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GLASS FABRICATORS INC.

AGM Glass

Make-up Name	Glass 1 & Coating	Glass 2 & Coating	Glass 3 & Coating	Gap 1	Gap 2	Visible Light			Ultraviolet		Solar Energy							Thermal Properties			Light to Solar Gain (LSG)	Embodied CO_2
						Transmittance	Reflectance		Trans UV (τ_{UV} %)	Tdw (T_{dw} %)	Transmittance	Reflectance		Absorptance	Solar Heat Gain Coefficient (SHGC)	Shading Coefficient (sc)	Relative Heat Gain (RHG)	U-Value		R-Value Winter Night (hr·ft²·F/Btu)		[eq. kg/m²] A1-A3
						Visible (τ_V %)	ρ_V % out	ρ_V % in			Solar (τ_e %)	ρ_e % out	ρ_e % in	Solar (α_e %)				Winter Night (Btu/hr·ft²·F)	Summer Day (Btu/hr·ft²·F)			
CG70/argon/clear/argon/CG70	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	52	20	20	6	36	21	43	43	36	0.29	0.33	68	0.128	0.134	7.82	1.83	38.40
CG70/argon/clear/argon/clear	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	63	19	22	17	48	29	44	42	27	0.32	0.37	76	0.182	0.176	5.49	1.96	27.93

Make-up Name	Glass 1 & Coating	Glass 2 & Coating	Glass 3 & Coating	Gap 1	Gap 2	Visible Light			Ultraviolet		Solar Energy							Thermal Properties			Light to Solar Gain (LSG)	Embodied CO_2
						Transmittance	Reflectance		Trans UV (τ_{uv} %)	Tdw (T_{dw} %)	Transmittance	Reflectance		Absorptance	Solar Heat Gain Coefficient (SHGC)	Shading Coefficient (sc)	Relative Heat Gain (RHG)	U-Value		R-Value Winter Night (hr·ft²·F/Btu)		[eq. kg/m²] A1-A3
						Visible (τ_v %)	ρ_v % out	ρ_v % in			Solar (τ_e %)	ρ_e % out	ρ_e % in	Solar (α_e %)				Winter Night (Btu/hr·ft²·F)	Summer Day (Btu/hr·ft²·F)			
CG70/argon/clear/CG80-71	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	ClimaGuard® 80/71 (North America) on Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	61	18	20	13	44	28	43	38	29	0.32	0.36	74	0.129	0.131	7.75	1.94	31.25
clear/argon/CG80/71	Guardian Clear Glass (North America)	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	N/A	10% Air, 90% Argon	N/A	69	16	15	20	53	32	46	42	21	0.43	0.49	101	0.242	0.213	4.13	1.62	19.72

Make-up Name	Glass 1 & Coating	Glass 2 & Coating	Glass 3 & Coating	Gap 1	Gap 2	Visible Light			Ultraviolet		Solar Energy							Thermal Properties			Light to Solar Gain (LSG)	Embodied CO_2
						Transmittance	Reflectance		Trans UV (τ_{uv} %)	Tdw (T_{dw} %)	Transmittance	Reflectance		Absorptance	Solar Heat Gain Coefficient (SHGC)	Shading Coefficient (sc)	Relative Heat Gain (RHG)	U-Value		R-Value Winter Night (hr·ft²·F/Btu)		[eq. kg/m²] A1-A3
						Visible (τ_v %)	ρ_v % out	ρ_v % in			Solar (τ_e %)	ρ_e % out	ρ_e % in	Solar (α_e %)				Winter Night (Btu/hr·ft²·F)	Summer Day (Btu/hr·ft²·F)			
clear/argon/CG80/71	Guardian Clear Glass (North America)	ClimaGuard® 80/71 (North America) on Guardian Clear Glass (North America)	N/A	10% Air, 90% Argon	N/A	80	14	14	44	67	62	21	20	17	0.71	0.81	166	0.265	0.246	3.78	1.13	19.72
clear/argon/clear/argon/CG80-71	Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	ClimaGuard® 80/71 (North America) on Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	73	20	19	37	60	55	23	24	22	0.64	0.73	149	0.186	0.199	5.37	1.15	27.93

