Report in Accordance with BFRC Guidelines and Regulations

Product description: Made For Trade Korniche Bi-Fold Doorset

CONFIDENTIAL

Client:	Aanco (UK) Ltd T/A Made For Trade Wellington House, Wynyard Avenue Wynyard Billingham TS22 5TB
Project:	Aluminium Korniche Bi-Fold Doorset
Project reference:	CU21577-34
Prepared By:	Richard Bate Technical Director
Issue date:	16 May 2022

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Approved Simulator 001

1 Introduction

The U-value calculations of the Made For Trade, Korniche bi-fold doorset detailed below were commissioned by Ashley Gaunt of Made For Trade.

2 Validation of Program

The BISCO 12.0 analysis software has been validated against proofs in Annex I (I1 to I10) of BS EN ISO 10077-2:2017.

3 Analysis Method

The frame profile results detailed below are provided by computer simulation using BISCO 12.0 software program and BFRC guidelines and regulations.

4 Summary of Results

A summary of results are detailed in the following sections. The details supplied for the analysis as well as all information required to verify the analysis can be found in the attached CD.

4.1 Frame thermal transmittance (following the principles of BS EN ISO 10077-2)

Frame Profile	Frame Thermal Transmittance (U_f)
Head	3.2 W/(m²·K)
Left Jamb	3.0 W/(m²·K)
Right Jamb	3.2 W/(m²·K)
Threshold	3.2 W/(m²·K)
Meeting Stile	2.9 W/(m²·K)

4.2 Linear thermal transmittance (following the principles of BS EN ISO 10077-2)

Frame Profile	Linear Thermal Transmittance (ψ)
Head	0.024 W/(m·K)
Left Jamb	0.029 W/(m·K)
Right Jamb	0.024 W/(m·K)
Threshold	0.024 W/(m·K)
Meeting Stile	0.051 W/(m·K)

4.3 Centre pane U-Value of glazing calculated in accordance with BS EN 673.

Glazing Unit	Centre Pane U-value (U_g)
4-18-6.8 Low-E 0.05 uncorrected emissivity (St Gobain Planitherm Total+), 90% Argon 10% Air filled, float outer pane (St Gobain Planiclear) glazing unit with Superspacer Premium spacer bar with 5mm hot melt butyl secondary seal.	1.2 W/(m²·K)

4.4 The thermal performance of the doorsets (U_D) in accordance with BFRC guidelines and regulations:

Korniche Frame Profile	Doorset U-Value
Aluminium frame system with 4-18-6.8 Low-E 0.05 uncorrected emissivity (St Gobain Planitherm Total+), 90% Argon 10% Air filled, float outer pane (St Gobain Planiclear) glazing unit with Superspacer Premium spacer bar with 5mm hot melt butyl secondary seal.	1.8 W/(m²·K)

4.6 The Effective L_{50} in accordance with BFRC guidelines and regulations:

Frame Profile	Effective L_{50}
Air permeability at 50 pa	0.00 W/(m²·K)

4.7 Total solar energy transmittance (g) in accordance with EN 410

Korniche Frame Profile	$g_{doorset}$
Aluminium frame system with 4-18-6.8 Low-E 0.05 uncorrected emissivity (St Gobain Planitherm Total+), 90% Argon 10% Air filled, float outer pane (St Gobain Planiclear) glazing unit with Superspacer Premium spacer bar with 5mm hot melt butyl secondary seal.	0.47

5.0 BFRC Rating

5.1 Made For Trade Korniche Bi-Fold doorset system

Korniche Frame Profile	Rating
Aluminium frame system with 4-18-6.8 Low-E 0.05 uncorrected emissivity (St Gobain Planitherm Total+), 90% Argon 10% Air filled, float outer pane (St Gobain Planiclear) glazing unit with Superspacer Premium spacer bar with 5mm hot melt butyl secondary seal.	- 19 (Rating Scale C)

6.0 Authorisation

	Prepared by:
Signature:	
Name:	Richard Bate
Title:	Technical Director

Technical Specification

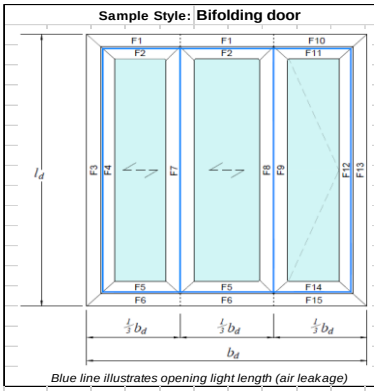
Profiles	Ref. No.	Material Type/Manufacturer's Name & Density (Timber only)	Dimensions (Height & Width)
Head	A-04105	Made For Trade, thermally broken aluminium	Outer frame - 56mm x 84mm Sash – 60mm x 75mm
Left Jamb	A-04104	Made For Trade, thermally broken aluminium	Outer frame - 56mm x 84mm Sash – 82mm x 83mm
Right Jamb	A-04103	Made For Trade, thermally broken aluminium	Outer frame - 56mm x 84mm Sash – 60mm x 75mm
Threshold	A-04114	Made For Trade, thermally broken aluminium	Outer frame - 56mm x 84mm Sash – 60mm x 75mm
Meeting Stile	A-04117	Made For Trade, thermally broken aluminium	60mm x 75mm

