	5	0.66	0.57	6.0	0.61
Green	66	6	6	56	6	6	0.75	0.66	5.9	0.88
Bronze	49	5	5	45	5	5	0.67	0.58	6.0	0.73
Cool Blue	66	6	6	60	6	6	0.79	0.69	5.8	0.84

Laminate - Double Interlayer

Substrate	Visible Properties			Solar Properties			Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4				
6.76mm										
Clear	84	7	7	72	7	7	0.89	0.78	5.8	0.94
Grey	21	4	4	32	5	5	0.57	0.50	6.3	0.37
Green	55	5	5	52	5	5	0.72	0.63	6.1	0.76
Bronze	31	5	5	34	5	5	0.58	0.51	6.2	0.53
Cool Blue	55	5	5	61	6	6	0.80	0.70	6.0	0.69
8.76mm										
Clear	82	7	7	69	7	7	0.86	0.75	5.8	0.95
Grey	20	4	4	30	5	5	0.55	0.48	6.2	0.36
Green	54	5	5	49	5	5	0.70	0.61	6.0	0.77
Bronze	30	4	4	32	5	5	0.57	0.50	6.2	0.53
Cool Blue	54	5	5	58	6	6	0.77	0.68	5.9	0.70
10.76mm										
Clear	82	7	7	66	6	6	0.83	0.73	5.8	0.99
Grey	20	4	4	29	5	5	0.54	0.47	6.1	0.37
Green	54	5	5	47	5	5	0.68	0.60	6.0	0.79
Bronze	30	4	4	31	5	5	0.55	0.48	6.1	0.55
Cool Blue	54	5	5	55	6	6	0.75	0.66	5.9	0.72
12.76mm										
Clear	81	7	7	63	6	6	0.81	0.71	5.8	1.00
Grey	20	4	4	28	4	4	0.53	0.46	6.1	0.38
Green	53	5	5	44	5	5	0.66	0.58	5.9	0.80
Bronze	30	4	4	29	5	5	0.54	0.47	6.1	0.56
Cool Blue	53	5	5	53	6	6	0.73	0.64	5.9	0.73

* Calculations are based on ASHRAE Standard Summer Conditions

Optilight Series

	Visible Properties			Solar Properties						
Laminate Make-up (Coating on Surface 4)	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
HL219										
4mm Green/0.76mm Clear/4mm EA	73	10	11	45	6	9	0.61	0.54	4.0	1.19
6mm Green/0.76mm Clear/4mm EA	68	9	10	37	5	8	0.55	0.48	4.1	1.24
6mm Green/0.76mm Clear/6mm EA	69	9	10	36	6	8	0.53	0.47	4.1	1.29
HL229										
4mm Green/0.38mm Grey, 0.38mm Clear/4mm EA	37	6	10	25	5	11	0.44	0.38	4.2	0.85
6mm Green/0.38mm Grey, 0.38mm Clear/4mm EA	35	6	9	19	5	10	0.39	0.33	4.1	0.89
6mm Green/0.38mm Grey, 0.38mm Clear/6mm EA	35	6	9	20	5	10	0.39	0.34	4.1	0.90
HL319										
4mm Grey/0.76mm Clear/4mm EA	50	7	10	40	5	8	0.57	0.50	4.1	0.87
6mm Grey/0.76mm Clear/4mm EA	38	6	9	29	5	10	0.48	0.41	4.2	0.79
6mm Grey/0.76mm Clear/6mm EA	39	6	8	29	5	8	0.47	0.41	4.1	0.82
HL419										
6mm Bronze/0.76mm Clear/4mm EA	45	7	9	36	5	8	0.53	0.47	4.1	0.85
HL519										
6mm Panasap Dark Blue/ 0.76mm Clear/4mm EA	50	7	10	31	5	11	0.49	0.42	4.2	1.03
6mm Panasap Dark Blue/ 0.76mm Clear/6mm EA	51	7	9	31	5	8	0.49	0.43	4.1	1.04
HL719										
4mm Azurlite/0.76mm Clear/4mm EA	66	9	10	32	5	8	0.49	0.43	4.2	1.35
6mm Azurlite/0.76mm Clear/4mm EA	64	8	10	29	5	11	0.47	0.41	4.2	1.36
6mm Azurlite/0.76mm Clear/6mm EA	65	8	9	30	5	7	0.47	0.42	4.1	1.39
HL819										
4mm Evergreen/ 0.76mm Clear/4mm EA	66	9	11	36	5	8	0.53	0.46	4.1	1.24
6mm Evergreen/ 0.76mm Clear/4mm EA	58	8	10	26	5	11	0.45	0.38	4.2	1.29
6mm Evergreen/ 0.76mm Clear/6mm EA	59	8	10	27	5	8	0.45	0.40	4.1	1.30
HL919										
4mm EA(S2)/0.76mm Clear/4mm EA	75	12	13	56	10	10	0.70	0.62	3.9	1.07
6mm EA(S2)/0.76mm Clear/6mm EA	74	11	12	51	9	10	0.66	0.58	3.9	1.12

EA = Energy Advantage; (S2) = Additional coating to Surface 2

Solarplus TE/TS Series - Monolithic

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
TE10										
6mm Clear	10	19	27	6	21	35	0.26	0.22	4.9	0.38
TS21										
6mm Clear	21	19	33	15	20	40	0.36	0.31	5.3	0.69
6mm Green	18	17	33	10	12	40	0.34	0.29	5.3	0.54
6mm Bronze	12	10	33	9	11	40	0.33	0.29	5.3	0.39
6mm Grey	10	8	33	9	10	40	0.34	0.29	5.3	0.30
6mm Evergreen	16	16	33	7	8	40	0.32	0.28	5.3	0.50

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus TE/TS Series - Monolithic (continued)

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm Azurlite	17	16	33	8	9	40	0.33	0.28	5.3	0.52
6mm Panasap Dark Blue	14	11	33	9	10	40	0.34	0.29	5.3	0.40
6mm Arctic Blue	13	11	33	8	9	40	0.33	0.28	5.3	0.41
TS30										
6mm Clear	30	15	28	22	15	33	0.44	0.38	5.6	0.69
6mm Green	27	12	28	14	10	33	0.39	0.34	5.6	0.74
6mm Bronze	18	9	28	14	10	33	0.39	0.34	5.6	0.44
6mm Grey	16	8	28	14	9	33	0.40	0.34	5.6	0.35
6mm Evergreen	22	10	28	10	7	33	0.37	0.32	5.6	0.60
6mm Azurlite	24	11	28	10	8	33	0.37	0.31	5.6	0.65
6mm Panasap Dark Blue	19	7	28	14	9	33	0.39	0.34	5.6	0.47
6mm Arctic Blue	18	7	28	10	8	33	0.37	0.31	5.6	0.49
TS35										
6mm Clear	34	12	27	26	11	30	0.49	0.42	5.7	0.70
6mm Green	29	10	27	16	7	30	0.42	0.36	5.7	0.69
6mm Bronze	21	8	27	17	8	30	0.43	0.37	5.7	0.50
6mm Grey	18	7	27	16	7	30	0.42	0.36	5.7	0.42
6mm Evergreen	26	9	27	12	7	30	0.38	0.33	5.7	0.67
6mm Azurlite	27	10	27	12	7	30	0.39	0.33	5.7	0.69
6mm Panasap Dark Blue	23	8	27	15	7	30	0.41	0.35	5.7	0.56
6mm Arctic Blue	22	8	27	12	7	30	0.39	0.33	5.7	0.57
TS40										
6mm Clear	40	10	23	30	10	26	0.53	0.46	5.9	0.75
6mm Green	34	9	23	19	8	26	0.45	0.39	5.9	0.74
6mm Bronze	23	7	23	19	8	26	0.45	0.39	5.9	0.48
6mm Grey	19	6	23	18	8	26	0.44	0.38	5.9	0.44
6mm Evergreen	30	8	23	14	6	26	0.42	0.36	5.9	0.72
6mm Azurlite	33	9	23	14	7	26	0.41	0.35	5.9	0.79
6mm Panasap Dark Blue	25	6	23	18	8	26	0.44	0.38	5.9	0.56
6mm Arctic Blue	23	6	23	14	8	26	0.41	0.35	5.9	0.57
TS50										
6mm Clear	52	6	18	41	6	19	0.65	0.56	5.9	0.80
6mm Green	44	7	17	25	5	18	0.51	0.44	5.9	0.86
6mm Bronze	31	5	17	25	5	18	0.51	0.44	5.9	0.61
6mm Grey	26	5	17	25	5	18	0.51	0.44	5.9	0.51
6mm Evergreen	39	7	17	21	5	18	0.48	0.41	5.9	0.81
6mm Azurlite	42	7	17	21	5	18	0.47	0.41	5.9	0.90
6mm Panasap Dark Blue	33	5	17	24	5	18	0.50	0.43	5.9	0.66
6mm Arctic Blue	33	5	17	21	5	18	0.48	0.41	5.9	0.68

Solarplus SS Series - Monolithic

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SS08										
6mm Clear	8	38	39	6	33	48	0.23	0.19	5.0	0.40
6mm Green	7	30	39	5	17	48	0.25	0.22	5.0	0.34

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SS Series - Monolithic (continued)

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm Bronze	5	16	39	4	15	48	0.26	0.22	5.0	0.19
6mm Grey	4	12	39	4	14	48	0.26	0.22	5.0	0.17
6mm Evergreen	7	24	39	3	12	48	0.26	0.22	5.0	0.27
6mm Azurlite	7	26	39	3	14	48	0.25	0.21	5.0	0.30
6mm Panasap Dark Blue	6	13	39	4	14	48	0.26	0.23	5.0	0.21
6mm Arctic Blue	6	13	39	3	14	48	0.25	0.22	5.0	0.22
SS14										
6mm Clear	14	29	34	10	24	43	0.29	0.25	5.1	0.49
6mm Green	13	24	34	7	13	43	0.29	0.25	5.1	0.45
6mm Bronze	8	13	34	6	12	43	0.29	0.25	5.1	0.28
6mm Grey	7	10	34	6	11	43	0.28	0.25	5.1	0.24
6mm Evergreen	11	18	34	5	10	43	0.28	0.24	5.1	0.39
6mm Azurlite	12	21	34	5	12	43	0.28	0.24	5.1	0.41
6mm Panasap Dark Blue	11	22	34	6	12	43	0.29	0.25	5.1	0.39
6mm Arctic Blue	12	23	34	6	12	43	0.29	0.25	5.1	0.40
SS22										
6mm Clear	22	20	31	15	19	38	0.36	0.31	5.4	0.60
6mm Green	19	16	31	10	12	38	0.34	0.29	5.4	0.52
6mm Bronze	13	11	31	10	11	38	0.34	0.30	5.4	0.38
6mm Grey	11	9	31	10	10	38	0.34	0.29	5.4	0.32
6mm Evergreen	16	14	31	7	9	38	0.32	0.28	5.4	0.48
6mm Azurlite	17	16	31	7	10	38	0.32	0.28	5.4	0.52
6mm Panasap Dark Blue	14	12	31	9	11	38	0.33	0.29	5.4	0.41
6mm Arctic Blue	13	12	31	7	11	38	0.32	0.27	5.4	0.41

Solarplus SC Series - Monolithic

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SC22										
6mm Clear	23	20	30	18	16	33	0.33	0.29	3.82	0.68
6mm Green	19	16	30	10	9	33	0.27	0.23	3.82	0.70
6mm Bronze	13	10	30	11	10	33	0.28	0.24	3.82	0.46
6mm Grey	11	9	30	11	10	33	0.27	0.24	3.82	0.42
6mm Evergreen	17	13	30	8	8	33	0.25	0.22	3.82	0.66
6mm Azurlite	18	15	30	8	9	33	0.25	0.22	3.82	0.72
6mm Panasap Dark Blue	14	10	30	10	10	33	0.27	0.23	3.82	0.53
6mm Arctic Blue	14	10	30	8	10	33	0.25	0.22	3.82	0.54
SC30										
6mm Clear	31	15	26	26	12	27	0.42	0.36	3.84	0.73
6mm Green	25	11	25	15	7	27	0.32	0.28	3.84	0.77
6mm Bronze	15	9	27	15	7	27	0.32	0.28	3.84	0.48
6mm Grey	14	8	25	15	7	27	0.32	0.28	3.84	0.44
6mm Evergreen	22	10	26	11	9	27	0.28	0.24	3.84	0.78
6mm Azurlite	22	11	26	12	9	27	0.29	0.25	3.84	0.76
6mm Panasap Dark Blue	17	9	26	15	7	27	0.32	0.28	3.84	0.53
6mm Arctic Blue	17	9	26	12	7	27	0.30	0.25	3.84	0.55

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SC Series - Monolithic (continued)

	Visible Properties			Solar Properties						
Substrate	Trans-mittance	Reflectance S1	Reflectance S2	Trans-mittance	Reflectance S1	Reflectance S2	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
SC40										
6mm Clear	42	10	17	37	7	18	0.60	0.52	5.98	0.70
6mm Green	36	9	18	20	6	19	0.47	0.40	5.98	0.76
6mm Bronze	24	7	18	19	6	19	0.46	0.40	5.98	0.52
6mm Grey	26	7	18	20	6	19	0.47	0.40	5.98	0.56
6mm Evergreen	32	8	18	15	5	19	0.43	0.37	5.98	0.75
6mm Azurlite	35	9	18	15	5	19	0.43	0.37	5.98	0.81
6mm Panasap Dark Blue	29	7	18	19	6	19	0.46	0.40	5.98	0.62
6mm Arctic Blue	28	7	18	15	6	19	0.43	0.37	5.98	0.64

