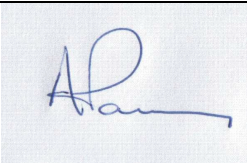


Address: Duraflex Ltd, Severn Drive, Tewkesbury Business Park, Tewkesbury, Glos, GL20 8TX Telephone: 01684 852600 Fax: 01684 852701	 BFRC Certified Simulator 054
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Client:	Central CRC Central House Hill Top West Bromwich West Midlands B70 0RD
Profile ID:	Diamond 70mm
Project reference:	706
BFRC simulator:	Tony Parry Technical Engineer
BFRC simulator number	054
Date:	13 February 2012
Signature:	

Calculation carried out in accordance with **BS EN ISO 10077 – 2:2003**

System:

Duraflex 70mm Internally Glazed, Fully Thermal reinforcing, 28mm Glazing, 4mm Float, 90% Argon, 4mm Planitherm one, Edgetech spacer.

P.V.C.U Profiles:

Intermediate Outer Frame	Dwg. Ref. TD 7002
Internally Glazed Sash	Dwg. Ref. TD 6060
Transom / Mullion	Dwg. Ref. TD 7033
Featured Bead	Dwg. Ref. TD 5851
Thermal inserts	Dwg. Ref. TD 4003/4004/4007

Steel Reinforcement:

Outer Frame	DWg. Ref. TD 3573S (Std. Steel)
Externally Glazed Sash	Dwg. Ref. TD 3573S (Std. Steel)
Transom / Mullion	Dwg. Ref. TD 3573S (Std. Steel)

Glazing Gasket:

Schlegel Q – Lon	Dwg. Ref. TD 8500
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Glazing:

28mm Glazing 4/204

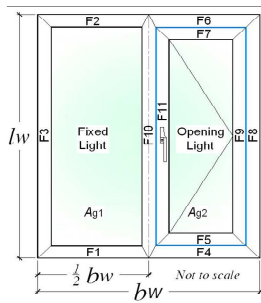
U _g (Glazing U – Value)	1.070	W/(m ² ·K)	BS EN 673
Pane 1 : 4mm Float ε = 0.89	1.0	W/(m·K)	St Gobain
20mm 90% Argon	0.0264	W/(m·K)	BS EN 673
Pane 2 : 4mm One Glass ε = 0.01	1.0	W/(m·K)	St Gobain
g – Value (Glazing Solar Factor)	0.50	-	Calumin
Air Leakage @ 50Pa	0.00	m ³ hr ⁻¹ m ⁻¹	BBA Report 2868 (31.01.2008)
Spacer Bar	Edgetech		

Boundaries @ 20℃ / 0℃**Materials and thermal conductivities in W/(m·K)**

λ	Material	λ	Material
0.035	Panel	0.16	Edgetech
0.06	Q – Lon Value Supplied by Schlegel	0.24	Butyl seal
0.17	P.V.C.U		
0.25	EPDM Glazing Gasket		
1	Glass		

Results Summary

U_{Window} (Wm⁻²K⁻¹)	1.2
g_{Window} (Solar Factor)	0.31
L_{Factor} (Effective Air Leakage – Wm⁻²K⁻¹)	0.00
Labelling Index (KWhm⁻²yr⁻¹)	-16
BFRC Window Rating	C



Sample Style: **Casement** **Fixed Light /** **Side Hung**

Blue line illustrates
opening light length
(air leakage)

Report Number: **706** Report Issue No.18: (08/08/2008)
Report Date: **13 February 2012**
Project Details: **FLOAT - 90 ARGON - PLANITHERM ONE - EDGETECH - 28MM - FEATURED - THERMAL INSERTS**

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

Parameter	Symbol	Units
Total window height ODP	l_w	1480 mm
Total window width ODP	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	20	mm
Gas fill (1/2)	Argon 90%	
Thickness of pane 2	4	mm
No further entry required for double glazed units		
Pane 2/3 distance (n/a for DG)		mm
Gas fill (2/3)	Air 100%	
Thickness of pane 3 (n/a for DG)		mm
Glazing Trans. - 3DP	U_g 1.070	W/(m ² ·K)
g-value - 2DP	g_L 0.50	

