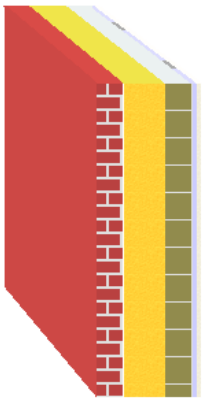
Source: **own catalogue - Flat roofs**
Component: **85 Palmer Road, External Wall U Value Calculation**

OUTSIDE INSIDE



This illustration of inhomogeneous layers is provided only to assist in visualising the arrangement.

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.0400
☑	1	Generic Building Materials	Brick outer leaf & Mortar outer leaf (f = 0.000 / automatic disregard acc. BRE 443)	0.1020	0.770	D	0.1325
☑	2	Own catalogue	Isover CWS 32	0.1500	0.032	E	4.6875
		Fixings	Double triangle stainless steel No./m²:	2.5/m²	17.000	D	-
		Fixings	equivalent diameter: 0.004 m / alpha: 0.800				
		Air gaps	Level 0: dU" = 0.00 W/(m²K)				
☑	3	Thermalite	Thermalite Turbo Block 440x215 & Mortar outer leaf (f = 0.067)	0.1000	0.165	D	0.6048
☑	4	Inhomogeneous material layer	consisting of:	0.0150	ø 0.156		0.0959
	4a	BS EN ISO 6946	Unventilated air layer: 15 mm, horiz. heat flow	80.00 %	0.088	D	-
	4b	Generic Building Materials	Plaster dabs -Gypsum [1200 kg/m³]	20.00 %	0.430	D	-
☑	5	Generic Building Materials	Standard wallboard (plasterboard up to 700kg/m³)	0.0125	0.210	D	0.0595
		Rsi					0.1300
				0.3795			

$R_T = (R_T' + R_T'')/2 = 5.77$ m²K/W

Correction to U-value for	according to	delta U [W/(m²K)]
Mechanical fasteners	BS EN ISO 6946 Annex F	~~0.0023~~
Air gaps	BS EN ISO 6946 Annex F	~~0.0000~~
Air gaps and fixings corrections need not be applied, as their total effect is less than 3% (Annex D BS 6946:1996).		
		0.0000

$U = 1/R_T + \Sigma\Delta U = 0.17$ W/(m²K)

Q .. The physical values of the building materials has been graded by their level of quality. These 5 levels are the following
A .. A: Data is entered and validated by the manufacturer or supplier. Data is continuously tested by 3rd party.
B .. B: Data is entered and validated by the manufacturer or supplier. Data is certified by 3rd party
C .. C: Data is entered and validated by the manufacturer or supplier.
D .. D: Information is entered by BuildDesk without special agreement with the manufacturer, supplier or others.
E .. E: Information is entered by the user of the BuildDesk software without special agreement with the manufacturer, supplier or others.

U = 0.17 W/(m²K) R_T= 5.77 m²K/W

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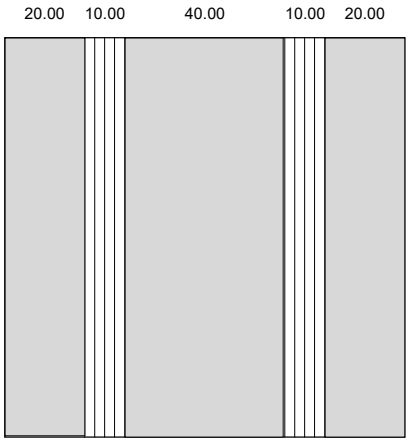
Draft of the component (portion in %):



The inhomogeneous layer consists of two zones (A, B).
The portion is given in %.

A	20.00 + 40.00 + 20.00 consisting of material layers: 1, 2, 3, 4a, 5	= 80.00%
B	10.00 + 10.00 consisting of material layers: 1, 2, 3, 4b, 5	= 20.00%

Upper limit of the thermal transfer resistance R

$$U_A\ [W/(m^2K)] = \frac{1}{(\sum R_{i,A}) + R_{si} + R_{se}} = \frac{1}{5.65 + 0.13 + 0.04} = 0.17$$

$$U_B\ [W/(m^2K)] = \frac{1}{(\sum R_{i,B}) + R_{si} + R_{se}} = \frac{1}{5.52 + 0.13 + 0.04} = 0.18$$

$$R_T' = \frac{1}{A * U_A + B * U_B} = 5.80\ m^2K/W$$

Lower limit of the thermal transfer resistance R

R_{se} [m²K/W]		= 0.04
R_1'' [m²K/W] = d_1/λ_1 =	0.1020 / 0.770	= 0.13
R_2'' [m²K/W] = d_2/λ'_2 =	0.1500 / 0.032	= 4.69
R_3'' [m²K/W] = d_3/λ_3 =	0.1000 / 0.165	= 0.60
R_4'' [m²K/W] = $d_4/(\lambda_{4a} * A + \lambda_{4b} * B)$ =	0.0150 /(0.088 * 80.00% + 0.430 * 20.00%)	= 0.10
R_5'' [m²K/W] = d_5/λ_5 =	0.0125 / 0.210	= 0.06
R_{si} [m²K/W]		= 0.13

$$R_T'' = \sum R_i'' + R_{si} + R_{se} = 5.75\ m^2K/W$$