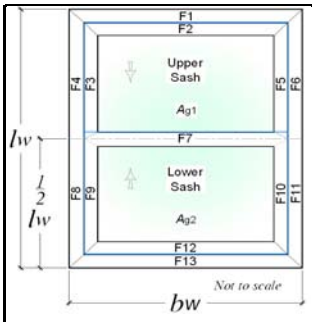

Sample Style:

Vertical Sliding Sash

Blue line illustrates opening light length (air leakage)

Report Number: VS078
Report Date: 4th November 2011
Report Issue No.14 *(15/07/11)*

Project Details: SG Diamant/Argon/Swisspacer V/SG Planitherm Total+/ Polysulphide Sealant - Steel/Aluminium

THIS SPREADSHEET IS THE PROPERTY OF THE BFRC AND CAN ONLY BE USED IN CONJUNCTION WITH A BFRC LICENCE APPLICATION

Input Values:
Yellow input, green intermediary, blue finals — X' DP is no.of decimal place to enter

Parameter	*Symbol*		*Units*
Total window height ***0DP***	l_w	1480	mm
Total window width ***0DP***	b_w	1230	mm

Nominal 4mm etc to ***0DP***, others ***1DP***

Glazing dimensions and properties:		
Thickness of pane 1, d_{p1}	**4.0**	mm
Glazing fill thickness 1/2, d_{gf1}	**16.0**	mm
Gas fill (1/2)	**Argon 90%**	
Thickness of pane 2, d_{p2}	**4.0**	mm
Complete next 3 cells for TG IGU		
Glazing fill thickness 2/2, d_{gf2}		mm
Gas fill (2/3)		
Thickness of pane 3, d_{p3}		mm
Glazing Trans. - ***3DP*** U_g	**1.195**	W/(m²·K)
g-value - ***2DP*** $g_\perp$	**0.74**	

Thermal transmittance of window from hot box test
U_w - 2DP — W/(m²·K)

Window Dimensions:			Area, A	
	Length, l	Width, b	No gasket	With gasket
Section	m	m	m²	m²
Upper glazing	0.5910	1.0020	0.5922	0.5922
Lower glazing	0.5980	1.0020	0.5992	0.5992
Total of glazing			1.1914	1.1914
Frame	m	m	m²	m²
F1	1.2300	0.0540	0.0635	0.0635
F2	1.1220	0.0600	0.0637	0.0637
F3	0.6860	0.0600	0.0383	0.0383
F4	0.7400	0.0540	0.0385	0.0385
F5	0.6860	0.0600	0.0383	0.0383
F6	0.7400	0.0540	0.0385	0.0385
F7	1.1220	0.0700	0.0743	0.0743
F8	0.7400	0.0540	0.0385	0.0385
F9	0.6850	0.0600	0.0385	0.0385
F10	0.6850	0.0600	0.0385	0.0385
F11	0.7400	0.0540	0.0385	0.0385
F12	1.1220	0.0520	0.0552	0.0552
F13	1.2300	0.0550	0.0647	0.0647
Total Frame			0.6290	0.6290
Total Window, Aw			1.8204	1.8204
Percentage upper glass area			32.53%	32.53%
Percentage lower glass area			32.92%	32.92%
Percentage glass area (total)			65.45%	65.45%

Solar Factor, *g*-value:		
glazing area A_g (m²)		1.3104
F_w		0.9
g_w		0.48

U_{window}	U_w	1.49	W/(m²·K)

Frame dimensions (All frame values to nearest 0.5mm, gaskets to 1DP)		Frame height, b_f (mm) Combo	Internal	External	Gasket protrusion (mm)	With gasket (mm)	Total
F1 fixed top rail		114.0	54.0	69.5	n/a	54.0	114.0
F2 moving top rail			60.0	44.5	**0.0**	60.0	
F3 top (LH) jamb (moving sash)		114.0	60.0	44.5	**0.0**	60.0	114.0
F4 top (LH) jamb (fixed frame)			54.0	69.5	n/a	54.0	
F5 top (RH) jamb (moving sash)		114.0	60.0	44.5	0.0	60.0	114.0
F6 top (RH) jamb (fixed frame)			54.0	69.5	n/a	54.0	
F7 mid rail	(upper)		70.0		**0.0**	70.0	70.0
	(lower)				**0.0**		
F8 bottom (LH) jamb (fixed frame)		114.0	54.0	69.5	n/a	54.0	114.0
F9 bottom (LH) jamb (moving sash)			60.0	44.5	**0.0**	60.0	
F10 bottom (RH) jamb (moving sash)		114.0	60.0	44.5	0.0	60.0	114.0
F11 bottom (RH) jamb (fixed frame)			54.0	69.5	n/a	54.0	
F12 bottom moving rail			52.0		**0.0**	52.0	107.0
F13 bottom fixed rail			55.0		n/a	55.0	
				Total gasket area	0	m²	