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

Frame dimensions:		No gasket	Gasket protrusion	With gasket	
		(mm)	(mm)	(mm)	
All frame values to nearest 0.5mm, gaskets to 1DP	F1 fixed sill	58	0.0	58	Total
	F2 fixed head	58	0.0	58	
	F3 fixed jamb	58	0.0	58	
F4 + F5 sash sill	F4 fixed sash sill	58	n/a	58	103.5
	F5 moving sash sill	45.5	0.0	45.5	
F6 + F7 sash head	F6 fixed sash head	58	n/a	58	103.5
	F7 moving sash head	45.5	0.0	45.5	
F8 + F9 sash jamb	F8 Fixed sash jamb	58	n/a	58	103.5
	F9 moving sash jamb	45.5	0.0	45.5	
F10 + F11 mullion	F10 fixed mullion	72	0.0	72	117.5
	F11 moving mullion	45.5	0.0	45.5	
Total gasket area		0		m ²	

Window Dimensions:			Area	
	Length	Width	No gasket	With gasket
Section	(m)	(m)	(m ²)	(m ²)
Fixed Light	1.3640	0.5210	0.7106	0.7106
Opening light	1.2730	0.4300	0.5474	0.5474
Total glazing, A_g			1.2580	1.2580
Frame	(m)	(m)	(m ²)	(m ²)
F1	0.6150	0.0580	0.0329	0.0329
F2	0.6150	0.0580	0.0329	0.0329
F3	1.4800	0.0580	0.0825	0.0825
F4	0.6150	0.0580	0.0329	0.0329
F5	0.5210	0.0455	0.0216	0.0216
F6	0.6150	0.0580	0.0329	0.0329
F7	0.5210	0.0455	0.0216	0.0216
F8	1.4800	0.0580	0.0825	0.0825
F9	1.3640	0.0455	0.0600	0.0600
F10	1.4800	0.0720	0.1024	0.1024
F11	1.3640	0.0455	0.0600	0.0600
Total Frame			0.5624	0.5624
Total Window, A_w			1.8204	1.8204
Percentage fixed light glass area			39.04%	39.04%
Percentage opening light glass area			30.07%	30.07%
Percentage glass area (total)			69.11%	69.11%

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 ODP			
		$W/(m \cdot K)$	b_p (mm)		$W/(m \cdot K)$
F1 fixed sill	L_f^{2D}	0.2610	190	L_ψ^{2D}	0.2945
F2 fixed head		0.2610	190		0.2945
F3 fixed jamb		0.2610	190		0.2945
F4 + F5 sash sill		0.3291	190		0.3623
F6 + F7 sash head		0.3291	190		0.3623
F8 + F9 sash jamb		0.3291	190		0.3623
F10 + F11 mullion		0.5466	380		0.6138

Frame:	b_f (no gaskets)	U_f	Frame areas (no gaskets)	Heat flow	ψ	l_g	Heat flow
Section	(m)	(W/(m ² ·K))	(m ²)	(W/K)	(W/(m·K))	(m)	(W/K)
F1 fixed sill	0.0580	1.1228	0.0329	0.0370	0.0261	0.5210	0.0136
F2 fixed head	0.0580	1.1228	0.0329	0.0370	0.0261	0.5210	0.0136
F3 fixed jamb	0.0580	1.1228	0.0825	0.0926	0.0261	1.3640	0.0356
F4 + F5 sash sill	0.1035	1.2872	0.0546	0.0703	0.0258	0.4300	0.0111
F6 + F7 sash head	0.1035	1.2872	0.0546	0.0703	0.0258	0.4300	0.0111
F8 + F9 sash jamb	0.1035	1.2872	0.1425	0.1834	0.0258	1.2730	0.0328
F10 + F11 mullion	0.1175	1.3179	0.1624	0.2140	0.0524	1.3185	0.0690
Totals	0.5624	0.7045		Total		0.1867	

Solar Factor, g-value:		F_w	0.9
		g_w	0.31
U_{window}	U_w	1.23	W/(m ² ·K)

Air Leakage loss:			
Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - 2DP			
Opening light length	3.7700 m	Total air leakage	0.000 m ³ /h
L_{50}	0.00 m ³ /(m ² ·h)	Heat loss = 0.0165 L_{50}	0.00 W/(m ² ·K)

