RED LETTER SUPPLIES

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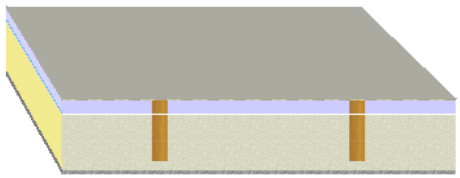
Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946
Source: **own catalogue**
Component: **New roof**

OUTSIDE



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

On the basis of the given information about the inhomogeneous layers, it is not possible to estimate how and where bearing elements intersect each other. It was assumed that the layers intersect crosswise. The size of the areas was calculated corresponding to their percentage of the whole area.

INSIDE

Assignment: Roof with a pitch >= 70°

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.1300
☐	1	BS EN 12524	Slate [2000 kg/m³]	0.0050	2.200	D	~~0.0023~~
☐	2	Inhomogeneous material layer	consisting of:	0.0500	ø 0.010		~~4.8077~~
	2a	BS EN ISO 6946	Well ventilated air layer	92.00 %	0.000	D	-
	2b	BS EN 12524	Softwood Timber [500 kg/m³]	08.00 %	0.130	D	-
☑	3	BS EN 12524	Breather membrane	0.0001	0.170	D	0.0006
☑	4	Inhomogeneous material layer	consisting of:	0.1750	ø 0.035		4.9659
	4a	Synthesia Air gaps	Synthesia 303 HFO Level 1: dU'' = 0.01 W/(m²K)	92.00 %	0.027	E	-
	4b	Generic Building Materials	Softwood Timber [500 kg/m³]	08.00 %	0.130	D	-
☑	5	Xtratherm Limited Air gaps	Thin-R XT/PR Pitched Roof Level 1: dU'' = 0.01 W/(m²K)	0.0400	0.022	C	1.8182
☑	6	BS EN 12524	Gypsum plasterboard	0.0125	0.250	D	0.0500
		Rsi					0.1300
				0.2826			

☐ was not taken into consideration in the calculation

$R_T = (R_T' + R_T'')/2 = 7.40$ m²K/W

Correction to U-value for	according to	delta U [W/(m²K)]
Air gaps	BS EN ISO 6946 Annex D	0.005
		0.005

$U = 1/R_T + \Sigma\Delta U = 0.14$ 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_{max} = 0.20 W/(m²K) U = 0.14 W/(m²K) R_T= 7.40 m²K/W

Source of Umax value: England and Wales Approved Document L1A 2010 Tab 2 Dwellings New

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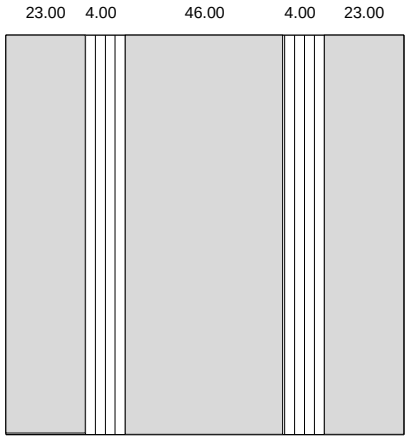
Component: **New roof**

Draft of the component (portion in %):



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

A	23.00 + 46.00 + 23.00 consisting of material layers: 3, 4a, 5, 6	= 92.00%
B	4.00 + 4.00 consisting of material layers: 3, 4b, 5, 6	= 8.00%

Upper limit of the thermal transfer resistance R

$$U_A\ [W/(m^2K)] = \frac{1}{(\Sigma R_{i,A}) + R_{si} + R_{se}} = \frac{1}{8.35 + 0.13 + 0.13} = 0.12$$

$$U_B\ [W/(m^2K)] = \frac{1}{(\Sigma R_{i,B}) + R_{si} + R_{se}} = \frac{1}{3.21 + 0.13 + 0.13} = 0.29$$

$$R_T' = \frac{1}{A * U_A + B * U_B} = 7.70\ m^2K/W$$

Lower limit of the thermal transfer resistance R

$R_{se}\ [m^2K/W]$		= 0.13
$R_3''\ [m^2K/W] = d_3/\lambda_3 =$	0.0001 / 0.170	= 0.00
$R_4''\ [m^2K/W] = d_4/(\lambda_{4a} * A + \lambda_{4b} * B) =$	0.1750 /(0.027 * 92.00% + 0.130 * 8.00%)	= 4.97
$R_5''\ [m^2K/W] = d_5/\lambda_5 =$	0.0400 / 0.022	= 1.82
$R_6''\ [m^2K/W] = d_6/\lambda_6 =$	0.0125 / 0.250	= 0.05
$R_{si}\ [m^2K/W]$		= 0.13

$$R_T'' = \Sigma R_i'' + R_{si} + R_{se} = 7.09\ m^2K/W$$