

Floor Coverings

Underfloor Hydronic Heating with Carpets

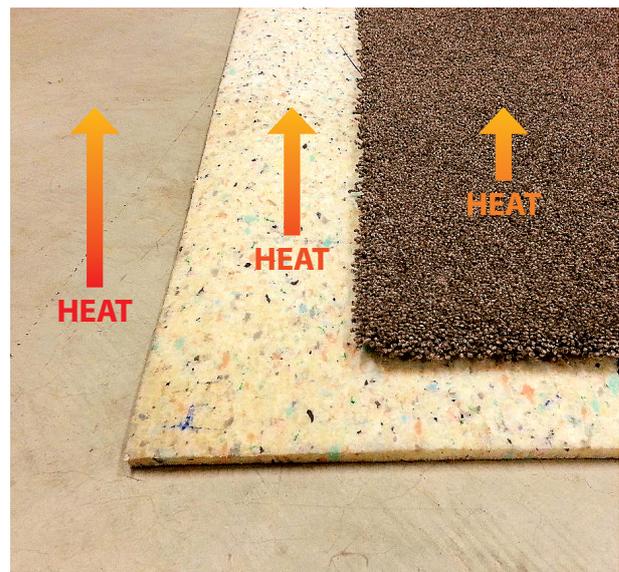
Carpet with underlay floor coverings are used extensively with hydronic underfloor heating throughout Europe, Asia, USA and New Zealand without problems provided the system is designed correctly and simple guidelines are followed.

Most carpet suppliers encourage the use of thicker underlays and carpets to provide increased levels of comfort underfoot. However, the thicker the underlay and carpet the harder it is for the heat to pass through from the heated slab to the room above.

For optimum underfloor heating performance it is better to use a thinner underlay, 7mm is suggested, and to use a typical thickness carpet of around 10mm.

How much heat will get through the carpet/underlay?

Thick underlay and carpet will reduce the amount of heat passing from the heated slab underneath to the room above. Generally, the thinner the better.



	Thickness	Effective R Value*	Published R Value
Underlay	7mm	0.09	0.14
Typical Carpet	10mm	0.06	0.1
Total	17mm	0.15	0.24

— Ideally the combined carpet and underlay published R-value is no more than R0.24

*Central Heating New Zealand has completed testing on carpet and underlay R values, we found that there was a reasonable reduction in the R values we measured/calculated compared to those published (as reflected above in the "Effective" and "Published Values", we also found international resources which suggest similar results. For more information regarding this please refer to the independent study completed by the Underfloor Heating Manufacturers Association which can be found on our [website](#).

Although internationally carpets sometimes have TOG values (1 TOG = R0.1), this is rarely the case in New Zealand which means it is better to stick to thickness guidelines.

Higher density underlay is also better as it conducts heat better. Dunlop Excellay is an example of a higher density underlay designed to provide the comfort of thicker traditional underlays whilst providing improved heat transfer.

There are other underlays such as commercial double sided that also allow good heat transfer.

The impact of restricting heat flow into a room also depends on the heat loss of a room. If it is a high heat loss room, heat needs to flow in faster to replace heat lost; therefore, thicker carpet is more likely to be a problem in high heat loss rooms.

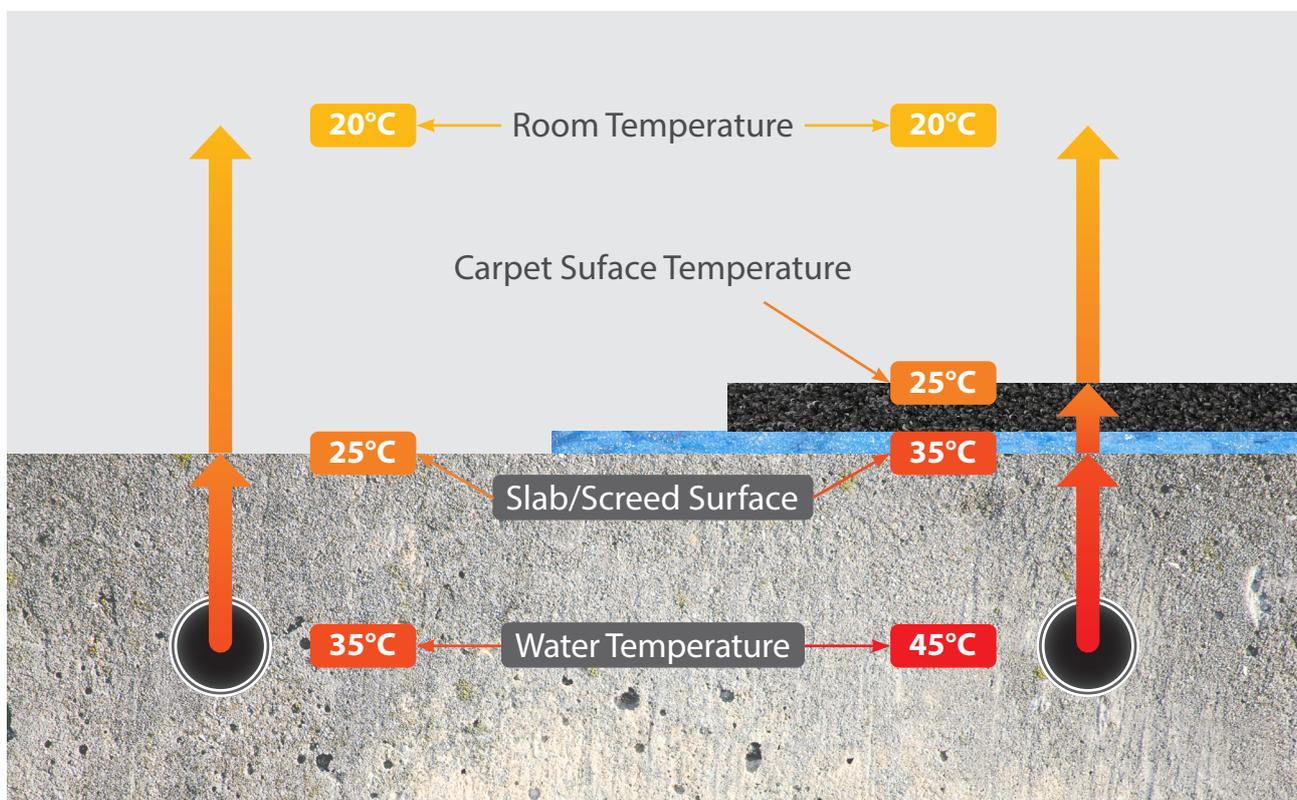
Will carpet floor coverings effect the efficiency of the heating system?

In order to push heat through the carpet the floor slab will have to be typically 10°C warmer than a polished concrete slab to provide the same amount of heating to a room.

This will impact on the efficiency of a heat pump as the increased operating temperature will reduce the heat pumps efficiency.

The actual temperature difference depends not only on the thickness of the carpet but also the heat loss of the room. In a higher heat loss room a thicker carpet will have a greater impact on efficiency than in a low heat loss room.

Slab and Carpet Comparison



— The temperatures in this drawing are chosen to illustrate the concept being discussed and will be different in every installation.