Glazing Component	Specification
Overall sealed unit: 1. Thickness (mm)	1. 28.8mm
Outer pane 1. Thickness (mm) 2. Manufacturer 3. Description	1. 4mm 2. St Gobain 3. Planiclear
Inner pane: 1. Thickness 2. Manufacturer 3. Description	1. 6.8mm 2. St Gobain 3. Laminated Planitherm Total+
Spacer bar: 1. Manufacturer 2. Description	1. Edgetech 2. Superspacer Premium
Cavity 1. Distance (mm) 2. Gas %	1. 18mm 2. Argon 90% Air 10%
Edge seal 1. Manufacturer 2. Description	1. N/A 2. 5mm hot melt butyl secondary seal

Additional Notes
Air leakage data is taken from Build Check Test report ref. W22208-1 dated May 2022 (data at 50Pa pressure = 0.05). Solar heat gain figures are calculated from g-values supplied by the product manufacturer from EN 410 calculations for the glass units used in this simulation. The value used is 0.72.

BFRC Spreadsheet

Sample Style: Bifolding door



Blue line illustrates opening light length (air leakage)

Report Number:	U21577-34	Issue 2.3: 04/01/2016
Report Date:	22 April 2022	
Project Details:	Aluminium Bi-fold Doorset	

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	2500	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*** $g_\perp$	0.72	

Thermal transmittance of door from hot box test

U_d - *2DP* — W/(m²·K)

Frame dimensions: All frame values to nearest mm, gaskets to nearest 0.1mm		Frame height, b_f	Gasket protrusion, b_{gf}	Frame with gasket	Total frame
		(mm)	(mm)	(mm)	(mm)
F1 + F2 L&M head rail	F1 left fixed head	56	n/a	56.0	106
	F2 left opening head	50	0.0	50.0	
F3 + F4 left jamb	F3 left fixed jamb	56	n/a	56.0	110
	F4 left opening jamb	54	0.0	54.0	
F5 + F6 L&M threshold	F5 left opening threshold	50	0.0	50.0	106
	F6 left fixed threshold	56	n/a	56.0	
F7 Meeting Stile	F7 Meeting Stile	132	0.0	132.0	
			0.0		
F8 + F9 Meeting stile	F8 bi-fold opener	60	0.0	60.0	132
	F9 opener	72	0.0	72.0	
F10 + F11 right head rail	F10 right fixed head	56	n/a	56.0	106
	F11 right opening head	50	0.0	50.0	
F12 + F13 right jamb	F12 right opening jamb	50	0.0	50.0	106
	F13 right fixed jamb	56	n/a	56.0	
F14 + F15 R threshold	F14 right opening threshold	50	0.0	50.0	106
	F15 right fixed threshold	56	n/a	56.0	
Recession depth	F6 & F15:		n/a		
Total gasket area			0	m²	

Door Dimensions:

Section	Length (m)	Width (m)	Area: No gasket (for U-value) (m²)	Area: With gasket (for g-value) (m²)
Left Sliding light	1.9680	0.6573	1.2936	1.2936
Middle Sliding light	1.9680	0.7073	1.3920	1.3920
Right Opening light	1.9680	0.6553	1.2897	1.2897
Total glazing, A_g			3.9754	3.9754
Frame	(m)	(m)	(m²)	(m²)
F1	1.6667	0.0560	0.0918	0.0918
F2	1.6107	0.0500	0.0744	0.0744
F3	2.1800	0.0560	0.1189	0.1189
F4	2.0680	0.0540	0.1090	0.1090
F5	1.6107	0.0500	0.0744	0.0744
F6	1.6667	0.0560	0.0918	0.0918
F7	2.0680	0.1320	0.2664	0.2664
F8	2.0680	0.0600	0.1211	0.1211
F9	2.0680	0.0720	0.1453	0.1453
F10	0.8333	0.0560	0.0451	0.0451
F11	0.7773	0.0500	0.0358	0.0358
F12	2.0680	0.0500	0.1009	0.1009
F13	2.1800	0.0560	0.1189	0.1189
F14	0.7773	0.0500	0.0358	0.0358
F15	0.8333	0.0560	0.0451	0.0451
Total Frame			1.4746	1.4746
Total door, Ad			5.4500	5.4500
Percentage left light glass area			23.74%	23.74%
Percentage middle light glass area			25.54%	25.54%
Percentage right light glass area			23.66%	23.66%
Percentage glass area (total)			72.94%	72.94%