Other parameters needed for calculation, taken from simulations:
 $\lambda_p = 0.035$ W/(m·K) $R_{se} = 0.04$ m²·K/W $R_{se} = 0.13$ m²·K/W
 Panel thickness, $d_p = d_g = 0.028$ m $R_p = 0.8000$ m²·K/W $R_{tot} = 0.9700$ m²·K/W $U_p = 1.0309$ W/(m²·K)

BFR Rating kWh/(m ² ·yr)	Label index	EWER Rating Scale	Window Rating
≥ 0	-16	A	C
-10 to <0		B	
-20 to <-10		C	
-30 to <-20		D	
-50 to <-30		E	
-70 to <-50		F	
<-70		G	

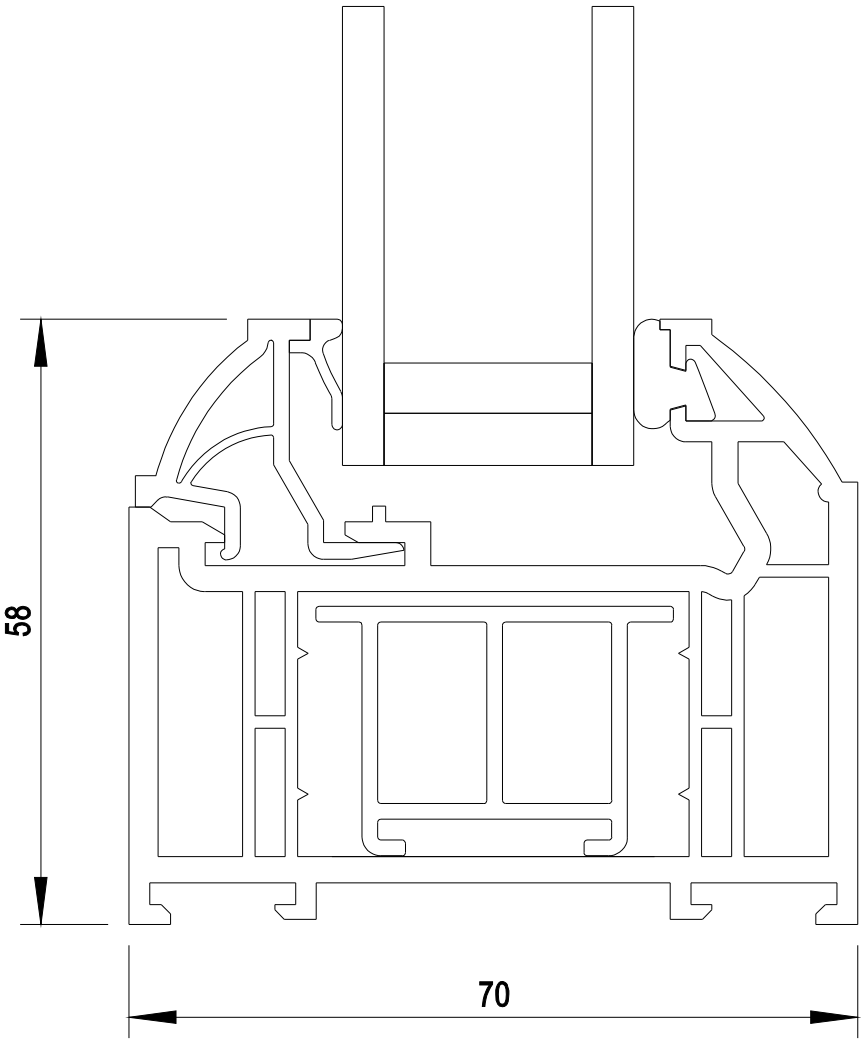
BFR Rating =	
218.6g _{window} - 68.5 × (U_{window} + Effective L_{50}) =	
-16.49	
Climate zone is:	
UK	

Thermal transmittance, W/(m ² ·K)	U_{window}	1.2
Solar factor	g_{window}	0.31
Window air leakage heat loss, W/(m ² ·K)	L_{factor}	0.00

