



Report Number: **D00667** Issue 2.7: 04/01/2016  
 Report Date: **09 March 2023**  
 Project Details: **O/O Sculp Energy+, Optifloat, Argon, K glass S, Swiss Ultimate, Butyl, LSW017 Threshold**

**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 places to enter

Parameter	Symbol	Units
Total door height <b>ODP</b>	$l_d$	2180 mm
Total door width <b>ODP</b>	$b_d$	2000 mm

Frame offset: **No**

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

**Glazing dimensions and properties:**

Thickness of pane 1	<b>4</b>	mm
Pane 1/2 distance	<b>20</b>	mm
Gas fill (1/2)	<b>Argon 90%</b>	
Thickness of pane 2	<b>4</b>	mm
Complete next 3 cells for TG IGU		
Pane 2/3 distance		mm
Gas fill (2/3)		
Thickness of pane 3		mm
Glazing Trans. - <b>3DP</b>	$U_g$ <b>1.219</b>	W/(m <sup>2</sup> ·K)
g-value - <b>2DP</b>	$g_L$ <b>0.71</b>	

Thermal transmittance of door from hot box test  
 $U_{d-2dp}$  W/(m<sup>2</sup>·K)

**Door Dimensions:**

Section	Length (m)	Width (m)	Area	
			No gasket (m <sup>2</sup> )	With gasket (m <sup>2</sup> )
Left Opening light	1.8680	0.7315	1.3664	1.3664
Right Opening light	1.8680	0.7315	1.3664	1.3664
Total glazing, $A_g$			2.7329	2.7329
Frame	(m)	(m)	(m <sup>2</sup> )	(m <sup>2</sup> )
F1	1.0000	0.0490	0.0478	0.0478
F2	0.9510	0.1070	0.0900	0.0900
F3	2.1800	0.0490	0.1044	0.1044
F4	2.0820	0.1070	0.2113	0.2113
F5	1.0000	0.0490	0.0478	0.0478
F6	0.9510	0.1070	0.0900	0.0900
F7	2.0820	0.2250	0.4444	0.4444
F8	1.0000	0.0490	0.0478	0.0478
F9	0.9510	0.1070	0.0900	0.0900
F10	2.1800	0.0490	0.1044	0.1044
F11	2.0820	0.1070	0.2113	0.2113
F12	1.0000	0.0490	0.0478	0.0478
F13	0.9510	0.1070	0.0900	0.0900
Total Frame			1.6271	1.6271
Total door, $A_d$			4.3600	4.3600
Percentage left light glass area			31.34%	31.34%
Percentage right light glass area			31.34%	31.34%
Percentage glass area (total)			62.68%	62.68%
<b>Solar Factor, g-value:</b>			$F_d$ <b>0.9</b>	
			$g_d$ <b>0.40</b>	

**Frame dimensions: All frame values to nearest 1mm, gaskets to 1DP**

	Frame heights, (b <sub>f</sub> )	Without gasket (mm)	Gasket protrusion (mm)	With gasket (mm)	Total (mm)
F1 + F2 left head rail	F1 left fixed head	<b>49</b>	n/a	49.0	156.0
	F2 left opening head	<b>107</b>		107.0	
F3 + F4 left jamb	F3 left fixed jamb	<b>49</b>	n/a	49.0	156.0
	F4 left opening jamb	<b>107</b>		107.0	
F5 +F6 left threshold	F5 left fixed threshold	<b>49</b>	n/a	49.0	156.0
	F6 left opening threshold	<b>107</b>		107.0	
F7 Meeting Stile	F7 Meeting Stile	<b>225</b>		225.0	
F8 + F9 right head rail	F8 right fixed head	<b>49</b>	n/a	49.0	156.0
	F9 right opening head	<b>107</b>		107.0	
F10 + F11 right jamb	F10 right fixed jamb	<b>49</b>	n/a	49.0	156.0
	F11 right opening jamb	<b>107</b>		107.0	
F12 + F13 right threshold	F12 right fixed threshold	<b>49</b>	n/a	49.0	156.0
	F13 right opening threshold	<b>107</b>		107.0	
Total gasket area				0	m <sup>2</sup>

