



TEACH Passiv



TEACHPASSIV.COM IS AN
INITIATIVE OF:

MARK STEPHENS ARCHITECTS

OFFICE

Roskey
Foxford
Co. Mayo
Ireland

MOBILE

085 159 4084

TEL

094 92 57621

EMAIL

mdstephens@gmail.com

WEB

MarkStephensArchitects.com

FACT SHEET

A basic guide to Thermal Conductivity & u values

This Fact sheet is in direct response to a lot of confusion regarding Conductivity and u values.

I was recently discussing the difference between two roof insulation materials (same type but different conductivity values):

thermal conductivity (often denoted k , λ , or κ) is the **property** of a material to **conduct heat**

The two insulations in question (a mineral wool incidentally) had a conductivity of:

0.034 [W/(mK)] (watts per meter kelvin)

0.044 [W/(mK)] (watts per meter kelvin)

The confusion with insulation materials is that these figures look like decimals with the maximum at 1.0; whereas building materials can vary for a good insulation at 0.021 [W/(mK)] up to 116 for zinc (examples only, not minimum or maximum values).

This confusion is compounded when the conductivity values are used in the resultant u value calculations. Typically for the same thickness of roof (say 300mm of insulation), the u values are:

Insulation with conductivity at 0.034 [W/(mK)], $u = 0.110$ W/(m²K)

Insulation with conductivity at 0.044 [W/(mK)], $u = 0.142$ W/(m²K)

Again if we think of these as decimals then you would think the difference is minimal; whereas the actual comparison should be as a percentage of each other.

The insulation with conductivity of 0.034 [W/(mK)] is over 20% better than the 0.044 [W/(mK)] insulation.

If I said you could have a house that is 20% thermally less efficient than your neighbours, would you go for it?

There are 2 critical components for the u-value calculation:

1. The materials conductivity
2. The materials thickness

This Fact Sheet does not take account of Thermal Bridging which is covered in a separate sheet