

Heat pumps & underfloor heating

OMNIE's philosophy of bringing together complementary technologies that work together effectively while lowering the associated environmental and financial costs is perfectly illustrated in the synergies between ground source/air source heat pumps and underfloor heating. But how can you ensure the two technologies work efficiently in the system you install?

It's widely acknowledged, even by communities in more northerly climes than the UK, that heat pumps are an excellent heat source for any building. They are not only far more efficient than gas boilers (using up to three times less energy), they also create a very comfortable, indoor warmth even in the depths of winter (down to -25°C).

But every heat source also needs an emitter, and underfloor heating is the perfect system to disseminate the heat created by the pump, not least because it typically requires lower water temperatures and still warms the room effectively.

Why is underfloor heating a perfect match for a heat pump?

Underfloor heating is, by design, the most comfortable, efficient, and effective way to control temperatures indoors. As an emitter, it warms a room using radiant heat rather than by very localised hot air circulation which is typical of radiators. We liken it to the feeling of comfort we get from the sun.



How can I ensure my home will warm up quickly?

The speed that a house warms up is down to the efficiency and responsiveness of the heating system.

Homeowners naturally want the space to warm-up quickly, rather than having to have an uncomfortable and prolonged wait in a chilly room.

It's easy to blame the heat source if it seems to take a long time, however, it's also important to ensure that the underfloor heating has been installed correctly and allows the system to work optimally. Key factors include:

- a) If your system has a pipe embedded in a thick concrete slab then it will have a longer warm-up time than dry construction systems in suspended, batten or floating floors.
- b) Your underfloor heating has been correctly sized not just to overcome the heat losses in a building but also to ensure a good response from cold.
- c) The type of floor finish; tiles are highly conductive, while carpet and underlay is far less conductive. Wooden floors can also prove problematic for some brands of underfloor heating because timber is not a good conductor of heat, so the system may require a higher water temperature to warm the room.
- d) The water temperature, which has a direct impact on the performance and running costs of a heating system. The lower the required water temperature within the system, the more efficiently a heat source can run. So, if your underfloor heating is set up to work efficiently at lower temperatures, it's highly likely that a heat pump will work effectively.
- e) You will also benefit from good conductive pathway from the underfloor heating to the floor surface. The bigger the gap, the slower the heat output.

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So, if your underfloor heating has high thermal mass and a pipe-in-screed design then it will not be able to respond quickly to demand changes and can waste a lot of energy as a result. By contrast, systems that use low thermal mass are highly responsive and create a more comfortable environment.

Therefore, it's worth reviewing the efficiency of the whole system before it is installed to ensure that your expectations are met – and just as importantly, that your energy bills are not going to go up, see *Caveat Emptor: Why Heat Pumps Aren't Necessarily Cheaper to Run than Gas Boilers*.

A correctly designed system should, ideally, have been independently tested and carry the necessary certification that verifies the manufacturer's claims. We have our products tested through the Building Services Research and Information Association (BSRIA).

The products you have installed should also meet the required British Standard (BS1264 is the Standard for underfloor heating).

Why is underfloor heating more efficient than radiators?

You need to compare the relative surface area of a radiator versus underfloor heating to understand their relative efficiencies.

The greater the surface area of the emitter, the cooler the temperature needs to be to achieve the same result. Underfloor heating systems extend across a room, whereas radiators are placed in specific locations. This relative size differential explains why an underfloor system can run effectively at lower water temperatures (between 32-55°C) than radiators (60-85°C).

Studies have shown that using underfloor heating rather than radiators with a ground source heat pump can increase the efficiency of the heat pump by up to 30%.

If you want to know more about OMNIE and our underfloor heating & heat pump systems, call us on 01392 363605.

If you have a project in mind you can send your plans to:
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