



Glazing dimensions and properties			
All to 3DP Thickness of pane 1			
	0.004		m
Pane1/2 distance	0.012		
Thickness of pane 2	0.004		
Pane2/3 distance	0.012		
Thickness of pane 3	0.004		
Thermal transmittance of glazing-2DP	U_g 0.743	W/(m ² ·K)	
Glazing solar factor, g-value-2DP	g 0.6		
Window air leakage at 50 Pa per hour and per unit length of opening light (BS 6375-1)-2DP	0.06	m ³ /(m·h)	
	To nearest 0.05	0.05	m ³ /(m·h)
Window air leakage at 50 Pa per hour and per unit area (for GGF window)-2DP			m ³ /(h·m ²)
	To nearest 0.05		m ³ /(h·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	0.6170	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 (A_g)	1.22150
Percentage glass area	67.10%

Solar Factor, g-value:	
F_w	0.9
g_w	0.36

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

Project details

Design 5 Uni
0.743 Centre Pane Swisspacer

Input Values:

Yellow input, green intermediary, blue finals
X' DP is no. of decimal points to enter

Parameter Symbol Units

All F values to nearest 0.0005

Total window height 2DP(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
	F5 moving (b _f)	0.046	
Sash sill (F6+F7)	F7 fixed (b _f)	0.054	m
	F6 moving (b _f)	0.046	
Sash jamb (F8+F9)	F8 moving (b _f)	0.046	m
	F9 fixed (b _f)	0.054	
Mullion	F10 moving (b _f)	0.054	m
	F11 fixed(b _f)	0.088	
Gaskets or beading protrusion 3DP		0.003	m

b _p (m)			
F1 fixed frame conduction	L_f^{2D}	0.2343	0.190
F2 fixed head conduction		0.2343	0.190
F3 fixed sill conduction		0.2343	0.190
F4+F5 sash head conduction		0.3008	0.190
F6+F7 sash sill conduction		0.3008	0.190
F8+F9 sash jamb conduction		0.3008	0.190
F10+F11 mullion conduction		0.5061	0.380

All L values to 4DP. All b values to nearest 0.001			
F1 fixed frame conduction	L_f^{2D}	0.1925	0.190
F2 fixed head conduction		0.1925	0.190
F3 fixed sill conduction		0.1925	0.190
F4+F5 sash head conduction		0.2588	0.190
F6+F7 sash sill conduction		0.2588	0.190
F8+F9 sash jamb conduction		0.2588	0.190
F10+F11 mullion conduction		0.4227	0.380

Where a U_w value from hot box testing is available, no L_f^{2D} or L_f^{2D}

values need to be entered

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

Frame: Data from EN.673. U_g and e to 2DP. K_{eff} to 4DP. All d to nearest 0.0001m

Section	b_f (m)	U_f W/(m ² ·K)	Frame areas m ²	Heat flow W/K	?	I_g (m)	Heat flow W/K
F1 fixed frame	0.054	1.4033	0.0770	0.1081	-0.0240	1.372	-0.0329
F2 fixed head	0.054	1.4033	0.0306	0.0429	-0.0240	0.517	-0.0124
F3 fixed sill	0.054	1.4033	0.0306	0.0429	-0.0240	0.517	-0.0124
F4+F5 sash head	0.1	1.4228	0.0520	0.0740	-0.0250	0.417	-0.0104
F6+F7 sash sill	0.1	1.4228	0.0520	0.0740	-0.0250	0.417	-0.0104
F8+F9 sash jamb	0.1	1.4228	0.1380	0.1963	-0.0250	1.28	-0.0320
F10+F11 mullion	0.142	1.3314	0.1971	0.2624	-0.0490	1.326	-0.0650
Totals			0.5773	0.8007		Total	-0.1756

$U_w = 0.85$ W/(m²·K)

Other parameters needed for calculation, taken from simulations:	
Panel thickness, $d_p = d_g$	0.036 m
I_p	0.035 W/(m·K)
R_{se}	0.04 m ² ·K/W
R_{so}	1.1986 m ² ·K/W
	$R_p = 1.0286$ m ² ·K/W
	$R_{si} = 0.13$ m ² ·K/W
	$U_p = 0.8343$ W/(m ² ·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 ² ·K)

Opening light length(internal)	
	3.778 m

BFRC Rating = 218.6g window - 68.5 x (U_{window} + Effective L_{50}) = 20.47

Window Rating	A
Labelling index, kWh/(m ² ·yr)	20
Thermal transmittance, W/(m ² ·K)	U_{window} 0.9
Solar factor	g_{window} 0.36
Window air leakage heat loss, W/(m ² ·K)	L_{factor} 0.00

