
What is Thermal Bridging?

You might have heard about thermal bridging, perhaps mentioned by your builder or architect. But what exactly is it?

Thermal bridging occurs in building envelopes when gaps or breaks in the insulation envelope create pathways for heat to leak out of the building. It can be caused by poor workmanship where gaps are left between insulation bats.

It also happens when any material that easily conducts heat such as concrete or steel passes right through your insulation layer. It is like a leak in a bucket. Concrete window cills, lintels, thresholds, eaves details and rising walls are typical culprits.



This load bearing insulated foundation system helps eliminate thermal bridging from foundations.
Image courtesy Kore Systems

How is it avoided?

Architects and builders have to be clever to avoid thermal bridging and need to carefully design each detail using a combination of special products and ingenuity. They should be able to show you a blown-up detail drawing showing exactly how they propose to avoid a thermal bridge for each building junction. They can also use the Acceptable Details published by the Department of Environment but you need to be certain that these are followed exactly on site with no shortcuts.

For example, your rising wall from the foundation needs to have a thermal break built into it to avoid heat traveling down into the cold ground. Otherwise it is like your house is wearing no socks on a snowy day. This thermal break can be a special load-bearing material with insulating properties such as foamed concrete block like a concrete aero bar, or a special load bearing insulation that maintains the line of insulation at floor level. There are plenty of solutions but it needs careful thought by your builder.



The arrows in this photograph show where a thermal bridge has been formed by the chimney structure which passes right through the insulation layer.
Image courtesy of Gavin O'Shea

What does thermal bridging mean for heat loss and condensation?

On a cold day your valuable heat wants to be outside and will look for a way out. Any weak points such as poorly designed junctions or thermal bridges will act as one of these escape routes. Thermal bridging can be responsible for more than 15% of all heat lost through the thermal envelope.

However that is not the worst. Thermal bridging means there are cold areas on the internal surfaces of your walls. As your precious heat queues up to leave through the thermal bridges, the water vapour from the moist internal air condenses onto these cold spots. This leads to mould growth and that is not a pretty sight!

Thermal bridging is a greater risk factor because of the levels of insulation now required under the current building regulations. Therefore your builder must take this issue much more seriously.



Thermal bridging leading to heat loss (the red parts of the image) can be seen in an infrared photo