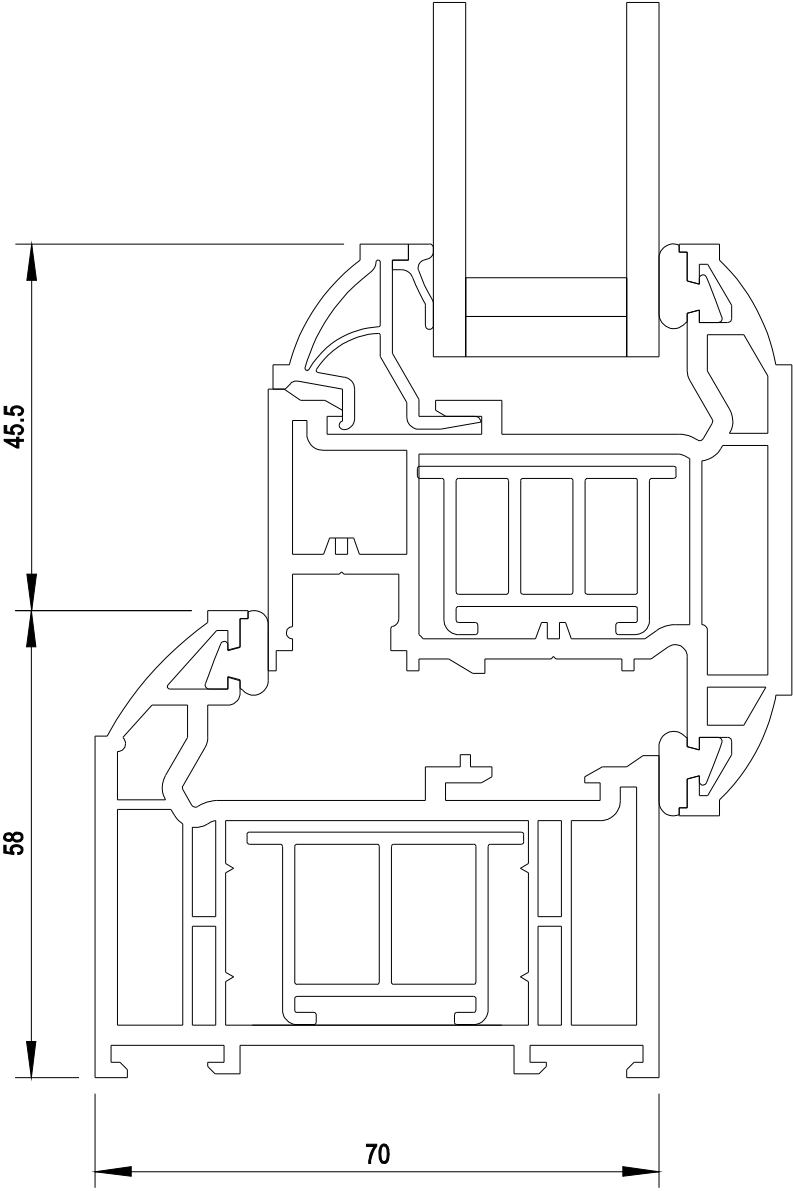
Simulator Name:



