

Thermal Bridging

Part L Building Regulations

Accredited Detailing

Like all other inputs into a building energy calculation, the way that insulation is installed to avoid thermal bridging has a numerical input into the software – which is called a Y-value.

A set of 'good practice' details have been available in the form of 'Accredited Construction Details' (ACDs) published by the Department for Communities and Local Government (DCLG) in the UK. These details are a set of design drawings for the junctions listed in Appendix K Table K1 in the SAP 2012 Manual which are most prone to heat loss. They detail, using traditionally used UK construction methods and materials how insulation should be installed at these critical junctions in order to improve not only the heat loss but also airtightness results and avoid condensation by ensuring surface temperatures are within a safe margin.

Xtratherm details are based on these Accredited Details delivering best practice results.

It's measured as a 'Y' value in SAP - is it important?

'If you look at the Y-value in the SAP as a penalty to be paid for bad detailing at junctions it puts it in perspective. The Y-value 'penalty' is added to the average U-value of the build - so 0.15 (the default Y in BER) pushes Passive Haus average U-values of 0.15 to 0.30W/m2K; It's like removing half of all the insulation!

An Overview

Another way of looking at the consequence of the Y-value is it's equivalent heatloss if it was simply a hole in the wall.



y = 0.15
(SAP Default)

The equivalent of an open 'Garage Door' 2.1m x 3.3m (6.93m²) opening.



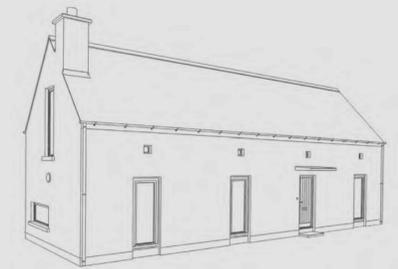
y = 0.08
(Accredited Details)

The equivalent of an open 'Patio Door' 2.1m x 1.8m (3.78m²) opening.



y = 0.03
(Thermally Modelled Junctions)

The equivalent of an open 'Window' 1.25m x 1.25m (1.56m²) opening.



Calculating the Y-value

To calculate the heatloss associated through 'non-repeating thermal bridges' you need 3 bits of data.

When all the junctions (As listed in table K1 in the SAP 2012 Manual) are quantified (in lineal metres) they are multiplied by their individual PSI Values. PSI Values are printed within table K or provided by manufacturers.

The sum of all the L x PSI (Ψ) are then divided by the Total Heatloss Area for the building (ie. The area of walls, floor, roofs and openings) and this results in your Y-value.

Y Value Calculation Table				
Total Envelope Area		356.160		
Junction	L		Ψ	L x Ψ
Lintels	17.840	x	0.001	= 0.02
Sill	15.080	x	0.036	= 0.54
Jamb with return block	48.370	x	0.030	= 1.45
Ground Floor	39.200	x	0.165	= 6.47
Intermediate Floor within a dwelling	39.200	x	0.001	= 0.04
Sloped (Insulation at eaves)	29.600	x	0.034	= 1.01
Sloped (Insulation at gables)	13.440	x	0.071	= 0.95
Corner (Normal)	19.400	x	0.035	= 0.68
Total				= 11.69
L x Ψ / Total Area				= 0.0313

