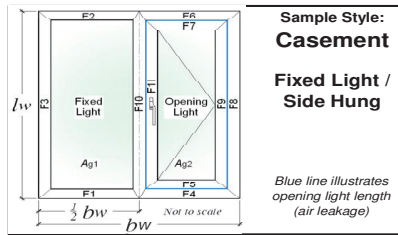


# BFRC Spreadsheet



Report Number: **U10351-1** Issue No.21: 04/03/2009  
 Report Date: **12 October 2010**  
 Project Details: **Rehau Tritec IG C5**

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

Parameter	Symbol	Units
Total window height <b>ODP</b>	$l_w$	1480 mm
Total window width <b>ODP</b>	$b_w$	1230 mm

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

**Glazing dimensions and properties:**

Thickness of pane 1	4	mm
Pane 1/2 distance	16	mm
Gas fill (1/2)	Argon 90%	
Thickness of pane 2	4	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>	$U_g$	1.197 W/(m <sup>2</sup> -K)
<b>g</b> -value - <b>2DP</b>	$g_{\pm}$	0.71

**Thermal transmittance of window from hot box test**

$U_w - 2DP$		W/(m <sup>2</sup> -K)
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**Frame dimensions:**

	(b <sub>i</sub> )	Without gasket		With gasket		
		(mm)	(mm)	(mm)	(mm)	
All frame values to nearest 0.5mm, gaskets to <b>1DP</b>	F1 fixed sill	62	1.0	63		Total
	F2 fixed head	62	1.0	63		
	F3 fixed jamb	62	1.0	63		
F4 + F5 sash sill	F4 fixed sash sill	62	n/a	62		107
	F5 moving sash sill	44	1.0	45		
F6 + F7 sash head	F6 fixed sash head	62	n/a	62		107
	F7 moving sash head	44	1.0	45		
F8 + F9 sash jamb	F8 Fixed sash jamb	62	n/a	62		107
	F9 moving sash jamb	44	1.0	45		
F10 + F11 mullion	F10 fixed mullion	70	1.0	71		116
	F11 moving mullion	44	1.0	45		
Total gasket area		0.007136		m <sup>2</sup>		

**Window Dimensions:**

Section	Length		Width		Area	
	(m)	(m)	(m)	(m)	No gasket (m <sup>2</sup> )	With gasket (m <sup>2</sup> )
Fixed Light	1.3560	0.5180	0.7024	0.6987		
Opening light	1.2680	0.4300	0.5452	0.5418		
Total glazing, A <sub>g</sub>					1.2476	1.2405
Frame	(m)	(m)	(m <sup>2</sup> )	(m <sup>2</sup> )		
F1	0.6150	0.0620	0.0351	0.0356		
F2	0.6150	0.0620	0.0351	0.0356		
F3	1.4800	0.0620	0.0879	0.0893		
F4	0.6150	0.0620	0.0351	0.0351		
F5	0.5180	0.0440	0.0209	0.0213		
F6	0.6150	0.0620	0.0351	0.0351		
F7	0.5180	0.0440	0.0209	0.0213		
F8	1.4800	0.0620	0.0879	0.0879		
F9	1.3560	0.0440	0.0577	0.0590		
F10	1.4800	0.0700	0.0993	0.1006		
F11	1.3560	0.0440	0.0577	0.0590		
Total Frame					0.5728	0.5799
Total Window, A <sub>w</sub>					1.8204	1.8204
Percentage fixed light glass area					38.59%	38.38%
Percentage opening light glass area					29.95%	29.77%
Percentage glass area (total)					68.54%	68.15%

Where a  $U_g$  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>	
	$L_{f,2D}$ (W/(m <sup>2</sup> -K))	$b_g$ (mm)	$L_{\psi,2D}$ (W/(m <sup>2</sup> -K))	$b_g$ (mm)
F1 fixed sill	0.3236	190	0.3997	190
F2 fixed head	0.3236	190	0.3997	190
F3 fixed jamb	0.3236	190	0.3997	190
F4 + F5 sash sill	0.4065	190	0.4814	190
F6 + F7 sash head	0.4065	190	0.4814	190
F8 + F9 sash jamb	0.4065	190	0.4814	190
F10 + F11 mullion	0.6399	380	0.7886	380

**Frame:**

Section	$b_f$ (no gaskets) (m)	$U_f$ (W/(m <sup>2</sup> -K))	Frame areas (no gaskets) (m <sup>2</sup> )	Heat flow (W/K)	$\psi$ (W/(m <sup>2</sup> -K))	$l_g$ (m)	Heat flow (W/K)
F1 fixed sill	0.0620	1.6381	0.0351	0.0575	0.0707	0.5180	0.0366
F2 fixed head	0.0620	1.6381	0.0351	0.0575	0.0707	0.5180	0.0366
F3 fixed jamb	0.0620	1.6381	0.0879	0.1440	0.0707	1.3560	0.0959
F4 + F5 sash sill	0.1060	1.7402	0.0560	0.0974	0.0695	0.4300	0.0299
F6 + F7 sash head	0.1060	1.7402	0.0560	0.0974	0.0695	0.4300	0.0299
F8 + F9 sash jamb	0.1060	1.7402	0.1456	0.2535	0.0695	1.2680	0.0881
F10 + F11 mullion	0.1140	1.7178	0.1570	0.2697	0.1379	1.3120	0.1809
Totals		0.5728	0.9770			Total	0.4980

**Solar Factor, g-value:**

$F_w$	0.9
$g_w$	0.44

**Air Leakage loss:**

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

Opening light length	3.7480	m	Total air leakage	0.112	m <sup>3</sup> /h
$L_{50}$	0.06	m <sup>3</sup> /(m <sup>2</sup> -h)	Heat loss = 0.0165 $L_{50}$	0.00	W/(m <sup>2</sup> -K)

Other parameters needed for calculation, taken from simulations:

Panel thickness, $d_p = d_g =$	0.024	m	$\lambda_p =$	0.035	W/(m <sup>2</sup> -K)	$R_{se} =$	0.04	m <sup>2</sup> -K/W	$R_{sp} =$	0.13	m <sup>2</sup> -K/W
			$R_p =$	0.6857	m <sup>2</sup> -K/W	$R_{tot} =$	0.8557	m <sup>2</sup> -K/W	$U_p =$	1.1686	W/(m <sup>2</sup> -K)

BFRC Rating kWh/(m <sup>2</sup> -yr)	Label index	EWER Rating Scale	Window Rating
≥ 0	<b>-15</b>	<b>A</b>	<b>C</b>
-10 to <0		<b>B</b>	
-20 to <-10		<b>C</b>	
-30 to <-20		<b>D</b>	
-50 to <-30		<b>E</b>	
-70 to <-50		<b>F</b>	
<-70		<b>G</b>	

**BFRC Rating =**

218.6g<sub>window</sub> - 68.5 x (U<sub>window</sub> + Effective L<sub>50</sub>) = **-15.47**

Climate zone is: **UK**

Thermal transmittance, W/(m <sup>2</sup> -K)	$U_{window}$	<b>1.6</b>
Solar factor	$g_{window}$	<b>0.44</b>
Window air leakage heat loss, W/(m <sup>2</sup> -K)	$L_{factor}$	<b>0.00</b>



Simulator Name: **Clive Cox**

The legal validity of this report can only be claimed on presentation of the complete report with supporting electronic information.