Make-up Name	Glass 1 & Coating	Glass 2 & Coating	Glass 3 & Coating	Gap 1	Gap 2	Visible Light			Ultraviolet		Solar Energy							Thermal Properties			Light to Solar Gain (LSG)	Embodied CO_2
						Transmittance	Reflectance		Trans UV (τ_{uv} %)	Tdw (T_{dw} %)	Transmittance	Reflectance		Absorptance	Solar Heat Gain Coefficient (SHGC)	Shading Coefficient (sc)	Relative Heat Gain (RHG)	U-Value		R-Value Winter Night (hr·ft²·F/Btu)		[eq. kg/m²] A1-A3
						Visible (τ_v %)	ρ_v % out	ρ_v % in			Solar (τ_e %)	ρ_e % out	ρ_e % in	Solar (α_e %)				Winter Night (Btu/hr·ft²·F)	Summer Day (Btu/hr·ft²·F)			
clear/argon/clear/CG 70	Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	ClimaGuard® 70 (North America) on Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	63	22	19	17	48	29	42	44	28	0.40	0.47	96	0.172	0.176	5.82	1.56	27.93
SNX62/27-argon/clear/argon/clear	SunGuard® SNX 62/27 (North America) on Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	Guardian Clear Glass (North America)	10% Air, 90% Argon	10% Air, 90% Argon	57	15	19	6	36	21	44	41	34	0.24	0.28	58	0.184	0.188	5.44	2.36	35.08

Calculation Standard: NFRC 2010

CG70/argon/clear/argon/CG70:
GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm) (2-ClimaGuard® 70 (North America)) GAP: 10% Air, 90% Argon 7/16" (11.1mm) GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm) GAP: 10% Air, 90% Argon 7/16" (11.1mm) GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm) (5-ClimaGuard® 70 (North America))

CG70/argon/clear/argon/clear:
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (2-ClimaGuard® 70 (North America)) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm)

CG70/argon/clear/CG80-71 :
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (2-ClimaGuard® 70 (North America)) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (5-ClimaGuard® 80/71 (North America))

clear/argon/CG80/71:
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (3-ClimaGuard® 70 (North America))

clear/argon/CG80/71 :
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (3-ClimaGuard® 80/71 (North America))

clear/argon/clear/argon/CG80-71 :
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (5-ClimaGuard® 80/71 (North America))

clear/argon/clear/CG70:
GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) GAP: 10% Air, 90% Argon 1/2" (12.7mm) GLASS: Guardian Clear Glass (North America) Glass, 1/8" (3mm) (5-ClimaGuard® 70 (North America))

SNX62/27-argon/clear/argon/clear :
GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm) (2-SunGuard® SNX 62/27 (North America)) GAP: 10% Air, 90% Argon 7/16" (11.1mm) GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm) GAP: 10% Air, 90% Argon 7/16" (11.1mm) GLASS: Guardian Clear Glass (North America) Glass, 5/32" (4mm)

CG70/argon/clear/argon/CG70

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors		Air -0.4	Air 89.6	wint. night Air 0.189 hr·ft²·F/Btu
GLASS 1	Guardian Clear Glass (North America) Thickness = 5/32" (4mm)	0.886	1.3	108.4	
	#1 ----- #2 ClimaGuard® 70 (North America)	0.019	1.5	109.5	0.023
GAP 1	10% Air, 90% Argon, 7/16" (11.1mm)	0.019			3.430
GLASS 2	Guardian Clear Glass (North America) Thickness = 5/32" (4mm)	0.886	32.3	109.2	
	#3 ----- #4 -----	0.886	32.5	109.1	0.022
GAP 2	10% Air, 90% Argon, 7/16" (11.1mm)	0.019			3.297
GLASS 3	Guardian Clear Glass (North America) Thickness = 5/32" (4mm)	0.019	62.1	91.1	
	#5 ClimaGuard® 70 (North America) #6 -----	0.886	62.3	90.7	0.021
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.836
					7.818 R total

Total Unit (Nominal) = 1 11/32 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 5.89 lb/ft²

Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	52	Solar Heat Gain Coefficient (SHGC)	0.29	Embodied CO_2	38.40
Reflectance-In % (ρ_v)	20	Shading Coefficient (sc)	0.33		
Reflectance-Out % (ρ_v)	20	Relative Heat Gain (RHG)	68		
Light to Solar Gain (LSG)	1.83	Transmittance % (τ_e)	21		
Thermal Properties		Reflectance-In % (ρ_e)	43		
U-Value Winter Night (Btu/hr·ft²·F)	0.128	Reflectance-Out % (ρ_e)	43		
U-Value Summer Day (Btu/hr·ft²·F)	0.134	Absorptance % (α_e)	36		
R-Value Winter Night (hr·ft²·F/Btu)	7.82	Ultraviolet Trans % (τ_{uv})	6		
		Damage-weighted Transmission %	36		

