

# Thermal Transmittance Report



Report Number

8034450

Client

Deceuninck Limited  
Porte marsh Industrial Estate  
Calne  
Wiltshire  
SN11 9PX

Subject

Verification of the method used to determine thermal transmittance data as required by EN14351-1:2006

Prepared by

Ian Chamberlain

Issue Date

20<sup>th</sup> May 2016 (original issue date 19<sup>th</sup> December 2013) This report is valid until 20<sup>th</sup> November 2016

Conditions of issue

This Report is issued subject to no extract, abridgement or abstraction from its content being published or used to advertise or promote a product, process or service without the written consent of the Managing Director, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought. The content applies only to the particular subject stated in this Report. The issuing of this Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product, process or service.



## **Introduction**

This report covers an evaluation of thermal transmittance data and associated calculations performed by the client, in relation to the requirements of BSEN14351 clause 4.12. The data is intended to be used by the clients customers to make an appropriate declaration of performance in relation to thermal transmittance and hence support the CE marking of their window and door products.

The evaluation takes into account the competence of individuals responsible for the simulations and the compliance of simulation software and associated calculations to the requirements of BSEN10077-1:2006 and BSEN10077-2:2012.

The evidence for evaluation was obtained via correspondence.

## **Report Scope**

U values for the following windows and doors as defined in version V1.6 22-04-16 of the Deceuninck 'Thermal transmittance table'

2500 Casement  
2500 Tilt & Turn  
2500 Single Door  
2500 Double Door

2800 Casement  
2800 Tilt & Turn  
2800 Single Door  
2800 Double Door

Monorail  
Vertical Slider  
Slide and Swing Door  
Fully Reversible  
Slider 24

Additional products may be added, on the basis that a revised document, including the additions is reissued and acknowledged by BSI.

## **Simulator competence**

Mark Castle is responsible for generating simulations and providing U values

Competence was determined through membership of relevant professional organisations and the examination of simulation data supplied.

## **Simulation Software validation**

The software system used was Physibel Bisco

The system had been validated in house as required by Clause 4.2 of BSEN10077-2. Evidence was seen demonstrating results within 3% of those quoted for examples given in Annex D of BSEN10077-2

## **Simulation Data**

Calculations for windows and doors are undertaken on samples as specified in BSEN14351 Annex E

$U_g$  values were seen to have been determined in accordance with EN673 as permitted by clause 5 of BSEN10077-2:2012

## **Simulation and calculation verification**

Geometric data used in the simulations was sampled and checked for accuracy. Files containing data produced by the software for a number of frame sections were obtained and recalculated.

Reports generated by the software were examined.

Thermal conductivity data for relevant materials seen, complied with Table A.1 of BSEN 10077:2: 2012. Where thermal conductivity was not derived from established standards it was seen to have been obtained from appropriate sources and hence compliant with BSEN10077-2 clause 5.1. Rules for boundary conditions and cavities appeared to have been applied correctly. Appropriate adiabatic surfaces were applied. Values for emissivity and surface resistances were consistent with the requirements of BSEN10077-2.

Consequently, the simulated  $U_f$  values were considered to be accurately generated.

The 'Socreta' company calculator was used in order to generate results for  $U_w$  and  $U_D$  in accordance with BSEN10077-1.

## **Conclusion**

Calculation software and competent resource was available to produce results compliant to BSEN10077-1 and 2

In our capacity as a Notified Body No 0086 for EN 14351-1: 2006 we have checked the basis on which the determination of the thermal transmittance for the above product range has been made, and can confirm it meets the requirements of clause 4.12. The data generated may therefore be used in support of claims against this clause.

