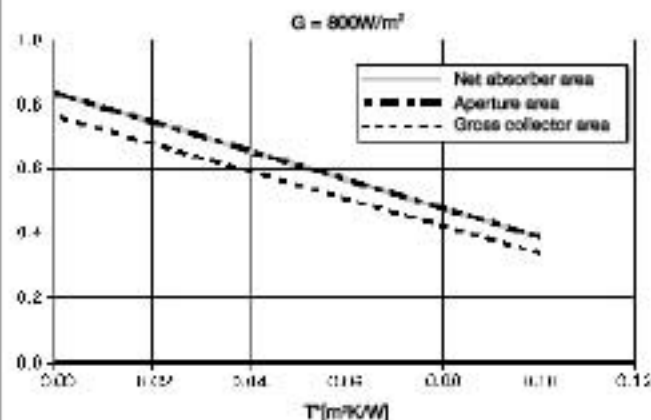


Fig. 5: Typical test result for a solar collector



Typical results of an EN 12975 collector efficiency test. Vertical scale shows efficiencies between 0 and 100% and the horizontal scale the temperature difference of the average collector fluid to the ambient air. The greater the temperature difference the lower the efficiency. Collectors for DHW mostly operate in the middle region of the graph. The best DHW collectors start above 0.8 (= 80%) optical efficiency and have a shallow slope.

standard European test and the results compared. However the results of this test are not a single, simple figure but instead a series of results such as the graph illustrated (Fig. 5) showing typical results from a test.

Only when a full set of independently tested data is available for each collector being judged can an accurate comparison be made. UK Government funded studies have shown that the collector optical efficiencies and corresponding system efficiencies made little difference to the total annual energy yield, providing the collector area of the lower efficiency collectors were oversized. In the UK to obtain the same yield with com-

mon commercial evacuated tube collectors, then the flat plate collector types should be oversized by at least 20% when comparing net absorber areas.

It should be noted that sometimes an unglazed collector appears to have an excellent optical efficiency. This is because it has no glass! Examining the efficiency at higher temperatures and the heat-loss (insulation value) it becomes obvious why these collectors are not suitable for heating domestic hot water, i.e. because as they get hotter, e.g. at DHW temperatures, they also become highly inefficient.

Care should be taken when suppliers mention areas of collectors, as there are at least three ways to use this term and comparisons should use the same one throughout:

Gross area	Largest overall dimension
Net absorber area	All areas that can be heated through the aperture but may be shaded at some incident angles
Aperture area	Unshaded opening that lets light in (or reflects it)

### What is the solar fraction?

Given that a solar water heating system is essentially attempting to provide the heat for your domestic washing and bathing water, it is useful to know what percentage of the annual DHW energy it is giving you. This fraction is known as the solar fraction or solar coverage. If a particular month or day is specified, this figure will be different compared to the annual amount. So, for example, if the annual solar fraction is 50%, the summer solar fraction may well be 90% and the winter perhaps only