Where a *Uw* value from hot box testing is available, no L_f^{2D} or L_ψ^{2D} values need to be entered

Frame conductance:		All *L* values to ***4DP***. All b values to ***0DP***				
		W/(m·K)	b_p (mm)		W/(m·K)	b_g (mm)
F1+F2 top rail		**0.4146**	**190**		**0.4426**	190
F3+F4 top (LH) jamb		**0.4146**	190		**0.4426**	190
F5+F6 top (RH) jamb		0.4146	190		0.4426	190
F7 mid rail	L_f^{2D}	**0.5935**	380	L_ψ^{2D}	**0.6554**	380
F8+F9 bottom (LH) jamb		**0.4139**	190		**0.4432**	190
F10+F11 bottom (RH) jamb		0.4139	190		0.4432	190
F12+F13 bottom rail		**0.4400**	190		**0.4678**	190

Frame:	b_f	U_f	A_f (no gasket)	Frame heat, HU	Ψ	l_g	Junction heat,Hψ
Section	m	W/(m²·K)	m²	W/K	W/(m·K)	m	W/K
F1+F2 top rail	0.1140	1.6892	0.1272	0.2149	0.0230	1.0020	0.0230
F3+F4 top left jamb	0.1140	1.6892	0.0768	0.1297	0.0230	0.5910	0.0136
F5+F6 top right jamb	0.1140	1.6892	0.0768	0.1297	0.0230	0.5910	0.0136
F7 mid rail	0.0700	2.1347	0.0743	0.1587	0.0519	1.0020	0.0520
F8+F9 btm left jamb	0.1140	1.6830	0.0770	0.1295	0.0243	0.5980	0.0145
F10+F11 btm right jamb	0.1140	1.6830	0.0770	0.1295	0.0243	0.5980	0.0145
F12+F13 bottom rail	0.1070	2.0370	0.1199	0.2442	0.0228	1.0020	0.0228
		Totals	0.6290	1.1364		Total	0.1541

Air Leakage loss:

Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - ***2DP***				0.25	m³/(m·h)
Opening light length, $l_{opening}$	6.3840	m	Total air leakage	1.596	m³/h
L_{50}	0.88	m³/(m²·h)	Heat loss = 0.0165 L_{50}	0.01	W/(m²·K)

Other parameters needed for calculation, taken from simulations:										
Glazing: Panel thickness, $d_p = d_g$ =	0.024	m	λ_p =	0.035	W/(m·K)	R_{se} =	0.04	m²·K /W	R_{se} =	0.13	m²·K /W
			R_p =	0.6857	m²·K /W	R_{tot} =	0.8557	m²·K/ W	U_p =	1.1686	W/(m²·K)

BFRC Rating kWh/(m²·yr)	Label index	EWER Rating Scale	Window Rating
≥ 0 ⇦	2	⇨ A ⇦	A
-10 to <0		B	
-20 to <-10		C	
-30 to <-20		D	
-50 to <-30		E	
-70 to <-50		F	
<-70		G	

BFRC Rating =	
218.6g_{window} - 68.5 x (U_{window} + Effective L_{50}) =	**2.18**
Climate zone is:	**UK**

Thermal transmittance, W/(m²·K)	U_{window}	**1.5**
Solar factor	g_{window}	**0.48**
Window air leakage heat loss, W/(m²·K)	L_{factor}	**0.01**

British Fenestration Rating Council

BFRC Certified Simulator 023

Simulator Name: Philip Parry