Solarplus TE/TS Series - Laminate

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
TE10										
6.38mm Clear Interlayer (S2)	10	25	23	5	33	30	0.26	0.22	6.15	0.38
8.38mm Clear Interlayer (S2)	10	25	23	5	32	29	0.26	0.22	6.07	0.38
10.38mm Clear Interlayer (S2)	10	24	23	5	29	29	0.27	0.23	5.98	0.35
12.38mm Clear Interlayer (S2)	9	24	22	4	29	26	0.26	0.22	5.90	0.36
6.38mm Grey Interlayer (S3)	5	9	25	3	13	33	0.31	0.27	6.15	0.16
8.38mm Grey Interlayer (S3)	5	9	25	3	13	32	0.31	0.27	6.07	0.15
10.38mm Grey Interlayer (S3)	5	9	24	3	13	29	0.31	0.26	5.98	0.15
12.38mm Grey Interlayer (S3)	5	9	24	3	12	29	0.31	0.26	5.90	0.15
6.38mm Bronze Interlayer (S3)	6	11	25	3	16	33	0.30	0.25	6.15	0.19
8.38mm Bronze Interlayer (S3)	6	11	25	3	16	32	0.30	0.25	6.07	0.19
10.38mm Bronze Interlayer (S3)	6	11	24	3	16	29	0.30	0.25	5.98	0.19
12.38mm Bronze Interlayer (S3)	5	10	24	3	14	29	0.30	0.26	5.90	0.18
6.38mm Green Interlayer (S3)	8	17	25	4	24	33	0.28	0.24	6.15	0.29
8.38mm Green Interlayer (S3)	8	17	25	4	23	32	0.28	0.24	6.07	0.29
10.38mm Green Interlayer (S3)	8	17	24	4	23	29	0.28	0.24	5.98	0.28
12.38mm Green Interlayer (S3)	8	16	24	4	21	29	0.28	0.24	5.90	0.28
6.38mm Cool Blue Interlayer (S3)	9	18	25	5	27	33	0.28	0.24	6.15	0.30
8.38mm Cool Blue Interlayer (S3)	8	18	25	4	26	32	0.27	0.24	6.07	0.31
10.38mm Cool Blue Interlayer (S3)	8	18	24	4	26	29	0.27	0.23	5.98	0.30
12.38mm Cool Blue Interlayer (S3)	8	17	24	4	24	29	0.27	0.24	5.90	0.30
6.38mm Azure Blue Interlayer (S3)	9	15	22	4	21	30	0.29	0.25	6.15	0.31
8.38mm Azure Blue Interlayer (S3)	8	15	21	4	20	29	0.29	0.25	6.07	0.28
10.38mm Azure Blue Interlayer (S3)	8	15	21	4	19	28	0.29	0.25	5.98	0.28
12.38mm Azure Blue Interlayer (S3)	8	15	21	4	19	27	0.29	0.25	5.90	0.28
TS21										
6.38mm Clear Interlayer (S2)	25	23	22	17	27	25	0.39	0.33	6.15	0.64
8.38mm Clear Interlayer (S2)	24	23	22	16	26	24	0.37	0.32	6.07	0.66
10.38mm Clear Interlayer (S2)	24	22	22	15	24	24	0.37	0.32	5.98	0.65
12.38mm Clear Interlayer (S2)	23	22	21	14	24	22	0.36	0.31	5.90	0.65
6.38mm Grey Interlayer (S3)	12	9	23	10	11	27	0.38	0.32	6.15	0.32
8.38mm Grey Interlayer (S3)	12	9	22	10	11	26	0.37	0.32	6.07	0.32
10.38mm Grey Interlayer (S3)	12	9	22	9	11	24	0.36	0.31	5.98	0.33

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus TE/TS Series - Laminate (continued)

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
12.38mm Grey Interlayer (S3)	12	8	22	9	10	24	0.36	0.31	5.90	0.32
6.38mm Bronze Interlayer (S3)	15	10	23	12	14	27	0.38	0.33	6.15	0.38
8.38mm Bronze Interlayer (S3)	14	10	22	11	13	26	0.38	0.32	6.07	0.37
10.38mm Bronze Interlayer (S3)	14	10	22	10	13	24	0.36	0.31	5.98	0.39
12.38mm Bronze Interlayer (S3)	14	10	22	10	12	24	0.36	0.31	5.90	0.38
6.38mm Green Interlayer (S3)	21	16	23	15	20	24	0.39	0.33	6.15	0.53
8.38mm Green Interlayer (S3)	20	16	23	14	19	26	0.38	0.33	6.07	0.53
10.38mm Green Interlayer (S3)	20	16	22	13	19	24	0.37	0.32	5.98	0.53
12.38mm Green Interlayer (S3)	19	16	22	13	18	24	0.37	0.32	5.90	0.52
6.38mm Cool Blue Interlayer (S3)	21	17	23	16	23	27	0.38	0.33	6.15	0.56
8.38mm Cool Blue Interlayer (S3)	21	17	23	15	22	26	0.38	0.32	6.07	0.55
10.38mm Cool Blue Interlayer (S3)	20	17	22	14	22	24	0.37	0.32	5.98	0.55
12.38mm Cool Blue Interlayer (S3)	20	16	22	14	20	24	0.37	0.32	5.90	0.54
6.38mm Azure Blue Interlayer (S3)	21	15	20	15	18	24	0.39	0.34	6.15	0.54
8.38mm Azure Blue Interlayer (S3)	21	15	20	14	17	23	0.39	0.32	6.07	0.54
10.38mm Azure Blue Interlayer (S3)	20	14	19	13	16	22	0.38	0.33	5.98	0.53
12.38mm Azure Blue Interlayer (S3)	20	14	19	12	16	22	0.37	0.32	5.90	0.54
TS30										
6.38mm Clear Interlayer (S2)	35	17	17	26	19	19	0.48	0.41	6.15	0.73
8.38mm Clear Interlayer (S2)	34	17	17	25	18	18	0.47	0.40	6.07	0.73
10.38mm Clear Interlayer (S2)	33	16	17	23	17	18	0.46	0.40	5.98	0.73
12.38mm Clear Interlayer (S2)	33	16	16	22	17	17	0.45	0.39	5.90	0.72
6.38mm Grey Interlayer (S3)	17	7	17	15	9	19	0.43	0.37	6.15	0.40
8.38mm Grey Interlayer (S3)	17	7	16	15	9	18	0.42	0.36	6.07	0.40
10.38mm Grey Interlayer (S3)	16	7	16	14	9	17	0.41	0.35	5.98	0.40
12.38mm Grey Interlayer (S3)	16	7	16	13	9	17	0.40	0.34	5.90	0.40
6.38mm Bronze Interlayer (S3)	20	9	17	18	11	19	0.44	0.38	6.15	0.46
8.38mm Bronze Interlayer (S3)	20	9	16	17	11	18	0.43	0.37	6.07	0.46
10.38mm Bronze Interlayer (S3)	20	9	16	16	11	17	0.42	0.36	5.98	0.46
12.38mm Bronze Interlayer (S3)	19	8	16	15	10	17	0.41	0.35	5.90	0.46
6.38mm Green Interlayer (S3)	29	13	17	23	16	19	0.47	0.40	6.15	0.61
8.38mm Green Interlayer (S3)	28	13	17	22	15	18	0.47	0.39	6.07	0.60
10.38mm Green Interlayer (S3)	28	13	16	21	15	17	0.45	0.39	5.98	0.61
12.38mm Green Interlayer (S3)	27	12	16	19	14	17	0.43	0.37	5.90	0.63
6.38mm Cool Blue Interlayer (S3)	30	14	17	24	17	19	0.47	0.40	6.15	0.64
8.38mm Cool Blue Interlayer (S3)	29	13	17	23	17	18	0.46	0.39	6.07	0.63
10.38mm Cool Blue Interlayer (S3)	29	13	16	22	17	17	0.45	0.39	5.98	0.63
12.38mm Cool Blue Interlayer (S3)	28	13	16	21	15	17	0.44	0.38	5.90	0.63
6.38mm Azure Blue Interlayer (S3)	30	11	14	22	13	17	0.47	0.40	6.15	0.64
8.38mm Azure Blue Interlayer (S3)	29	11	14	21	13	16	0.46	0.39	6.07	0.63
10.38mm Azure Blue Interlayer (S3)	28	11	13	20	13	15	0.45	0.38	5.98	0.62
12.38mm Azure Blue Interlayer (S3)	28	11	13	19	12	15	0.44	0.38	5.90	0.64
TS35										
6.38mm Clear Interlayer (S2)	41	15	15	31	17	17	0.45	0.41	6.15	0.91
8.38mm Clear Interlayer (S2)	40	15	15	30	16	16	0.52	0.45	6.07	0.77
10.38mm Clear Interlayer (S2)	39	14	15	28	15	15	0.50	0.43	5.98	0.78

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus TE/TS Series - Laminate (continued)

Laminate Make-up	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
12.38mm Clear Interlayer (S2)	38	14	14	27	15	15	0.49	0.43	5.90	0.78
6.38mm Grey Interlayer (S3)	20	7	15	18	8	17	0.45	0.39	6.15	0.44
8.38mm Grey Interlayer (S3)	20	7	14	18	8	16	0.45	0.39	6.07	0.44
10.38mm Grey Interlayer (S3)	19	7	14	17	8	15	0.44	0.38	5.98	0.43
12.38mm Grey Interlayer (S3)	19	7	14	16	8	15	0.43	0.37	5.90	0.44
6.38mm Bronze Interlayer (S3)	23	8	14	22	10	17	0.48	0.41	6.15	0.48
8.38mm Bronze Interlayer (S3)	23	8	14	20	10	16	0.46	0.40	6.07	0.50
10.38mm Bronze Interlayer (S3)	23	8	14	19	10	15	0.45	0.38	5.98	0.51
12.38mm Bronze Interlayer (S3)	22	8	14	18	9	15	0.44	0.38	5.90	0.50
6.38mm Green Interlayer (S3)	34	11	15	28	14	17	0.51	0.44	6.15	0.67
8.38mm Green Interlayer (S3)	33	11	15	27	13	16	0.51	0.44	6.07	0.65
10.38mm Green Interlayer (S3)	33	11	14	26	13	15	0.50	0.43	5.98	0.66
12.38mm Green Interlayer (S3)	32	10	14	25	13	15	0.48	0.42	5.90	0.67
6.38mm Cool Blue Interlayer (S3)	35	12	15	29	15	17	0.52	0.45	6.15	0.67
8.38mm Cool Blue Interlayer (S3)	34	12	15	28	15	16	0.51	0.44	6.07	0.67
10.38mm Cool Blue Interlayer (S3)	34	11	14	26	15	15	0.49	0.42	5.98	0.69
12.38mm Cool Blue Interlayer (S3)	33	11	14	25	13	15	0.48	0.42	5.90	0.69
6.38mm Azure Blue Interlayer (S3)	28	9	11	21	9	11	0.47	0.41	6.15	0.59
8.38mm Azure Blue Interlayer (S3)	27	9	11	19	8	10	0.46	0.39	6.07	0.59
10.38mm Azure Blue Interlayer (S3)	26	9	10	18	8	10	0.45	0.38	5.98	0.59
12.38mm Azure Blue Interlayer (S3)	26	9	10	17	8	10	0.44	0.37	5.90	0.59
TS40										
6.38mm Clear Interlayer (S2)	47	13	13	36	15	14	0.58	0.50	6.15	0.81
8.38mm Clear Interlayer (S2)	46	13	13	34	14	14	0.56	0.48	6.07	0.82
10.38mm Clear Interlayer (S2)	45	12	13	32	13	13	0.55	0.47	5.98	0.82
12.38mm Clear Interlayer (S2)	44	12	12	31	13	13	0.53	0.46	5.90	0.83
6.38mm Grey Interlayer (S3)	23	6	12	21	8	15	0.48	0.41	6.15	0.48
8.38mm Grey Interlayer (S3)	23	6	12	20	7	14	0.47	0.40	6.07	0.48
10.38mm Grey Interlayer (S3)	22	6	12	19	7	13	0.46	0.39	5.98	0.48
12.38mm Grey Interlayer (S3)	22	6	12	18	7	13	0.45	0.38	5.90	0.48
6.38mm Bronze Interlayer (S3)	27	7	12	25	9	15	0.51	0.44	6.15	0.54
8.38mm Bronze Interlayer (S3)	27	7	12	23	9	14	0.49	0.42	6.07	0.55
10.38mm Bronze Interlayer (S3)	26	7	12	22	9	13	0.48	0.41	5.98	0.54
12.38mm Bronze Interlayer (S3)	26	7	12	21	8	13	0.47	0.40	5.90	0.54
6.38mm Green Interlayer (S3)	39	10	13	32	12	15	0.55	0.48	6.15	0.70
8.38mm Green Interlayer (S3)	38	10	13	30	11	14	0.54	0.46	6.07	0.70
10.38mm Green Interlayer (S3)	37	10	12	28	11	13	0.52	0.45	5.98	0.71
12.38mm Green Interlayer (S3)	36	10	12	27	11	13	0.51	0.44	5.90	0.71
6.38mm Cool Blue Interlayer (S3)	40	11	13	34	13	15	0.57	0.49	6.15	0.71
8.38mm Cool Blue Interlayer (S3)	39	11	13	32	12	14	0.54	0.47	6.07	0.73
10.38mm Cool Blue Interlayer (S3)	38	10	12	30	12	13	0.53	0.46	5.98	0.72
12.38mm Cool Blue Interlayer (S3)	37	10	12	29	12	13	0.52	0.45	5.90	0.72
6.38mm Azure Blue Interlayer (S3)	40	9	10	30	10	13	0.54	0.47	6.15	0.74
8.38mm Azure Blue Interlayer (S3)	39	9	10	29	10	12	0.53	0.46	6.07	0.74
10.38mm Azure Blue Interlayer (S3)	38	9	10	28	10	12	0.52	0.45	5.98	0.73
12.38mm Azure Blue Interlayer (S3)	37	9	10	26	9	11	0.51	0.44	5.90	0.73

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus TE/TS Series - Laminate (continued)