CG70/argon/clear/argon/clear

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors		Air -0.4	Air 89.6	wint. night Air 0.189 hr·ft²·F/Btu
GLASS 1	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.886	2.0	105.3	0.017
	#1 ----- #2 ClimaGuard® 70 (North America)	0.019	2.2	106.0	
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.019			3.331
GLASS 2	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.886	44.8	90.2	0.017
	#3 ----- #4 -----	0.886	45.0	90.1	
GAP 2	10% Air, 90% Argon, 1/2" (12.7mm)	0.796			1.101
GLASS 3	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.886	59.1	83.1	0.017
	#5 ----- #6 -----	0.886	59.3	83.0	
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.820 5.492 R total

Total Unit (Nominal) = 1 3/8 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 4.56 lb/ft²

Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	63	Solar Heat Gain Coefficient (SHGC)	0.32	Embodied CO_2	27.93
Reflectance-In % (ρ_v)	22	Shading Coefficient (sc)	0.37		
Reflectance-Out % (ρ_v)	19	Relative Heat Gain (RHG)	76		
Light to Solar Gain (LSG)	1.96	Transmittance % (τ_e)	29		
Thermal Properties		Reflectance-In % (ρ_e)	42		
U-Value Winter Night (Btu/hr·ft²·F)	0.182	Reflectance-Out % (ρ_e)	44		
U-Value Summer Day (Btu/hr·ft²·F)	0.176	Absorptance % (α_e)	27		
R-Value Winter Night (hr·ft²·F/Btu)	5.49	Ultraviolet Trans % (τ_{uv})	17		
		Damage-weighted Transmission %	48		

CG70/argon/clear/CG80-71

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors				wint. night Air 0.189 hr·ft²·F/Btu
			Air -0.4	Air 89.6	
GLASS 1	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.886	1.3	105.9	0.017
	#1 ----- #2 ClimaGuard® 70 (North America)	0.019	1.5	106.7	
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.019			3.602
GLASS 2	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.886	34.1	98.9	0.017
	#3 ----- #4 -----	0.886	34.2	98.8	
GAP 2	10% Air, 90% Argon, 1/2" (12.7mm)	0.067			3.075
GLASS 3	Guardian Clear Glass (North America) Thickness = 1/8" (3mm)	0.067	62.1	84.3	0.017
	#5 ClimaGuard® 80/71 (North America)	0.886	62.2	84.1	
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.836
					7.754 R total

Total Unit (Nominal) = 1 3/8 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 4.56 lb/ft²

Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	61	Solar Heat Gain Coefficient (SHGC)	0.32	Embodied CO_2	31.25
Reflectance-In % (ρ_v)	20	Shading Coefficient (sc)	0.36		
Reflectance-Out % (ρ_v)	18	Relative Heat Gain (RHG)	74		
Light to Solar Gain (LSG)	1.94	Transmittance % (τ_e)	28		
Thermal Properties		Reflectance-In % (ρ_e)	38		
U-Value Winter Night (Btu/hr·ft²·F)	0.129	Reflectance-Out % (ρ_e)	43		
U-Value Summer Day (Btu/hr·ft²·F)	0.131	Absorptance % (α_e)	29		
R-Value Winter Night (hr·ft²·F/Btu)	7.75	Ultraviolet Trans % (τ_{uv})	13		
		Damage-weighted Transmission %	44		

clear/argon/CG80/71

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors				wint. night Air 0.189 hr·ft²·F/Btu
			Air -0.4	Air 89.6	
GLASS 1	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #1 ----- #2 -----	0.886	2.8	96.4	0.017
		0.886	3.1	96.6	
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.019			3.104
GLASS 2	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #3 ClimaGuard® 70 (North America) #4 -----	0.019	55.8	96.1	0.017
		0.886	56.1	95.6	
	Indoors		Air 69.8 (°F)	Air 75.2 (°F)	Air 0.806
					4.134 R total

Total Unit (Nominal) = 3/4 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 3.04 lb/ft²