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 L&M head rail	**0.5330**	**190**	**0.5940**	**190**
F3 + F4 left jamb	**0.5240**	190	**0.5900**	190
F5 + F6 L&M threshold	**0.5320**	190	**0.5930**	190
F7 Meeting Stile	**0.7600**	380	**0.8860**	380
F8 + F9 Meeting stile	**0.7600**	380	**0.8860**	380
F10 + F11 right head rail	**0.5330**	190	**0.5940**	190
F12 + F13 right jamb	**0.5300**	190	**0.5910**	190
F14 + F15 R threshold	**0.5320**	190	**0.5930**	190

Solar Factor, *g*-value:

F_d	0.9	
g_d	0.47	

Frame:

Section	Frame widths (no gaskets), B_f (m)	Frame U-value, U_f (W/(m²·K))	Frame areas (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 L&M head rail	0.1060	3.2230	0.1661	0.5355	0.0236	1.3647	0.0322
F3 + F4 left jamb	0.1100	3.0239	0.2279	0.6892	0.0286	1.9680	0.0563
F5 + F6 L&M threshold	0.1060	3.2135	0.1661	0.5339	0.0236	1.3647	0.0322
F7 Meeting Stile	0.1320	2.8581	0.2664	0.7613	0.0512	1.9680	0.1008
F8 + F9 Meeting stile	0.1320	2.8581	0.2664	0.7613	0.0512	1.9680	0.1008
F10 + F11 right head rail	0.1060	3.2230	0.0809	0.2608	0.0236	0.6553	0.0155
F12 + F13 right jamb	0.1060	3.1947	0.2198	0.7023	0.0236	1.9680	0.0465
F14 + F15 R threshold	0.1060	3.2135	0.0809	0.2600	0.0236	0.6553	0.0155
Totals		1.4746	4.5044			Total	0.3997

Other parameters: Panel thickness, d_p=d_g= 0.0288 m

λ_p =	0.035	W/(m·K)	R_{se} =	0.04	m²·K/W	R_{se} =	0.13 m²·K/W
R_p =	0.8229	m²·K/W	R_{tot} =	0.9929	m²·K/W	U_p =	1.0072 W/(m²·K)

U_{door}		W/(m²·K)
	No bars; or attached bars: 1.78	
	Single cross bar in IGU: 1.9	
	Multiple cross bar in IGU: 2.0	
	Glazing bar (Georgian bar): 2.2	

Air Leakage loss:

Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - ***2DP***				0.05	m³/(m·h)
Opening light length	13.0480	m	Total air leakage	0.652	m³/h
L_{50}	0.12	m³/(m²·h)	Heat loss = 0.0165 L_{50}	0.00	W/(m²·K)

Energy Window
Energy Index
-19
Window Rating
C

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	

BFRC Rating =
218.6g_{door} - 68.5 x (U_{door} + Effective L_{50}) = -18.61
Climate zone is: UK

Thermal transmittance, W/(m²·K)	U_{door}	1.8
Solar factor	g_{door}	0.47
Door air leakage heat loss, W/(m²·K)	L_{factor}	0.00

BFRC

BFRC Certified Simulator No

Simulator Name: Richard Bate — **001**

BS EN 673 Spreadsheet

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

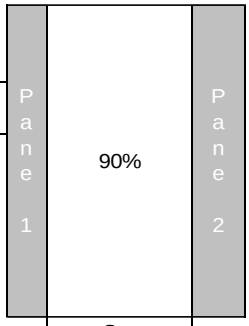
Number of spaces
1

Help

Spaces 1

Glazing orientation	
	Vertical
Resistivity panes	1 m·K/W

Outside



Calculate

			Gas	
			Argon	
Thickness (mm)	4.0	18		6.8
Normal emissivity		0.89	0.05	
$\sum d_j \cdot r_j$ =	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/(m²·K)	(m²·K)/W	W/(mK)	
1	1.204	0.65	0.0277	15
2	1.204	0.65	0.0277	15

Spacer Conductivity

May 2014 – No. W21 – Revision Index 3-06/2021 – valid until June 30th, 2023

'WARM EDGE' WORKING PARTY

Data sheet Psi values for windows

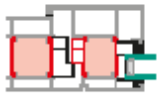
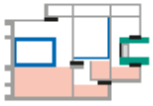
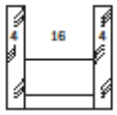
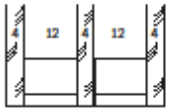
Only valid for use with hotmelt-sealant

