ALUWOOD
WINDOWS & DOORS

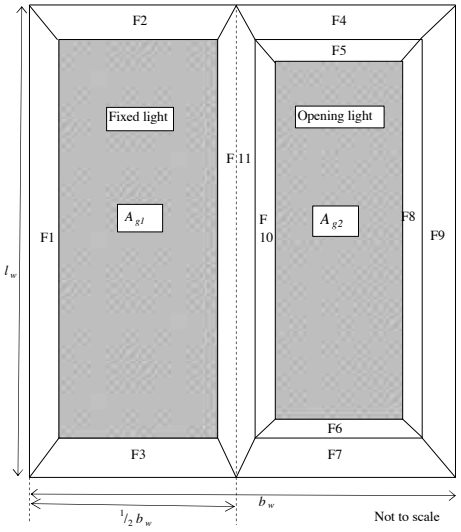
Project details AluWood

1.19 Centre Pane (G Glass = .71) Swisspacer

Input Values: **Yellow input, green intermediary,blue finals**

X' DP is no.of decimal points to enter

All F values to nearest 0.0005



Parameter		Symbol		Units	
Total window height2*DP(3DP?)*		l_w	1.48	m	
Total window width *2DP(3DP?)*		b_w	1.23	m	
	F1 fixed jamb (b_f)		0.054	m	
	F2 fixed head (b_f)		0.054	m	
	F3 fixed sill (b_f)		0.054	m	Total
Sash head (F4+F5)	F4 fixed (b_f)		0.054	m	0.1
	F5 moving (b_f)		0.046	m	
Sash sill (F6+F7)	F7 fixed (b_f)		0.054	m	0.1
	F6 moving (b_f)		0.046	m	
Sash jamb (F8+F9)	F8 moving (b_f)		0.046	m	0.1
	F9 fixed (b_f)		0.054	m	
Mullion	F10 moving (b_f)		0.054	m	0.142
	F11 fixed(b_f)		0.088	m	
Gaskets or beading protrusion *3DP*			0.003	m	

			b_p (m)
F1 fixed frame conductance	$L_f{}^{2D}$	0.2756	0.190
F2 fixed head conductance		0.2756	0.190
F3 fixed sill conductance		0.2756	0.190
F4+F5 sash head conductance		0.3447	0.190
F6+F7 sash sill conductance		0.3447	0.190
F8+F9 sash jamb conductance		0.3447	0.190
F10+F11 mullion conductance		0.5904	0.380
***All* L *values to 4DP.* All b values to nearest 0.001**			b_g (m)
F1 fixed frame conductance	$L_?{}^{2D}$	0.3281	0.190
F2 fixed head conductance		0.3281	0.190
F3 fixed sill conductance		0.3281	0.190
F4+F5 sash head conductance		0.3986	0.190
F6+F7 sash sill conductance		0.3986	0.190
F8+F9 sash jamb conductance		0.3986	0.190
F10+F11 mullion conductance		0.6980	0.380

W/(m·K) ⟺

Where a U_w value from hot box testing is available, no $L_f{}^{2D}$ or $L_?{}^{2D}$ values need to be entered

Thermal transmittance of window from hot box testing-***2DP***	U_w		W/(m²·K)
To nearest 0.05			

Glazing dimensions and properties			
All to 3DP Thickness of pane 1		0.004	m
Pane1/2 distance		0.02	
Thickness of pane 2		0.004	
Pane2/3 distance			
Thickness of pane 3			
Thermal transmittance of glazing-***2DP***	U_g	1.19	W/(m²·K)
Glazing solar factor, *g*-value-***2DP***	$g_.$	0.71	
Window air leakage at 50 Pa per hour and per unit length of opening light (BS 6375-1)-***2DP***		0.06	m³/(m·h)
To nearest 0.05		0.05	m³/(m·h)
Window air leakage at 50 Pa per hour and per unit area (for GGF window)-***2DP***			$m^3/(h{\cdot}m^2)$
To nearest 0.05			$m^3/(h{\cdot}m^2)$

Window Dimensions:

Section	Length (m)	Width (m)	Area (m^2)
Fixed light	1.3720	0.5170	0.7093
Opening light	1.2800	0.4170	0.5338
Total glazing, A_g			1.2431
Frame			
F2	0.6150	0.0540	0.0306
F3	0.6150	0.0540	0.0306
F1	1.4800	0.0540	0.0770
F4	0.6150	0.0540	0.0306
F5	0.5170	0.0460	0.0215
F7	0.6150	0.0540	0.0306
F6	0.5170	0.0460	0.0215
F8	1.3720	0.0460	0.0610
F9	1.4800	0.0540	0.0770
F10	1.3720	0.0540	0.0716
F11	1.4800	0.0880	0.1255
Total Frame			0.5773
Total Window, A_w			1.820400

Visible glass area (Ag)	1.22150
Percentage glass area	67.10%

Solar Factor, *g*-value:

F_w =	0.9
g_w =	0.43

BFRC Rating kWh/(m^2 yr)	EWER Rating Scale
= 0	A
-10 to <-0	B
-20 to <-10	C
-30 to <-20	D
-50 to < -30	E
-70 to < -50	F
<-70	G

Frame: Data from EN.673. *Ug and* e to **2DP**. Keff to **4DP. All d to nearest 0.0001m**

Section	b_f (m)	U_f W/(m²·K)	Frame areas m²	Heat flow W/K	? W/(m·K)	l_g (m)	Heat flow W/K
F1 fixed frame	0.054	1.4764	0.0770	0.1137	0.0220	1.372	0.0302
F2 fixed head	0.054	1.4764	0.0306	0.0451	0.0220	0.517	0.0114
F3 fixed sill	0.054	1.4764	0.0306	0.0451	0.0220	0.517	0.0114
F4+F5 sash head	0.1	1.4882	0.0520	0.0775	0.0240	0.417	0.0100
F6+F7 sash sill	0.1	1.4882	0.0520	0.0775	0.0240	0.417	0.0100
F8+F9 sash jamb	0.1	1.4882	0.1380	0.2054	0.0240	1.28	0.0307
F10+F11 mullion	0.142	1.3989	0.1971	0.2757	0.0470	1.326	0.0623
		Totals	0.5773	0.8399		Total	0.1660

U_w = 1.37 W/(m²·K)

Other parameters needed for calculation, taken from simulations:

Panel thickness, $d_p = d_g$ = 0.028 m

λ_p =	0.035	W/(m·K)	R_p =	0.8000	m^2K /W
R_{se} =	0.04	m^2K/ W	R_{si} =	0.13	m^2K /W
R_{tot} =	0.9700	m^2K/ W	U_p =	1.0309	W/(m²·K)

Air Leakage Loss:

Total air leakage=	0.19	m^3/h
L_{50} =	0.10	$m^3/(m^2.h)$
Heat loss = 0.0165 L_{50}		
0.00		W/(m^2K)

Opening light length(internal)

3.778 m

BFRC Rating = 218.6g_{window} - 68.5 x (U_{window} + Effective L_{50}) = 0.15

Window Rating		**A**
Labelling index, kWh/(m^2yr)		**0**
Thermal transmittance, W/(m^2·K)	U_{window}	**1.4**
Solar factor	g_{window}	**0.43**
Window air leakage heat loss, W/(m^2K)	L_{factor}	**0.00**

British Fenestration Rating Council