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### U-value calculation

by BRE U-value Calculator version 2.03  
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### Element type: Roof - Structural insulated panel

Calculation Method: BS EN ISO 6946

### Roof Type 1 - 194mm SIP

Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	12.5	0.160			0.078		Vapourcheck plasterboard
2							Protect VC Foil Ultra Insulating AVCL
Membrane							
3	25	R-value <sup>1</sup>	0.120	0.125	0.530	0.208	Air layer unventilated
4	11	0.130			0.085		SIP - OSB
5	172	0.030			5.733		SIP - Lambdatherm EPS
6	11	0.130			0.085		SIP - OSB
7							Protect VP400 Plus LR
8	50	R-value					Air layer ventilated
9	12	1.000					Roof Tiles
					<u>0.100 #</u>		Rse
	<u>294 mm (total roof thickness)</u>				<u>6.711</u>		

<sup>1</sup>Specified thermal resistance

# this resistance substitutes for Rse and the resistance of layers 8-9 because of the ventilated air layer (layer 8)

Total resistance: Upper limit: 6.669 Lower limit: 6.625 Ratio: 1.007 Average: 6.647 m<sup>2</sup>K/W

U-value 0.150  
**U-value (rounded) 0.15 W/m<sup>2</sup>K**

The U value result has been determined as follows:

#### **Bridging:**

A thermal bridge percentage for the timber studs of 12.5% has been used in accordance with BR 443: 2006 Conventions for U values (section 4.5.1 (ii)).

#### **Correction level:**

A correction level of 0 has been used in accordance with Table F1 of BS EN ISO 6946: 2017 Building components and Building elements - Thermal transmittance - Calculation methods.

Please check to confirm and advise if any amendments are required.

Calculated by Protect Technical Services