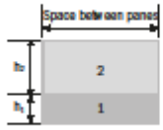
based on determination of the equivalent thermal conductivity of spacers by measurement

Edgetech

Edgetech Europe GmbH
Gladbacher Straße 23
D-52525 Heinsberg

Profile description		Spacer height h in mm	Material	Thickness d in mm
	Super Spacer Premium	4.7 Spacer category E	Mylar foil Silicone foam	0.10 4.7

Representative glass constructions	Metal with thermal break	Plastic	Wood	Wood/Metal
Representative frame profiles				
Representative psi value double-sheet thermally insulating glass W/mK	 Double-sheet insulating glass U_g=1.1 W/m²K	0.035	0.031	0.030	0.031
Representative psi value triple-sheet thermally insulating glass W/mK	 Triple-sheet insulating glass U_g=0.7 W/m²K	0.030	0.029	0.028	0.029

Two Box model Characteristic values	Space between panes in mm	$\lambda_{eq,28}$ in W/mK	
		Box 1 - h_1 = 5 mm	Box 2 - h_2 = 4.7 mm
	Can be used for all spacer widths	0.24	0.15

Explanations

The equivalent thermal conductivity has been determined in accordance with the ift guideline WA-17engl/1 "Thermally improved spacers – Determination of the equivalent thermal conductivity by measurement". The representative linear heat transfer coefficients calculated in this way (representative psi values) apply to typical frame profiles and glazing for the determination of the heat transfer coefficient U_w of windows. They have been determined under the boundary conditions (frame profiles, glazing, glass mounting depth, back covering, primary and secondary sealant) defined in the ift guideline WA-08engl/3 "Thermally improved spacers – Part 1: Determination of the representative Psi value for window frame profiles". This guideline also governs the area of validity and application of the representative psi values. In order to avoid rounding errors, the psi values in the data sheet have been given at 0.001 W/mK. The method for the arithmetical determination of the psi values has an accuracy of ± 0.003 W/mK. Differences of less than 0.005 W/mK are not significant. For further information, refer to the Bulletin 004/2008 "Guide to Warm Edge" of Bundesverband Flachglas.

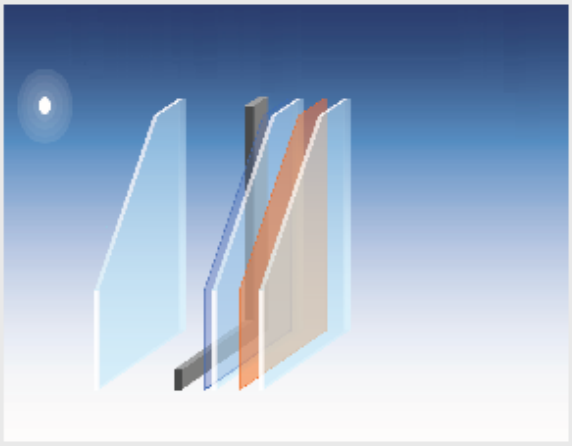
Characteristic values determined by:

ift ROSENHEIM

G-Value Source

SAINT-GOBAIN

CalumenLive
Friday, May 6, 2022



Glazing 1	PLANICLEAR 4 mm
Cavity 1	Argon 90% 18 mm
Glazing 2	PLANITHERM TOTAL+ FG PLANICLEAR 3 mm PVB STANDARD 0.76 mm PLANICLEAR 3 mm

Last name: Sue Peatey
Country: United Kingdom

Notes:

LUMINOUS FACTORS — EN410 (2011-04)

Light Transmittance (TL)	79 %
Outdoor Reflectance (RLe)	13 %
Indoor Reflectance (RLi)	12 %

THERMAL TRANSMISSION — EN673-2011

Ug	1.2 W/(m².K)
Angle relative to the vertical	0 °

MANUFACTURING SIZES

Nominal Thickness	28.76 mm
Weight	25.8 kg/m²

ACOUSTICS — EN 12758

Rw (C;Ctr)	N/A
STC (ASTM E413)	N/A
OITC (ASTM E1332)	N/A

SAFETY CLASS — EN 12600

Pendulum Body Resistance	NPD/1B1

ENERGY FACTORS — EN410 (2011-04)

Transmittance (TE)	59 %
Outdoor Reflectance (Ree)	20 %
Indoor Reflectance (Rei)	17 %
Absorptance A1 (AE1)	6 %
Absorptance A2 (AE2)	15 %

SOLAR FACTORS — EN410 (2011-04)

