



Earth Cycle Technologies

Thermal Bridging Inception Booklet

Psi (2 Dimensional Heat Flow), Chi (3Dimensional Heat Flow), Interstitial Condensation and fRsi (Surface Temperature/Condensation)

Thermal Bridging Introduction (Why Calculate Thermal Bridges?)

Thermal bridging occurs in two ways. **1)** Everywhere an insulation layer is interrupted by a more conductive element such as steel, aluminium, concrete and sometimes even wood or plastic, and **2)** Where the insulation layer changes direction or thickness.

Where these situations occur (which is almost every corner and penetration of the insulated envelope), the increased heat flow must be assumed or calculated.

In Passive House, a consultant can make an assumption whether a detail is thermal bridge free based on a visual inspection. In DEAP (Dwelling Energy Assessment Procedure) this is taken care of with the Y-value and/or with the government accredited construction details.

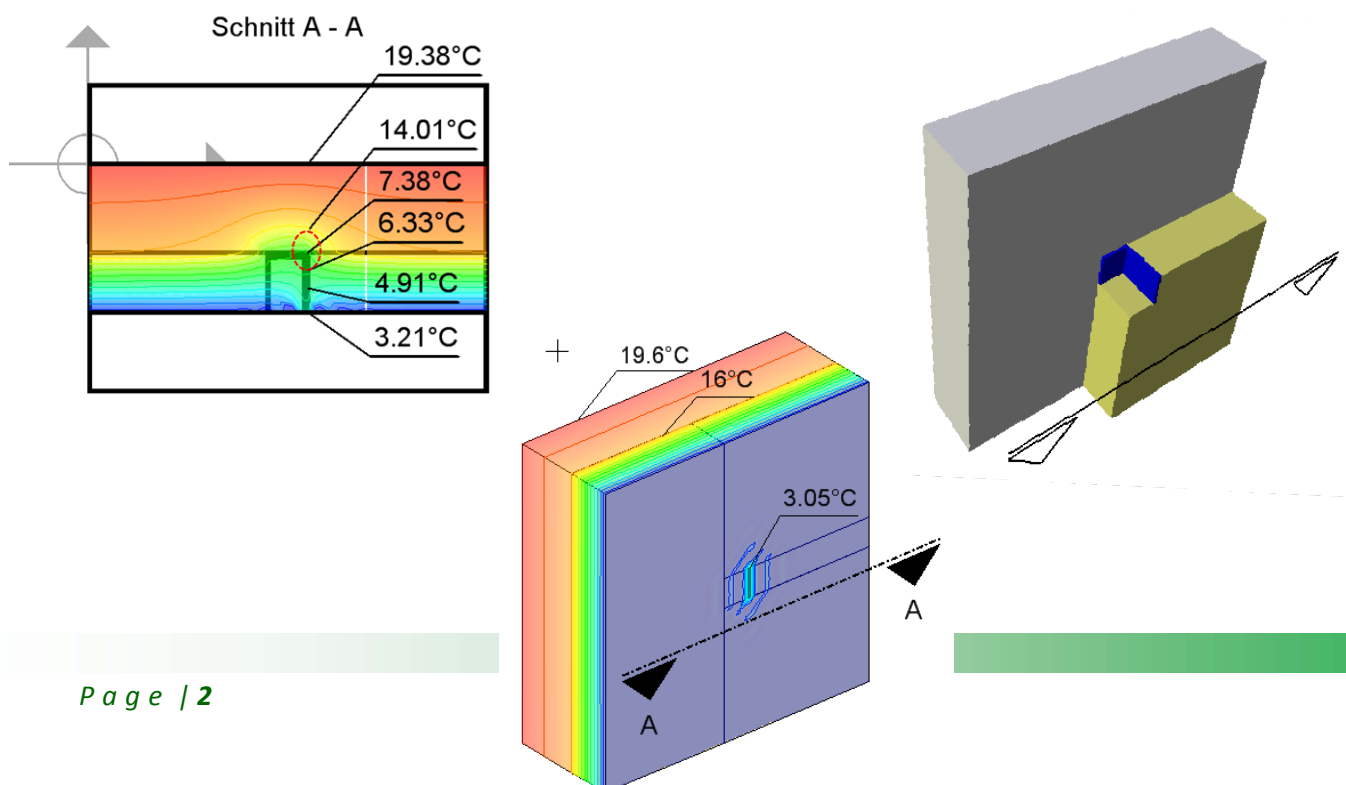
If you are unsure about either of these methods then you **MUST CALCULATE** the thermal bridge coefficients to be absolutely sure you are **"Thermal Bridge Free"** (PHI/PHPP) or that you have an acceptable **Y-value** (DEAP). **You also** need to be sure that **moisture** is not a problem.

In DEAP not all details are covered by the accredited details and by calculating you can achieve lower Y-values. Earth Cycle can provide Y-values and Psi/Chi Calculations for any type of detail. If sought after you can then use a lower Y-factor which might mean you have to use less insulation or renewable technologies saving you money on the build.

The last crucial item with thermally insulated constructions needing explanation is the risk of "sweating" or interstitial condensation. With super air tight buildings that are highly insulated this risk is hugely reduced. The effects of leaks in current regulation buildings are ~360 times greater than that of vapour transmission of materials. (PHI 0.6 ach vs SEAI/DOE ~7 ach)

Nevertheless and in either case; care needs to be taken so that temperatures at the membrane are above ~12.7 degrees in the average temperatures of the coldest month for their climate.

This type of calculation can only be performed with advanced finite 2D and 3D models.



Thermal Bridging Consultancy Process is as follows:

1. The commencement retainer of 25% is requested and work commences on payment.
2. The inception requires a set of drawings in dwg/dxf format for review and to initially depict the amount of details needed to complete the overall envelope.

Once within three to five days we have identified all details that are required; we will send a request list to you of the details you need to prepare (if any are missing)

Single details can also be calculated if it is only for investigational purposes but for any certification all details must have had a calculation to support them. (be it catalogue or previous calculation)

3. Calculation commences once these details are received taking ~0.5 day per detail
4. Payment request is sent on completion of the calculations
5. Once Payment is received the complete set of files are sent.

Fees

There are seven types of thermal bridging additives; each individual price per detail is as follows:

2D Geometric Thermal Bridge

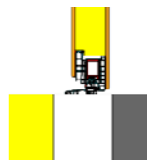
€175 per detail



.....Any Corner Detail/Intermediate Wall or Floor/Eaves etc.

2D Window/Door Thermal Bridge

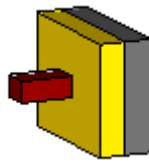
€225 per detail



.....Window Details (Each is separate if different at all)

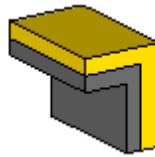
3D Point Thermal Bridge

€245 per detail



3D Point Thermal Bridge Two Plains

€295 per detail



Contd.....

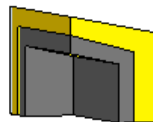
3D Point Thermal Bridge Three Plains

€325 per detail



3D Point Thermal Bridge Three Plains Angled

€375 per detail



This calculation of fee's is normally carried out in-house before but adjusted after stage 2 of the process. However it may be usefull for rough calculations while designing your envelope to estimate from the above.



Many thanks for your custom.

Earth Cycle Technologies

Contact Us

Email: info@earthcycle.co

Phone;

00 353 85 147 5880

Post;

5 Pebble Bay
Wicklow Town
Co. Wicklow
Ireland