

THERMAL PERFORMANCE

Generic Windows

Thermal Performance of generic windows in					Aluminium Frames			Composite Aluminium Frame			Thermally Broken Frame		
mm	Outer Pane	Space mm	Inner Pane mm	Inner Pane	R Window	R Window	R Window	SC COG	SC COG	SC COG	SC COG	SC COG	SC COG
Single Glazed													
4	Clear	-	-	-	0.15	0.15	0.17	0.97	0.97	0.97	0.97	0.97	0.97
6	Clear Laminated	-	-	-	0.15	0.15	0.17	0.92	0.92	0.92	0.92	0.92	0.92
4	Clear Low E	-	-	-	0.21	0.21	0.24	0.82	0.82	0.82	0.82	0.82	0.82
6	Solar Low E	-	-	-	0.19	0.20	0.22	0.69	0.69	0.69	0.69	0.69	0.69
5	Grey	-	-	-	0.15	0.15	0.17	0.71	0.71	0.71	0.71	0.71	0.71
5	Bronze	-	-	-	0.15	0.15	0.17	0.77	0.77	0.77	0.77	0.77	0.77
6	Green	-	-	-	0.15	0.15	0.17	0.71	0.71	0.71	0.71	0.71	0.71
5	Evergreen	-	-	-	0.15	0.15	0.17	0.67	0.67	0.67	0.67	0.67	0.67
6	Arctic Blue	-	-	-	0.15	0.15	0.17	0.6	0.6	0.6	0.6	0.6	0.6
Insulated Glass Units													
4	Clear	6	4	Clear	0.24	0.24	0.28	0.85	0.85	0.85	0.85	0.85	0.85
4	Clear	8	4	Clear	0.25	0.25	0.3	0.85	0.85	0.85	0.85	0.85	0.85
4	Clear	10	4	Clear	0.25	0.25	0.31	0.85	0.85	0.85	0.85	0.85	0.85
4	Clear	12	4	Clear	0.26	0.26	0.31	0.85	0.85	0.85	0.85	0.85	0.85
5	Grey	12	4	Clear	0.26	0.26	0.31	0.58	0.58	0.58	0.58	0.58	0.58
5	Bronze	12	4	Clear	0.26	0.26	0.31	0.64	0.64	0.64	0.64	0.64	0.64
6	Green	12	4	Clear	0.26	0.26	0.31	0.58	0.58	0.58	0.58	0.58	0.58
5	Evergreen	12	4	Clear	0.26	0.26	0.31	0.54	0.54	0.54	0.54	0.54	0.54
6	Arctic blue	12	4	Clear	0.26	0.26	0.31	0.46	0.46	0.46	0.46	0.46	0.46
4	Clear	8 argon	4	Clear	0.26	0.26	0.31	0.85	0.85	0.85	0.85	0.85	0.85
4	Clear	10 argon	4	Clear	0.26	0.26	0.32	0.85	0.85	0.85	0.85	0.85	0.85
5	Grey	12 argon	4	Clear	0.26	0.27	0.32	0.58	0.58	0.58	0.58	0.58	0.58
5	Evergreen	12 argon	4	Clear	0.26	0.27	0.32	0.53	0.53	0.53	0.53	0.53	0.53
4	Clear	12	4	Clear Low E	0.31	0.31	0.39	0.8	0.8	0.8	0.8	0.8	0.8
6	Solar Low E	12	4	Clear	0.29	0.29	0.36	0.59	0.59	0.59	0.59	0.59	0.59
5	Grey	12	4	Clear Low E	0.31	0.31	0.39	0.52	0.52	0.52	0.52	0.52	0.52
5	Evergreen	12	4	Clear Low E	0.31	0.31	0.39	0.47	0.47	0.47	0.47	0.47	0.47
4	Clear	10 argon	4	Clear Low E	0.32	0.32	0.41	0.8	0.8	0.8	0.8	0.8	0.8
5	Grey	12 argon	4	Clear Low E	0.32	0.33	0.41	0.51	0.51	0.51	0.51	0.51	0.51

Note

- 1 For single glazing the Low E coated surface is on one side of the building.
- 2 For an IGU the Low E coating is on surface 2 if an outer pane and surface 3 of the IGU if an inner pane
- 3 The performance of the units containing argon gas is based on the cavity having a 90% argon/10% air mix

Thermal performance of windows and doors is a complex calculation based upon the frame, sash, panel and glazing performance of each unit. Additionally wide disparity in thermal performance is likely to exist between each unit due to size and configuration.

As a result we do not have accurate thermal performance test information for a wide range of configurations or sizes.

However Wanz has done testing and the following represents generic window analysis based upon tests conducted and published as Window Energy Rating System (WERS). This data has subsequently been cited in NZ4218:2009.

Shading Coefficient (SC COG)

The ratio of the total solar heat gain through a particular glass compared to the total solar heat gain through 3mm clear float glass. (86%) The shading coefficient of 3mm clear float by definition is 1.0 and represents a base glass performance. The lower the shading coefficient the less heat gain and thus more shading is provided by the glass. The shading coefficient is calculated as $SC = SHGC/0.86$

In areas such as Northland you would expect to see a higher use to tinted glass which reduces the heat gain on particularly western and northern glazed aspects. In the South Island you would expect to see a lower use of tinted glass to allow greater heat gain from the sun in a cooler climate.

R Value (R Window)

The R value is the value of thermal resistance of a building element which is the sum of the surface resistances on each side plus each component of a building element. It is the inverse of the U value $R=1/U$ and is expressed as $m^2 C/W$

R Window is the R value measure when measured within a window frame. Different frame types having a different influence on overall thermal performance.

In cooler climates or areas where heating is required more frequently having a higher R window value provides greater insulation protection.