

Technical Solution Sheet 6.01

6: Hot Water Plumbing

Achieving Hot Water Delivery Temperatures/Dead Ends

AIM

The aim of this technical solution is to clarify the requirements for control and delivery of heated water at fixture outlets.

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 related to the installation of heated water services. [AS/NZS 3500.4: 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 “Water temperature”.

HEATED WATER TEMPERATURES

Heated water supplied from new heated water services must be delivered to ablutionary fixtures at a temperature that reduces the likelihood of scalding. Also, heated water must be delivered to fixtures and appliances at flow rates and temperatures which are adequate for the correct functioning of those fixtures and appliances.

[AS/NZS 3500.4](#) requires that heated water be stored at not less than 60°C to inhibit the growth of Legionella bacteria.

In childhood centres, nursing homes, primary schools and the like, the delivery temperature to sanitary fixtures used primarily for personal hygiene purposes must not exceed 45°C.

In other buildings, the maximum temperature delivery to sanitary fixtures used primarily for personal hygiene purposes must not exceed 50°C.

In kitchens and laundries, heated water must be delivered to fixtures and appliances at flow rates and temperatures which are adequate for the correct functioning of those fixtures and appliances. The temperature required may be greater than 50°C (see Figure 1).

SOME CONSIDERATIONS AND FACTORS INFLUENCING COMPLIANCE

When working on some water supply plumbing installations and isolating the cold water supply, it might be possible for the temperature delivery of heated water to increase to a temperature greater than that permitted by [AS/NZS 3500.4](#). In this situation, the risk of scalding is increased. Plumbing practitioners must take precautions to ensure that this risk is minimized.

For new storage heated water installations, it may be possible to alter the water heater temperature controls.

Any alteration should not permit the delivery temperature to increase to a temperature greater than that permitted by [AS/NZS 3500.4](#). Any device that simply shuts off the water supply when the temperature is exceeded may

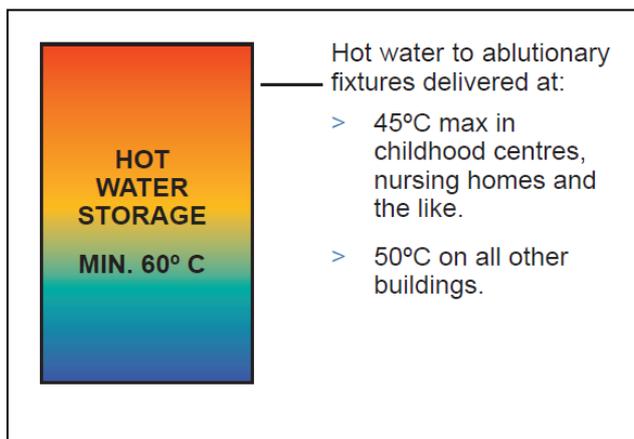
Technical Solution Sheet 6.01

provide a measure of safety, however it does not comply.

This is because the heated water must be delivered to fixtures at flow rates and temperatures which are adequate for the correct functioning of those fixtures.

Some water supply taps have a flow adjustment by an internal screw etc, however this also is not an acceptable means of temperature control. If the storage or heated water temperature were to be increased, or the cold water supply were to be isolated, this might permit the delivery temperature to increase to a temperature greater than that permitted by [AS/NZS 3500.4](#)

FIGURE 1 - EXAMPLE OF MINIMUM STORED WATER TEMPERATURE



APPROVED DEVICES

Only devices that automatically adjust / modulate the water temperature are approved to control the delivery temperature of heated water. Thermostatic mixing valves, tempering valves, and also electronically activated flow control systems as fitted to continuous flow heated water systems are examples of approved temperature control devices.

In childhood centres, nursing homes, primary schools and the like, where the delivery temperature to sanitary fixtures must not exceed 45°C, a thermostatic mixing valve is an acceptable means of controlling the water

temperature. Tempering valves must not be used.

DEAD ENDS

Heated water must be stored and delivered under conditions which avoid the likelihood of the growth of Legionella bacteria and contamination of drinking water.

Dead ends in both heated and cold water installations can place the drinking water at risk. A dead end is a branch in a water supply line that does not have an outlet or a draw off point that is used. While there is no flow, the water in the branch stagnates and water quality deteriorates. Therefore, it is incumbent on plumbers to reduce the risk by ensuring all dead ends of piping are removed, or kept to a minimum.

In heated water systems, a dead end, especially those that branch from a circulatory system can create conditions for Legionella and must be avoided.

Dead ends are typically created in renovation work rather than in new installations.

Dead ends should be eliminated, preferably by removing the tee or branch fitting, or at the very least by disconnecting the disused branch pipe and sealing the branch (see Figure 2).

Technical Solution Sheet 6.01

FIGURE 2 - EXAMPLE OF DEAD END

