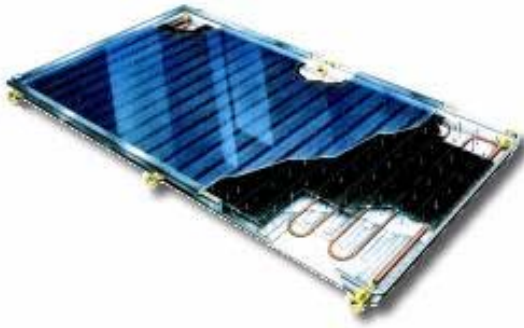


Flat Plate Solar Collectors



Solar energy is free and can be harvested very effectively to produce the majority of your hot water needs.

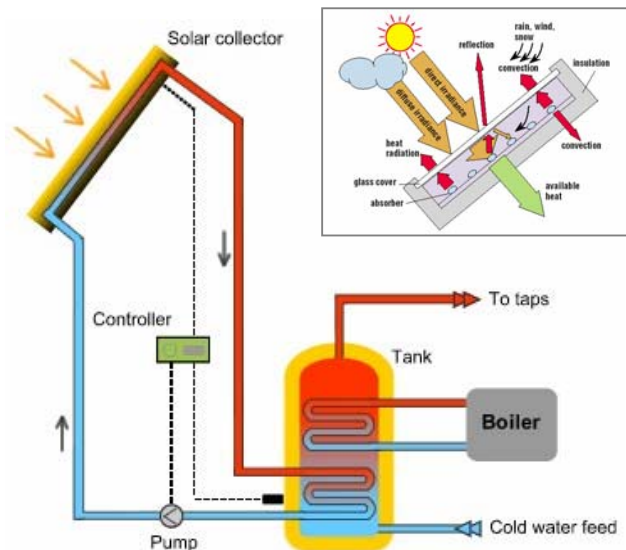
There are three basic types of solar collector; the Heat pipe or Direct heated Vacuum tube types and the Flat Plate type. This data sheet will look at the last of these.

Although it is possible for solar collectors to be used to produce hot water for space heating systems the surface area of collectors and the capacity of the storage vessel required means the system would be grossly over-sized during the summer conditions when heat is not required.

This is particularly so with flat-plate collection systems that have a greater efficiency in summer than they do in winter months. It is therefore not recommended, either technically or economically to use these products for space heating. The more common use for these systems in the UK is to provide a domestic hot water (DHW) for washing and swimming pool installations.

A Flat Plate solar system is normally sized to meet the DHW demand during the summer conditions when collection efficiency is at its highest. In Spring and Autumn it can be expected to achieve 60-75% of the demand and in winter this will fall to 30%, hence a secondary heating input will be needed from the boiler.

A typical system comprises a solar collector mounted on a sloping, south facing roof through which water is pumped. The collector panel has 2.5 m² of copper absorption plate coated with Titanium-Nitric Oxide to help absorb the sun's energy. A high-transparency, safety glass cover, creates a greenhouse effect and a thick layer of mineral wool insulation at the back and sides of the collector help to ensure that energy loss is minimized.



Solar energy heats circulating water directly as it flows through a thin copper tube passing inside the collector unit emerging as hot water that is pumped to the heat transfer coil in a thermal storage tank where the DHW is to be stored. Flat plate collectors are sensitive to ambient temperature conditions so in hot summer days they can equal the performance of vacuum tube collectors but in Winter they are generally less than half as effective. They can achieve up to 65-78% solar conversion efficiency, requiring more collector area than vacuum tube units but generally offering lower initial costs, energy savings and CO₂ reductions.

Sensors at the panel and in the tank inform the controller of the temperatures, which controls the pump and boiler, drawing heat from the collector whenever available and bringing the boiler on only when required.

Solar systems have few moving parts and can last 30 years or more. We provide a full design and installation service using equipment of the highest quality installed by fully accredited Solar Trade Association teams that qualify for the proposed renewable heat incentive RHI, to be unveiled in April 2011

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