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
TS50										
6.38mm Clear Interlayer (S2)	49	8	8	38	7	7	0.62	0.54	6.15	0.80
8.38mm Clear Interlayer (S2)	48	8	8	36	7	7	0.61	0.52	6.07	0.79
10.38mm Clear Interlayer (S2)	47	8	8	35	6	7	0.59	0.51	5.98	0.80
12.38mm Clear Interlayer (S2)	46	8	8	33	6	6	0.57	0.49	5.90	0.81
6.38mm Grey Interlayer (S3)	24	5	7	23	5	6	0.50	0.43	6.15	0.49
8.38mm Grey Interlayer (S3)	24	5	7	21	5	6	0.49	0.42	6.07	0.48
10.38mm Grey Interlayer (S3)	23	5	7	20	5	6	0.48	0.41	5.98	0.48
12.38mm Grey Interlayer (S3)	23	5	7	19	5	6	0.47	0.40	5.90	0.48
6.38mm Bronze Interlayer (S3)	29	6	7	26	5	7	0.53	0.45	6.15	0.54
8.38mm Bronze Interlayer (S3)	28	5	7	25	5	6	0.52	0.44	6.07	0.54
10.38mm Bronze Interlayer (S3)	27	5	7	24	5	6	0.51	0.43	5.98	0.54
12.38mm Bronze Interlayer (S3)	27	5	7	22	5	6	0.49	0.43	5.90	0.55
6.38mm Green Interlayer (S3)	41	7	8	34	6	7	0.59	0.50	6.15	0.69
8.38mm Green Interlayer (S3)	40	7	7	32	6	7	0.57	0.49	6.07	0.70
10.38mm Green Interlayer (S3)	39	7	7	30	6	6	0.56	0.48	5.98	0.69
12.38mm Green Interlayer (S3)	38	7	7	29	6	6	0.54	0.47	5.90	0.70
6.38mm Cool Blue Interlayer (S3)	42	7	8	36	6	7	0.61	0.52	6.15	0.69
8.38mm Cool Blue Interlayer (S3)	41	7	8	34	6	7	0.59	0.51	6.07	0.70
10.38mm Cool Blue Interlayer (S3)	40	7	7	32	6	6	0.57	0.49	5.98	0.71
12.38mm Cool Blue Interlayer (S3)	39	6	7	31	6	6	0.56	0.48	5.90	0.70
6.38mm Azure Blue Interlayer (S3)	42	5	5	33	5	5	0.59	0.50	6.15	0.71
8.38mm Azure Blue Interlayer (S3)	41	5	5	31	5	5	0.57	0.49	6.07	0.71
10.38mm Azure Blue Interlayer (S3)	40	5	5	29	5	5	0.55	0.47	5.98	0.72
12.38mm Azure Blue Interlayer (S3)	39	5	5	28	5	5	0.54	0.46	5.90	0.72

Solarplus SS Series - Laminate

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
SS08										
6.38mm Clear Interlayer (S2)	9	43	33	7	40	31	0.28	0.24	6.15	0.32
8.38mm Clear Interlayer (S2)	9	42	32	7	38	30	0.26	0.22	6.07	0.34
10.38mm Clear Interlayer (S2)	9	40	32	6	35	30	0.26	0.22	5.98	0.33
12.38mm Clear Interlayer (S2)	8	40	31	6	35	27	0.25	0.22	5.90	0.34
6.38mm Grey Interlayer (S3)	4	11	43	4	14	40	0.32	0.28	6.15	0.14
8.38mm Grey Interlayer (S3)	4	11	42	4	13	38	0.32	0.27	6.07	0.13
10.38mm Grey Interlayer (S3)	4	11	40	4	13	35	0.31	0.27	5.98	0.14
12.38mm Grey Interlayer (S3)	4	11	40	4	12	35	0.31	0.27	5.90	0.13
6.38mm Bronze Interlayer (S3)	5	14	43	5	17	40	0.31	0.27	6.15	0.17
8.38mm Bronze Interlayer (S3)	5	14	42	5	16	38	0.32	0.27	6.07	0.16
10.38mm Bronze Interlayer (S3)	5	14	40	4	16	35	0.31	0.27	5.98	0.16
12.38mm Bronze Interlayer (S3)	5	13	40	4	15	35	0.30	0.26	5.90	0.16
6.38mm Green Interlayer (S3)	7	24	43	6	25	40	0.30	0.26	6.15	0.25
8.38mm Green Interlayer (S3)	7	23	42	6	24	38	0.30	0.26	6.07	0.24
10.38mm Green Interlayer (S3)	7	23	40	6	24	35	0.29	0.25	5.98	0.24
12.38mm Green Interlayer (S3)	7	23	40	5	22	35	0.29	0.25	5.90	0.24

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SS Series - Laminate (continued)

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6.38mm Cool Blue Interlayer (S3)	8	25	43	7	28	40	0.29	0.25	6.15	0.27
8.38mm Cool Blue Interlayer (S3)	8	25	42	6	27	38	0.29	0.25	6.07	0.26
10.38mm Cool Blue Interlayer (S3)	7	25	40	6	25	35	0.29	0.25	5.98	0.25
12.38mm Cool Blue Interlayer (S3)	7	24	40	6	24	35	0.29	0.25	5.90	0.25
6.38mm Azure Blue Interlayer (S3)	8	22	40	6	22	37	0.31	0.26	6.15	0.26
8.38mm Azure Blue Interlayer (S3)	7	22	39	6	21	36	0.31	0.26	6.07	0.23
10.38mm Azure Blue Interlayer (S3)	7	22	37	5	21	33	0.30	0.25	5.98	0.23
12.38mm Azure Blue Interlayer (S3)	7	21	37	5	19	32	0.30	0.26	5.90	0.23
SS14										
6.38mm Clear Interlayer (S2)	16	32	28	13	30	28	0.34	0.29	6.15	0.47
8.38mm Clear Interlayer (S2)	16	31	27	12	29	27	0.33	0.28	6.07	0.47
10.38mm Clear Interlayer (S2)	15	30	27	12	26	27	0.33	0.29	5.98	0.46
12.38mm Clear Interlayer (S2)	15	30	26	11	26	24	0.33	0.28	5.90	0.45
6.38mm Grey Interlayer (S3)	8	10	32	8	13	30	0.35	0.31	6.15	0.23
8.38mm Grey Interlayer (S3)	8	10	31	7	12	29	0.35	0.30	6.07	0.22
10.38mm Grey Interlayer (S3)	8	10	30	7	12	26	0.34	0.29	5.98	0.22
12.38mm Grey Interlayer (S3)	7	10	30	7	11	26	0.34	0.29	5.90	0.21
6.38mm Bronze Interlayer (S3)	9	12	32	9	15	30	0.36	0.31	6.15	0.26
8.38mm Bronze Interlayer (S3)	9	12	31	8	15	29	0.35	0.30	6.07	0.26
10.38mm Bronze Interlayer (S3)	9	12	30	8	15	26	0.34	0.29	5.98	0.26
12.38mm Bronze Interlayer (S3)	9	12	30	8	14	26	0.34	0.30	5.90	0.26
6.38mm Green Interlayer (S3)	13	20	32	11	23	30	0.34	0.29	6.15	0.39
8.38mm Green Interlayer (S3)	13	20	31	11	22	29	0.34	0.30	6.07	0.38
10.38mm Green Interlayer (S3)	13	20	30	10	22	26	0.33	0.29	5.98	0.38
12.38mm Green Interlayer (S3)	12	19	30	10	20	26	0.34	0.29	5.90	0.36
6.38mm Cool Blue Interlayer (S3)	14	22	32	12	25	30	0.34	0.30	6.15	0.40
8.38mm Cool Blue Interlayer (S3)	13	21	31	12	24	29	0.35	0.30	6.07	0.38
10.38mm Cool Blue Interlayer (S3)	13	21	30	11	24	26	0.33	0.29	5.98	0.39
12.38mm Cool Blue Interlayer (S3)	13	20	30	10	22	26	0.33	0.28	5.90	0.38
6.38mm Azure Blue Interlayer (S3)	14	19	29	11	20	27	0.35	0.30	6.15	0.40
8.38mm Azure Blue Interlayer (S3)	13	19	28	11	19	26	0.35	0.31	6.07	0.37
10.38mm Azure Blue Interlayer (S3)	13	19	27	10	19	24	0.34	0.30	5.98	0.38
12.38mm Azure Blue Interlayer (S3)	13	18	27	9	17	24	0.34	0.29	5.90	0.38
SS22										
6.38mm Clear Interlayer (S2)	23	26	21	18	27	23	0.40	0.35	6.15	0.58
8.38mm Clear Interlayer (S2)	23	26	21	17	26	22	0.38	0.33	6.07	0.59
10.38mm Clear Interlayer (S2)	22	25	21	16	24	22	0.38	0.32	5.98	0.58
12.38mm Clear Interlayer (S2)	21	25	20	15	24	20	0.37	0.31	5.90	0.58
6.38mm Grey Interlayer (S3)	11	8	26	11	11	27	0.38	0.33	6.15	0.30
8.38mm Grey Interlayer (S3)	11	8	25	10	10	26	0.38	0.33	6.07	0.29
10.38mm Grey Interlayer (S3)	11	8	24	10	10	24	0.37	0.32	5.98	0.29
12.38mm Grey Interlayer (S3)	11	8	24	9	10	24	0.36	0.31	5.90	0.29
6.38mm Bronze Interlayer (S3)	13	10	26	12	13	27	0.39	0.34	6.15	0.34
8.38mm Bronze Interlayer (S3)	13	10	25	12	13	26	0.38	0.33	6.07	0.34
10.38mm Bronze Interlayer (S3)	13	10	24	11	13	24	0.37	0.32	5.98	0.35
12.38mm Bronze Interlayer (S3)	13	10	24	10	12	24	0.36	0.31	5.90	0.35

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SS Series - Laminate (continued)

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6.38mm Green Interlayer (S3)	19	16	26	16	19	27	0.40	0.34	6.15	0.48
8.38mm Green Interlayer (S3)	19	15	25	15	18	26	0.39	0.34	6.07	0.47
10.38mm Green Interlayer (S3)	18	15	24	14	18	24	0.38	0.33	5.98	0.48
12.38mm Green Interlayer (S3)	18	15	24	13	17	24	0.37	0.32	5.90	0.48
6.38mm Cool Blue Interlayer (S3)	20	17	26	17	21	27	0.40	0.35	6.15	0.49
8.38mm Cool Blue Interlayer (S3)	19	16	25	16	20	26	0.39	0.34	6.07	0.49
10.38mm Cool Blue Interlayer (S3)	19	16	25	15	20	24	0.38	0.33	5.98	0.49
12.38mm Cool Blue Interlayer (S3)	18	16	25	14	18	24	0.38	0.32	5.90	0.48
6.38mm Azure Blue Interlayer (S3)	19	14	23	15	16	25	0.40	0.34	6.15	0.48
8.38mm Azure Blue Interlayer (S3)	19	14	22	15	15	24	0.40	0.35	6.07	0.48
10.38mm Azure Blue Interlayer (S3)	19	14	22	14	15	21	0.39	0.34	5.98	0.49
12.38mm Azure Blue Interlayer (S3)	18	13	22	13	14	21	0.38	0.33	5.90	0.47

Solarplus SC Series - Laminate

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SC22										
6.38mm Clear Interlayer (S2)	22	23	23	17	19	18	0.40	0.35	6.15	0.54
8.38mm Clear Interlayer (S2)	21	23	22	16	18	17	0.40	0.34	6.07	0.53
10.38mm Clear Interlayer (S2)	21	22	22	15	17	17	0.39	0.34	5.98	0.53
12.38mm Clear Interlayer (S2)	20	22	22	14	17	16	0.38	0.33	5.90	0.53
6.38mm Grey Interlayer (S3)	11	9	23	10	9	19	0.39	0.33	6.15	0.27
8.38mm Grey Interlayer (S3)	10	9	22	9	9	18	0.37	0.32	6.07	0.28
10.38mm Grey Interlayer (S3)	10	9	22	9	9	17	0.37	0.32	5.98	0.27
12.38mm Grey Interlayer (S3)	10	9	22	8	8	17	0.36	0.31	5.90	0.28
6.38mm Bronze Interlayer (S3)	13	11	23	11	11	19	0.39	0.33	6.15	0.32
8.38mm Bronze Interlayer (S3)	12	10	22	11	10	18	0.39	0.33	6.07	0.31
10.38mm Bronze Interlayer (S3)	12	11	22	10	10	17	0.37	0.32	5.98	0.32
12.38mm Bronze Interlayer (S3)	12	10	22	10	10	17	0.37	0.32	5.90	0.32
6.38mm Green Interlayer (S3)	18	17	23	15	15	19	0.40	0.35	6.15	0.44
8.38mm Green Interlayer (S3)	17	17	23	14	14	18	0.40	0.34	6.07	0.43
10.38mm Green Interlayer (S3)	17	17	22	13	14	17	0.39	0.33	5.98	0.43
12.38mm Green Interlayer (S3)	17	16	22	13	13	17	0.39	0.33	5.90	0.42
6.38mm Cool Blue Interlayer (S3)	18	18	23	16	16	19	0.41	0.35	6.15	0.45
8.38mm Cool Blue Interlayer (S3)	18	18	23	15	16	18	0.40	0.34	6.07	0.45
10.38mm Cool Blue Interlayer (S3)	18	18	22	14	16	17	0.39	0.33	5.98	0.45
12.38mm Cool Blue Interlayer (S3)	17	17	22	13	15	17	0.38	0.32	5.90	0.45
6.38mm Azure Blue Interlayer (S3)	18	15	20	14	12	16	0.41	0.35	6.15	0.44
8.38mm Azure Blue Interlayer (S3)	18	15	20	14	12	16	0.40	0.35	6.07	0.44
10.38mm Azure Blue Interlayer (S3)	17	15	19	13	12	15	0.39	0.34	5.98	0.44
12.38mm Azure Blue Interlayer (S3)	17	15	19	12	11	15	0.38	0.33	5.90	0.44
SC30										
6.38mm Clear Interlayer (S2)	29	16	16	25	14	14	0.48	0.42	6.15	0.61
8.38mm Clear Interlayer (S2)	29	16	16	23	14	13	0.47	0.41	6.07	0.61
10.38mm Clear Interlayer (S2)	28	16	16	22	13	13	0.46	0.40	5.98	0.61
12.38mm Clear Interlayer (S2)	27	15	15	21	13	12	0.45	0.39	5.90	0.61

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SC Series - Laminate (continued)

