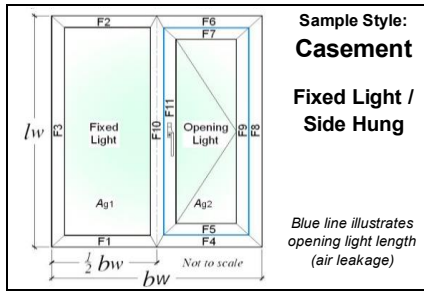


BFRC Spreadsheet



Sample Style:
Casement
Fixed Light / Side Hung

Blue line illustrates opening light length (air leakage)

Report Number: U20250-1
Report Date: 27 July 2020
Project Details: C70 Window - double glazed

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

Frame offset: **No**

Nominal 4mm etc to ODP , others 1DP	
Glazing dimensions and properties:	
Thickness of pane 1	4 mm
Pane 1/2 distance	20 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)	mm
Thickness of pane 3	mm
Glazing Trans. - 3DP	U_g 1.219 W/(m ² ·K)
g-value - 2DP	g_{\pm} 0.71

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

Window Dimensions:		Area		
Section	Length (m)	Width (m)	No gasket (m ²)	With gasket (m ²)
Fixed Light	1.3600	0.5200	0.7072	0.7072
Opening light	1.2660	0.4260	0.5393	0.5393
Total glazing, A_g			1.2465	1.2465
Frame	(m)	(m)	(m ²)	(m ²)
F1	0.6150	0.0600	0.0341	0.0341
F2	0.6150	0.0600	0.0341	0.0341
F3	1.4800	0.0600	0.0852	0.0852
F4	0.6150	0.0600	0.0341	0.0341
F5	0.5200	0.0470	0.0222	0.0222
F6	0.6150	0.0600	0.0341	0.0341
F7	0.5200	0.0470	0.0222	0.0222
F8	1.4800	0.0600	0.0852	0.0852
F9	1.3600	0.0470	0.0617	0.0617
F10	1.4800	0.0700	0.0994	0.0994
F11	1.3600	0.0470	0.0617	0.0617
Total Frame			0.5739	0.5739
Total Window, A_w			1.8204	1.8204
Percentage fixed light glass area			38.85%	38.85%
Percentage opening light glass area			29.63%	29.63%
Percentage glass area (total)			68.47%	68.47%

Solar Factor, g-value:	F_w	0.9
	g_w	0.44

U_{window}	No bars; or attached bars	1.35	W/(m ² ·K)
	Single cross bar in IGU	1.4	
	Multiple cross bar in IGU	1.5	
	Glazing bar (Georgian bar)	1.7	

Energy Window
Energy Index

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Window Rating

A

BFRC Rating
kWh/(m²·yr)

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

Parameter	Symbol	Units
Total window height ODP	l_w	1480 mm
Total window width ODP	b_w	1230 mm

Frame dimensions:		Frame width, b_f (mm)	Gasket protrusion, b_{gf} (mm)	Frame & gasket widths (mm)	
All frame values round to nearest 1mm, gaskets to 1DP	F1 fixed sill	60	0.0	60.0	Total
	F2 fixed head	60	0.0	60.0	
	F3 fixed jamb	60	0.0	60.0	
F4 + F5 sash sill	F4 fixed sash sill	60	n/a	60.0	107.0
	F5 moving sash sill	47	0.0	47.0	
F6 + F7 sash head	F6 fixed sash head	60	n/a	60.0	107.0
	F7 moving sash head	47	0.0	47.0	
F8 + F9 sash jamb	F8 Fixed sash jamb	60	n/a	60.0	107.0
	F9 moving sash jamb	47	0.0	47.0	
F10 + F11 mullion	F10 fixed mullion	70	0.0	70.0	117.0
	F11 moving mullion	47	0.0	47.0	
Total gasket area				0	m ²

Where a U_w value from hot box testing is available, no L_f^{2DP} or L_{ψ}^{2DP} values need to be entered							
Frame conductance:	All L values to 4DP . All b values to ODP						
		$W/(m^2 \cdot K)$	b_g (mm)	$W/(m^2 \cdot K)$	b_g (mm)	$W/(m^2 \cdot K)$	b_g (mm)
F1 fixed sill	0.2652	190	0.3262	190	0.3262	190	
F2 fixed head	0.2652	190	0.3262	190	0.3262	190	
F3 fixed jamb	0.2652	190	0.3262	190	0.3262	190	
F4 + F5 sash sill	0.3417	190	0.4028	190	0.4028	190	
F6 + F7 sash head	0.3417	190	0.4028	190	0.4028	190	
F8 + F9 sash jamb	0.3417	190	0.4028	190	0.4028	190	
F10 + F11 mullion	0.5536	380	0.6764	380	0.6764	380	

Frame:	Frame width, b_f (m)	Frame U -value, U_f (W/(m ² ·K))	Frame area, A_f (m ²)	Frame heat flow, H_U (WK)	Linear trans, ψ (W/(m·K))	Linear length, l_g (m)	Junction heat flow, H_{ψ} (WK)
F1 fixed sill	0.0600	1.1554	0.0341	0.0393	0.0253	0.5200	0.0131
F2 fixed head	0.0600	1.1554	0.0341	0.0393	0.0253	0.5200	0.0131
F3 fixed jamb	0.0600	1.1554	0.0852	0.0984	0.0253	1.3600	0.0344
F4 + F5 sash sill	0.1070	1.3628	0.0563	0.0767	0.0254	0.4260	0.0108
F6 + F7 sash head	0.1070	1.3628	0.0563	0.0767	0.0254	0.4260	0.0108
F8 + F9 sash jamb	0.1070	1.3628	0.1469	0.2002	0.0254	1.2660	0.0321
F10 + F11 mullion	0.1170	1.3833	0.1611	0.2229	0.0513	1.3130	0.0674
Totals				0.5739	0.7536		0.1818

Other parameters needed for calculation, taken from simulations:

$d_p = d_g = 0.028$ m
 $\lambda_p = 0.035$ W/(m·K) $R_{se} = 0.04$ m²·K/W $R_{se} = 0.13$ m²·K/W
 $R_p = 0.8000$ m²·K/W $R_{tot} = 0.9700$ m²·K/W $U_p = 1.0309$ W/(m²·K)

Air Leakage loss:			
Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - 2DP			
Opening light length	3.7600 m	Total air leakage	0.02 m ³ /(m ² ·h)
L_{50}	0.04 m ³ /(m ² ·h)	Heat loss = 0.0165 L_{50}	0.00 W/(m ² ·K)

BFRC Rating =
218.6g window - 68.5 x (U_{window} + Effective L_{50}) = **3.13**
Climate zone is: **UK**

Thermal transmittance, W/(m²·K)	U_{window}	1.3
Solar factor	g_{window}	0.44
Window air leakage heat loss, W/(m²·K)	L_{factor}	0.00

Simulator Name: **Richard Bate** **001**

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