Solar Factor (g)	0.72
Shading Coefficient (SC)	0.83

COLOR RENDERING

Transmission (Ra)	99
Reflection (Ra)	90

ANTI-BURGLARY — EN 356

Burglar Resistance	NPD/P1A

CARBON FOOTPRINT — EN 15804+A2

Global Warming Potential (GWP) (kg. CO_2 equiv/m²) European average	47.58

Calumen calculates the photometric characteristics and thermal transmission of glass using calculation algorithms which comply with the following standards: the European standards EN 410 and EN 673, the International standard ISO9050, the Japanese standard JIS R 3106/3107 and the Korean standard KS L 2514/2525. The functional output and calculation rules of Calumen for standards EN 410 and EN 673 have been validated by TÜV Rheinland (report 11923R-11-33705). The technical performances obtained according to these standards are provided for information only and are subject to amendment. Only the values entered in the performance declaration available on the CE marking site of Saint-Gobain Glass are official. The sound attenuation indices are measured under laboratory conditions according to the standards EN ISO 10140 and EN 12758. The calculated indices are provided for information only. The accuracy for Rw index lies within a range of +/-2dB.The glass thickness calculations comply with the 2012 version of the DTU39-P4 description. The USER is responsible for ensuring that the correct calculation hypotheses are entered and the DTU39 is applied appropriately for the project concerned.

Air Leakage Test Evidence

Glazing Component	Specification
Overall sealed unit: 1. Thickness (mm)	 1. 28mm
1. Outer pane 2. Cavity 3. Inner pane	1. 4mm clear toughened glass 2. 20mm 3. 4mm clear toughened glass

The above specimen description has been supplied by the client and not verified by Build Check.

Dimensions: Outer frame (w x h): 2500mm x 2180mm

3. Test Details

Test Date: 14 April 2022

Test performed by: Angelo Wells

Test carried out at Build Check Ltd's test laboratory, Unit 3 Lincoln Park Business Centre, Lincoln Road, High Wycombe, HP12 3RD

Test conditions in accordance with standard.

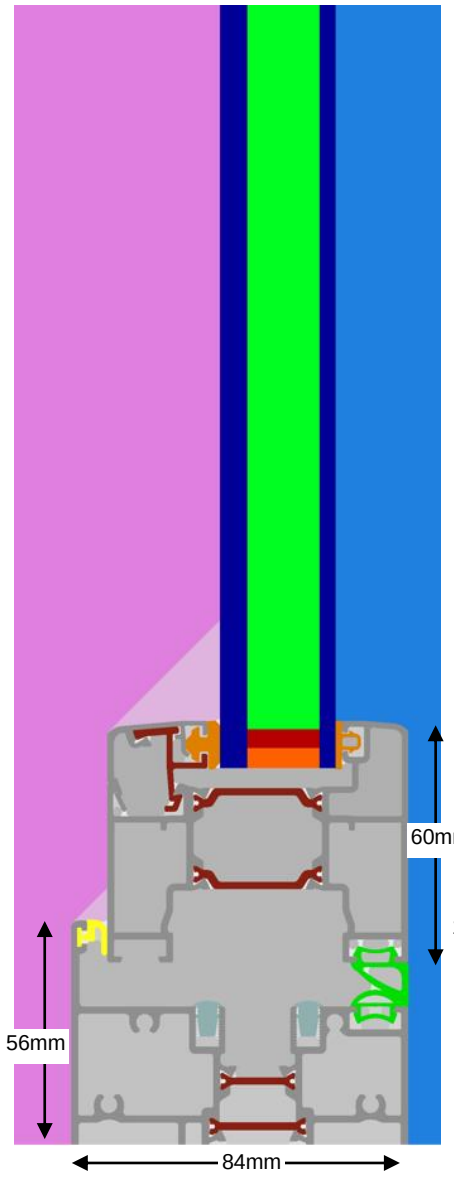
4. Results

Average between positive and negative pressure						
	Positive pressure		Negative pressure		Mean	
Air Pressure (Pa)	Net permeability per m^2 area ($m^3/h \cdot m^2$)	Net permeability per m opening length ($m^3/h \cdot m$)	Net permeability per m^2 area ($m^3/h \cdot m^2$)	Net permeability per m opening length ($m^3/h \cdot m$)	Per m^2 area ($m^3/h \cdot m$)	Per m opening length ($m^3/h \cdot m$)
50	0.15	0.06	0.10	0.04	0.13	0.05

