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Report in Accordance with BFRC Guidelines and Regulations

Energy Rating Performance of Windows & Doors

CONFIDENTIAL

Report reference:	U25-001-1
Prepared for:	Aanco (UK) Ltd t/a Made For Trade Wellington House, Wynyard Avenue, Wynyard Billingham. TS22 5TB
Product Description:	Cortizo 4700 Patio Door
Date:	14 March 2025
Prepared by:	Sue Peatey BFRC Technical Officer Approved Simulator S166

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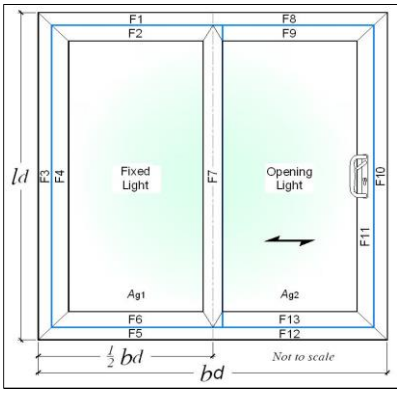
5 BFRC Spreadsheet



Blue line illustrates opening light length (air leakage)

Sample Style: **Patio Door**

Report Number: 25-001-1 Issue 2.7: *04/01/2016*
Report Date: 20 January 2025
Project Details: Cortizo 4700 Patio door.

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

Parameter	*Symbol*		*Units*
Total door height ***0DP***	l_d	2180	mm
Total door width ***0DP***	b_d	2000	mm

Frame offset: **No**

Nominal 4mm etc to ***0DP***, 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)		
Thickness of pane 3		mm
Glazing Trans. - ***3DP*** U_g	1.219	W/(m²·K)
g -value - ***2DP*** $g_\perp$	0.74	

Thermal transmittance of door from hot box test

$U_{d\text{ - 2dp}}$		W/(m²·K)

Door Dimensions:			Area	
Section	Length (m)	Width (m)	No gasket (m²)	With gasket (m²)
Left Fixed Light	1.9560	0.8705	1.7027	1.7027
Right Opening light	1.9560	0.8705	1.7027	1.7027
Total glazing, A_g			3.4054	3.4054
Frame	(m)	(m)	(m²)	(m²)
F1	1.0000	0.0470	0.0459	0.0459
F2	0.9530	0.0660	0.0602	0.0602
F3	2.1800	0.0470	0.1003	0.1003
F4	2.0860	0.0590	0.1192	0.1192
F5	1.0000	0.0470	0.0459	0.0459
F6	0.9530	0.0640	0.0584	0.0584
F7	2.0860	0.0470	0.0950	0.0950
F8	1.0000	0.0470	0.0459	0.0459
F9	0.9530	0.0660	0.0602	0.0602
F10	2.1800	0.0470	0.1003	0.1003
F11	2.0860	0.0590	0.1192	0.1192
F12	1.0000	0.0470	0.0459	0.0459
F13	0.9530	0.0640	0.0584	0.0584
Total Frame			0.9546	0.9546
Total door, A_d			4.3600	4.3600
Percentage left light glass area			39.05%	39.05%
Percentage right light glass area			39.05%	39.05%
Percentage glass area (total)			78.11%	78.11%
Solar Factor, *g* -value:			F_d	0.9
			g_d	0.52

Frame dimensions: All frame values to nearest 1mm, gaskets to 1DP	Frame heights, (b_f)	Without gasket (mm)	Gasket protrusion (mm)	With gasket (mm)	Total (mm)
F1 + F2 left head rail	F1 left fixed head	47	n/a	47.0	113.0
	F2 left opening head	66	0.0	66.0	
F3 + F4 left jamb	F3 left fixed jamb	47	n/a	47.0	106.0
	F4 left opening jamb	59	0.0	59.0	
F5 +F6 left threshold	F5 left fixed threshold	47	n/a	47.0	111.0
	F6 left opening threshold	64	0.0	64.0	
F7 Meeting Stile	F7 Meeting Stile	47	0.0	47.0	
			0.0		
F8 + F9 right head rail	F8 right fixed head	47	n/a	47.0	113.0
	F9 right opening head	66	0.0	66.0	
F10 + F11 right jamb	F10 right fixed jamb	47	n/a	47.0	106.0
	F11 right opening jamb	59	0.0	59.0	
F12 + F13 right threshold	F12 right fixed threshold	47	n/a	47.0	111.0
	F13 right opening threshold	64	0.0	64.0	
	Total gasket area		0	m^2	

Where a U_d 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***				
	L_f^{2D} W/(m·K)	b_p (mm)		L_ψ^{2D} W/(m·K)	b_g (mm)
F1 + F2 left head rail	**0.5703**	**190**		**0.6370**	**190**
F3 + F4 left jamb	**0.5464**	190		**0.6125**	190
F5 +F6 left threshold	**0.5610**	190		**0.6276**	190
F7 Meeting Stile	**0.7135**	380		**0.8515**	380
F8 + F9 right head rail	**0.5856**	190		**0.6489**	190
F10 + F11 right jamb	**0.5632**	190		**0.6265**	190
F12 + F13 right threshold	**0.5788**	190		**0.6420**	190