Laminate Make-up	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
6.38mm Grey Interlayer (S3)	15	7	16	14	8	14	0.42	0.36	6.15	0.35
8.38mm Grey Interlayer (S3)	14	7	16	14	7	14	0.42	0.36	6.07	0.34
10.38mm Grey Interlayer (S3)	14	7	15	13	7	13	0.41	0.35	5.98	0.34
12.38mm Grey Interlayer (S3)	14	7	15	12	7	13	0.40	0.34	5.90	0.34
6.38mm Bronze Interlayer (S3)	17	8	16	17	9	14	0.44	0.38	6.15	0.39
8.38mm Bronze Interlayer (S3)	17	8	16	16	8	14	0.43	0.37	6.07	0.39
10.38mm Bronze Interlayer (S3)	16	8	15	15	8	13	0.42	0.36	5.98	0.39
12.38mm Bronze Interlayer (S3)	16	8	15	14	8	13	0.41	0.35	5.90	0.39
6.38mm Green Interlayer (S3)	24	12	16	22	12	14	0.47	0.41	6.15	0.51
8.38mm Green Interlayer (S3)	24	12	16	20	11	14	0.45	0.39	6.07	0.52
10.38mm Green Interlayer (S3)	23	12	15	19	11	13	0.44	0.38	5.98	0.53
12.38mm Green Interlayer (S3)	23	12	15	18	10	13	0.44	0.38	5.90	0.51
6.38mm Cool Blue Interlayer (S3)	25	13	16	23	13	14	0.47	0.41	6.15	0.53
8.38mm Cool Blue Interlayer (S3)	25	13	16	22	12	14	0.46	0.40	6.07	0.53
10.38mm Cool Blue Interlayer (S3)	24	13	15	21	12	13	0.46	0.39	5.98	0.52
12.38mm Cool Blue Interlayer (S3)	23	12	15	20	11	13	0.45	0.39	5.90	0.52
6.38mm Azure Blue Interlayer (S3)	25	11	13	21	9	12	0.47	0.41	6.15	0.53
8.38mm Azure Blue Interlayer (S3)	24	11	13	20	9	11	0.46	0.40	6.07	0.53
10.38mm Azure Blue Interlayer (S3)	24	10	13	19	9	11	0.45	0.39	5.98	0.52
12.38mm Azure Blue Interlayer (S3)	23	10	13	8	9	11	0.44	0.38	5.90	0.53
SC40										
6.38mm Clear Interlayer (S2)	40	12	12	34	9	9	0.58	0.50	6.15	0.69
8.38mm Clear Interlayer (S2)	39	12	11	32	9	8	0.56	0.48	6.07	0.70
10.38mm Clear Interlayer (S2)	38	11	11	30	8	8	0.55	0.47	6.98	0.69
12.38mm Clear Interlayer (S2)	37	11	11	29	8	6	0.53	0.46	6.09	0.70
6.38mm Grey Interlayer (S3)	20	6	11	20	6	8	0.48	0.41	6.15	0.41
8.38mm Grey Interlayer (S3)	19	6	11	19	6	8	0.47	0.40	6.07	0.41
10.38mm Grey Interlayer (S3)	19	6	11	18	6	8	0.45	0.39	5.98	0.42
12.38mm Grey Interlayer (S3)	18	6	11	17	6	8	0.44	0.38	5.90	0.42
6.38mm Bronze Interlayer (S3)	23	7	11	23	6	9	0.50	0.43	6.15	0.47
8.38mm Bronze Interlayer (S3)	23	7	11	22	6	8	0.49	0.42	6.07	0.47
10.38mm Bronze Interlayer (S3)	22	7	11	21	6	8	0.48	0.41	5.98	0.46
12.38mm Bronze Interlayer (S3)	22	7	11	20	6	8	0.47	0.40	5.90	0.46
6.38mm Green Interlayer (S3)	33	9	11	30	8	9	0.55	0.47	6.15	0.60
8.38mm Green Interlayer (S3)	32	9	11	28	7	8	0.54	0.46	6.07	0.60
10.38mm Green Interlayer (S3)	32	9	11	27	7	8	0.52	0.45	5.98	0.61
12.38mm Green Interlayer (S3)	31	9	11	25	7	8	0.50	0.43	5.90	0.61
6.38mm Cool Blue Interlayer (S3)	34	10	12	32	8	9	0.57	0.49	6.15	0.60
8.38mm Cool Blue Interlayer (S3)	33	10	11	30	8	9	0.55	0.47	6.07	0.61
10.38mm Cool Blue Interlayer (S3)	33	9	11	29	8	8	0.54	0.46	5.98	0.60
12.38mm Cool Blue Interlayer (S3)	32	9	11	27	7	8	0.52	0.45	5.90	0.61
6.38mm Azure Blue Interlayer (S3)	34	6	7	29	6	7	0.55	0.47	6.15	0.61
8.38mm Azure Blue Interlayer (S3)	33	8	9	27	6	6	0.53	0.46	6.07	0.62
10.38mm Azure Blue Interlayer (S3)	32	8	9	26	6	6	0.52	0.45	5.98	0.62
12.38mm Azure Blue Interlayer (S3)	32	7	9	25	6	6	0.51	0.44	5.90	0.62

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SL Series - Laminate

	Visible Properties			Solar Properties						
Laminate Make-up	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
SL20										
6.38mm Clear Interlayer (S2)	20	23	23	17	22	22	0.40	0.34	6.15	0.50
8.38mm Clear Interlayer (S2)	20	22	22	16	21	21	0.39	0.33	6.07	0.50
10.38mm Clear Interlayer (S2)	19	22	22	15	19	21	0.38	0.33	5.98	0.50
12.38mm Clear Interlayer (S2)	19	22	22	14	19	19	0.37	0.32	5.90	0.50
6.38mm Grey Interlayer (S3)	10	9	23	10	10	21	0.38	0.33	6.15	0.26
8.38mm Grey Interlayer (S3)	10	9	22	10	10	21	0.38	0.33	6.07	0.25
10.38mm Grey Interlayer (S3)	9	9	21	9	10	19	0.37	0.31	5.98	0.25
12.38mm Grey Interlayer (S3)	9	9	21	9	9	19	0.37	0.32	5.90	0.25
6.38mm Bronze Interlayer (S3)	12	11	23	12	12	21	0.38	0.33	6.15	0.31
8.38mm Bronze Interlayer (S3)	11	10	22	11	12	21	0.38	0.33	6.07	0.30
10.38mm Bronze Interlayer (S3)	11	10	22	10	12	19	0.37	0.32	5.98	0.30
12.38mm Bronze Interlayer (S3)	11	10	21	10	11	19	0.37	0.32	5.90	0.29
6.38mm Green Interlayer (S3)	17	17	23	15	18	22	0.39	0.34	6.15	0.42
8.38mm Green Interlayer (S3)	16	17	22	14	17	21	0.39	0.33	6.07	0.41
10.38mm Green Interlayer (S3)	16	17	22	13	17	19	0.37	0.32	5.98	0.42
12.38mm Green Interlayer (S3)	15	16	22	13	16	19	0.38	0.32	5.90	0.41
6.38mm Cool Blue Interlayer (S3)	17	18	23	16	19	22	0.40	0.34	6.15	0.43
8.38mm Cool Blue Interlayer (S3)	17	18	22	15	19	21	0.39	0.33	6.07	0.43
10.38mm Cool Blue Interlayer (S3)	16	18	22	14	19	19	0.38	0.32	5.98	0.43
12.38mm Cool Blue Interlayer (S3)	16	17	22	14	17	19	0.38	0.33	5.90	0.42
6.38mm Azure Blue Interlayer (S3)	17	18	23	15	17	21	0.40	0.34	6.15	0.43
8.38mm Azure Blue Interlayer (S3)	17	17	22	14	16	21	0.39	0.34	6.07	0.44
10.38mm Azure Blue Interlayer (S3)	16	17	22	13	16	19	0.38	0.33	5.98	0.42
12.38mm Azure Blue Interlayer (S3)	16	17	22	12	15	19	0.37	0.32	5.90	0.43
SL30										
6.38mm Clear Interlayer (S2)	33	19	19	28	19	19	0.50	0.43	6.15	0.66
8.38mm Clear Interlayer (S2)	32	19	19	27	18	18	0.49	0.42	6.07	0.66
10.38mm Clear Interlayer (S2)	32	18	19	25	17	18	0.47	0.41	5.98	0.67
12.38mm Clear Interlayer (S2)	31	18	18	24	17	17	0.46	0.40	5.90	0.67
6.38mm Grey Interlayer (S3)	16	8	19	17	9	19	0.44	0.38	6.15	0.37
8.38mm Grey Interlayer (S3)	16	8	18	16	9	18	0.43	0.37	6.07	0.37
10.38mm Grey Interlayer (S3)	16	8	18	15	9	17	0.42	0.36	5.98	0.37
12.38mm Grey Interlayer (S3)	15	8	18	14	9	17	0.41	0.35	5.90	0.37
6.38mm Bronze Interlayer (S3)	19	9	19	19	11	19	0.45	0.39	6.15	0.43
8.38mm Bronze Interlayer (S3)	19	9	18	18	11	18	0.44	0.38	6.07	0.43
10.38mm Bronze Interlayer (S3)	18	9	18	17	11	17	0.43	0.37	5.98	0.43
12.38mm Bronze Interlayer (S3)	18	9	18	16	10	17	0.42	0.36	5.90	0.43
6.38mm Green Interlayer (S3)	27	14	19	25	16	19	0.48	0.41	6.15	0.57
8.38mm Green Interlayer (S3)	27	14	19	23	15	18	0.47	0.40	6.07	0.57
10.38mm Green Interlayer (S3)	26	14	18	22	15	17	0.46	0.39	5.98	0.57
12.38mm Green Interlayer (S3)	25	14	18	21	14	17	0.45	0.39	5.90	0.56
6.38mm Cool Blue Interlayer (S3)	28	15	19	26	17	19	0.49	0.42	6.15	0.58
8.38mm Cool Blue Interlayer (S3)	28	15	19	25	17	18	0.48	0.41	6.07	0.57
10.38mm Cool Blue Interlayer (S3)	27	15	18	24	17	17	0.47	0.40	5.98	0.57
12.38mm Cool Blue Interlayer (S3)	26	14	18	22	15	17	0.45	0.39	5.90	0.58

* Calculations are based on ASHRAE Standard Summer Conditions

Solarplus SL Series - Laminate (continued)

Laminate Make-up	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6.38mm Azure Blue Interlayer (S3)	28	13	16	24	13	17	0.48	0.42	6.15	0.58
8.38mm Azure Blue Interlayer (S3)	27	13	16	23	13	16	0.47	0.41	6.07	0.58
10.38mm Azure Blue Interlayer (S3)	27	13	15	21	13	15	0.45	0.39	5.98	0.59
12.38mm Azure Blue Interlayer (S3)	26	12	15	20	12	15	0.45	0.38	5.90	0.58

Twin-Glaze Body Tint

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

Outer Glass	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm Clear	76	14	14	64	11	11	0.83	0.72	2.8	0.92
6mm Green	68	12	14	39	7	11	0.57	0.49	2.8	1.19
6mm Bronze	45	7	12	39	7	10	0.57	0.49	2.8	0.79
6mm Grey	38	6	12	38	7	10	0.56	0.47	2.8	0.68
6mm Evergreen	58	11	14	26	6	10	0.44	0.38	2.8	1.33
6mm Azurlite	63	11	13	26	6	10	0.44	0.38	2.8	1.42
6mm Panasap Dark Blue	52	9	13	33	6	10	0.52	0.45	2.8	1.00
6mm Arctic Blue	50	9	13	27	6	10	0.46	0.39	2.8	1.08
6mm Optigray	20	5	12	15	5	10	0.32	0.28	2.8	0.63
6mm Supergrey	8	4	11	6	4	9	0.23	0.20	2.8	0.33

Twin-Glaze Body Tints with Low E

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

Outer Glass	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm Clear	72	18	17	50	14	13	0.76	0.65	2.0	0.94
6mm Green	61	14	16	31	8	12	0.52	0.45	2.0	1.17
6mm Bronze	43	9	15	31	8	12	0.52	0.44	2.0	0.83
6mm Grey	35	8	15	29	8	12	0.49	0.42	2.0	0.71
6mm Evergreen	53	12	16	21	7	12	0.39	0.33	2.0	1.37
6mm Azurlite	57	13	16	21	13	16	0.39	0.33	2.0	1.47
6mm Panasap Dark Blue	47	10	15	28	7	12	0.47	0.41	2.0	1.00
6mm Arctic Blue	45	10	15	23	6	12	0.41	0.35	2.0	1.10
6mm Optigray	19	6	15	12	5	12	0.27	0.23	2.0	0.69
6mm Supergrey	7	4	14	5	4	11	0.18	0.15	2.0	0.38

Twin-Glaze Solarplus TE/TS Series

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

Outer Glass	Visible Properties			Solar Properties						
	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
TE10 (S2)										
6mm TE10 on Clear	9	19	30	5	21	32	0.17	0.14	2.3	0.53
TS21 (S2)										
6mm TS21 on Clear	19	19	34	12	20	32	0.25	0.22	2.5	0.76
6mm TS21 on Green	17	15	34	8	12	32	0.22	0.19	2.5	0.75
6mm TS21 on Bronze	12	11	34	7	11	32	0.21	0.18	2.5	0.56
6mm TS21 on Grey	9	8	34	7	10	32	0.22	0.19	2.5	0.42

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus TE/TS Series (continued)