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	69	Solar Heat Gain Coefficient (SHGC)	0.43	Embodied CO_2	19.72
Reflectance-In % (ρ_v)	15	Shading Coefficient (sc)	0.49		
Reflectance-Out % (ρ_v)	16	Relative Heat Gain (RHG)	101		
Light to Solar Gain (LSG)	1.62	Transmittance % (τ_e)	32		
Thermal Properties		Reflectance-In % (ρ_e)	42		
U-Value Winter Night (Btu/hr·ft²·F)	0.242	Reflectance-Out % (ρ_e)	46		
U-Value Summer Day (Btu/hr·ft²·F)	0.213	Absorptance % (α_e)	21		
R-Value Winter Night (hr·ft²·F/Btu)	4.13	Ultraviolet Trans % (τ_{uv})	20		
		Damage-weighted Transmission %	53		

clear/argon/CG80/71

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors				wint. night Air 0.189 hr·ft²·F/Btu
			Air -0.4	Air 89.6	
GLASS 1	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #1 ----- #2 -----	0.886	3.1	94.4	0.017
		0.886	3.4	94.6	
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.067			2.751
GLASS 2	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #3 ClimaGuard® 80/71 (North America)	0.067	54.6	93.8	0.017
		0.886	54.9	93.5	
	Indoors		Air 69.8 (°F)	Air 75.2 (°F)	Air 0.802
					3.776 R total

Total Unit (Nominal) = 3/4 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 3.04 lb/ft²

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	80	Solar Heat Gain Coefficient (SHGC)	0.71	Embodied CO_2	19.72
Reflectance-In % (ρ_v)	14	Shading Coefficient (sc)	0.81		
Reflectance-Out % (ρ_v)	14	Relative Heat Gain (RHG)	166		
Light to Solar Gain (LSG)	1.13	Transmittance % (τ_e)	62		
Thermal Properties		Reflectance-In % (ρ_e)	20		
U-Value Winter Night (Btu/hr·ft²·F)	0.265	Reflectance-Out % (ρ_e)	21		
U-Value Summer Day (Btu/hr·ft²·F)	0.246	Absorptance % (α_e)	17		
R-Value Winter Night (hr·ft²·F/Btu)	3.78	Ultraviolet Trans % (τ_{uv})	44		
		Damage-weighted Transmission %	67		

clear/argon/clear/argon/CG80-71

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors				wint. night Air 0.189 hr·ft²·F/Btu
			Air -0.4	Air 89.6	
GLASS 1	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #1 ----- #2 -----	0.886	2.1	97.4	0.017
		0.886	2.3	97.7	
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.796			1.333
GLASS 2	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #3 ----- #4 -----	0.886	19.7	106.9	0.017
		0.886	20.0	106.9	
GAP 2	10% Air, 90% Argon, 1/2" (12.7mm)	0.067			2.977
GLASS 3	Guardian Clear Glass (North America) Thickness = 1/8" (3mm) #5 ClimaGuard® 80/71 (North America)	0.067	58.9	94.3	0.017
		0.886	59.1	93.9	
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.818
					5.368 R total

Total Unit (Nominal) = 1 3/8 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 4.56 lb/ft²

Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	73	Solar Heat Gain Coefficient (SHGC)	0.64	Embodied CO_2	27.93
Reflectance-In % (ρ_v)	19	Shading Coefficient (sc)	0.73		
Reflectance-Out % (ρ_v)	20	Relative Heat Gain (RHG)	149		
Light to Solar Gain (LSG)	1.15	Transmittance % (τ_e)	55		
Thermal Properties		Reflectance-In % (ρ_e)	24		
U-Value Winter Night (Btu/hr·ft²·F)	0.186	Reflectance-Out % (ρ_e)	23		
U-Value Summer Day (Btu/hr·ft²·F)	0.199	Absorptance % (α_e)	22		
R-Value Winter Night (hr·ft²·F/Btu)	5.37	Ultraviolet Trans % (τ_{uv})	37		
		Damage-weighted Transmission %	60		

clear/argon/clear/CG70

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors				wint. night Air 0.189 hr·ft²·F/Btu
			Air -0.4	Air 89.6	
GLASS 1	Guardian Clear Glass (North America) #1 -----	0.886	1.9	100.5	
	Thickness = 1/8" (3mm) #2 -----	0.886	2.1	100.9	0.017
GAP 1	10% Air, 90% Argon, 1/2" (12.7mm)	0.796			1.341
GLASS 2	Guardian Clear Glass (North America) #3 -----	0.886	18.3	114.9	
	Thickness = 1/8" (3mm) #4 -----	0.886	18.5	115.0	0.017
GAP 2	10% Air, 90% Argon, 1/2" (12.7mm)	0.019			3.420
GLASS 3	Guardian Clear Glass (North America) #5 ClimaGuard® 70 (North America)	0.019	59.7	97.4	
	Thickness = 1/8" (3mm) #6 -----	0.886	59.9	96.9	0.017
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.822
					5.823 R total