** During the test, the chamber leakage was greater than 30% of the combined chamber and specimen leakage rate.*

Appendix - Profile Drawings

Head

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BISCO Calculation Results

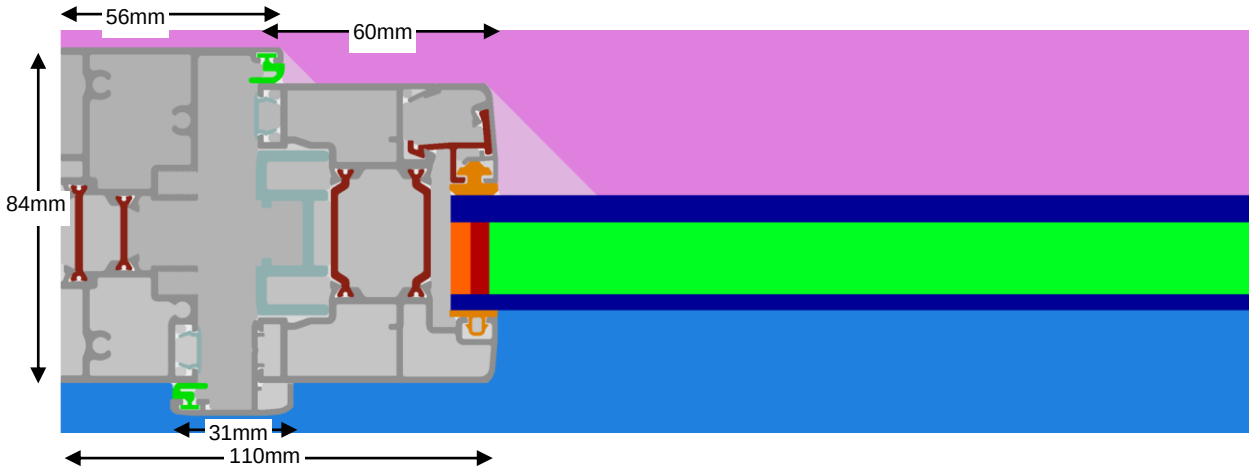
BISCO data file: A-04105 head.bsc

Number of nodes = 69031
Heat flow divergence for total object = 0.000746013
Heat flow divergence for worst node = 0.913472

