

UNDERFLOOR HEATING CONSIDERATIONS

IMPORTANT INFORMATION FOR HOMEOWNERS AND SPECIFIERS DURING THE DESIGN PHASE OF THE PROJECT

We design our systems to cope in the normal range of weather for your region and based on the information to hand at the time, but sometimes changes occur during the building process that affect the performance of the heating system. This can happen when alterations to the building elements are made either after we have designed the heating system or after the installation of the system. Also, unforeseen behaviour, such as thermal bridging, can occur during the building process, which affects the performance of the heating system.

GETTING THE MOST OUT OF YOUR SYSTEM

The design of the heating system is based on an international standard depending on geographical location. For New Zealand, we use the Institute of Refrigeration Heating & Air Conditioning Engineers of New Zealand (IRHACE) External Design Conditions & Data for your area (www.irhace.org.nz/uploads/design_temps.pdf). Under these conditions, the system is designed to achieve at least 21°C in the living areas and 17°C in bedrooms and hallways. However, if any of the design criteria are compromised, supplementary heating may be required at times.

- **Running the System:** To give good living temperatures with reasonable running costs, in slab underfloor heating requires constant running. The slab is a large mass which is easier to keep warm than to reheat each day. At the start of each season, the floor will take approximately 8 hours to heat up to its ideal temperature and consume more energy than when the floor is maintained at that temperature. Because of this, we suggest leaving the system operating throughout the winter as opposed to switching it on and off.
- **Insulation:** Insulation under the floor slab is required to limit downward heat loss. We advocate the installation of at least 50mm of high density polystyrene under the slab during construction for the underfloor heated areas.
- **Thermal Bridging:** Thermal bridging is when heat is transferred through conduction to areas surrounding the slab. To help mitigate issues such as thermal bridging, we suggest insulating the perimeter of the foundation and isolating the heated slab from patios and paths with thermal breaks. This helps keep the heat in the home by reducing heat loss.
- **Increased Load:** Two storey houses that only have the ground floor heated and houses that have large areas of glazing, a high ratio of external wall to floor area or rooms that have more than two external walls will require more heat than other homes.
- **Floor Coverings:** The underfloor heating system works by radiating heat from the concrete slab into the room. It's important to consider heat emission when choosing a floor covering as they can significantly reduce the emission of heat into the rooms. Floor coverings such as thick or high specification underlays are primarily designed to insulate and should be avoided. Underfloor heating works well with all floor coverings but should be as close to the recommended industry standard of maximum R 0.15 resistance as possible. E.g. a 5mm underlay has an R value of 0.137.
- **Curtains:** The use of curtains is advised for efficiency and maximum comfort as it is always colder near windows (even if they are the highest quality double glazing). This is especially true if the other factors listed above are compromised. **NB:** Privacy roller blinds provide little thermal insulation value.