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value ($W/m^2.K$)	Luminous Efficacy
6mm TS21 on Evergreen	14	16	34	6	8	32	0.20	0.17	2.5	0.72
6mm TS21 on Azurlite	15	16	34	6	9	32	0.20	0.18	2.5	0.77
6mm TS21 on Panasap Dark Blue	12	11	34	7	10	32	0.22	0.19	2.5	0.55
6mm TS21 on Arctic Blue	12	11	34	6	9	32	0.21	0.18	2.5	0.58
TS30 (S2)										
6mm TS30 on Clear	27	16	31	18	15	27	0.33	0.28	2.6	0.83
6mm TS30 on Green	26	13	30	11	10	27	0.27	0.23	2.6	0.96
6mm TS30 on Bronze	16	9	30	11	10	27	0.27	0.23	2.6	0.57
6mm TS30 on Grey	13	8	30	11	9	27	0.27	0.23	2.6	0.47
6mm TS30 on Evergreen	20	10	30	8	7	27	0.24	0.20	2.6	0.83
6mm TS30 on Azurlite	22	12	30	8	8	27	0.23	0.20	2.6	0.94
6mm TS30 on Panasap Dark Blue	17	7	30	11	9	27	0.26	0.23	2.6	0.64
6mm TS30 on Arctic Blue	16	7	30	8	8	27	0.23	0.20	2.6	0.70
TS35 (S2)										
6mm TS35 on Clear	31	13	29	21	14	25	0.37	0.32	2.6	0.84
6mm TS35 on Green	26	10	29	13	7	25	0.28	0.24	2.6	0.93
6mm TS35 on Bronze	19	8	29	14	8	25	0.30	0.25	2.6	0.64
6mm TS35 on Grey	16	7	29	12	7	25	0.28	0.24	2.6	0.56
6mm TS35 on Evergreen	23	10	29	9	7	25	0.25	0.21	2.6	0.92
6mm TS35 on Azurlite	24	11	29	9	7	25	0.25	0.22	2.6	0.97
6mm TS35 on Panasap Dark Blue	21	8	29	12	7	25	0.28	0.24	2.6	0.74
6mm TS35 on Arctic Blue	20	8	29	10	7	25	0.25	0.22	2.6	0.80
TS40 (S2)										
6mm TS40 on Clear	35	11	26	24	11	23	0.41	0.35	2.7	0.85
6mm TS40 on Green	30	10	26	15	8	23	0.32	0.27	2.7	0.94
6mm TS40 on Bronze	20	7	26	15	8	23	0.32	0.27	2.7	0.61
6mm TS40 on Grey	17	6	26	14	8	23	0.31	0.26	2.7	0.55
6mm TS40 on Evergreen	27	8	26	11	6	23	0.28	0.24	2.7	0.96
6mm TS40 on Azurlite	29	9	26	11	7	23	0.27	0.24	2.7	1.08
6mm TS40 on Panasap Dark Blue	22	6	26	14	8	23	0.31	0.26	2.7	0.72
6mm TS40 on Arctic Blue	21	6	26	11	8	23	0.27	0.23	2.7	0.77
TS50 (S2)										
6mm TS50 on Clear	46	9	22	33	7	19	0.51	0.44	2.7	0.91
6mm TS50 on Green	39	8	22	20	6	18	0.37	0.32	2.7	1.06
6mm TS50 on Bronze	28	6	22	20	6	18	0.37	0.32	2.7	0.75
6mm TS50 on Grey	23	5	22	19	6	18	0.37	0.32	2.7	0.62
6mm TS50 on Evergreen	35	8	21	16	6	18	0.34	0.29	2.7	1.02
6mm TS50 on Azurlite	38	8	21	16	6	18	0.33	0.29	2.7	1.14
6mm TS50 on Panasap Dark Blue	30	6	22	19	6	18	0.36	0.31	2.7	0.82
6mm TS50 on Arctic Blue	29	6	22	17	6	18	0.34	0.29	2.7	0.85

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus SS Series

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SS08 (S2)										
6mm SS08 on Clear	7	38	39	5	33	37	0.15	0.13	2.3	0.47
6mm SS08 on Green	6	30	39	4	23	37	0.15	0.13	2.3	0.40
6mm SS08 on Bronze	8	13	39	3	15	37	0.16	0.13	2.3	0.47
6mm SS08 on Grey	4	13	39	3	14	37	0.16	0.14	2.3	0.26
6mm SS08 on Evergreen	6	28	39	2	12	37	0.15	0.13	2.3	0.37
6mm SS08 on Azurlite	6	31	39	2	14	37	0.15	0.13	2.3	0.41
6mm SS08 on Panasap Dark Blue	8	13	39	3	14	37	0.16	0.14	2.3	0.47
6mm SS08 on Arctic Blue	7	13	39	2	14	37	0.15	0.13	2.3	0.49
SS14 (S2)										
6mm SS14 on Clear	13	29	36	8	24	34	0.20	0.17	2.3	0.65
6mm SS14 on Green	12	24	36	6	17	34	0.20	0.17	2.3	0.60
6mm SS14 on Bronze	7	15	36	5	14	34	0.18	0.15	2.3	0.41
6mm SS14 on Grey	6	11	36	4	12	34	0.17	0.15	2.3	0.35
6mm SS14 on Evergreen	10	18	36	4	10	34	0.17	0.15	2.3	0.58
6mm SS14 on Azurlite	11	21	36	4	12	34	0.17	0.14	2.3	0.62
6mm SS14 on Panasap Dark Blue	10	22	36	5	12	34	0.18	0.16	2.3	0.56
6mm SS14 on Arctic Blue	11	23	36	5	12	34	0.18	0.16	2.3	0.58
SS22 (S2)										
6mm SS22 on Clear	20	20	33	12	19	31	0.26	0.22	2.5	0.75
6mm SS22 on Green	17	16	33	8	12	31	0.22	0.19	2.5	0.77
6mm SS22 on Bronze	12	11	33	8	11	31	0.22	0.19	2.5	0.53
6mm SS22 on Grey	10	9	33	8	10	31	0.23	0.19	2.5	0.41
6mm SS22 on Evergreen	14	14	33	6	9	31	0.20	0.17	2.5	0.70
6mm SS22 on Azurlite	15	16	33	6	10	31	0.20	0.17	2.5	0.75
6mm SS22 on Panasap Dark Blue	12	12	33	7	11	31	0.22	0.19	2.5	0.55
6mm SS22 on Arctic Blue	12	12	33	6	11	31	0.20	0.17	2.5	0.59

Twin-Glaze Solarplus SC Series

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SC22 (S2)										
6mm SC22 on Clear	20	22	32	14	17	27	0.29	0.25	2.6	0.70
6mm SC22 on Green	17	16	32	8	9	27	0.23	0.20	2.6	0.74
6mm SC22 on Bronze	12	10	32	9	10	27	0.24	0.21	2.6	0.49
6mm SC22 on Grey	10	9	32	8	10	27	0.24	0.20	2.6	0.43
6mm SC22 on Evergreen	15	13	32	6	8	27	0.21	0.18	2.6	0.71
6mm SC22 on Azurlite	16	15	32	6	9	27	0.21	0.18	2.6	0.78
6mm SC22 on Panasap Dark Blue	13	10	32	8	10	27	0.23	0.20	2.6	0.56
6mm SC22 on Arctic Blue	12	10	32	6	10	27	0.21	0.18	2.6	0.58
SC30 (S2)										
6mm SC30 on Clear	28	16	28	21	13	24	0.37	0.32	2.6	0.75
6mm SC30 on Green	22	12	28	12	7	24	0.28	0.24	2.6	0.79
6mm SC30 on Bronze	14	9	29	12	7	24	0.28	0.24	2.6	0.49

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus SC Series (continued)

6mm Outer Glass/12mm Air Space/6mm Clear Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm SC30 on Grey	13	8	28	12	7	24	0.28	0.24	2.6	0.45
6mm SC30 on Evergreen	20	10	28	9	9	24	0.24	0.21	2.6	0.81
6mm SC30 on Azurlite	20	11	28	10	9	24	0.25	0.22	2.6	0.79
6mm SC30 on Panasap Dark Blue	15	9	28	12	7	24	0.28	0.24	2.6	0.55
6mm SC30 on Arctic Blue	15	9	28	10	7	24	0.26	0.22	2.6	0.57
SC40 (S2)										
6mm SC40 on Clear	38	12	22	29	8	18	0.47	0.40	2.7	0.80
6mm SC40 on Green	32	10	22	16	6	19	0.33	0.28	2.7	0.97
6mm SC40 on Bronze	22	8	22	15	6	19	0.32	0.27	2.7	0.67
6mm SC40 on Grey	23	8	22	15	6	19	0.33	0.28	2.7	0.71
6mm SC40 on Evergreen	29	9	22	11	5	19	0.28	0.24	2.7	1.03
6mm SC40 on Azurlite	31	10	22	11	5	19	0.28	0.24	2.7	1.11
6mm SC40 on Panasap Dark Blue	26	8	22	15	6	19	0.32	0.27	2.7	0.80
6mm SC40 on Arctic Blue	25	8	22	11	6	19	0.28	0.24	2.7	0.88

Twin-Glaze Solarplus TE/TS Series

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
TE10 (S2)										
6mm TE10 on Clear	9	24	30	4	24	27	0.14	0.12	1.9	0.63
TS21 (S2)										
6mm TS21 on Clear	18	20	33	10	20	28	0.22	0.19	1.9	0.82
6mm TS21 on Green	16	15	33	7	12	28	0.16	0.15	1.9	0.97
6mm TS21 on Bronze	11	11	33	6	11	28	0.18	0.15	1.9	0.61
6mm TS21 on Grey	9	8	33	6	10	28	0.18	0.16	1.9	0.48
6mm TS21 on Evergreen	14	16	33	5	8	28	0.17	0.14	1.9	0.79
6mm TS21 on Azurlite	14	16	33	5	9	28	0.17	0.15	1.9	0.85
6mm TS21 on Panasap Dark Blue	12	11	33	6	10	28	0.18	0.16	1.9	0.64
6mm TS21 on Arctic Blue	11	11	33	6	9	28	0.17	0.15	1.9	0.67
TS30 (S2)										
6mm TS30 on Clear	26	15	30	15	16	25	0.29	0.25	1.9	0.88
6mm TS30 on Green	24	10	27	10	10	25	0.23	0.19	1.9	1.06
6mm TS30 on Bronze	15	7	29	10	10	25	0.23	0.19	1.9	0.63
6mm TS30 on Grey	12	6	29	10	9	25	0.23	0.19	1.9	0.52
6mm TS30 on Evergreen	19	11	29	7	7	25	0.19	0.17	1.9	0.98
6mm TS30 on Azurlite	20	12	29	7	8	25	0.19	0.17	1.9	1.07
6mm TS30 on Panasap Dark Blue	16	7	29	9	9	25	0.22	0.19	1.9	0.71
6mm TS30 on Arctic Blue	15	7	29	7	8	25	0.19	0.16	1.9	0.80
TS35 (S2)										
6mm TS35 on Clear	29	14	29	18	12	23	0.33	0.28	2.0	0.88
6mm TS35 on Green	25	10	29	11	7	23	0.24	0.21	2.0	1.02
6mm TS35 on Bronze	18	8	29	12	8	23	0.25	0.22	2.0	0.72
6mm TS35 on Grey	15	7	29	11	7	23	0.24	0.21	2.0	0.62
6mm TS35 on Evergreen	22	10	29	8	7	23	0.21	0.18	2.0	1.02

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus TE/TS Series (continued)

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
6mm TS35 on Azurlite	23	11	29	8	7	23	0.21	0.18	2.0	1.09
6mm TS35 on Panasap Dark Blue	19	8	29	10	7	23	0.24	0.20	2.0	0.81
6mm TS35 on Arctic Blue	19	8	29	8	7	23	0.21	0.18	2.0	0.90
TS40 (S2)										
6mm TS40 on Clear	34	12	26	20	11	21	0.36	0.31	2.0	0.93
6mm TS40 on Green	28	9	26	13	9	21	0.27	0.23	2.0	1.04
6mm TS40 on Bronze	18	6	26	13	9	21	0.27	0.23	2.0	0.68
6mm TS40 on Grey	16	6	25	12	8	21	0.26	0.23	2.0	0.63
6mm TS40 on Evergreen	25	9	26	9	6	21	0.23	0.20	2.0	1.10
6mm TS40 on Azurlite	27	10	26	9	7	21	0.23	0.20	2.0	1.19
6mm TS40 on Panasap Dark Blue	21	6	26	12	8	21	0.26	0.23	2.0	0.80
6mm TS40 on Arctic Blue	20	6	26	9	8	21	0.23	0.20	2.0	0.85
TS50 (S2)										
6mm TS50 on Clear	43	10	23	27	8	18	0.46	0.40	2.0	0.93
6mm TS50 on Green	36	9	23	16	6	17	0.32	0.28	2.0	1.13
6mm TS50 on Bronze	26	6	23	16	6	17	0.32	0.28	2.0	0.80
6mm TS50 on Grey	21	6	23	16	6	17	0.32	0.27	2.0	0.66
6mm TS50 on Evergreen	32	8	22	14	6	17	0.29	0.25	2.0	1.10
6mm TS50 on Azurlite	35	9	22	13	6	17	0.29	0.25	2.0	1.19
6mm TS50 on Panasap Dark Blue	27	6	23	16	6	17	0.31	0.27	2.0	0.87
6mm TS50 on Arctic Blue	27	6	23	14	6	17	0.29	0.25	2.0	0.92

Twin-Glaze Solarplus SS Series

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SS08 (S2)										
6mm SS08 on Clear	8	37	37	4	33	32	0.13	0.11	1.9	0.60
6mm SS08 on Green	7	29	37	4	17	32	0.13	0.11	1.9	0.55
6mm SS08 on Bronze	7	13	37	3	15	32	0.13	0.11	1.9	0.55
6mm SS08 on Grey	4	13	37	3	14	32	0.13	0.11	1.9	0.30
6mm SS08 on Evergreen	5	28	37	2	12	32	0.12	0.11	1.9	0.44
6mm SS08 on Azurlite	6	31	37	2	14	32	0.12	0.10	1.9	0.48
6mm SS08 on Panasap Dark Blue	7	13	37	3	14	32	0.13	0.11	1.9	0.55
6mm SS08 on Arctic Blue	7	13	37	2	14	32	0.12	0.10	1.9	0.58
SS14 (S2)										
6mm SS14 on Clear	12	30	35	7	25	28	0.17	0.15	1.9	0.70
6mm SS14 on Green	10	23	35	5	15	28	0.15	0.13	1.9	0.67
6mm SS14 on Bronze	7	15	35	4	14	28	0.15	0.13	1.9	0.45
6mm SS14 on Grey	6	12	35	4	12	28	0.15	0.13	1.9	0.37
6mm SS14 on Evergreen	9	18	35	3	10	28	0.14	0.12	1.9	0.65
6mm SS14 on Azurlite	10	21	35	3	12	28	0.14	0.12	1.9	0.69
6mm SS14 on Panasap Dark Blue	9	23	35	4	12	28	0.15	0.13	1.9	0.63
6mm SS14 on Arctic Blue	10	23	35	4	12	28	0.15	0.13	1.9	0.65

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus SS Series (continued)

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SS22 (S2)										
6mm SS22 on Clear	18	20	31	10	19	27	0.22	0.19	1.9	0.83
6mm SS22 on Green	15	17	32	7	12	27	0.19	0.16	1.9	0.78
6mm SS22 on Bronze	11	12	32	7	11	27	0.19	0.16	1.9	0.58
6mm SS22 on Grey	9	10	32	6	10	27	0.18	0.15	1.9	0.49
6mm SS22 on Evergreen	13	14	32	5	9	27	0.16	0.14	1.9	0.83
6mm SS22 on Azurlite	14	16	32	5	10	27	0.16	0.14	1.9	0.88
6mm SS22 on Panasap Dark Blue	12	12	32	6	11	27	0.18	0.15	1.9	0.64
6mm SS22 on Arctic Blue	11	12	32	5	11	27	0.16	0.14	1.9	0.69