Product	Maximum Glazing U value to achieve whole element U value of $\leq 1.6 \text{ W/m}^2\text{K}$		Maximum Glazing U value to achieve whole element U value of $\leq 1.8 \text{ W/m}^2\text{K}$	
	Metallic spacer	Warm edge spacer	Metallic spacer	Warm edge spacer
Traditional 2500 Casement	<b>1.289</b>	<b>1.569</b>	-	-
Traditional 2500 Tilt & Turn	<b>1.234</b>	<b>1.525</b>	-	-
Traditional 2500 Single Door with mid-rail	<b>1.354</b>	<b>1.567</b>	<b>1.682</b>	<b>1.800</b>
Traditional 2500 Single Door with mid-rail Aluminium low threshold	<b>1.161</b>	<b>1.372</b>	<b>1.485</b>	<b>1.696</b>
Traditional 2500 Double Door	<b>1.379</b>	<b>1.561</b>	<b>1.696</b>	<b>1.800</b>
Traditional 2500 Double Door Aluminium low threshold	<b>1.191</b>	<b>1.373</b>	<b>1.505</b>	<b>1.687</b>

Product	Maximum Glazing U value to achieve whole element U value of $\leq 1.6 \text{ W/m}^2\text{K}$		Maximum Glazing U value to achieve whole element U value of $\leq 1.8 \text{ W/m}^2\text{K}$	
	Metallic spacer	Warm edge spacer	Metallic spacer	Warm edge spacer
Heritage 2800 Casement	<b>1.272</b>	<b>1.552</b>	-	-
Heritage 2800 Tilt & Turn	<b>1.207</b>	<b>1.496</b>	-	-
Heritage 2800 Single Door with mid-rail	<b>1.368</b>	<b>1.581</b>	<b>1.696</b>	<b>1.800</b>
Heritage 2800 Single Door with mid-rail Aluminium low threshold	<b>1.186</b>	<b>1.397</b>	<b>1.509</b>	<b>1.721</b>
Heritage 2800 Double Door	<b>1.385</b>	<b>1.568</b>	<b>1.703</b>	<b>1.800</b>
Heritage 2800 Double Door Aluminium low threshold	<b>1.203</b>	<b>1.385</b>	<b>1.517</b>	<b>1.699</b>

Product	Maximum Glazing U value to achieve whole element U value of $\leq 1.6 \text{ W/m}^2\text{K}$		Maximum Glazing U value to achieve whole element U value of $\leq 1.8 \text{ W/m}^2\text{K}$	
	Metallic spacer	Warm edge spacer	Metallic spacer	Warm edge spacer
Monorail	<b>1.159</b>	<b>1.330</b>	<b>1.451</b>	<b>1.622</b>
Vertical Slider	<b>1.184</b>	<b>1.437</b>	-	-
Slide & Swing Door	<b>1.110</b>	<b>1.374</b>	<b>1.441</b>	<b>1.700</b>
Fully Reversible Window	<b>1.237</b>	<b>1.520</b>	-	-
Slider24 Patio	<b>1.329</b>	<b>1.494</b>	<b>1.601</b>	<b>1.766</b>
Slider24 Patio Aluminium low threshold	<b>1.265</b>	<b>1.429</b>	<b>1.532</b>	<b>1.696</b>

### Profile specification

Window and door products listed are based on worse performing configuration meaning all variations are covered.

### IGU specification

Cavity size options:

- 16mm to 20mm

Metallic spacer bar ( $\Psi \leq 0.08$ ):

- Aluminium or steel with butyl hot melt, polyurethane or polysulfide sealant, overall sightline 12mm

Warm edge spacer bar ( $\Psi \leq 0.032$ ):

- Edgetech Super Spacer Premium; butyl hot melt sealant
- Swisspacer Ultimate; butyl hot melt, polyurethane or polysulfide sealant
- Thermobar; butyl hot melt, polyurethane or polysulfide sealant
- Thermoflex; butyl hot melt sealant

### Deceuninck Ltd

Unit 2, Stanier Road • Porte Marsh Industrial Estate -Calne -Wiltshire -SN11 9PX  
T +44 1249 816969 • F +44 1249 815234

[deceuninck.ltd@deceuninck.com](mailto:deceuninck.ltd@deceuninck.com) • [www.deceuninck.co.uk](http://www.deceuninck.co.uk)



Building a sustainable home

Thermal Transmittance Table  
Report Ref. 8034450  
V1.6 22-04-16

## CE Marking; Thermal Transmittance Tables F1 & F3

Tables F.1 and F.3 give typical indicative values calculated by the method shown in EN ISO 10077 using linear thermal transmittances from Annex E, for normal types of glazing spacer bars i.e. metallic, see Table F.1, for thermally improved glazing spacer bars i.e. warm edge, see Table F.3.

