



Tasmania

# Plumbing Regulation *Advisory Notes*

## Building Standards and Regulation

Department of Infrastructure, Energy and Resources  
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Advisory notes are issued to assist in the interpretation of Tasmanian plumbing legislation and to keep all relevant stakeholders informed of developments within the plumbing industry.

### HOT WATER PLUMBING WATER TEMPERING CONTROL OPTIONS FOR NON- STORAGE INSTANTANEOUS AND CONTINUOUS FLOW WATER HEATERS

#### PURPOSE

The purpose of this advice is to give guidance and provide for a performance based solution that will satisfy the Tasmanian Plumbing Code (TPC) performance requirements and AS/NZS 3500.4.2:1997, and Section 3: *Hot Water Supply* of AS/NZS 3500.5:2000 in the interim period until the later versions of these standards are called up into regulation (the TPC).

#### BACKGROUND

Tempered hot water is hot water reduced to a safe and controlled temperature by mixing cold water with the heated water source. It is important that water be delivered at a controlled temperature to sanitary fixtures. At 60°C it takes only one second to cause a full thickness scald whereas at 50°C it takes five minutes. This may not seem a great difference in temperature, but it can mean the difference between unbearable pain, hospitalisation, skin grafts and scarring for life, or minor injury. The table shows how long it takes for skin to receive a major scald burn from water at a range of temperatures.

Water temperature:	Major burn in:
49°C	5 minutes
52°C	1.5 – 2 minutes
54°C	30 seconds
57°C	10 seconds
60°C	Less than 5 seconds
63°C	Less than 3 seconds
66°C	1.5 seconds
68°C	1 second

#### REGULATION

The Tasmanian Plumbing Code (TPC) is a performance-based code, which allows for any solution to the performance requirements. Clause B4.7.4 of the TPC requires hot water provided to sanitary fixtures and appliances, used for personal hygiene, to be delivered at a temperature, which avoids the likelihood of scalding. Many users of the TPC, however, will chose to use the TPC without making use of this opportunity. Generally all plumbing installations are installed to the deemed-to-satisfy provisions in the relevant Parts of the TPC. To comply with these Performance Requirements plumbing installers choose to comply with (in the case of hot water installations) the referenced Australian Standard AS/NZS 3500.4.2 –1997 *National Plumbing and Drainage Part 4.2 Hot Water supply systems—Acceptable solutions*.

To keep Local Government, Statutory Authorities, Engineers, Designers and the Plumbing Industry informed on developments, and to assist in the clarification and interpretation of parts of the Act, the Plumbing Regulations, and the Tasmanian Plumbing Code and its referenced standards, advisory notes are issued as and when necessary.

Please circulate to:



## ACCEPTABLE SOLUTION AND VERIFICATION METHOD

### General

A hot water service may be verified as satisfying the performance requirements specified in Clause B4.7.4 of the TPC if the installation complies with AS/NZS3500.4.2:1997 or Section 3, Hot Water Supply of AS/NZS 3500.5 for domestic installations and using authorised products.

AS/NZS 3500.4.2:1997 requires that the maximum heated water delivered temperature to all sanitary fixtures must not exceed 45°C in early childhood centres, primary and secondary schools and nursing homes and similar buildings, and must not exceed 50°C in all other buildings.

One or more of the following methods can achieve these requirements:

1. A thermostatic mixing valve must be used where heated water delivery temperatures are not to exceed 45°C;
2. A tempering valve may be used where heated water delivery temperatures are not to exceed 50°C;
3. A water heater complying with AS 3498 – *Authorization requirements for plumbing products – Water heaters and hot-water storage tanks*, and be marked 'This appliance delivers water not exceeding 50°C in accordance with AS 3498'.
4. Continuous flow water heaters with electronic temperature control converted 'on-site' to a limit of 50°C by the installing plumber in consultation with the manufacturer;
5. Continuous flow water heaters supplied by the manufacturer as "Factory preset to 50°C" and marked accordingly.

*NOTE: The intent of AS 3498 is that any temperature setting controls must be permanently disabled thus making it impossible for the end user or plumber to alter the temperature setting plus the provision of a notice.*

### NON STORAGE HOT WATER SYSTEMS

#### Temperature limited water heaters

AS 3498 provides for a new class of water heater that can deliver water not exceeding 50°C.