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

**Frame conductance:**

Section	All L values to <b>4DP</b> . All b values to <b>ODP</b>		$L_\psi^{2D}$	$W/(m \cdot K)$	$b_g$ (mm)
	$L_f^{2D}$	$b_f$ (mm)			
F1 + F2 left head rail	<b>0.3947</b>	<b>190</b>	$L_\psi^{2D}$	<b>0.4536</b>	<b>190</b>
F3 + F4 left jamb	<b>0.4193</b>	190		<b>0.4817</b>	190
F5 +F6 left threshold	<b>0.3947</b>	190		<b>0.4536</b>	190
F7 Meeting Stile	<b>0.7557</b>	380		<b>0.8742</b>	380
F8 + F9 right head rail	<b>0.3947</b>	190		<b>0.4536</b>	190
F10 + F11 right jamb	<b>0.4193</b>	190		<b>0.4817</b>	190
F12 + F13 right threshold	<b>0.3947</b>	190		<b>0.4536</b>	190
Totals	1.6271	2.3255		Total	0.2553

**Frame:**

Section	Frame width, b <sub>f</sub> (m)	Frame U-value, U <sub>f</sub> (W/(m <sup>2</sup> ·K))	Frame area (no gaskets), A <sub>f</sub> (m <sup>2</sup> )	Frame heat flow, HU (W/K)	Linear trans, $\psi$ (W/(m·K))	Linear length, l <sub>g</sub> (m)	Junction heat flow, H <sub>ψ</sub> (W/K)
F1 + F2 left head rail	0.1560	1.2744	0.1378	0.1756	0.0232	0.7315	0.0170
F3 + F4 left jamb	0.1560	1.4319	0.3157	0.4521	0.0267	1.8680	0.0498
F5 +F6 left threshold	0.1560	1.2744	0.1378	0.1756	0.0232	0.7315	0.0170
F7 Meeting Stile	0.2250	1.6175	0.4444	0.7188	0.0470	1.8680	0.0879
F8 + F9 right head rail	0.1560	1.2744	0.1378	0.1756	0.0232	0.7315	0.0170
F10 + F11 right jamb	0.1560	1.4319	0.3157	0.4521	0.0267	1.8680	0.0498
F12 + F13 right threshold	0.1560	1.2744	0.1378	0.1756	0.0232	0.7315	0.0170
Totals				2.3255	Total	0.2553	

Other parameters needed for calculation, taken from simulations:

$\lambda_p = 0.035$  W/(m·K)  $R_{se} = 0.04$  m<sup>2</sup>·K/W  $R_p = 0.8000$  m<sup>2</sup>·K/W  $R_{tot} = 0.9700$  m<sup>2</sup>·K/W

$d_p = d_g = 0.028$  m  $R_{se} = 0.13$  m<sup>2</sup>·K/W  $U_p = 1.0309$  W/(m<sup>2</sup>·K)

**U<sub>door</sub>**

No bars; or attached bars	<b>1.36</b>	<b>W/(m<sup>2</sup>·K)</b>
Single cross bar in IGU	<b>1.5</b>	
Multiple cross bar in IGU	<b>1.6</b>	
Glazing bar (Georgian bar)	<b>1.8</b>	

**Air Leakage loss:**

Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - **2DP**

Opening light length	10.0500 m	Total air leakage	<b>1.307</b> m <sup>3</sup> /h
$L_{50}$	<b>0.30</b> m <sup>3</sup> /(m <sup>2</sup> ·h)	Heat loss = 0.0165 $L_{50}$	<b>0.00</b> W/(m <sup>2</sup> ·K)

**Energy Door**  
Energy Index

**-6**

Door Rating

**B**

**BFRC Rating**  
kWh/(m<sup>2</sup>·yr)

- ≥ 20 **A** ++
- >10 to 20 **A** +
- 0 to <80 **A**
- 10 to <0 **B** ✓
- 20 to <-10 **C**
- 30 to <-20 **D**
- 50 to <-30 **E**

**BFRC Rating =**  
 $218.6g_d - 68.5 \times (U_d + \text{Effective } L_{50}) =$  **-5.67**

Climate zone is: **UK**

Thermal transmittance, W/(m <sup>2</sup> ·K)	$U_{door}$	<b>1.4</b>
Solar factor	$g_{door}$	<b>0.40</b>
Door air leakage heat loss, W/(m <sup>2</sup> ·K)	$L_{factor}$	<b>0.00</b>

Simulator Name: **Andy Gibson**

**BFRC**

BFRC Certified Simulator No

**018**