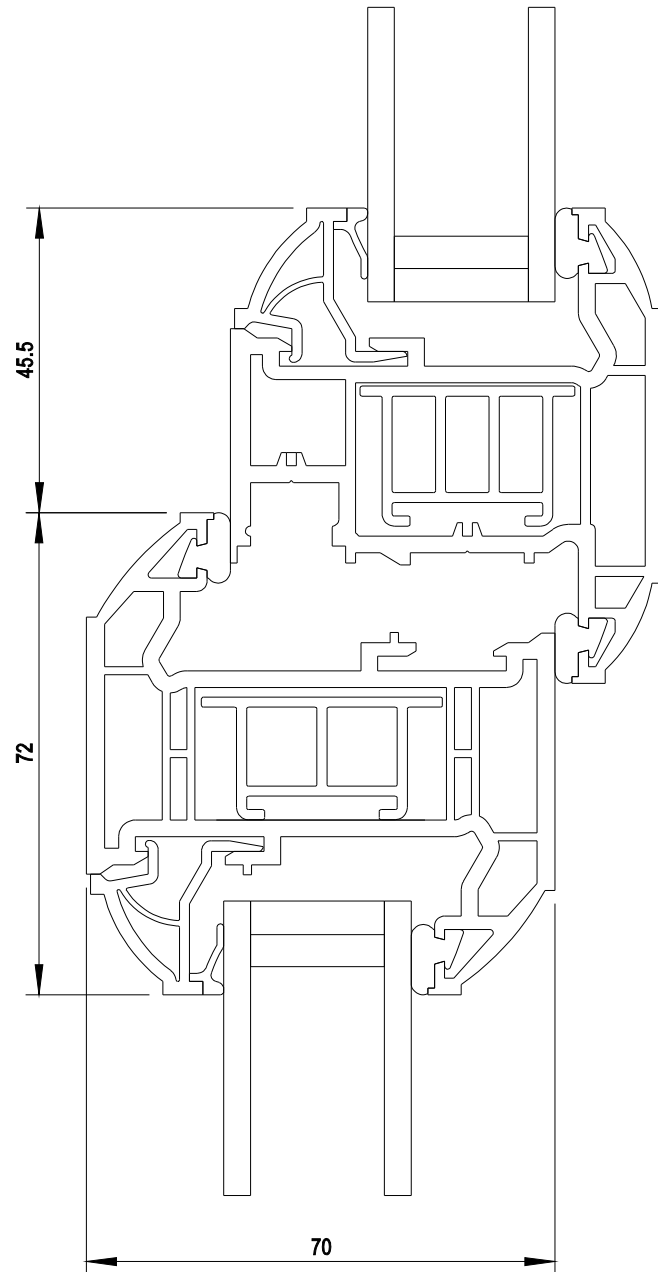
Fixed Light Outer Frame



Opening Light

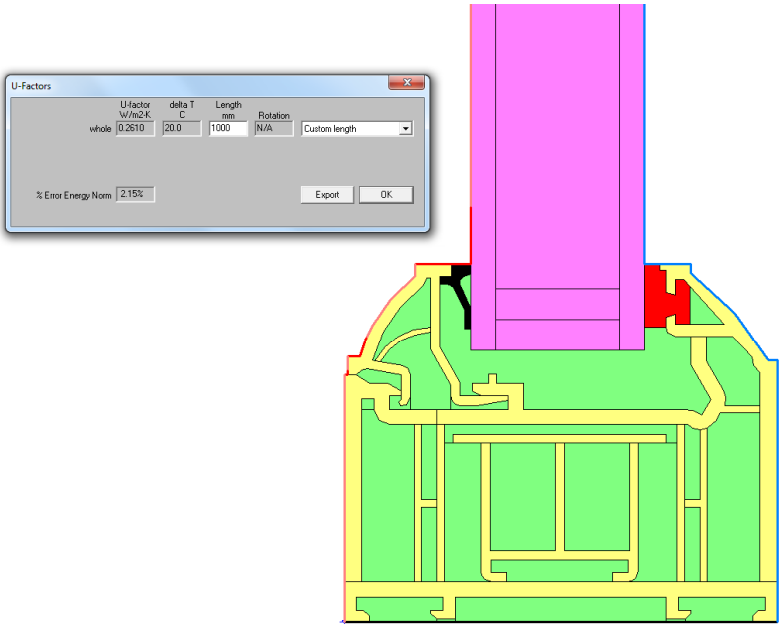
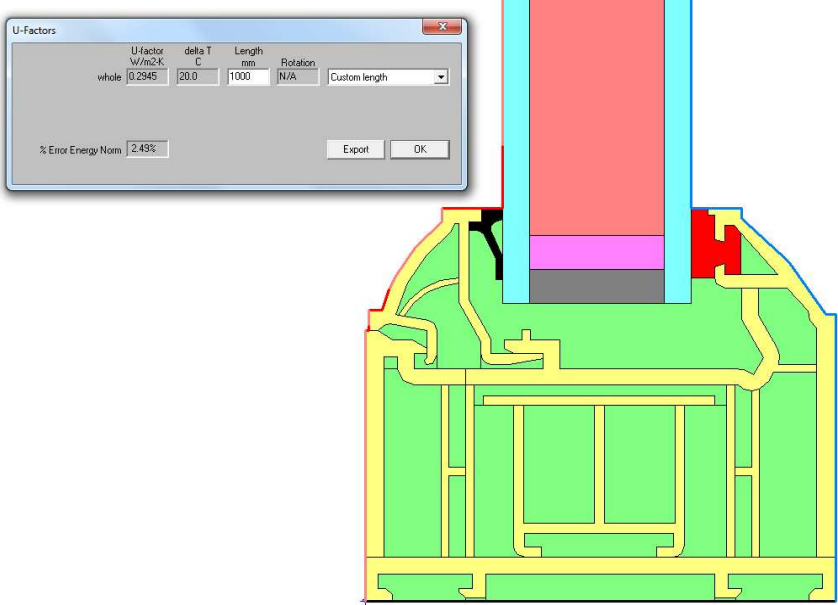


