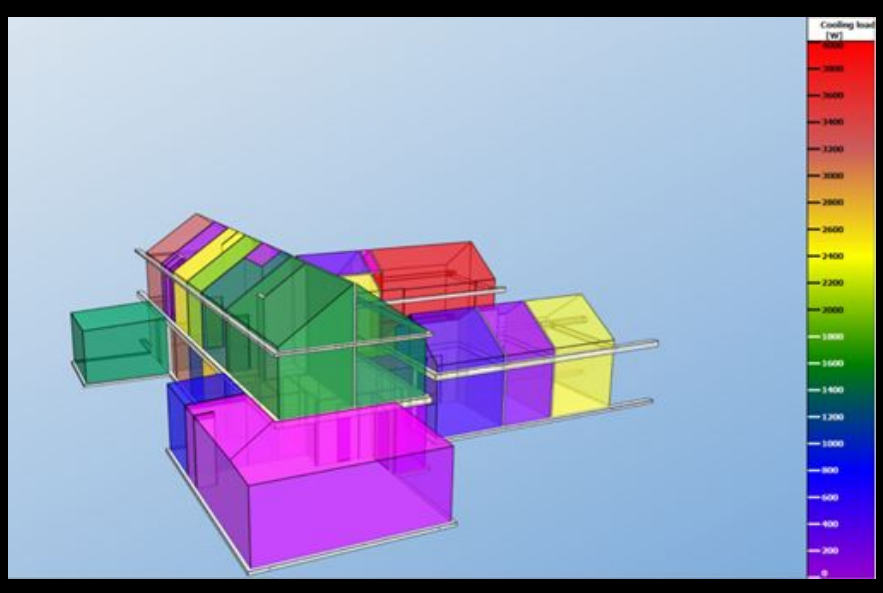
3D Thermal Modelling
for Heating & Cooling Load Calculations

Thermal modelling is a crucial step in designing HVAC (Heating, Ventilation, and Air Conditioning) systems to ensure optimal performance, energy efficiency, healthy air quality, and indoor comfort. It is the process of determining the amount of heating or cooling required to maintain a desired indoor temperature in a building or room.

Services offered by Solutionair

- Heating Load Calculation for Underfloor Heating Systems (incl. 3D-Modell, AW DIN EN 12831)
- Heating & Cooling Load Calculation (incl. 3D Model)
- Ventilation Load Calculation and Layout for MVHR Systems (excl. Thermal Modelling)
- Full HVAC Load Calculation, Layout and Proposal (incl. 3D Model)

Why is Thermal Modelling important?



✔ Proper HVAC Sizing
Prevents oversizing (waste of energy) or under sizing (underperformance)

✔ Energy Efficiency
Reduces operational costs by optimising system performance

✔ Indoor Comfort
Ensures consistent and comfortable indoor temperatures

✔ Equipment Longevity
Prevents excessive strain

What effects the outcome?

- Size and shape of the building and space
- Thermal insulation (windows, walls, roof, and floors)
- Ventilation without heat-exchanger and air leakage create heat loss (or gain)
- Window exposure and orientation creating heat gain (Greenhouse Effect)
- Solar heat gain due to location, orientation and exposure of the house
- Additional heat sources like lighting, appliances and body heat contribution

How we calculate

To get the most accurate figure, we need as much information as possible. This includes building plans, information about building materials, and the personal preferences of the future occupants.
After creating a 3D model of the building, thermal modelling software (validated to ASHRAE Standard 140-2017) creates an hourly simulation using historical local climate data to identify peak loads throughout the year.
The result is a comprehensive report of total and space specific heating/cooling loads according to the preferences provided.