Total Unit (Nominal) = 1 3/8 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 4.56 lb/ft²

Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	63	Solar Heat Gain Coefficient (SHGC)	0.40	Embodied CO_2	27.93
Reflectance-In % (ρ_v)	19	Shading Coefficient (sc)	0.47		
Reflectance-Out % (ρ_v)	22	Relative Heat Gain (RHG)	96		
Light to Solar Gain (LSG)	1.56	Transmittance % (τ_e)	29		
Thermal Properties		Reflectance-In % (ρ_e)	44		
U-Value Winter Night (Btu/hr·ft²·F)	0.172	Reflectance-Out % (ρ_e)	42		
U-Value Summer Day (Btu/hr·ft²·F)	0.176	Absorptance % (α_e)	28		
R-Value Winter Night (hr·ft²·F/Btu)	5.82	Ultraviolet Trans % (τ_{uv})	17		
		Damage-weighted Transmission %	48		

SNX62/27-argon/clear/argon/clear

		Normal Emissivity (ε_n)	Winter Night Temps	Summer Day Temps	R Value (hr·ft²·F/Btu)
	Outdoors		Air -0.4	Air 89.6	wint. night Air 0.189 hr·ft²·F/Btu
GLASS 1	Guardian Clear Glass (North America) #1 -----	0.886	2.0	110.2	
	Thickness = 5/32" (4mm) #2 SunGuard® SNX 62/27 (North	0.016	2.3	111.4	0.023
GAP 1	10% Air, 90% Argon, 7/16" (11.1mm)	0.016			3.305
GLASS 2	Guardian Clear Glass (North America) #3 -----	0.886	45.0	91.0	
	Thickness = 5/32" (4mm) #4 -----	0.886	45.3	90.9	0.022
GAP 2	10% Air, 90% Argon, 7/16" (11.1mm)	0.796			1.062
GLASS 3	Guardian Clear Glass (North America) #5 -----	0.886	59.0	83.2	
	Thickness = 5/32" (4mm) #6 -----	0.886	59.2	83.0	0.021
			Air 69.8 (°F)	Air 75.2 (°F)	Air 0.819
					5.441 R total

