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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 2 - 169mm SIP

Layer	d (mm)	$\lambda$ layer	$\lambda$ bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	50	0.021			2.381		Gyproc Thermaline Super
2							Protect VC Foil Ultra Insulating AVCL
Membrane							
3	25	R-value <sup>1</sup>	0.120	0.0800	0.530	0.208	Air layer unventilated
4	11	0.130			0.085		SIP - OSB
5	147	0.030			4.800		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>303 mm (total roof thickness)</u>				8.080		

<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: 8.039 Lower limit: 7.994 Ratio: 1.006 Average: 8.016 m<sup>2</sup>K/W

U-value 0.125

**U-value (rounded) 0.12 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