Thermal transmittance of frame (EN 10077-2)
Uf = (Q/(ti-te) - Up1*wp1 - Up2*wp2) / wf = -3.427 W/(m².K)
Thermal coupling coefficient
L2D = Q/(ti-te) = 0.594 W/(m.K)
  Q = 11.876 W/m
  ti = 20.00°C
  te = 0.00°C
  Up1 = 5.033 W/(m².K)   (top edge of bitmap)
  wp1 = 0.1900 m         (distance no. 2)
  Up2 = 0.000 W/(m².K)
  wp2 = 0.0000 m
  wf = 0.1058 m          (distance no. 1)
```

	Material	Thermal Conductivity W/(m.K)
	PVC-U Rigid, BS EN 10077-2	0.17
	PVC Flexible, BS EN 10077-2	0.14
	Aluminium, BS EN 10077-2	160.0
	Soda Lime Glass, BS EN 10077-2	1.0
	Superspacer Premium, IFT Rosenheim report 13-002649-PR02 (declared value)	0.15
	Hot Melt Butyl, BS EN 10077-2	0.24
	Polyurethane Foam, BS 10456	0.05
	EPDM, BS EN 10077-2	0.25
	Polyamide, BS EN 10077-2	0.30

Left Jamb



BISCO Calculation Results

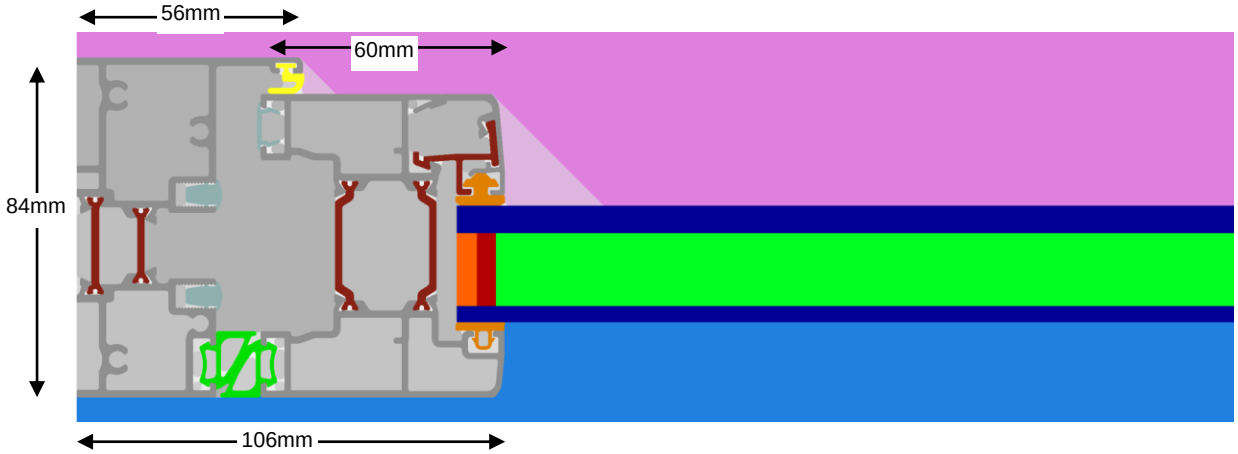
BISCO data file: A-04104 left jamb.bsc

Number of nodes = 72083
Heat flow divergence for total object = 2.81387e-05
Heat flow divergence for worst node = 0.459044

Thermal transmittance of frame (EN 10077-2)
Uf = (Q/(ti-te) - Up1*wp1 - Up2*wp2) / wf = -3.335 W/(m².K)
Thermal coupling coefficient
L2D = Q/(ti-te) = 0.590 W/(m.K)
  Q = 11.798 W/m
  ti = 20.00°C
  te = 0.00°C
  Up1 = 5.033 W/(m².K) (right edge of bitmap)
  wp1 = 0.1900 m (distance no. 2)
  Up2 = 0.000 W/(m².K)
  wp2 = 0.0000 m
  wf = 0.1099 m (distance no. 1)

	Material	Thermal Conductivity W/(m.K)
	PVC-U Rigid, BS EN 10077-2	0.17
	PVC Flexible, BS EN 10077-2	0.14
	Aluminium, BS EN 10077-2	160.0
	Soda Lime Glass, BS EN 10077-2	1.0
	Superspacer Premium, IFT Rosenheim report 13-002649-PR02 (declared value)	0.15
	Hot Melt Butyl, BS EN 10077-2	0.24
	Polyurethane Foam, BS 10456	0.05
	EPDM, BS EN 10077-2	0.25
	Polyamide, BS EN 10077-2	0.30

Right Jamb



BISCO Calculation Results

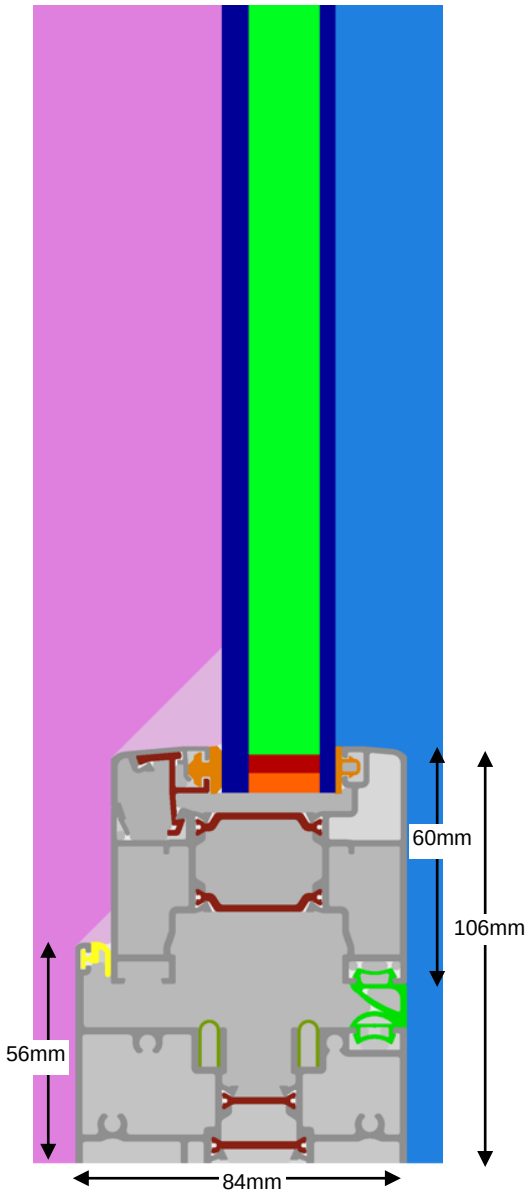
```
BISCO data file: A-04103 right jamb.bsc

Number of nodes = 69251
Heat flow divergence for total object = 0.000803807
Heat flow divergence for worst node = 0.607267