Total Unit (Nominal) = 1 11/32 in Slope = 90° Window Height = 1 meter

Estimated Nominal Glazing Weight: 5.89 lb/ft²

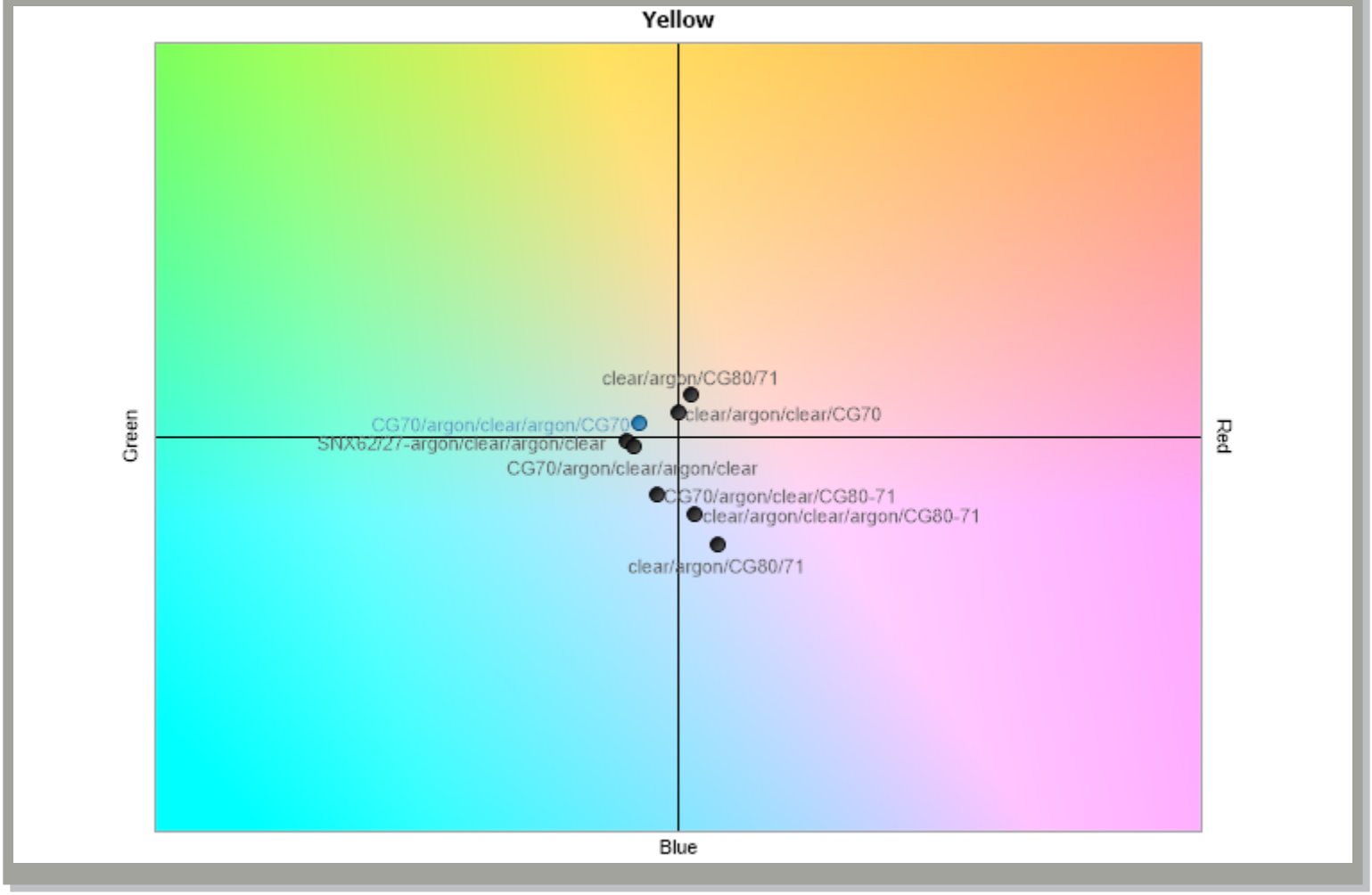
Indoors

Summary Data

Calculation Standard: NFRC 2010

Visible Light		Solar Energy		Other Data	
Transmittance % (τ_v)	57	Solar Heat Gain Coefficient (SHGC)	0.24	Embodied CO_2	35.08
Reflectance-In % (ρ_v)	19	Shading Coefficient (sc)	0.28		
Reflectance-Out % (ρ_v)	15	Relative Heat Gain (RHG)	58		
Light to Solar Gain (LSG)	2.36	Transmittance % (τ_e)	21		
Thermal Properties		Reflectance-In % (ρ_e)	41		
U-Value Winter Night (Btu/hr·ft²·F)	0.184	Reflectance-Out % (ρ_e)	44		
U-Value Summer Day (Btu/hr·ft²·F)	0.188	Absorptance % (α_e)	34		
R-Value Winter Night (hr·ft²·F/Btu)	5.44	Ultraviolet Trans % (τ_{uv})	6		
		Damage-weighted Transmission %	36		

Color Comparison Chart: Outdoor Reflected Color



Important Notes

Calculations and terms in this report are based on NFRC 2010. The performance values shown above represent nominal values for the center of glass with no spacer system or framing.

Embodied CO2 [eq. kg/m2] A1-A3 is estimated based on material Embodied Carbon Factor (ECF), derived from Guardian Glass Regional third-party independently verified and published / current Environmental Product Declarations (EPDs) which are produced to EN 15804 and are compliant with the requirements of ISO 14044, the International Life Cycle Assessment (LCA) standard, and ISO 14025 and ISO 21930, the international standards covering EPD for construction products. The A1–A3 ECF is an estimate of the embodied carbon due to production of that material. The resulting material value should then be multiplied by the square area of glazing to provide an estimate of embodied carbon of the material at the project scale. Embodied CO2 estimates provided by Guardian represent only values associated with the glass components manufactured by Guardian. The estimated values do not represent in any way a plant-specific and/or product specific guarantee.

