NVELOPE
MAKING CLADDING HAPPEN

Designed for architects. Built for installers
Realisation of architectural expression

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Thermal calculations for heat loss and thermal resistance of your façade buildup.

NVELOPE's Project Builder combines powerful industry thermal software solutions to offer fast and easy project-specific thermal calculations. Speak to your local NVELOPE sales representative or complete your Project Builder online now.
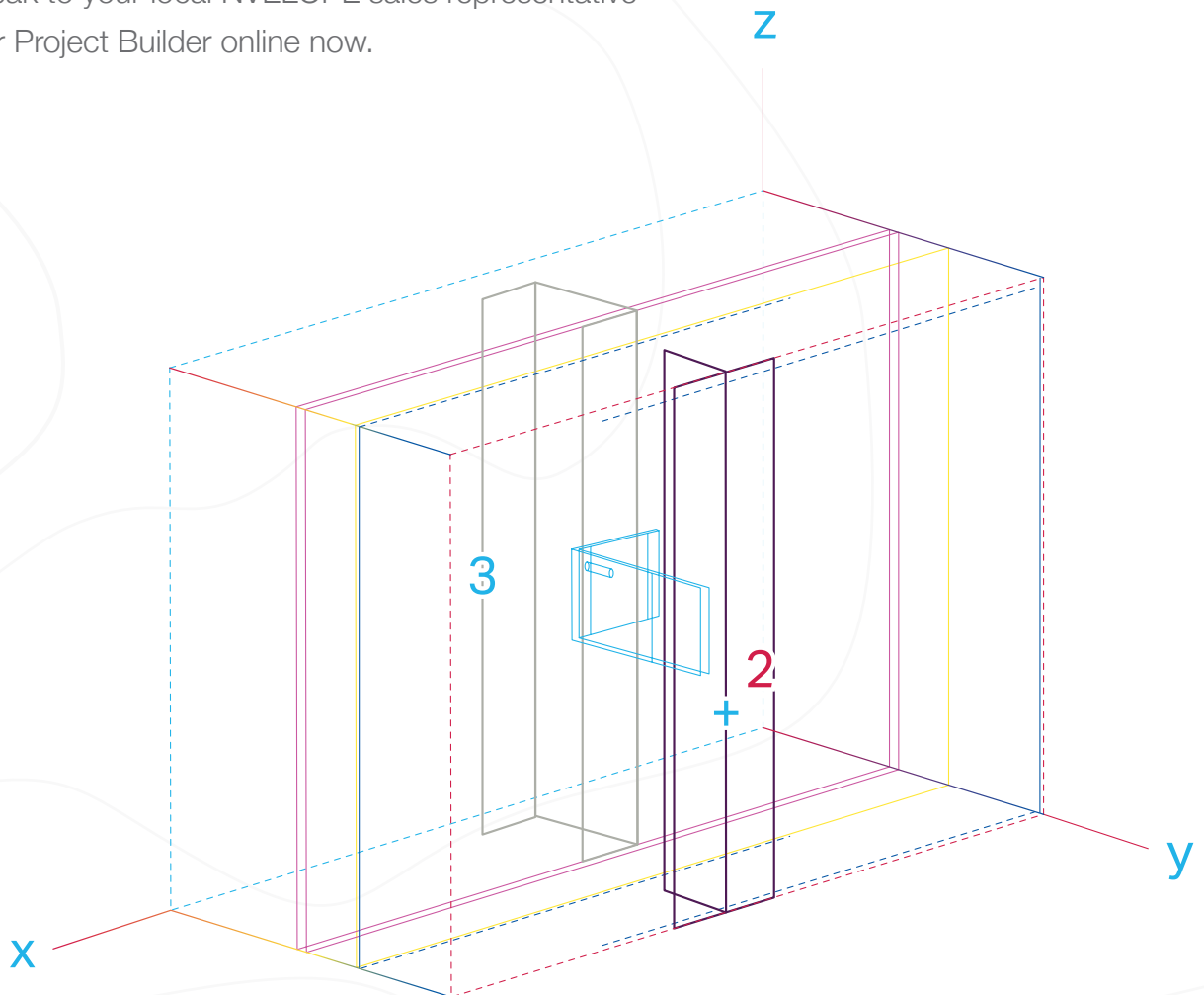
Project Builder thermal calculations
The power of a thermal expert with a few button clicks

Project Builder's latest powerful offering combines together the knowledge of powerful industry thermal software solutions to offer fast and easy project specific thermal calculations.

Use Project Builder's easy online form to submit your project information and based on the project specific calculations our technicians are able to generate project specific 3D thermal modelling to calculate each bracket's pointloss value. Each change in the project build-up, whether a substrate, insulation thickness or type change requires a new bracket pointloss calculation.

Project Builder has simplified this process and now offers this powerful feature as standard.

3D Thermal pointloss calculations are bracket specific

Our 3D thermal reporting calculations cannot be used with third party brackets. The calculations require 3D thermal modelling and any variance in the material, size or design will require new calculations. The pointloss chi calculated is exclusively for and only available for NVELOPE and EKO brackets. We do not offer this service for competitor brackets.

Industry recognised thermal software
HEAT3 and BuildDesk U

Peace of mind. We're using industry respected 'HEAT3' for 3D thermal pointloss modelling and 'BuildDesk U' by factoring the calculated pointloss bracket Chi-Values into 'BuildDesk U'. The BR443 report produced by the 'BuildDesk U' calculation software is created by replicating your project's wall build-up in both 'HEAT3' and 'BuildDesk U'.