Frame: Section	Frame width, b_f (m)	Frame U-value, U_f (W/(m²·K))	Frame ares (no gaskets), A_f (m²)	Frame heat flow, HU (W/K)	Linear trans, Ψ (W/(m·K))	Linear length, l_g (m)	Junction heat flow, HΨ (W/K)
F1 + F2 left head rail	0.1130	3.3135	0.1061	0.3515	0.0310	0.8705	0.0270
F3 + F4 left jamb	0.1060	3.3068	0.2195	0.7258	0.0304	1.9560	0.0594
F5 +F6 left threshold	0.1110	3.2894	0.1042	0.3429	0.0309	0.8705	0.0269
F7 Meeting Stile	0.0470	6.8457	0.0950	0.6503	0.0665	1.9560	0.1301
F8 + F9 right head rail	0.1130	3.4489	0.1061	0.3658	0.0276	0.8705	0.0240
F10 + F11 right jamb	0.1060	3.4653	0.2195	0.7606	0.0276	1.9560	0.0539
F12 + F13 right threshold	0.1110	3.4498	0.1042	0.3596	0.0275	0.8705	0.0239
		Totals	0.9546	3.5565		Total	0.3452

Other parameters needed for calculation, taken from simulations:

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

U_{door}		
	No bars; or attached bars	1.85
	Single cross bar in IGU	1.9
	Multiple cross bar in IGU	2.0
	Glazing bar (Georgian bar)	2.2

W/(m²·K)

Air Leakage loss:
Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - ***2DP*** **1.28** m³/(m·h)

Opening light length	10.0700	m	Total air leakage	12.890	m³/h
L_{50}	2.96	m³/(m²·h)	Heat loss = 0.0165 L_{50}	0.05	W/(m²·K)

Energy Door
Energy Index
-16
Door Rating
C

BFRC Rating
kWh/(m²·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 x (U_d + Effective L_{50}) = **-16.15**
Climate zone is: **UK**

Thermal transmittance, W/(m²·K)	U_{door}	**1.8**
Solar factor	g_{door}	**0.52**
Door air leakage heat loss, W/(m²·K)	L_{factor}	**0.05**

Simulator Name: **Sue Peatey**

BFRC Certified Simulator No **S166**

6 BS EN 673 Spreadsheet

Version 12 18/06/2015. Calculations according to BS EN 673:2011

Number of spaces	Help					
1						
		Spaces		1		
Glazing orientation						
	Vertical					
Resistivity panes	1	m·K/W	Pane 1	90%	Pane 2	
	Outside					
Calculate				Gas		
				Argon		
	Thickness (mm)		4.0	20		4.0
	Normal emissivity			0.89	0.05	
	$\sum d_j \cdot r_j$=	0.008		Uncoated		

For uncoated surfaces input 0.89 for normal emissivity, which corresponds to a corrected emissivity of 0.837

External, R_{se}	0.04	$(m^2 \cdot K)/W$			
Internal, R_{si}	0.13	$(m^2 \cdot K)/W$			
Iteration number	U value	$\sum 1/h_s$		λeff	ΔT
	$W/(m^2 \cdot K)$	$(m^2 \cdot K)/W$		W/(mK)	
1	1.219	0.64228		0.0311	15
2	1.219	0.64228		0.0311	15

8 G-Value Data

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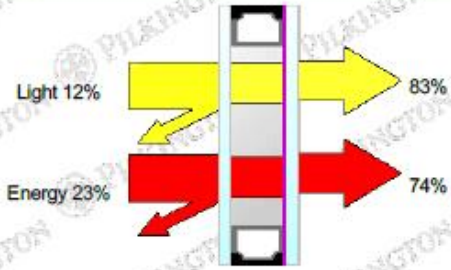

DESCRIPTION

Position	Product	Process	Thickness (nominal) mm	Weight kg/m²
Pilkington **Insulight™** Therm				
Glass 1	Pilkington **Optiwhite™**	Annealed	4.0	
Cavity 1	Argon (90%)		20.0	
Glass 2	Pilkington **K Glass™** S	Annealed	4.0	
Product Code	4w-20Ar-KS4		28.0	20.00

PERFORMANCE

Light		
Transmittance	LT	83%
	UV %	41%
Reflectance Out	LR out	12%
Reflectance In	LR in	13%

Performance Code	
U_g-value/Light/Energy	1.2 / 83 / 74
Ra	99

The values of some of characteristics are displayed as NPD. This stands for No Performance Determined.

Energy		
Direct Transmittance	ET	64%
Reflectance	ER	23%
Absorptance	EA	13%
Total Transmittance	g	74%
Shading Coefficient Total		0.85
Shading Coefficient Shortwave		0.74
Sound Reduction	R_w (C;C_{tr}) dB	31 (-2; -5)
Thermal Transmittance	W/m²K	1.2

Carbon Footprint		
GWP	$kgCO_2e/m^2$	34

Global Warming Potential (GWP) values derived from the Life Cycle Assessment (LCA) that underpins the third-party verified product Environmental Product Declarations (EPDs). They are declared for modules A1 to A3; the scope of the EPDs is cradle-to-grave and module D in accordance with the requirements of Product Category Rules EN 15804:2012+A2:2019/AC:2021 and EN17074:2019. As noted in the EPD, indicators for modules A1 to A3 should not be used without considering indicators for module C.

Pilkington Spectrum allows you to combine a wide range of products available from Pilkington and determine their key properties such as light transmittance, g value and U value. The program includes restrictions that prevent some combinations being selected that may be considered unwise or impractical. Even with these restrictions, it is still possible to create product combinations that may not be available from your supplier. Please check with your supplier that your chosen product combination is possible, available in the sizes required and in a timescale appropriate to your project. Furthermore, it is essential that you check that your product combination is appropriate for satisfying local, regional, national and other project-specific requirements.

Calculations are made according to EN standards 410 and 673/12898

Pilkington Spectrum Version UK:7.4.1 04/03/2025

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