The data in Tables F.1 and F.3 are calculated for windows;

- Positioned vertically
- Of dimensions 1230mm by 1480mm
- With frame area equal to 30 % of the total window area i.e. up to a combined frame and sash sightline of 116.5mm

With glazing and frame types as follows;

- Glazing:  $U_g \geq 2.1$ : uncoated glass;  $U_g \leq 2.0$ : low emissivity glass,
- $U_f = 7.0$ : metal without thermal break;  $2.2 \leq U_f \leq 3.8$ : metal with thermal break;  $U_f \leq 2.0$ : wood or PVC
- With a single light.

Thermal transmittance values for windows of other sizes, positioned other than vertically, with other frame area fractions or with other frame/glazing permutations can be evaluated by means of thermal simulation to EN ISO 10077-2\*. Please be aware that these simulated calculation results need to be approved by a notified body if they are to be used as performance characteristics for CE Marking. Calculating simulated values for all available products and profile combinations is not financially practical.

\*Thermal transmittance values specific to Deceuninck products are available. Please contact the our technical department for details.



**Deceuninck Ltd**

Unit 2, Stanier Road • Porte Marsh Industrial Estate -Calne -Wiltshire –SN11 9PX

T +44 1249 816969 • F +44 1249 815234

Building a sustainable home [deceuninck.ltd@deceuninck.com](mailto:deceuninck.ltd@deceuninck.com) • [www.deceuninck.co.uk](http://www.deceuninck.co.uk)

EN ISO 10077-1:2006

Table F.1 Indicative thermal transmittances for vertical windows with fraction of the frame area 30% of the whole window area and common types of glazing spacer bars (metallic)

