

Technical Solution Sheet 98.01

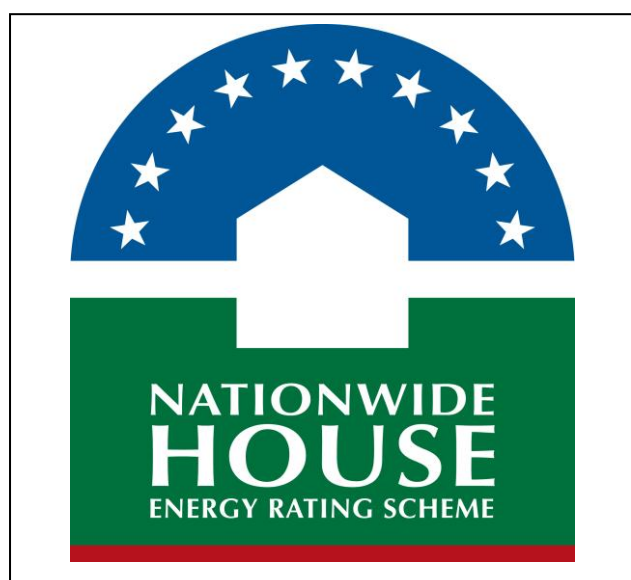
98: Solar Installation

Duplicate solution of 6.13 (Hot Water Plumbing) – Applies from 19 April 2013

Solar Heated Water – 6 Star Requirements

AIM

The aim of this technical solution is to clarify the installation requirements for solar water heaters (SWH) when this option is selected to satisfy the 6 Star Building Standard.



PLUMBING REGULATIONS 2008

The *Plumbing Code of Australia* (PCA) is adopted by and forms part of the *Plumbing Regulations 2008*. Part B2 of the PCA specifies the objectives and performance requirements relating to the installation of heated water services. *AS/NZS 3500.4:2003 Plumbing and drainage Part 4: Heated water services*, is a “Deemed-to-Satisfy” document listed in Part B2 of the PCA and contains a section on “Installation of solar water heaters”.

The 6 Star requirements as set out in the Victorian variation to the energy provisions of the Building Code of Australia provide that, in

the case of a new Class 1 building, either a rainwater tank connected to all sanitary flushing systems or a SWH system is to be installed in accordance with the *Plumbing Regulations 2008*.

BACKGROUND

Q: What are the performance requirements of a SWH when the system is installed as part of the 6 star building standard?

A: You need to ensure the SWH performs to a minimum 60% energy savings relative to a conventional water heater calculated in accordance with *AS/ NZS 4234:2008 Heater water systems – Calculation of energy consumption*.

Q: How do I know what systems perform to 60%?

A: The Essential Services Commission maintains a website with a list of compliant SWH. The list includes the solar hot water heater details such as brand, model number for each system, tank size, annual energy savings and number of collectors.

The system can be selected based on the number of bedrooms and the boost energy, gas or electric. It is important that the system selected matches exactly the details on the website. Refer to:

<https://www.veet.vic.gov.au/Public/ProductRegistrySearch.aspx>.

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Q: If a builder or customer supplies the SWH, are there any other ways of identifying compliance?

A: Yes, the SWH must have a label permanently attached to the heater's storage container. The label must be legible and contain the relevant information, as follows: "This solar water heater installation complies with the *Plumbing Regulations 2008* (Victoria) when installed with the following collectors..." You will need to ensure that the SWH and collectors are adequate for the application.

Q: Is boosting required?

A: A SWH installed in Victoria will need a form of boosting to ensure hot water is available all year round at a temperature suitable for use that meets the regulations for safe operation.

Q: What type of boosting energy is available?

A: Gas or electricity are the two commercially available energy sources. If a reticulated gas supply is available to the property, then the SWH must be gas boosted, you cannot install an electric boosted unit.

Q: Is frost protection needed?

A: Yes, most inland areas of Victoria experience frost conditions and even the milder coastal areas can occasionally be subject to frost. Most, if not all manufacturers will recommend frost protection for their units in Victoria. Many units are designed with provisions for frost protection.

Q: What piping insulation is required?

A: *AS/NZS 3500.4* requires flow and return pipes between the collectors and storage container to be insulated to a minimum R value of 0.3. This is equivalent to 13mm wall thickness closed cell polymer insulation.

Depending upon the Climate Region, the R value may need to be increased to 0.6 or 1.0. Refer to Table 8.2 in *AS/NZS 3500.4*.

Thermal insulation materials must be fit for purpose, be capable of withstanding the high temperatures a solar hot water system subjects its pipes to, and where external, appropriately weather resistant and protected from ultra violet degradation.

Q: Which direction (orientation) should the solar collectors face?

A: The collectors must face as close as possible to magnetic north but may be installed facing between 30° east and 60° west of magnetic north as measured by a compass (see Figure 1).

Q: At what angle (inclination) should the collectors be installed?

A: About 35° to the horizontal (equal to latitude) is ideal but it may be installed at $35^\circ \pm 20^\circ$ to allow for different roof pitches. Standard roof pitch (20° to 25°) is quite suitable (See Figure 2).

Q: What if I cannot comply with orientation and inclination requirements?

A: It is possible that adequate performance can be achieved using the technical solution "Solar hot water performance requirements". Refer to the Victorian Building Authority website www.vba.vic.gov.au.

Q: Do heat pump water heaters comply as a solar option?

A: Yes, only under limited conditions. If a reticulated gas supply from a gas company is available for connection to the building, the solar water heater—

1. Must be a gas boosted solar water heater if it incorporates booster heating and is not a heat pump water heater; and
2. If it is a heat pump water heater, no part of the heater that is capable of heating water must be capable of being connected to the mains electricity supply for that part of the heater to operate.

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Q: Are there any other issues I need to consider?

A: Yes, in addition to the questions and answers listed above, you need to consider the following:

- Compliance with [AS/NZS 3500.4](#)
- Temperature requirements e.g. storage and delivery temperature
- Temperature Pressure Relief (TPR) valve termination
- The weight of any heated water storage container installed on a roof
- Compliance with the OH&S Act. e.g. working from heights, fall protection
- You must read the manufacturer's installation instructions thoroughly
- If there is anything you do not understand call the manufacturer.

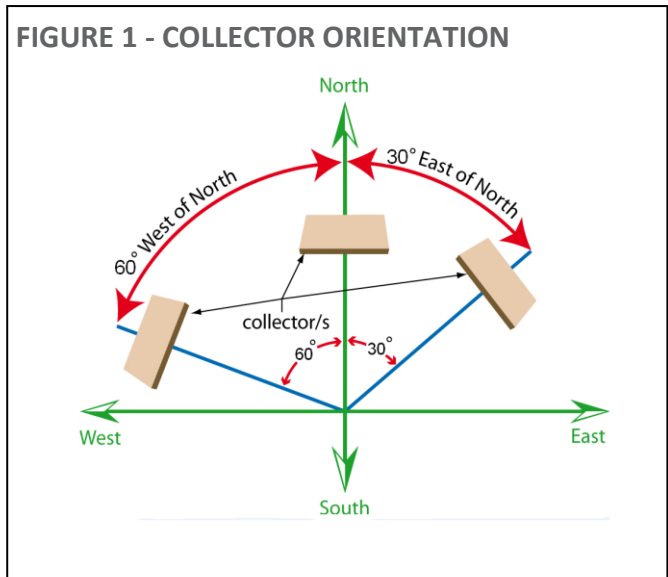


FIGURE 2 - COLLECTOR INCLINATION