Thermal transmittance of frame (EN 10077-2)
Uf = (Q/(ti-te) - Up1*wp1 - Up2*wp2) / wf = -3.453 W/(m².K)
Thermal coupling coefficient
L2D = Q/(ti-te) = 0.591 W/(m.K)
  Q = 11.813 W/m
  ti = 20.00°C
  te = 0.00°C
  Up1 = 5.033 W/(m².K)   (right edge of bitmap)
  wp1 = 0.1900 m         (distance no. 2)
  Up2 = 0.000 W/(m².K)
  wp2 = 0.0000 m
  wf = 0.1059 m          (distance no. 1)
```

	Material	Thermal Conductivity W/(m.K)
	PVC-U Rigid, BS EN 10077-2	0.17
	PVC Flexible, BS EN 10077-2	0.14
	Aluminium, BS EN 10077-2	160.0
	Soda Lime Glass, BS EN 10077-2	1.0
	Superspacer Premium, IFT Rosenheim report 13-002649-PR02 (declared value)	0.15
	Hot Melt Butyl, BS EN 10077-2	0.24
	Polyurethane Foam, BS 10456	0.05
	EPDM, BS EN 10077-2	0.25
	Polyamide, BS EN 10077-2	0.30

Threshold



BISCO Calculation Results

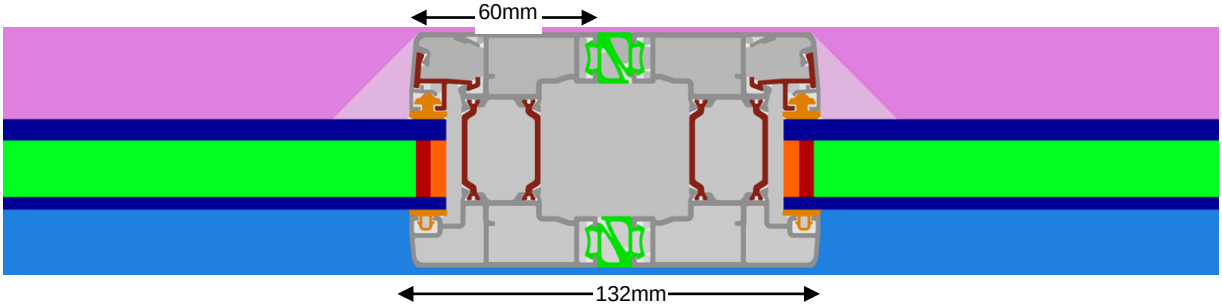
BISCO data file: A-04114 threshold.bsc

Number of nodes = 68998
Heat flow divergence for total object = 0.000865678
Heat flow divergence for worst node = 0.354333

Thermal transmittance of frame (EN 10077-2)
Uf = (Q/(ti-te) - Up1*wp1 - Up2*wp2) / wf = -3.430 W/(m².K)
Thermal coupling coefficient
L2D = Q/(ti-te) = 0.593 W/(m.K)
Q = 11.870 W/m
ti = 20.00°C
te = 0.00°C
Up1 = 5.033 W/(m².K) (top edge of bitmap)
wp1 = 0.1900 m (distance no. 2)
Up2 = 0.000 W/(m².K)
wp2 = 0.0000 m
wf = 0.1058 m (distance no. 1)

	Material	Thermal Conductivity W/(m.K)
	PVC-U Rigid, BS EN 10077-2	0.17
	PVC Flexible, BS EN 10077-2	0.14
	Aluminium, BS EN 10077-2	160.0
	Soda Lime Glass, BS EN 10077-2	1.0
	Superspacer Premium, IFT Rosenheim report 13-002649-PR02 (declared value)	0.15
	Hot Melt Butyl, BS EN 10077-2	0.24
	Polyurethane Foam, BS 10456	0.05
	EPDM, BS EN 10077-2	0.25
	Polyamide, BS EN 10077-2	0.30

Meeting Stile



BISCO Calculation Results

```
BISCO data file: A-04117 meeting stile.bsc

Number of nodes = 101901
Heat flow divergence for total object = 0.00037338
Heat flow divergence for worst node = 0.696044

Thermal transmittance of frame (EN 10077-2)
Uf = (Q/(ti-te) - Up1*wp1 - Up2*wp2) / wf = -7.796 W/(m².K)
Thermal coupling coefficient
L2D = Q/(ti-te) = 0.886 W/(m.K)
  Q = 17.719 W/m
  ti = 20.00°C
  te = 0.00°C
  Up1 = 5.033 W/(m².K)   (left edge of bitmap)
  wp1 = 0.1900 m         (distance no. 2)
  Up2 = 5.033 W/(m².K)   (right edge of bitmap)
  wp2 = 0.1900 m         (distance no. 3)
  wf = 0.1317 m          (distance no. 1)
```

	Material	Thermal Conductivity W/(m.K)
	PVC-U Rigid, BS EN 10077-2	0.17
	PVC Flexible, BS EN 10077-2	0.14
	Aluminium, BS EN 10077-2	160.0
	Soda Lime Glass, BS EN 10077-2	1.0
	Superspacer Premium, IFT Rosenheim report 13-002649-PR02 (declared value)	0.15
	Hot Melt Butyl, BS EN 10077-2	0.24
	Polyurethane Foam, BS 10456	0.05
	EPDM, BS EN 10077-2	0.25
	Polyamide, BS EN 10077-2	0.30