

Location:

Joiners: CHT Joinery (1480 x 1230mm)



Date	19th May 2015	
Unique Reference No.	U-Value0001052015	
Product Information		
Manufacture Date	May 2015	
Material Used	Glazing	4mm / Argon / 4mm
	Frame	Softwood
	Glazing Seal	Super Spacer
	Frame Edge Insulation	Foam
Certified U-Value		1.16 W/m²K

Purpose

The purpose of this calculation is to determine the overall Heat Transfer Co-efficient of a workshop manufactured window.

Method

This calculation has been undertaken using an Excel Spreadsheet.

Basis

The calculation has been performed in accordance with the U-value equation provided in European Standard EN ISO 10077: Thermal performance of windows, doors and shutters.

References

The reference sources outlined below have been used to complete this calculation.

1. Engineers toolbox material values
2. European standard ENISO 10077.



Input Data

Glazing Dimensions				
Dimension	Length	Width	Unit	
Pane 1	L2, W2	0.603	1.04	m
Pane 2	L3, W3	0.603	1.04	m
Pane 3	L4, W4	0	0	m
Pane 4	L5, W5	0	0	m
Pane 5	L6, W6	0	0	m
Pane 6	L7, W7	0	0	m

Frame Dimensions				
Dimension	Length	Width	Unit	
Frame	L1, W1	1.48	1.23	m

Thermal Properties					
Parameter		Value	Unit	Material	Ref. ⁽¹⁾
Glazing U-Value	U _g	1.2	W/m ² K	4mm / Argon / 4mm	
Frame U-Value	U _f	0.12	W/m ² K	Softwood	
Glass Edge Thermal Bridge Co-efficient	Ψ _g	0.16	W/mK		
Window Installation Thermal Bridge	Ψ _{inst}	0	W/mK	Foamed in place	
Window Spacer Correction Factor	U _{corr}	-0.28	W/m ² K	Super Spacer	

⁽¹⁾ For Thermal Property reference sources please refer to cover sheet.

⁽²⁾ Application of Window Spacer Correction Factor is based on spacer manufacturers guidance, which indicates that the use of specific spacer types can improve the overall window U-value. Please refer to applicable reference source for further information

Calculated Data

Total Surface Areas				
Component		Units	Calculation	
Glazing	A _g	1.25424	m ²	L ₂ x W ₂ + L ₃ x W ₃ + L ₄ x W ₄ +.....
Frame	A _f	0.56616	m ²	(L ₁ x W ₁) - A _g

Perimeters				
Component		Units	Calculation	
Glazing	l _g	6.572	m	2 x (L ₂ + W ₂ + L ₃ + W ₃ +
Frame	l _{inst}	5.42	m	2 x (L ₁ + W ₁)

Calculated Window U-Value

The overall Window Heat Transfer Co-efficient, U_w , is determined from the equation below, using the raw and calculated data outlined on the previous sheet. This equation originates from European Standard EN ISO 10077: Thermal performance of windows, doors and shutters.

$$U_w = \frac{A_g U_g + A_f U_f + l_g \Psi_g + l_{inst} \Psi_{inst}}{A_g + A_f}$$

Window U-value (with no Window Spacer Correction Factor)

Using the above equation, and **NOT** taking into account the Window Spacer Correction Factor identified in the Thermal Property Raw Data table, the U-Value of the window specified in this document is calculated to be:

$$\text{Window U Value, } U_w = 1.44 \text{ W/m}^2\text{K}$$

Window U-value (with Window Spacer Correction Factor)

Taking into account the Window Spacer Correction Factor identified in the Thermal Property Raw Data table, the equation outlined above becomes:

$$U_w = \frac{A_g U_g + A_f U_f + l_g \Psi_g + l_{inst} \Psi_{inst}}{A_g + A_f} + U_{corr}$$

The U-factor then becomes:

$$\text{Window U Value, } U_w = 1.162 \text{ W/m}^2\text{K}$$

Unique Cert No.

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