



U-value Calculator

U-values measure how effective a material is as an insulator. Please use our simple calculator to find the necessary values for your project. For more detailed calculators, please [ask our Support team](#) for help.

U Value Calculator

Thickness in mm (‘t’ Value)	Thermal Resistance (‘R’ Value)	Thermal Conductivity (‘K’ Value)
External Surface resistance	0.04	
Step 1 - Choose System		
K Systems EWI System	Expanded Polystyrene Insulation (EPS)	
8	0.07	0.115



Normal insulation

Grey Expanded Polystyrene (EPS) - 20-250mm

EWI Systems	Projects	Partner with Experts	EWI Academy	Tools	Government Funding	Con
	250		7.576		0.033	

Expanded Polystyrene Insulation (EPS) ST Bedding Adhesive

5	0.043	0.115
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Step 3 - Choose Structure Type and input thickness in mm

Structure

Steel Frame - External Cement Particle Board

Type

Steel Studwork (150x35mm - Clear Cavity)

150	0.18	0
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Step 4 - Choose Internal Finishes

Plaster Dabs (Dot & Dab)

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12.5mm Plasterboard (BS5250)

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12.5	0.074	0.17
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2nd Layer 12.5mm Plasterboard (BS5250)

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12.5	0.074	0.17
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Plaster, 2mm Skim (BS5250)

☐



Internal Surface resistance

EWI Systems

Projects

Partner with Experts

EWI Academy

Tools

Government Funding

Con

0.13

Total Resistance

8.24

('R' Value)

Calculate

U Value

0.12 W/M² °C

USING A U-VALUE CALCULATOR – METHOD

Thermal Resistance (R value)

In order to measure the resistance to the passage of heat through a specific thickness of any given material, the thickness (t) is divided by the thermal conductivity (k) value. The thickness is always expressed in metres (e.g 90mm would be expressed as 0.09). This value is known as the 'R' value, and represents thermal resistance, so in this case higher values indicate better resistance to heat loss.

The 'R' value is expressed in m²°C/W.

$$R = t / K$$

Thermal Transmission (U value)

The overall expression of heat loss through a structure such as a wall or roof is known as the 'U' value, which represents thermal transmission (i.e heat loss). This is expressed in W/m²°C and indicates the heat lost through one square metre of the construction for each degree of temperature difference



$$U = 1 / \text{Total R (Rsi + Rso + Ra + R1 + R2 + R3 + R4 etc)}$$

Where Rsi = thermal resistance of the internal surface

Rso = thermal resistance of the external surface

Ra = the thermal resistance of air spaces within the construction

R1, R2 etc = the thermal resistance of individual components

Acceptable (maximum) U values for elements of buildings can be found in the current Building Regulations (Approved Documents L1 and L2) for England and Wales (Conservation of Fuel and Power), Section J of the Technical Standards in Scotland, and Section F in Northern Ireland.

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