Twin-Glaze Solarplus SC Series

6mm Outer Glass/12mm Air Space/6mm Low E (Surface 3) Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
SC22 (S2)										
6mm SC22 on Clear	19	22	31	12	17	24	0.25	0.22	1.9	0.76
6mm SC22 on Green	16	16	31	7	9	24	0.19	0.16	1.9	0.84
6mm SC22 on Bronze	11	10	31	7	10	24	0.20	0.17	1.9	0.55
6mm SC22 on Grey	10	10	31	7	10	24	0.20	0.17	1.9	0.49
6mm SC22 on Evergreen	14	13	31	5	8	24	0.17	0.15	1.9	0.83
6mm SC22 on Azurlite	15	15	31	5	9	24	0.17	0.15	1.9	0.90
6mm SC22 on Panasap Dark Blue	12	10	31	7	10	24	0.19	0.16	1.9	0.63
6mm SC22 on Arctic Blue	11	10	31	5	10	24	0.17	0.15	1.9	0.67
SC30 (S2)										
6mm SC30 on Clear	26	16	28	18	13	22	0.33	0.28	2.0	0.79
6mm SC30 on Green	21	12	28	10	7	22	0.24	0.20	2.0	0.86
6mm SC30 on Bronze	13	9	28	10	7	22	0.24	0.20	2.0	0.54
6mm SC30 on Grey	12	8	27	10	7	22	0.24	0.20	2.0	0.50
6mm SC30 on Evergreen	18	11	28	7	9	22	0.20	0.17	2.0	0.92
6mm SC30 on Azurlite	19	12	28	8	9	22	0.21	0.18	2.0	0.89
6mm SC30 on Panasap Dark Blue	14	9	28	10	7	22	0.24	0.20	2.0	0.60
6mm SC30 on Arctic Blue	14	9	28	8	7	22	0.21	0.18	2.0	0.66
SC40 (S2)										
6mm SC40 on Clear	35	12	23	24	9	17	0.42	0.36	2.0	0.82
6mm SC40 on Green	30	11	23	13	6	18	0.28	0.24	2.0	1.05
6mm SC40 on Bronze	20	8	23	12	6	18	0.27	0.23	2.0	0.73
6mm SC40 on Grey	22	8	23	13	6	18	0.28	0.24	2.0	0.77
6mm SC40 on Evergreen	26	9	23	10	5	18	0.23	0.20	2.0	1.15
6mm SC40 on Azurlite	29	11	23	10	5	18	0.23	0.20	2.0	1.24
6mm SC40 on Panasap Dark Blue	23	8	23	12	6	18	0.27	0.23	2.0	0.87
6mm SC40 on Arctic Blue	23	8	23	10	6	18	0.23	0.20	2.0	0.98

* Calculations are based on ASHRAE Standard Summer Conditions

Twin-Glaze Solarplus Low E (LE80 and LE54)

6mm Low E (Surface 2) Outer Glass/12mm Air Space/6mm Clear Inner Glass

	Visible Properties			Solar Properties						
Outer Glass	Trans-mittance	Reflectance S1	Reflectance S4	Trans-mittance	Reflectance S1	Reflectance S4	Shading Coeff.	Solar Heat Gain Coeff.	U-value (W/m².K)	Luminous Efficacy
LE80 (S2)										
6mm LE80 on Clear	68	11	16	42	22	25	0.57	0.49	1.8	1.20
6mm LE80 on Green	60	10	16	25	9	25	0.39	0.34	1.8	1.54
6mm LE80 on Bronze	37	7	16	22	10	25	0.36	0.31	1.8	1.02
6mm LE80 on Grey	31	6	16	21	10	25	0.34	0.30	1.8	0.91
6mm LE80 on Evergreen	50	8	16	17	8	25	0.29	0.25	1.8	1.73
6mm LE80 on Azurlite	55	9	16	19	9	25	0.32	0.27	1.8	1.71
6mm LE80 on Panasap Dark Blue	44	8	16	21	10	25	0.34	0.30	1.8	1.29
6mm LE80 on Arctic Blue	43	8	16	17	8	25	0.30	0.26	1.8	1.42
LE54 (S2)										
6mm LE54 on Clear	48	12	13	28	22	23	0.41	0.35	1.8	1.17
6mm LE54 on Green	42	11	13	17	12	23	0.29	0.25	1.8	1.45
6mm LE54 on Bronze	26	7	13	15	10	23	0.27	0.23	1.8	0.95
6mm LE54 on Grey	22	6	13	14	10	23	0.26	0.23	1.8	0.83
6mm LE54 on Evergreen	35	10	13	11	8	23	0.23	0.20	1.8	1.53
6mm LE54 on Azurlite	38	11	13	13	9	23	0.24	0.21	1.8	1.60
6mm LE54 on Panasap Dark Blue	31	8	13	14	10	23	0.26	0.23	1.8	1.18
6mm LE54 on Arctic Blue	30	8	13	12	8	23	0.23	0.20	1.8	1.30

* Calculations are based on ASHRAE Standard Summer Conditions

16.0 Glossary

16.1 Glossary

Absorption
That portion of total incident radiation that is absorbed by the glass and subsequently re-radiated either outside or inside.

Acoustics
The science of sound, and sound control.

Adipic Acid
A weak organic acid whose function is to neutralise any bases produced by the prolonged contact of moisture with the glass surface.

Ambient Temperature
Temperature of the surrounding air (˚C).

Annealing
In the manufacturing of float glass, it is the process of controlled cooling done in a lehr to prevent residual stresses in the glass. Re-annealing is the process of removing objectionable stresses in glass by re-heating to a suitable temperature followed by controlled cooling.

Annealing Lehr
An on-line, controlled heating/cooling apparatus located after the tin bath and before the cooling conveyor of a float glass production line. Its purpose is to relieve induced stress from the flat glass product to allow normal cold end processing.

Anodise
To apply a hard corrosion resistant oxide film onto the surface of aluminium using electrolysis.

Arriss
A small bevel at an angle of approximately 45 degrees to the surface of the glass applied usually with a wet or dry belt, stone or machine.

Aspect Ratio
The quotient of the long side of a glazing panel over the short side of that panel.

Attenuation
The reduction of sound intensity (or signal strength) with distance. Attenuation is the opposite of amplification, and is measured in decibels.

Autoclave
A vessel that employs high pressure and heat to produce a bond between glass and PVB or urethane sheet, creating a laminated glass product.

Backer Rod
A polyethylene or polyurethane foam material installed under compression and used to control sealant joint depth, provide a surface for sealant tooling, serve as a bond breaker to prevent three-sided adhesion, and provide an hour glass contour of the finished sealant bead.

Bead
A strip of timber, aluminium or other suitable material secured to the rebate to retain the glass in place (sometimes referred to as glazing bead).

Bent Glass
(See Curved Glass.)

Bevelling
The process of edge finishing flat glass to a bevel angle.

Bite
Also referred to as structural bite, is the width of silicone sealant that is applied to the panel of glass to adhere it to the frame.

Blisters
A profusion of bubbles or gaseous inclusions in the glass. Small bubbles less than 2mm diameter referred to as seeds.

Bloom
A surface film on the glass resulting from atmospheric attack or deposition by smoke or other vapours.

Body Tinted Glass
(See Tinted Glass.)

Bow (and Warp)
A curve, bend or other deviation from flatness in glass.

Breather (Tube) Units
An insulating glass unit with a tube factory-placed into the unit's spacer to accommodate pressure differences encountered in shipping due to change in elevation. These tubes are to be sealed on the job site prior to unit installation. (See also Capillary Tubes.)

Brilliant Cut
Decorative process in which designs are cut into the glass with abrasive and polishing wheels.

British Thermal Unit (BTU)
The amount of energy required to raise one pound water to 170˚F.

Bubbles
In float glass, a gaseous inclusion.

In laminated glass, a gas pocket in the interlayer material or between the glass and the interlayer.

Bullet Resistant Glass
A multiple lamination of glass and plastic that is designed to resist penetration from medium-to-super-power small arms and high-power rifles.

Butt Glazing
The installation of glass products where the vertical glass edges are glazed with silicone and without structural supporting mullions.

Capillary Tube Units
An insulating glass unit with a very small metal tube of specific length and inside diameter factory-placed into the unit's spacer to accommodate pressure differences encountered in shipping because of substantial changes in elevation and the pressure differences encountered daily after installation. (See also Breather Tubes.)

C.T.S
Abbreviation for cut-to-size glass.

Cast-In-Place Lamination
Lamination process where the interlayer is a liquid poured between the glass and then chemically cured to produce the final product.

Casting
Process of shaping glass by pouring into a mould or onto a table.

Channel Depth
The measurement from the sight line of the frame to the bottom of the channel.

Channel Glazing (Pocket Glazing)
A three sided, U-shaped opening in a sash or frame to accommodate a glass panel. Beads maybe fixed or removable.

Channel Width
The distance between the stationary and removable beads at the widest point.

Chemically Toughened Glass
Chemical strengthening of glass is brought about through a process known as ion-exchange. Glass is submersed in a molten salt bath at temperatures below the annealing range of the glass. In the case of soda/lime/silica glass, the salt bath consists of potassium-nitrate. During the submersion cycle, the larger alkali potassium icons exchange places with the smaller alkali sodium ions in the surface of the glass. The larger alkali potassium ions 'wedge' their way into the voids in the surface created by the vacating smaller alkali sodium ions. This 'strengthened' surface may penetrate to a depth of only a few microns. It is not a safety glass.

Chip
A small shallow piece of glass which has become detached from the original glass edge.

Cladding Glass
Special glass usually ceramic painted (Colourlite) in curtain walls or as a cover to columns and walls.
(See also Spandrel.)

Clips
Wired spring devices used in face glazing (putty) to hold glass in sash rebate without beads.

Cohesive Failure
Internal splitting of a sealant resulting from over stressing and insufficient elasticity and elongation to absorb the strain.

Colonial Bars
Horizontal or vertical bars that divide the sash frame into smaller panels of glass. Colonial bars are smaller in dimensions and weight than mullions.

Coolness Factor
(See Luminous Efficacy.)

Compound
A chemical formulation of ingredients used to produce a caulking, elastomeric joint sealant, etc.

Compression Set
The permanent deformation of a material after removal of the compressive stress.

Condensation
The appearance of moisture (water vapour) on the surface of an object caused by warm moist air coming into contact with a colder object.

Corrosion
The deterioration of metal by chemical or electrochemical reaction mainly caused by exposure to moisture and/or chemicals.

Cullet
Broken glass, excess glass from a previous melt or edges trimmed off when cutting glass to size. Cullet is an essential ingredient in the raw glass (batch) mix as it facilitates the melting process.

Cure
To alter the properties of a sealant by chemical reaction initiated by the action of air, heat and/or other catalyst.

Curved Glass
Flat glass which has been shaped while hot into cylindrical or curved shapes.

Cutting
Scoring glass with a diamond, steel wheel, or other hard alloy wheel and breaking it along the score. Other methods of cutting glass include water jet and laser.

Daylight Size
The clear unsupported opening size that admits light.

Decorated Glass
Clear or patterned - processed by craftsmen - stained glass, lead-lights, sandblasted, acid etched, embossed and screen-printed.

Deflection (Centre of glass)
The amount of bending movement of the centre of a glass panel perpendicular to the plane of the glass surface under an applied load.

Desiccant (Silica Gel)
Molecular sieve or extremely porous crystalline substance used to absorb moisture inside the air space of insulated glass units.

Design Pressure
Specified pressure a product is designed to withstand.

Dew Point
The temperature at which condensation of water begins when air is cooled.

Dice
The more or less cubical pattern of fracture of fully tempered glass.

Diffusing
Scattering, dispersing, as the tendency to eliminate a direct beam of light.

Diffuse Reflection
Glass used in picture framing to avoid reflections and the glare of lighting.

Direct Radiation (Transmittance)
The sun's emitted solar heat energy, which reaches us directly in varying intensity, due to atmospheric conditions. That portion of solar energy, which is directly transmitted through the glazing.

Draw Lines
Refers to the direction of flow (or pull) of glass during production. (See also Sheet Glass.)

Distortion
Alteration of viewed images caused by variations in glass flatness and is an inherent characteristic of heat treated glass.

Double Glazing
In general, any use of two panels of glass, separated by an air space, within an opening, to improve insulation against heat transfer and/or sound transmittance. In insulating glass units the air between the glass sheets is thoroughly dried and the space is sealed, eliminating possible condensation and providing superior insulating properties.

Dry Glazing
Also called compression glazing, this term is used to describe various means of sealing monolithic and insulating glass in the supporting framing system using pre-formed and extruded materials such as glazing gaskets.

Durometer
An instrument for measuring the relative hardness of materials such as rubber. Also, the term often used (loosely) as a synonym for relative hardness.

Edge Clearance
Nominal spacing between the edge of the glass and the bottom of the surrounding glazing pocket (channel).

Edge Cover
The distance between the edge of the glass and the edge of the rebate forming the sight opening of the window frame.

Edge Working
Grinding the edge of glass to a desired shape or finish.

Emissivity
The measure of a surface's ability to emit long-wave infra-red radiation.

Environmental Control Glass
The broad name for all types of glass that have a function in controlling heat, glare, noise or radiation.

EPDM
A synthetic rubber prepared by polymerising ethylene, propylene and a diene monomer.

Etch
To alter the surface of glass with hydrofluoric acid or caustic agents. Permanent etching of glass may occur from alkali and other run-off from surrounding building materials.

Fenestration
Any glass panel, window, door, curtain wall or skylight unit on the exterior of a building.

Fins
Supporting glass panels incorporated into the design of glass facades installed at 90° angle to the glazed surface.

Figured Glass
(See Patterned Glass.)

Fire-Polish
To make glass smooth or glossy by the action of fire or intense heat.

Flare
A protrusion on the edge of a panel of a glass.

Flat Glass
A general term that describes float glass, sheet glass, plate glass and rolled glass.

Float Glass
Glass formed on a bath of molten tin. The surface in contact with the tin is known as the tin surface or tin side. The top surface is known as the atmosphere surface or air side.

Flush Glazing
Glass set in a aluminium frame without any external mullion or transom projections.

Frosted Finish
A surface treatment for glass, consisting of acid etching or sandblasting of one or both surfaces to diffuse transmitted light.

Fully Toughened Glass
Flat or curved glass that has been heat treated to induce a high surface and /or edge compression. Fully toughened glass, if broken, will fracture into many small pieces (dice) which are more or less cubical. Fully toughened glass is approximately 4 to 5 times stronger than annealed glass of the same thickness when exposed to uniform static pressure loads. Is sometimes called 'tempered glass'.