They are tested and marked accordingly. These water heaters must pass a testing regime similar to tempering valves and must have all 'dipswitches' factory set and permanently disabled. They must also be marked with a label stating:

**THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50°C WHEN TESTED IN ACCORDANCE WITH AS3498. REFER TO AS/NZS 3500.4, LOCAL REQUIREMENTS AND INSTALLATION INSTRUCTIONS TO DETERMINE IF ADDITIONAL DELIVERY TEMPERATURE CONTROL IS REQUIRED.**

### Continuous flow water heaters with electronic temperature control preset to a maximum temperature of 50°C.

Continuous flow water heaters with electronic temperature control are typically supplied with a factory set default maximum delivery temperature of 55°C or 60°C. It may be possible for the installing plumber to alter this to 50°C, which will enable the unit to be installed without the need for further tempering. A registered plumber in consultation with the manufacturer may only alter temperature settings. The installing plumber must ensure that the end user does not have access to the temperature setting information (for example, dip switch settings) supplied by the manufacturer. Alternatively, some units are supplied with a factory set default maximum delivery temperature of 50°C and will be marked as such by the manufacturer (for example, "Preset to 50°C"). The installing plumber can install these units without alteration to temperature settings without the need for further tempering.

### Continuous flow water heaters with electronic temperature control preset to a maximum temperature EXCEEDING 50°C.

Continuous flow water heaters with electronic temperature control are typically supplied with a factory set default maximum delivery temperature of 55°C or 60°C. The installing plumber can install these units without alteration to temperature settings provided the water is delivered to the outlets at the temperatures specified by AS/NZS 3500.4.2-1997 usually by one of the following means:

1. A tempering valve complying with AS/NZS 4032.2 is fitted and adjusted to an outlet temperature not exceeding 50°C or
2. A thermostatic mixing valve is fitted complying with AS4032.1 and adjusted to an outlet temperature not exceeding 50°C or 45°C as required.

### Optional remote temperature control pads



Many continuous flow water heater models with electronic temperature control are available with remote temperature control pads. These enable the end user to select the temperature required for a given application, typically in the range of 37 to 43°C for baths and showers and higher for other applications. The use of

temperature control pads does not guarantee compliance with the temperature delivery requirements of AS/NZS 3500.4.2:1997. The water heater itself may still need to be limited to a temperature of 50°C or a tempering/thermostatic mixing valve may still be required. The installing plumber should refer to the manufacturers installation requirements.

#### Other instantaneous water heaters

Other Instantaneous water heaters do not have electronic temperature control and outlet temperature can vary greatly due to ambient cold water supply temperatures and fluctuations in water flow and pressure. It is therefore necessary to install a tempering valve or thermostatic mixing valve in the bathroom supply from an instantaneous heated water system. Tempering valves are an accepted method of providing temperature control in buildings requiring 50°C-heated water for ablution purposes.

#### STORAGE HOT WATER SYSTEMS

When hot water is stored at 60°C there are, in general, two methods to ensure the water is delivered to the outlets at the temperatures specified by AS/NZS3500.4.2:1997.



*Note: Some manufacturers supply storage water heaters with an 'in-built' tempering or thermostatic mixing valve.*

These methods are:

1. Tempering valves complying with AS/NZS 4032.2 and adjusted to a delivery temperature at the outlet not exceeding 50°C;



1. Thermostatic mixing valves complying with AS 4032.1 and adjusted to a delivery temperature at the outlet not exceeding 50°C or 45°C as required.



### Further Information

Further information about the Building Act 2000, the Plumbing Regulations 2004 and the Tasmanian Plumbing Code (TPC) can be obtained from: <http://www.wst.tas.gov.au/building> or from Building Standards and Regulation, 30 Gordons Hill Road, Rosny Park, 7018 or P O Box 56, Rosny Park 7018 or Phone: Helpline 1300 366 322 Fax: (03) 6233 8338  
Email: [wstinfo@dier.tas.gov.au](mailto:wstinfo@dier.tas.gov.au)

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