NVELOPE Thermals
### Energy performance of your building

Developers are serious about conserving power, energy and reducing CO_2 emissions, and the drive to reduce energy consumption in buildings places a greater emphasis on the performance of the building envelope and all the components in a façade system.

NVELOPE Project Builder static calculations and 3D thermal modelling

Use Project Builder's easy online form to submit your project information and based on the project specific calculations our technicians are able to generate project specific 3D thermal modelling to calculate each bracket's pointloss value.

Façades and heat loss in construction
BS EN 10211 and BRE 443 (convections for U-Value calculations)

With NVELOPE's 3D Thermal Service the construction is modelled into a 3 dimensional form to allow a distinct understanding of the geometry and effect of the intended materials. NVELOPE brackets and fixings are modelled correctly with a point thermal transmittance (Chi-Value) calculated for the thermal bridge formed. The result can be used for condensation risk assessment. The thermal calculation can accommodate specific materials or use generic values and be tailored to suit your project design.
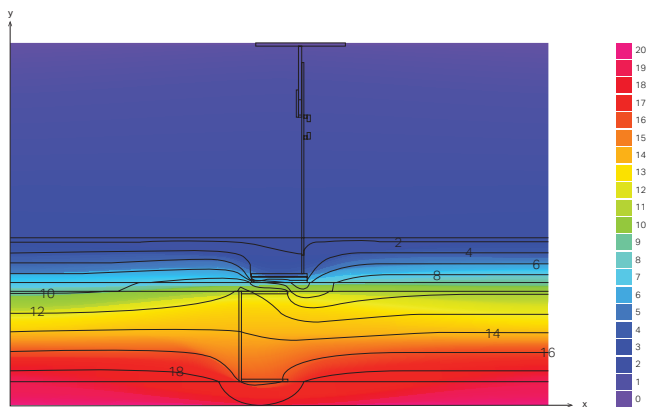
NVELOPE static calculations

STEP ONE Complete an NVELOPE 'Project Builder' - this will allow us to prepare a project specific cladding solution that includes optimum setting out information for the support system.

NVELOPE heat loss / calculations

By calculating the U-Value in a buildings construction it enables an understanding of the implications this thermal performance has when aiming to meet current building regulations.

Rainscreen Cladding façades utilise a tried and tested method of an external façade material coupled with external / internal insulation layers. A ventilated layer behind the chosen façade material ensures the risk of condensation is minimized as well as dissipating solar gain on the building.

The NVELOPE rainscreen support brackets, primary fixings, rails and carriers are an integral part of the Rainscreen Cladding build up and their role on heat loss in the construction, plays a key role.

NVELOPE can assist the specifier or thermal engineer understand the effects caused by our elements in the buildup in respect of heat loss and U-Values by undertaking detailed thermal calculations on the intended façade construction.

STEP TWO These calculations conform to BS EN 10211 as well as BRE 443 (convections for U-Value calculations) and ensure the full detailed construction is understood rather than a generic scenario which as such play no reference to the intended design.

Our static calculations determine the parameters for these calculations and thus can also include project specific information such as insulation type/manufacturers.

Using a point thermal transmittance for a discrete fixing bracket that penetrates an insulation layer.

A 3D numerical calculation is undertaken on a section through the wall containing a representative fixing bracket (size selected via completion of 'NVELOPE Project Builder').

The boundaries of the model should be at quasi-adiabatic positions (e.g. mid-way between two NVELOPE brackets).

The result is compared with a calculation in which the brackets are omitted so as to obtain a point thermal transmittance, as described in BS ENISO 10211

That calculation needs to be done only once for a given design of bracket and penetrated insulation thickness.

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NVELOPE Isolators
Maximising energy performance

The use of an isolator between the NVELOPE 'helping hand' bracket and the substrate / structure will help to mitigate the effects of cold bridging – NVELOPE offer a clipped isolator (5mm fitted to bracket). An additional flat NVELOPE isolator can be used in combination with the standard isolator (total 10 mm) to increase resistance.

Thermal bridges cause increased flow of heat and should be taken into consideration when designing a façade/façade system. Since the fixing of ventilated cladding must go through the thermal insulation into the substrate it cannot be avoided.

Thermal decoupling of the substructure from the ventilated façade is achieved through thermal separation layers.

NVELOPE NV and NH brackets are pre-assembled with thermal isolators – isolators help reduce thermal bridging – in addition NVELOPE isolators prevent a chemical reaction occurring between aluminium brackets and lime in concrete frames.

The thermal value of NVELOPE brackets / isolators has been calculated.

U-Values

- The U-Value is the heat loss through an element, e.g. a wall
- The U-Value of the plane elements, necessary for the calculation of the overall loss from the building
- Corrections need to be made for any thermal bridging, fixings and bracketry. This includes linear heat loss should the rail penetrate the insulation layer

Chi-Values

- The Chi-Value is the heat loss at (for example) a bracket and is measured as W/mK
- Either a default correction is used or a 3D calculation is carried out
- Default bracket corrections can be wildly out with a nominal 0.02W/mK being used and then some bracket point loss figures being >0.05W/mK once calculated – potentially a huge difference in the thermal world

> www.nvelope.com/thermal

Helping our clients ACHIEVE THEIR TARGET THERMAL VALUES.