



TEACH Passiv

REGISTERED
PRACTICE

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RIAI



P DESIGNER

**CERTIFIED
PASSIVE HOUSE
DESIGNER**

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FACT SHEET No. 10

Thermal Bridges

One of the 5 Passive House principles (from Fact Sheet No.1) is thermal bridge free design. Think of Thermal Bridges as leakage areas in your building where heat (and money) can escape. This Fact Sheet (No.10) looks at this in more detail:

A thermal (or cold) bridge is where heat can pass through from the outside of the building to inside through a material of higher conductivity. This normally occurs where the thermal insulation layer is penetrated or compromised.

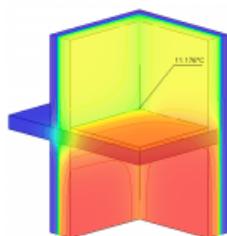
There are 2 types of thermal bridge:

1. Construction Thermal Bridge where the insulation layer is penetrated by a material of higher conductivity and,
2. Geometric Thermal Bridge where the thickness or direction of the insulation layer changes.

For Passivhaus PHPP Calculations/Certification thermal bridges are divided as:

1. Linear Thermal Bridge (Ψ (psi)) where the bridge occurs on a linear basis such as a balcony penetrating the thermal envelope and
2. Point Thermal Bridge (χ (chi)) where for example a mechanical fixing penetrates the thermal layer at a specific point.

Thermal bridge free is where the external thermal bridge value is less than 0.01 W/mK for Ψ (psi) and 0.01 W/m²K for χ (chi) and to be Thermal Bridge free (and achieve Passivhaus certification) the calculation below should give the result ≤ 0 (ie zero or negative)



For more information on Thermal Bridges visit the Passipedia website [HERE](#)

There are many details now that have been deemed 'Thermal Bridge Free' for all forms of construction but software is also available such as [THERM](#) or [Psi-Therm](#) that analyses heat transfer through products, materials and construction:

The maths

$$\sum (\Psi \times \text{Length}) + \sum (\chi / \text{area of element}) \leq 0.00 \text{ W/K}$$

Where:

Ψ = psi value for linear thermal bridge and χ = chi value for point thermal bridge