Transom / Mullion



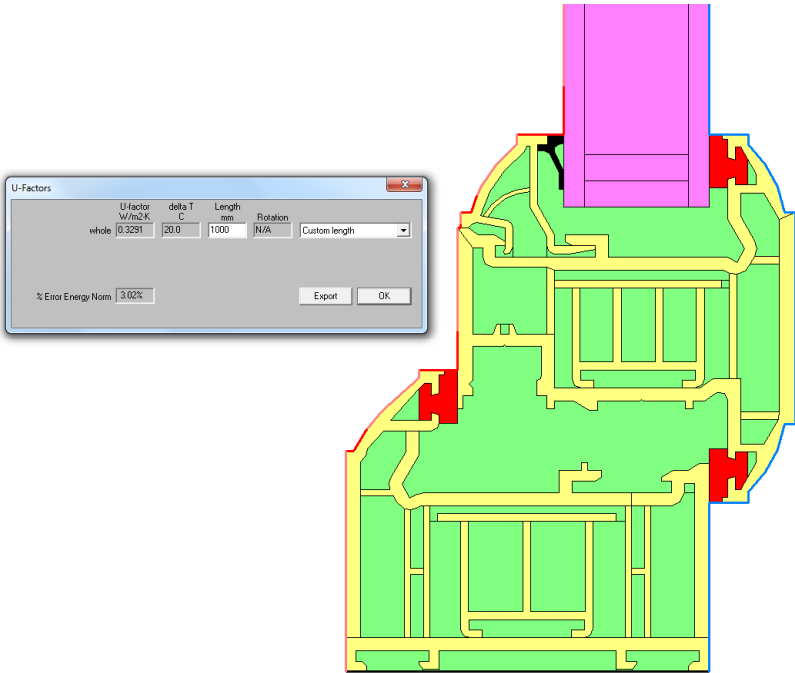
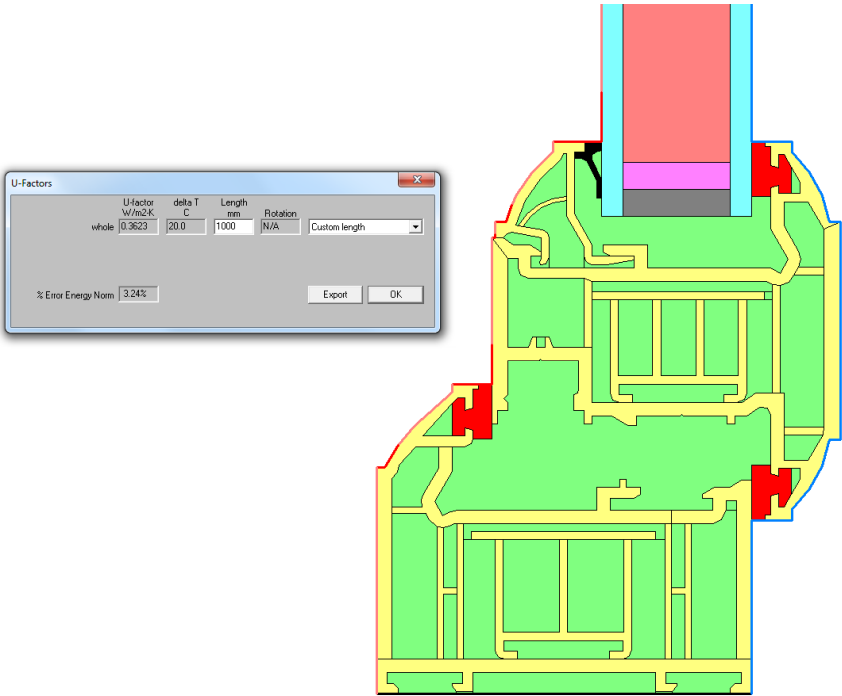
Therm Results:

