

## 6 : HOT WATER PLUMBING

### Solar Hot Water Performance Requirements

#### Determining performance

To optimise overall energy saving, solar hot water systems should be installed at latitude angle (in Melbourne, 38 degrees) facing true North.

The performance at any other orientation or inclination will degrade performance, though often only slightly.

Figure 1 shows the performance required from a solar water system, at a range of orientations and inclinations, to achieve an equivalent performance to an optimally installed system with a 60% solar savings.

The horizontal axis shows the orientation in degrees from magnetic North. Easterly orientations are positive, Westerly orientations are negative.

The vertical axis shows the inclination in degrees from the horizontal.

The shaded regions on the graph show the solar savings performance required.

The hatched area shows the performance zone defined in the regulations. Its is defined as having an azimuth between -70 and +50 degrees from magnetic north, and an inclination between 10 and 50 degrees from the horizontal.

#### How to use

1. Determine the orientation of the solar collectors, in degrees from magnetic North, using a compass or off a plan.
2. Determine the inclination from the horizontal of the solar collectors.
3. Using the graph, determine the required solar savings performance of the system.

#### Examples

##### Example 1

The solar collectors are mounted at a roof pitch angle of 22 degrees, facing 20 degrees east of magnetic north.

Looking up 22 degrees inclination on the vertical axis, and +20 degrees on the horizontal axis, shows the system is required to have a solar savings performance of 60-65%.

This is also within the regulatory compliance zone.

##### Example 2

The solar collectors are mounted on a frame at an angle of 40 degrees, facing 90 degrees west of magnetic north (ie due West on a compass).

Looking up 40 degrees inclination on the vertical axis, and -90 degrees on the horizontal axis, shows the performance required is 70-75% solar savings. This is outside the regulatory compliance zone.

If the orientation and inclination as set cannot be achieved, or if solar access is not available on a particular site, you need to talk to the Plumbing Industry Commission. The Act enables modifications to regulations if the regulations cannot be met. This is a formal process but may be of assistance if you have a problem.

The energy savings of a solar water heater is evaluated generally at one orientation and inclination using *AS4234 Solar Water Heaters – Domestic and heat pumps – Calculation of energy consumption*. The effect on performance of variation from that orientation and inclination can be evaluated from the following diagram which has been developed using *AS 3500.4 2003 Plumbing and Drainage Part 4: Heated water services*.

Fig 1

Required solar hot water systems performance at various inclinations and azimuths