Type of glazing	$U_g$ W/(m <sup>2</sup> ·K)	Thermal transmittances for common types of glazing spacer bars													
		$U_f$ W/(m <sup>2</sup> ·K)													
		0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,6	3,0	3,4	3,8	7,0	
Single	5,7	4,2	4,3	4,3	4,4	4,5	4,5	4,6	4,6	4,8	4,9	5,0	5,1	6,1	
Double or triple	3,3	2,7	2,8	2,8	2,9	2,9	3,0	3,1	3,2	3,3	3,4	3,5	3,6	4,5	
	3,2	2,6	2,7	2,7	2,8	2,9	2,9	3,0	3,1	3,2	3,3	3,5	3,6	4,4	
	3,1	2,6	2,6	2,7	2,7	2,8	2,9	2,9	3,0	3,1	3,3	3,4	3,5	4,3	
	3,0	2,5	2,5	2,6	2,7	2,7	2,8	2,8	3,0	3,1	3,2	3,3	3,4	4,2	
	2,9	2,4	2,5	2,5	2,6	2,7	2,7	2,8	2,9	3,0	3,1	3,2	3,4	4,2	
	2,8	2,3	2,4	2,5	2,5	2,6	2,6	2,7	2,8	2,9	3,1	3,2	3,3	4,1	
	2,7	2,3	2,3	2,4	2,5	2,5	2,6	2,6	2,7	2,9	3,0	3,1	3,2	4,0	
	2,6	2,2	2,3	2,3	2,4	2,4	2,5	2,6	2,7	2,6	2,9	3,0	3,2	4,0	
	2,5	2,1	2,2	2,3	2,3	2,4	2,4	2,5	2,6	2,5	2,8	3,0	3,1	3,9	
	2,4	2,1	2,1	2,2	2,2	2,3	2,4	2,4	2,5	2,5	2,8	2,9	3,0	3,8	
	2,3	2,0	2,1	2,1	2,2	2,2	2,3	2,4	2,5	2,4	2,7	2,8	3,0	3,8	
	2,2	1,9	2,0	2,0	2,1	2,2	2,2	2,3	2,4	2,3	2,6	2,8	2,9	3,7	
	2,1	1,9	1,9	2,0	2,0	2,1	2,2	2,2	2,3	2,3	2,6	2,7	2,8	3,6	
	2,0	1,8	1,9	2,0	2,0	2,1	2,1	2,2	2,3	2,5	2,6	2,7	2,8	3,6	
	1,9	1,8	1,8	1,9	1,9	2,0	2,1	2,1	2,3	2,4	2,5	2,5	2,7	3,6	
	1,8	1,7	1,8	1,8	1,9	1,9	2,0	2,1	2,2	2,3	2,4	2,6	2,7	3,5	
	1,7	1,6	1,7	1,7	1,8	1,9	1,9	2,0	2,1	2,2	2,4	2,5	2,6	3,4	
	1,6	1,6	1,6	1,7	1,7	1,8	1,9	1,9	2,1	2,2	2,3	2,4	2,5	3,3	
	1,5	1,5	1,5	1,6	1,7	1,7	1,8	1,8	2,0	2,1	2,2	2,3	2,5	3,3	
	1,4	1,4	1,5	1,5	1,6	1,7	1,7	1,8	1,9	2,0	2,2	2,3	2,4	3,2	
1,3	1,3	1,4	1,5	1,5	1,6	1,6	1,7	1,8	2,0	2,1	2,2	2,3	3,1		
1,2	1,3	1,3	1,4	1,5	1,5	1,6	1,6	1,8	1,9	2,0	2,1	2,3	3,1		
1,1	1,2	1,3	1,3	1,4	1,4	1,5	1,6	1,7	1,8	1,9	2,1	2,2	3,0		
1,0	1,1	1,2	1,3	1,3	1,4	1,4	1,5	1,6	1,8	1,9	2,0	2,1	2,9		
0,9	1,1	1,1	1,2	1,2	1,3	1,4	1,4	1,6	1,7	1,8	1,9	2,0	2,9		
0,8	1,0	1,1	1,1	1,2	1,2	1,3	1,4	1,5	1,6	1,7	1,9	2,0	2,8		
0,7	0,9	1,0	1,0	1,1	1,2	1,2	1,3	1,4	1,5	1,7	1,8	1,9	2,7		
0,6	0,9	0,9	1,0	1,0	1,1	1,2	1,2	1,4	1,5	1,6	1,7	1,8	2,7		
0,5	0,8	0,8	0,9	1,0	1,0	1,1	1,2	1,3	1,4	1,5	1,6	1,8	2,6		



Deceuninck Ltd

Unit 2, Stanier Road • Porte Marsh Industrial Estate -Calne -Wiltshire -SN11 9PX

T +44 1249 816969 • F +44 1249 815234

Building a sustainable home [deceuninck.ltd@deceuninck.com](mailto:deceuninck.ltd@deceuninck.com) • [www.deceuninck.co.uk](http://www.deceuninck.co.uk)

EN ISO 10077-1:2006

Table F.3 Indicative thermal transmittances for vertical windows with fraction of the frame area 30% of the whole window area and glazing spacer bars with improved thermal performance (warm edge)