Fixed Light Outer Frame



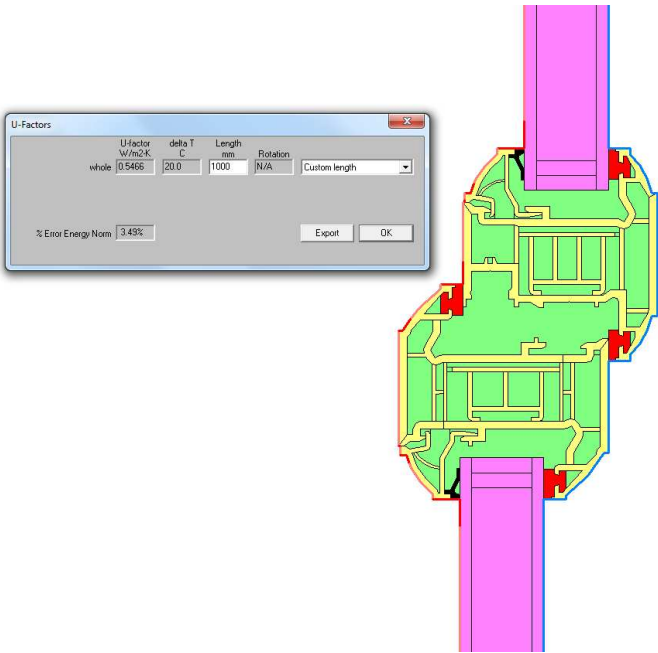
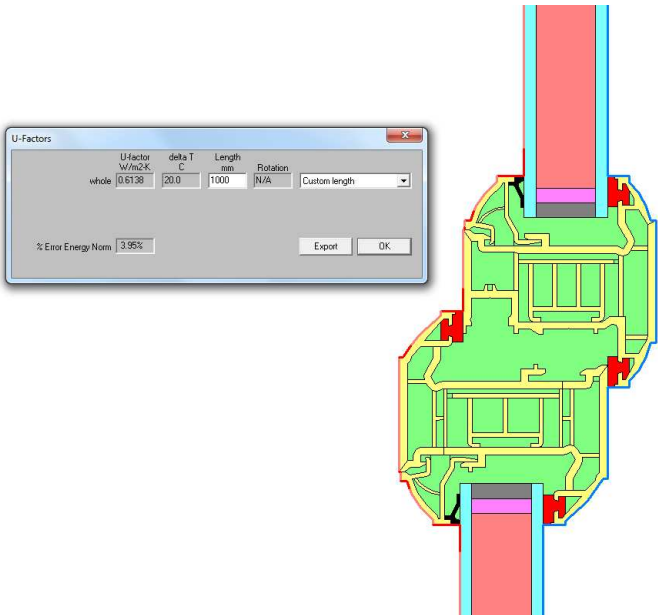
Therm Results:

Opening Light



Therm Results:

Transom / Mullion



Number of spaces
1

Spaces1

Glazing orientation

Vertical

Resistivity panes

1

m·K/W

Outside

Pane1

90%

Pane2

Gas

Argon

Thickness (mm)

4.0

20

4.0

Normal emissivity

0.89

0.01

$\sum d_i \cdot \epsilon_i =$

0.008

Uncoated

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

Iteration number	U value	$\sum 1/h_s$	λ_{eff}	ΔT
	W/(m²·K)	(m²·K)/W		
1	1.070	0.75659	0.0264	15
2	1.070	0.75659	0.0264	15

Calumen® II

FileStandardConfigurationGlassModeHelpInformation

Results

EN 410ISO 9050 m1.5

Luminous factors

TL %71

RLe %22

RLi %23

Energy factors

TE %44

REe %39

REi %39

AE1 %11

AE2 %6

Solar factors

g0.50

SC0.58

Thermal transmission - EN673:2011

α^* 0

U_g W/m²·K1.1

Glazing 1

Coating side 1x

Substrate 14

Coating side 2x

PLANILUX

Cavity 1

Gas20

Argon 90%

Glazing 2

Coating side 3x

Substrate 24

Coating side 4x

PLANITHERM ONE

PLANILUX

Select glazing

Composition

☐ Single glazing

☒ Double glazing

☐ Triple glazing

Functions

☐ Low-E

☐ Solar control

☐ Self-cleaning

☐ Anti-reflective

☐ Protect

☐ Silence

Information

Reset

Results preview

Compute

Save

Quit

Re: 22 %

REe: 39 %

TL: 71 %

TE: 44 %