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Report in Accordance with BFRC Guidelines and Regulations

Energy Rating Performance of Windows & Doors

CONFIDENTIAL

Report reference:	U25-001-3
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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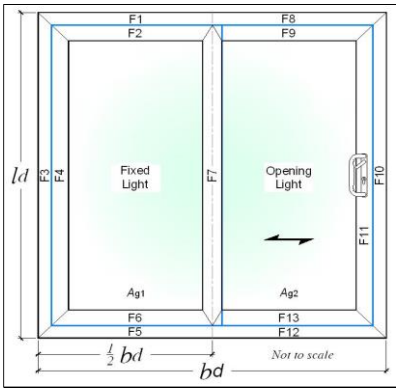
The results in this report relate only to the products calculated from technical drawings received and do not necessarily relate to samples from the production line of the above named company. This report does not constitute in any way a warranty or representation to the performance or quality of the said product. The above named company has supplied all technical specifications. BFRC and its representatives accept no liability for misuse of this report.

5 BFRC Spreadsheet



Blue line illustrates opening light length (air leakage)

Sample Style: **Patio Door**

Report Number: U25-001-3 Issue 2.7: *04/01/2016*
Report Date: 22 January 2025
Project Details: Cortizo 4700 Patio door.

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 ***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	18	mm
Gas fill (1/2)	Argon 90%	
Thickness of pane 2	6.8	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	1.204	W/(m²·K)
g -value - ***2DP*** $g_\perp$	0.73	

Thermal transmittance of door from hot box test
$U_{d\text{ - }2dp}$ W/(m²·K)

Door Dimensions:

Section	Length (m)	Width (m)	Area No gasket (m^2)	Area With gasket (m^2)
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)	(m^2)	(m^2)
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	0.51

U_{door}			
	No bars; or attached bars	1.85	W/(m²·K)
	Single cross bar in IGU	2.0	
	Multiple cross bar in IGU	2.1	
	Glazing bar (Georgian bar)	2.3	

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	0.5656	190	0.6401	190
F3 + F4 left jamb	0.5418	190	0.6156	190
F5 +F6 left threshold	0.5564	190	0.6307	190
F7 Meeting Stile	0.7031	380	0.8605	380
F8 + F9 right head rail	0.5809	190	0.6508	190
F10 + F11 right jamb	0.5585	190	0.6283	190
F12 + F13 right threshold	0.5740	190	0.6438	190

Frame:

Section	Frame width, b_f (m)	Frame U-value, U_f (W/(m²·K))	Frame ares (no gaskets), A_f (m^2)	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	3.3118	0.1061	0.3513	0.0371	0.8705	0.0323
F3 + F4 left jamb	0.1060	3.3060	0.2195	0.7256	0.0364	1.9560	0.0712
F5 +F6 left threshold	0.1110	3.2886	0.1042	0.3428	0.0369	0.8705	0.0321
F7 Meeting Stile	0.0470	6.8163	0.0950	0.6475	0.0826	1.9560	0.1616
F8 + F9 right head rail	0.1130	3.4472	0.1061	0.3656	0.0325	0.8705	0.0283
F10 + F11 right jamb	0.1060	3.4635	0.2195	0.7602	0.0324	1.9560	0.0634
F12 + F13 right threshold	0.1110	3.4471	0.1042	0.3594	0.0324	0.8705	0.0282
		Totals	0.9546	3.5524		Total	0.4171

Other parameters needed for calculation, taken from simulations:
λ_p = 0.035 W/(m·K) R_{se} = 0.04 m²·K/W $d_p = d_g$ = 0.0288 m
R_p = 0.8229 m²·K/W R_{tot} = 0.9929 m²·K/W R_{se} = 0.13 m²·K/W
U_p = 1.0072 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
-18
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}) =	**-17.95**
Climate zone is:	**UK**

Thermal transmittance, W/(m²·K)	U_{door}	**1.9**
Solar factor	g_{door}	**0.51**
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						
1	Help					
		Spaces		1		
Glazing orientation			Pane 1		Pane 2	
	Vertical					
Resistivity panes	1	m·K/W		90%		
	Outside					
Calculate				Gas		
				Argon		
	Thickness (mm)		4.0	18		6.8
	Normal emissivity			0.89	0.05	
	$\sum d_i \cdot r_i$=	0.0108		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	1.204	0.64997		0.0277	15
2	1.204	0.64997		0.0277	15

8 G-Value Data

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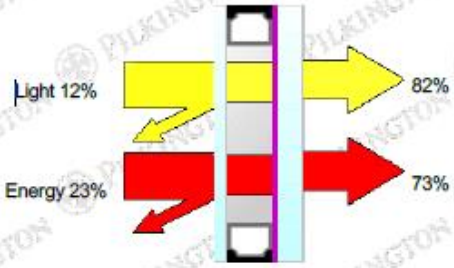

DESCRIPTION

Position	Product	Process	Thickness (nominal) mm	Weight kg/m²
Pilkington **Insulight™** Protect				
Glass 1	Pilkington **Optiwhite™**	Annealed	4.0	
Cavity 1	Argon (90%)		18.0	
Glass 2	Pilkington **Optilam K Glass™** S	Laminated	6.8	
Product Code	4w-18Ar-KS6.8L		28.8	25.76

PERFORMANCE

Light		
Transmittance	LT	82%
	UV %	1%
Reflectance Out	LR out	12%
Reflectance In	LR in	12%

Performance Code	
U_g-value/Light/Energy	1.2 / 82 / 73
Ra	98

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

Energy		
Direct Transmittance	ET	60%
Reflectance	ER	23%
Absorptance	EA	17%
Total Transmittance	g	73%
Shading Coefficient Total		0.84
Shading Coefficient Shortwave		0.69
Sound Reduction	R_w (C;C_{tr}) dB	35 (-1; -5)
Thermal Transmittance	W/m²K	1.2

Carbon Footprint		
GWP	$kgCO_2e/m^2$	50

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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