Laminated products:
The Performance Calculator allows the user to model a wide variety of laminated glass makeups using different float glass substrates, coatings and interlayer material, including those makeups where the coating faces the interlayer. It is the user's responsibility to assess whether the laminated glass makeup meets relevant regional standards and complies with applicable laminated glass safety regulations.

In addition, when the laminated glass makeup includes a coating facing the interlayer material, there may be a loss of thermal insulation performance and a color change compared to non-embedded coated class.

Non-specular products (translucent or diffuse):
The performance measurement for non-specular (translucent or diffuse) materials such as translucent interlayers or acid etched glass surface, or surface with ceramic frit is limited by the current experimental technologies. Since measurements capture physically only a part of the resulting radiation, calculated performance results provided herein and based on such

measurements are not compliant with any standard (including EN 410) and may only be used as a general reference. Actual values may vary significantly based upon exact fabrication process, as well as type, thickness and color of used non-specular material.

Please note that the Thermal Stress Guideline is only a general guide to the thermal safety of a glazing, and it is not a replacement for detailed thermal stress analysis.

Explanation of Terms

Visible Light Transmittance (Tv, %) is the percentage of incident light in the wavelength range of 380 nm to 780 nm that is transmitted by the glass.

Ultraviolet (UV) Transmittance (Tuv, %) is the percentage of the incident solar radiation transmitted by the glazing in the 300 nm to 380 nm range.

Solar Energy Direct Transmittance (Te, %) is the percentage of incident solar energy in the wavelength range of 300 nm to 2500 nm that is directly transmitted by the glass.

Visible Light Reflectance Outdoors/Indoor (Rv out/in, %) is the percentage of incident visible light directly reflected by the glass.

Solar Direct Reflectance Outdoors/Indoors (Re out/in, %) is the percentage of incident solar energy directly reflected by the glass.

Solar Energy Absorptance (Ae, %) is the percentage of the sun's energy that is absorbed by glass.

U-Value is the glazing parameter that characterizes the heat transfer through the central part of the glazing, i.e. without edge effects, and expresses the steady-state density of heat transfer rate per temperature difference between the environmental temperatures on each side. US Standard units are Btu/hr·ft²·F and SI / Metric units are W/m2 K.

Relative Heat Gain (RHG) is the total net heat gain to the indoors due to both the air-to-air thermal conductance and the solar heat gain. US Standard units are Btu/hr.ft² and SI / Metric units are W/m².

Shading Coefficient (sc) is Solar Factor divided by 0.87. It is a measure of the solar heat gain referenced to 3 mm clear glass which has the designated value of 1.00.

Solar Heat Gain Coefficient (SHGC) is the sum of the solar direct transmittance and the secondary heat transfer factor of the glazing towards the inside, the latter resulting from heat transfer by convection and longwave IR-radiation of that part of the incident solar radiation which has been absorbed by the glazing.

Light-to-Solar Gain (LSG) is the ratio of visible light gain to solar gain. LSG = (Visible Transmittance) / (SHGC)

Color Rendering Index in transmission, D65 (R_a) is the change in color of an object as a result of the light being transmitted by the glass.

Weighted Sound Reduction Index (Rw) is a single-number quantity which characterizes the airborne sound insulation of a material or building element over a range of frequencies.

Sound Transmission Class (STC) is a single-number quantity which characterizes the airborne sound insulation of a material or building element over a range of frequencies.

Disclaimer

This performance analysis is provided for the limited purpose of assisting the user in evaluating the performance of the glass products identified on this report.

Spectral data for products manufactured by Guardian reflect nominal values derived from typical production samples or CE Initial Type Testing and subject to variations due to manufacturing and calculation tolerances. Spectral data for products not manufactured by Guardian were derived from the LBNL International Glazing Database and have not been independently verified by Guardian. Guardian recommends a full-size mock-up be approved.

The values provided herein are generated according to established engineering practices and applicable calculation standards. Many factors may affect glazing characteristics, including glass size, building orientation, shading, wind speed, type of installation, production process and others. The applicability and results of the analysis are directly related to user inputs and any changes in actual conditions can have a significant effect on the results. It is the responsibility of the users of the analysis to ensure that the intended application is appropriate and complies with all relevant laws, regulations, standards, codes of

practices, processing guidelines and other requirements. Guardian makes no guarantee that any glazing modeled herein is available from Guardian or any other manufacturer. The user has the responsibility to check with the manufacturer regarding availability of any glass type or make-up.

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