Type of glazing	$U_g$ W/(m <sup>2</sup> ·K)	Thermal transmittances for common types of glazing spacer bars													
		$U_f$ W/(m <sup>2</sup> ·K)													
		0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,2	2,6	3,0	3,4	3,8	7,0	
Single	5,7	4,2	4,3	4,4	4,4	4,5	4,5	4,6	4,7	4,8	4,9	5,0	5,1	6,1	
Double or triple	3,3	2,7	2,7	2,8	2,9	2,9	3,0	3,0	3,1	3,2	3,4	3,5	3,6	4,4	
	3,2	2,6	2,7	2,7	2,8	2,8	2,9	3,0	3,0	3,2	3,3	3,4	3,5	4,4	
	3,1	2,5	2,6	2,7	2,7	2,8	2,8	2,9	3,0	3,1	3,2	3,3	3,5	4,3	
	3,0	2,5	2,5	2,6	2,6	2,7	2,8	2,8	2,9	3,0	3,1	3,3	3,4	4,2	
	2,9	2,4	2,5	2,5	2,6	2,6	2,7	2,8	2,8	3,0	3,1	3,2	3,3	4,2	
	2,8	2,3	2,4	2,4	2,5	2,6	2,6	2,7	2,8	2,9	3,0	3,1	3,2	4,1	
	2,7	2,3	2,3	2,4	2,4	2,5	2,6	2,6	2,7	2,8	2,9	3,1	3,2	4,0	
	2,6	2,2	2,2	2,3	2,4	2,4	2,5	2,5	2,6	2,6	2,9	3,0	3,1	3,9	
	2,5	2,1	2,2	2,2	2,3	2,4	2,4	2,5	2,6	2,5	2,8	2,9	3,0	3,9	
	2,4	2,0	2,1	2,2	2,2	2,3	2,3	2,4	2,5	2,5	2,7	2,8	3,0	3,8	
	2,3	2,0	2,0	2,1	2,2	2,2	2,3	2,3	2,4	2,4	2,7	2,8	2,9	3,7	
	2,2	1,9	2,0	2,0	2,1	2,1	2,2	2,3	2,3	2,3	2,6	2,7	2,8	3,7	
	2,1	1,8	1,9	2,0	2,0	2,1	2,1	2,2	2,3	2,2	2,5	2,6	2,8	3,6	
	2,0	1,8	1,8	1,9	2,0	2,0	2,1	2,1	2,3	2,4	2,5	2,6	2,7	3,6	
	1,9	1,7	1,8	1,8	1,9	2,0	2,0	2,1	2,2	2,3	2,4	2,5	2,7	3,5	
	1,8	1,6	1,7	1,8	1,8	1,9	1,9	2,0	2,1	2,2	2,4	2,5	2,6	3,5	
	1,7	1,6	1,6	1,7	1,8	1,8	1,9	1,9	2,0	2,2	2,3	2,4	2,5	3,4	
	1,6	1,5	1,6	1,6	1,7	1,7	1,8	1,9	2,0	2,1	2,2	2,3	2,5	3,3	
	1,5	1,4	1,5	1,6	1,6	1,7	1,7	1,8	1,9	2,0	2,1	2,3	2,4	3,2	
	1,4	1,4	1,4	1,5	1,5	1,6	1,7	1,7	1,8	2,0	2,1	2,2	2,3	3,2	
	1,3	1,3	1,4	1,4	1,5	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	3,1	
	1,2	1,2	1,3	1,3	1,4	1,5	1,5	1,6	1,7	1,8	1,9	2,1	2,2	3,0	
	1,1	1,2	1,2	1,3	1,3	1,4	1,5	1,5	1,6	1,7	1,9	2,0	2,1	3,0	
1,0	1,1	1,1	1,2	1,3	1,3	1,4	1,4	1,6	1,7	1,8	1,9	2,0	2,9		
0,9	1,0	1,1	1,1	1,2	1,3	1,3	1,4	1,5	1,6	1,7	1,8	2,0	2,8		
0,8	0,9	1,0	1,1	1,1	1,2	1,2	1,3	1,4	1,5	1,7	1,8	1,9	2,8		
0,7	0,9	0,9	1,0	1,1	1,1	1,2	1,2	1,3	1,5	1,6	1,7	1,8	2,7		
0,6	0,8	0,9	0,9	1,0	1,0	1,1	1,2	1,3	1,4	1,5	1,6	1,8	2,6		
0,5	0,7	0,8	0,9	0,9	1,0	1,0	1,1	1,2	1,3	1,4	1,6	1,7	2,5		



Deceuninck Ltd

Unit 2, Stanier Road • Porte Marsh Industrial Estate -Calne -Wiltshire -SN11 9PX

T +44 1249 816969 • F +44 1249 815234

Building a sustainable home [deceuninck.ltd@deceuninck.com](mailto:deceuninck.ltd@deceuninck.com) • [www.deceuninck.co.uk](http://www.deceuninck.co.uk)