Gaskets
A pre-formed resilient rubber-like compound providing a continuous surround for glass and a weather tight seal when compressed.

Glass
A hard brittle substance, usually transparent, made by fusing silicates, under high temperatures with soda, lime, etc.

Glass Clad Polycarbonate
Two or more panels of flat glass bonded with urethane interlayer to one or more sheets of extruded polycarbonate in a pressure/ temperature/vacuum laminating process.

Glassflux
A finely ground powder from one or more 'low melting' glasses.

Glazing
The securing of glass in prepared openings.

Glazing Bead
(See Bead.)

Glue Chip
Decorative glass produced by sticking material onto the glass with a glue. As the glue cures the material is stripped off the glass, the surface of which is plucked. This gives a random pattern.

Head
Top horizontal frame member of window/door frame.

Heat Absorbing Glass
Glass that absorbs an appreciable amount of solar energy. (e.g. tinted glass.)

Heat Resisting Glass
Glass able to withstand high thermal shock, generally because of a low coefficient of expansion.

Heat Strengthened Glass
Flat or bent glass that has been heat treated to a specific surface and/or edge compression range. Heat strengthened glass is approximately twice as strong as annealed glass of the same thickness when exposed to uniform static pressure loads. Heat strengthened glass is not considered safety glass and will not completely dice as will fully toughened glass.

Heat Treated
Term used for both fully toughened glass and heat strengthened glass.

Heat Transfer
Heat is transferred in the following manner:

Conduction - in which there is direct contact of molecules in a solid body, for example, the passage of heat along a metal bar of which one end is inserted in a fire.

Convection - in which actual movement of the medium, gas or liquid occurs, for example, heated air from a convection heater.

Radiation - by which heat passes from source to object without heating space between them for example, heat from the sun to earth.

Heel Bead
Sealant applied at the base of a channel, after setting the panel and before the bead is installed. One of its purposes is to prevent air and water ingress.

Hermetically Sealed
Made airtight by fusion or sealing. Referred to in the manufacture of insulated glass units.

High Transmittance Glass
Glass which transmits an exceptionally high percentage of visible light.

IGMA
Abbreviation for Insulating Glass Manufacturers Association.

Insulated Glass Unit (IG unit)
Where two or more panels of glass spaced apart and hermetically sealed to form a single unit with an air space between each panel. (Also see Double Glazing).

Interlayer
Any material used to bond two panels of glass and/or plastic together to form a laminate.

Jamb
Vertical frame member at the perimeter of the opening of a window or door.

Knocked Down Condition (KDC)
Fabricated framing components shipped loose for assembly at another location.

Laminated Glass
Two or more panels of glass permanently bonded together with one or more interlayers.

Lite
Another term for a panel or pane of glass, particularly used in the USA.

Live Load
Loads produced by the use and occupancy of the building or other structure and do not include construction or environmental loads such as wind load, snow load, ice load, rain load, seismic load or dead load.

Low Emissivity (or Low E)
A low rate of emitting absorbed radiant energy, i.e. long wave infra-red.

Luminous Efficacy
(Light-to-Shading Coefficient Ratio)
The visible transmittance of a glazing system divided by the shading coefficient. This ratio is helpful in selecting glazing products for different climates in terms of those that transmit more heat than light and those that transmit more light than heat. Also referred to as coolness factor.

Modulus
Stress at a given strain. Also tensile strength at a given elongation.

Monolithic Glass
A single homogeneous piece of glass as opposed to laminated glass or a insulated glass unit.

Multiple Glazed Units
Insulated glass units with three or more insulated panels of glass.

Mullion
A vertical frame member that supports and holds panels, glass or sashes.

Mirror
Glass silvered on one side producing a highly reflective surface.

Neoprene
A synthetic rubber with similar properties to natural rubber, but manufactured without sulphur for vulcanisation.

Nominal Thickness
The commonly used dimension by which the thickness is described. NB: Actual thickness of glass may not coincide with nominal thickness.

One-way Vision
Generic description of a reflective glass, which if glazed with appropriate lighting ratios, allows visual security to be maintained.

Obscure Glass
(See Patterned Glass.)

Opacifier
Applied polyester film or coating to the surface of reflective glass rendering it opaque. Suitable for use in spandrel and non-vision areas.

Organic
Any compound which consists of carbon and hydrogen with a restricted number of other elements, such as oxygen, nitrogen, sulphur, phosphorous, chlorine, etc.

Out-gassing
A gaseous bi-product from cleaners, solvents and sealants.

Pane
A single piece of glass in a window or door.

Patterned Glass
One type of rolled glass having a pattern impressed on one or both sides. Used extensively for light control, bath enclosures and decorative glazing. Sometimes called rolled, figured or obscure glass.

Pocket Glazing
(See Channel Glazing.)

Points
Thin, flat, triangular or diamond shaped pieces of zinc used to hold glass in wood sashes by driving them into the wood.

Polariscope and G.A.S.P. Laser
A device for examining the degree of strain in a sample of glass. (Either edge or surface compression).

Polished Plate
Glass that has been ground and polished on both sides to produce optically high quality.

Polished Wired Glass
Transparent wired glass that has been ground and polished on both surfaces.

Polyvinyl Butyral Interlayer
An extremely tough resilient plastic film used to bond glass together in the laminating process.

Polyisobutylene
Typically the primary seal in a dual seal IG unit and the key component in restricting moisture vapour transmittance.

Polysulphide Sealant
Polysulphide liquid polymer sealants. They can be converted to rubbers at room temperature without shrinkage upon addition of a curing agent.

Polyurethane Sealant
An organic compound formed by the reaction of a glycol with an isocyanate.

Polyvinyl Chloride (PVC)
Polymer formed by polymerisation of vinyl chloride monomer. Sometimes called vinyl.

Pre-Shimmed Tape Sealant
A sealant having a pre-formed shaped containing solids or discrete particles that limit its deformation under compression.

Primer
A coating specifically designed to enhance the adhesion of sealant systems to certain surfaces, to form a barrier to prevent migration of components, or to seal a porous substrate.

Processed
Glass which has undergone further treatment after manufacture (e.g. laminated, toughened, curved, silvered, coated etc).

PVC
(See Polyvinyl Chloride.)

Pyrolytic
A glass which has a coating deposited during the glass manufacturing process. The coating is fired into the glass surface at 700˚C and is therefore extremely hard and durable.

Quench Pattern
(See Strain Pattern.)

Racking
A movement or distortion of sash or frames causing a shape in angularity of corners.

Rebate
An 'L' shaped section which can be face glazed or receive a removable glazing bead to hold the panel of glass in place.

Reflective Glass
Glass with a metallic coating to reduce solar heat gain. (See also Solar Control Glass.)

Relative Heat Gain
The amount of heat gain through a glass product taking into consideration the effects of solar heat gain (shading coefficient) and conductive heat gain (U-value). The value is expressed in (W/m^2). The lower the relative heat the more the glass product restricts heat gain.

Roller-wave Distortion
Waviness imparted to horizontal heat treated glass while the glass is transported through the furnace on a roller conveyor. The waves produce a distortion when the glass is viewed in reflection.

Rolled Glass
Glass formed by rolling, including patterned glass and wired glass. (See also Patterned Glass.)

Rub
A series of small scratches in glass generally caused during transport by a chip lodged between two panels.

R-value
The thermal resistance of a glazing system. The higher the R-value the less heat is transmitted throughout the glazing material. The R-value is the reciprocal of the U-value

STC (Sound Transmittance Class)
A single number rating derived from individual transmittance losses at specified test frequencies. It is used for interior walls, ceilings and floors and in the past was also used for preliminary comparison of the performance of various glazing materials.

STL (Sound Transmittance Loss)
The reduction of the amount of sound energy passing through a wall, floor, roof, etc. It is related to the specific frequency (Hz) at which it is measured and it is expressed in decibels (dB). Also called Transmittance Loss (TL).

Sandblasted Finish
A surface treatment for glass obtained by spraying the glass with hard particles to roughen one or both surfaces of the glass.

The effect is to increase obscurity and diffusion, but it makes the glass weaker and harder to clean.

Safety Glass
Processed glass types which satisfy the requirements of AS/NZS 2208 for safety glazing. Laminated, toughened safety glass are rated Grade A. Wired glass is rated Grade B.

Salt Spray Test
Accelerated corrosion test in which samples are exposed to a fine mist of salt water. Primarily used to test silvered glass.

Salvage Edges (Bulb Edge)
The extreme lateral edges of the glass ribbon which are stripped off and recycled.

Sash
The moveable window frame which contains the glass pane.

Seeds
Minute bubbles in float glass.

Security Glass
Glass not just designed as Grade A safety but to also withstand various forms of violent attack. They are usually special combinations of laminated glass and can incorporate toughened glass and polycarbonates - see G.James ArmaClear range (BR, PA and PS).

Setting Blocks
Generally rectangular, cured extrusions of neoprene, EPDM, silicone, rubber or other suitable material on which the glass product bottom edge is placed to effectively support the weight of the glass.

Shading Coefficient
Ratio of the solar heat gain through a specific glass product compared to the solar heat gain through 3mm clear glass.

Sheet Glass
Refers to the drawn sheet process, which is pulled up vertically and consequently embodies inherent lines of distortion. It is a fire finished glass.

Shadowgraph
A test rig for inspecting glass with respect to distortion and other defects.

Shelf Life
Used in the glazing and sealant business to refer to the length of time a product may be stored before beginning to lose its effectiveness. Manufacturers usually state the shelf life and the necessary storage conditions on the package.

Shims
(See Spacers.)

Shore 'A' Hardness
Measure of firmness of a compound by means of a Durometer Hardness Gauge (A hardness range of 20-25 is about the firmness of an art gum eraser. A hardness of 90 is about the firmness of a rubber heel.

Sight Line
The line along the perimeter of the glazed panel corresponding to the edge of stationary or removable bead. The line to which sealants contacting the glazed panel are sometimes finished off.

Silicone Sealant
One part or two part elastromeric adhesive, rubber sealant which cures at room temperature (also referred to as room temperature vulcanising (RTV)). Its inorganic composition means silicone sealant is unaffected by UV, ozone and extremes of hot and cold. Further it will not break-down or lose adhesion and for this reason is widely used in most glazing applications.

Silkscreen
A decorating process in which a design is printed on glass through a fine silk mesh or similar screen.

Sill
The bottom horizontal member of the window/door frame.

Silvering
The application by chemical or other methods of a film of silver to a glass surface to create mirrors.

Sloped Glazing
Any installation of glass that is less than 70° from vertical.

Smoke
Streaked areas appearing as slight discolouration on glass.

Solar Control Glass
Tinted and/or coated glass that reduces the amount of solar heat gain transmitted through a glazed product.

Solar Energy Reflectance
In the solar spectrum, the percentage of solar energy that is reflected from the glass surface(s).

Solar Energy Transmittance
The percentage of ultra-violet, visible and infra-red energy within the solar spectrum that is transmitted through the glass.

Solar Heat Gain Coefficient
The ratio of directly transmitted and absorbed solar energy that enters into the building's interior (when compared to an open space). Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then re-radiated, conducted, or convected.

Spacers (Shims)
Small blocks of neoprene, EPDM, silicone or other suitable material, placed on each side of the glass product to provide glass centring, maintain uniform width of sealant bead and prevent excessive sealant distortion.

Spandrel
The panel(s) of a wall located between vision areas of windows which conceal structural columns, floors and shear walls.

Spectrally Selective Glass
Tinted and/or coated flat glass that selectively reduces the amount of ultra-violet and infra-red transmittance.

Stain
Discolouration of either a glass or finished aluminium surface caused by alkalis that leach from surrounding materials such as pre-cast or cast-in-place concrete or from sealants, pollutants or other contaminants.

Stained Glass
Refers to the craft of lead-lighting - glass which is coloured by fusing pigments to the surface or windows made up of pieces of stained glass.

Stones
Any crystalline inclusion embedded in the glass.

Strain
The percentage of elongation or compression of a material or portion of a material caused by an applied force.

Strain Pattern
A specific geometric pattern of iridescence or darkish shadows that may appear under certain lighting conditions, particularly in the presence of polarised light (also called quench pattern). The phenomena is caused by the localised stresses imparted by the rapid air cooling of the tempering operation. Strain pattern is characteristic of all heat treated glass.

Stress (Residual)
Any condition of tension or compression existing within the glass, caused by incomplete annealing or induced temperature gradient during the manufacture of heat treated glass.

Substance
Refers to the thickness of glass expressed in mm.

Surface Modified
Glass whose surface has been modified in such a way that it reduces solar heat gain by reflection rather than absorption.

Structural Glazing Gaskets
Cured elastomeric channel-shaped extrusions used in place of a conventional sash to install glass products onto structurally supporting sub-frames, with the pressure of sealing exerted by the insertion of separate lockstrip wedging splines.

Structural Silicone Glazing
The use of a silicone sealant for the structural transfer of loads from the glass to its perimeter support system and retention of the glass in opening.

Substrate
A base material to which other materials are applied.

Tape Sealant
A sealant having a pre-formed shape and intended to be used in a joint under compression.

Thermal Endurance
The relative ability of glass to withstand thermal shock.

Thermal Stress
Stress generated in glasses as a consequence of temperature differentials such as hot centre and cold edges (in the frame).

Tinted Glass
Glass with colourants added to the basic glass batch that give the glass colour, as well as, light and heat reducing capabilities. The colour extends throughout the thickness of the glass. Typical colours include bronze, grey, dark grey, aquamarine, green, deep green and blue.

Tong Marks
Small, surface indentations near and parallel to one edge of vertically toughened or vertically heat strengthened glass resulting from the tongs used to suspend the glass during the heat treating process.

Transmittance
The ability of the glass to pass light and/or heat, usually expressed in percentages (visible transmittance, thermal transmittance, etc).

Transom
A cross piece which separates a door from a window above. The horizontal member that supports panels, glass, sashes or sections of curtain wall.

Two-Part (Multi-Component) Sealant
A product comprised of a base and curing agent or accelerator, necessarily packaged in two separate containers which are uniformly mixed just prior to use.

Total Heat Gain
The sum of direct solar transmittance plus the proportion of absorbed energy, which is re-radiated to the inside of the glazing.

Toughened Glass
(See Fully Toughened Glass)

Ultra-violet
The name of the invisible portion of the light spectrum with wave lengths shorter than 380 nanometres.

U-value
A measure of air-to-air heat transmittance (loss or gain) due to thermal conductance and the difference in indoor and outdoor temperatures. As the U-value decreases, so does the amount of heat that is transferred through the glazing material. The lower the U-value, the better the insulation.

Vents
Small cracks at the edges of glass that can lead to breakage.

Vinyl Back Mirror
Organic vinyl backing applied to mirrors that holds the glass together when broken.

Visible Light Reflectance
The percentage of visible light (380 to 780 nanometres) within the solar spectrum that is reflected from the glass surface.

Visible Light Transmittance
The percentage of visible light (380 to 780 nanometres) within the solar spectrum that is transmitted through glass.

Weathering (also Stain)
Attack of a glass surface by atmospheric elements.

Weep Holes
Small holes or slots in the sash or framing system which allows water to drain to the building exterior.

Wet Seal
Application of an elastomeric sealant between the glass and sash to form a weather-tight seal.

Wired Glass
Rolled glass having a layer of meshed or stranded wire embedded near to the centre of thickness of the panel. This glass is available as polished glass (one or both surfaces) and patterned glass.

How to complete the Thermal Safety Assessment Request

(For further information on Thermal Breakage refer Section 1.11)

Vision / Sloped Glazing

Location
City, town or country where building is located.

Glass Type
Full description required, e.g. IG unit comprising 6mm TS40 (2) on Green/12mm airspace/6mm Energy Advantage (3).

Glass Sizes
Largest and smallest panel sizes required as the size of the glass has an effect on thermal stress.

Glass Application
Options are fixed glass, sliding windows and doors (which include double hung windows) and openable awning or casement sashes. The window configuration may effect thermal stress, e.g. a fully opened sliding door/window can act as a double glazed unit increasing the amount of solar absorption to the outer lite.

Glass Orientation
This refers to the aspect of the facades containing glass. If glass is installed to all four sides of the building, tick all four boxes. The angle of the glazing is also required, as glass glazed on a slope is subject to higher solar radiation than panels glazed vertically.

Glazing Type
Options include the following:

- Glass fully glazed (captive) in a frame
- 2-sided captive – vertical is framing only to the vertical edges with no framing to the horizontal edges.
- 2-sided captive – horizontal is the reverse of 2-sided captive vertical.
- 4-sided structural is glass retained by silicone only without any framing.

Frame Material
Options are metal (aluminium/steel), wood/timber or PVC.

Frame Colour
Options include Light (clear anodised, white), Medium (light grey, light blue) or Dark (black, dark bronze).

Overhead Shading
Distance (mm) any overhang, soffit or awning extends beyond the front of the glass.

Mullion Projection
Distance (mm) the mullion extends beyond the front of the glass.

Transom Projection
Distance (mm) the transom extends beyond the front of the glass.

Depth of Column
Distance (mm) a column extends beyond the front of the glass face creating a vertical shadow.

Depth of Set Back
Distance (mm) from extreme building face of the glass in a 'punched' (recessed) window.

Blinds/Drapes Behind Glass
Will blinds or drapes be installed to the inside of the glass?

Ventilated Airspace
Will the space between blinds/drapes and the glass be ventilated? The criteria for a ventilated airspace are:

- A 50mm clearance between the glass and the shading device
- A 38mm clearance between the top and bottom or one side and bottom between shading device and surround

Colour of blinds
Refers to the colour of the blinds/drapes, either light (white) or dark (black).

Venetian Blinds Between Two Glasses
Will venetian blinds be installed between any two glasses (i.e. double glazed or jockey sash windows)?

Gaps (Glass-Blind-Glass)
Distance (mm) between glass to blind to glass.

Spandrel Glass

Glass Type
Full description required, for example 6.38mm TS21 Clear Laminated.

Glass Sizes
Largest and smallest panel sizes required as the size of the glass has an effect on thermal stress.

Backup Wall
Does the spandrel cavity contain a backup wall of masonry, metal sheeting or other material?

Colour of Backup Wall
Refers to the colour of the backup wall material, either light (white) or dark (black).

Distance from Wall to Glass
Distance (mm) from back of spandrel glass to backup wall.

Airspace Ventilated
Is there a cavity behind the spandrel glass and is it fully sealed or ventilated (preferable at the top and bottom) to allow airflow?

NB: If you require assistance in completing the Thermal Safety Assessment Request, please contact our Technical Advisory Service.

G.James Thermal Safety Assessment Request

PHOTOCOPY, COMPLETE FORM AND SEND TO G.JAMES SAFETY GLASS

The following information is required to conduct a Thermal Safety Assessment. Please complete all relevant sections. The accuracy of the assessment is based on the information supplied.

Company Name _____ Contact _____

Phone No. _____ Fax No. _____

Project Reference _____ Location _____

Vision / Sloped Glazing

Glass Type (Full Description) _____

Glass Sizes

Largest _____

Smallest _____

Glass Application

☐ Fixed Glazed ☐ Sliding Windows/Doors

☐ Openable Sash

Glass Orientation

☐ North ☐ South ☐ East ☐ West

☐ Vertical ☐ Sloped Angle _____

Glazing Type

☐ Fully Captive ☐ 2-Sided Captive – Vertical

☐ 2-Sided Captive – Horizontal ☐ 4-Sided Structural

Framing Material

☐ Metal ☐ Wood ☐ PVC

Frame Colour

☐ Light ☐ Medium ☐ Dark

Overhead Shading _____ mm

Mullion Projection _____ mm

Depth of Column _____ mm

Transom Projection _____ mm

Depth of Set Back _____ mm

Blinds/Drapes Behind Glass

☐ Yes ☐ No

Colour of Blinds

☐ Light ☐ Dark

Ventilated Air Space

☐ Yes ☐ No

Venetian Blind Between Two Glasses

☐ Yes ☐ No

Gaps (Glass-Blind-Glass)

_____ mm and _____ mm

Spandrel Glass

Glass Type (Full Description) _____

Glass Sizes

Largest _____

Smallest _____

Backup Wall

☐ Yes ☐ No

Backup Wall Colour

☐ Light ☐ Dark

Distance from Wall to Glass _____ mm

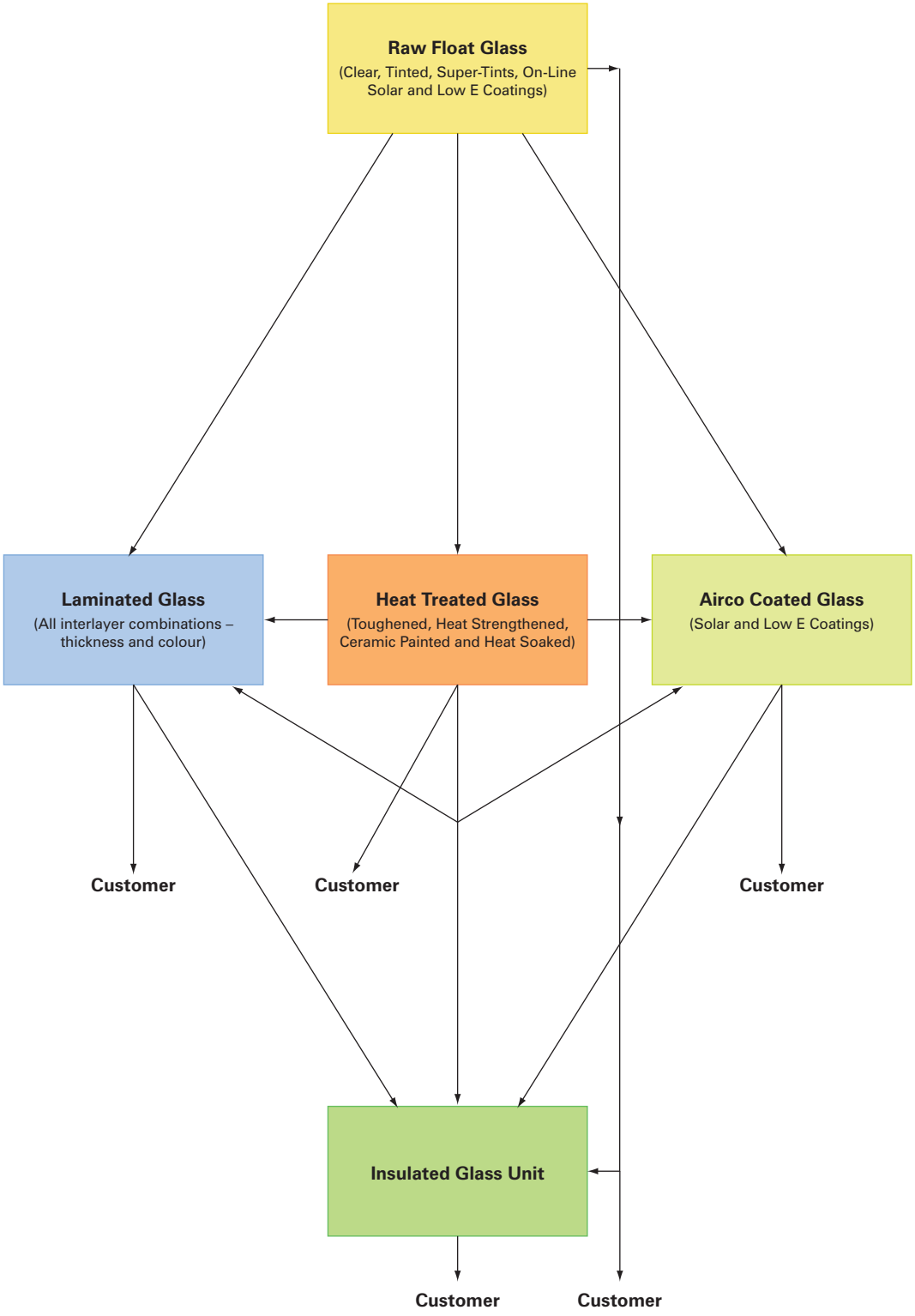
Airspace Ventilated

☐ Yes ☐ No

Signed _____ Date _____

Glass Processing Flow Chart

(Possible Combinations)



Index

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- Reed Educational and Professional Publishing Australia
- Saint-Gobain
- Schott
- Solutia Inc.
- Viracon
- J.Weck GMBH U. Co./Obeco Glass Blocks

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- Glass in Building, Butterworth Architecture – *Button and Pye*
- Glass in Building – *Saint-Gobain*
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Disclaimer

While drawing on our experience of almost 90 years in the glass industry, we have also drawn from industry publications and many manufacturers literature from around the world. G.James have been careful and diligent to ensure the accuracy of all the information contained in this handbook but to the extent limited by law G.James accepts no responsibility for any inaccuracies of any kind.

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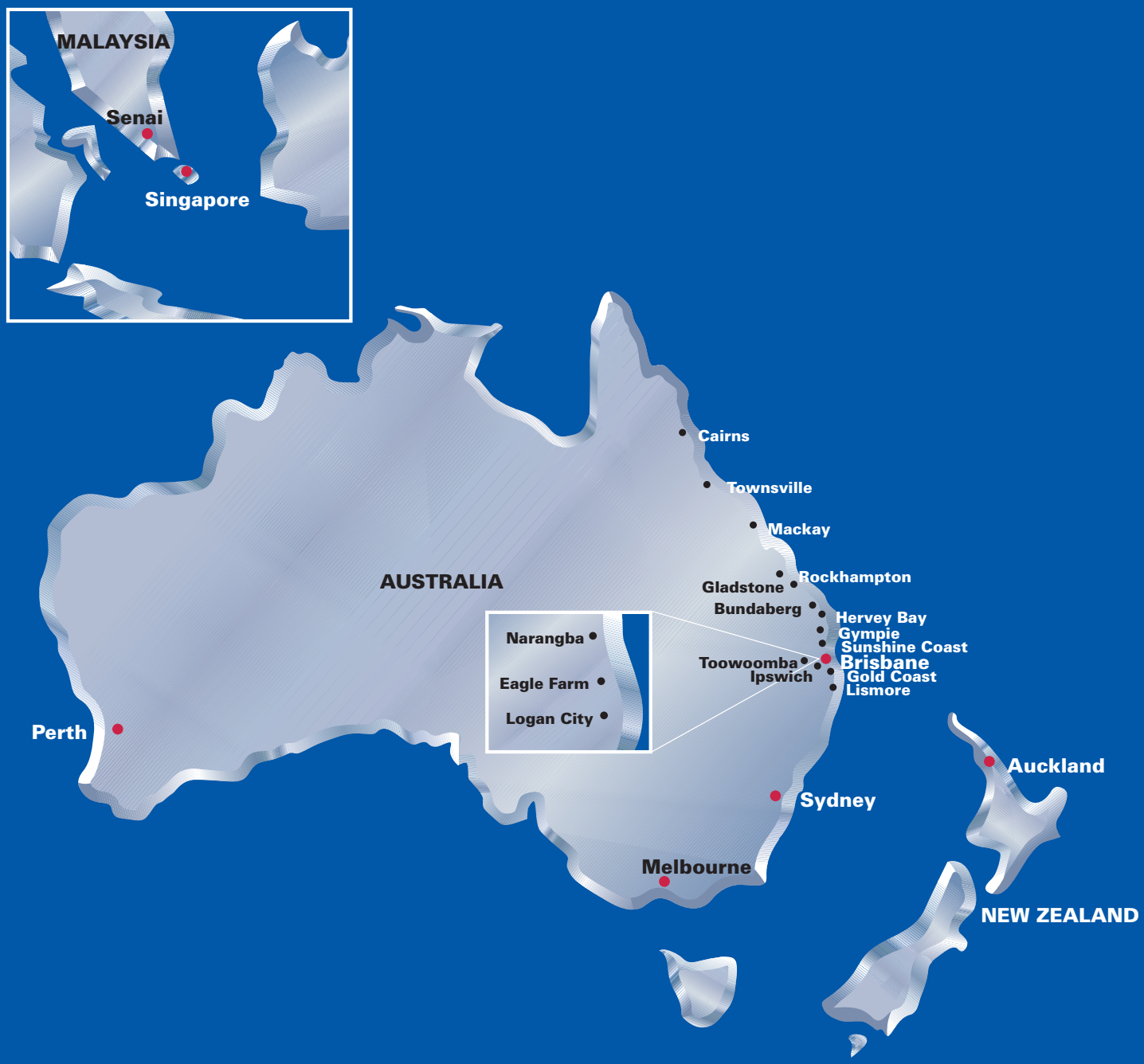

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