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Australian Government
Department of Health



Family &
Community Services
Ageing, Disability & Home Care

Consumer Factsheet

Hot water safety in bathrooms

PEER
REVIEWED

The purpose of this factsheet is to assist people to have hot water at a safe temperature. Hot water in the bathroom can be a hazard if the temperature is too high or too low. Water that is too hot can cause serious burn injuries, especially in the bath and shower.

This factsheet will help you to decide the best way to control the temperature of hot water in your bathroom(s). There is also extra safety advice for anyone in your home that has a higher risk of burn injuries due to their age or disability.

What temperature should hot water for the bathroom be?

Severe, full thickness burns to skin occur more quickly at higher temperatures. Children (and older people) have thinner skin so the time it takes for their skin to burn is less than for adults. The table below, shows the time taken for a full thickness (third degree) burn to occur at different temperatures.

Delivered hot water temperature	Time to cause a full thickness (third degree) burn in adults	Time to cause a full thickness (third degree) burn in children
70°C	1 second	0.5 seconds
60°C	5 seconds	1 second
55°C	30 seconds	7 seconds
50°C	5 minutes	5 minutes

Source: AS 4032.2-2005 (R 2015- Water supply—Valves for the control of hot water supply temperatures, Part 2: Tempering valves and end-of-line temperature-actuated devices) Figure E1. © Standards Australia Limited. Copied by HMinfo with the permission of Standards Australia and Standards New Zealand under Licence 1801-c062.

Hot water must be stored at a temperature of at least 60°C. The high storage temperature is needed to prevent harmful bacteria growing in the water. Water at the storage temperature of 60°C would severely burn a person's skin very quickly.

To help avoid accidental hot water burns, the Australian Plumbing Code limits the temperature of hot water delivered to bathroom hot water taps, to 50°C. This gives people more time to get out of water that is too hot, before their skin is seriously burned. However, it can take longer for older and very young people, and people with disability, to get out of the shower or bath if the water is too hot. They could still be badly burned in 50°C water. For this reason, the Australian Plumbing Code limits the temperature of hot water delivered to bathrooms to 45°C in early childhood centres, schools, nursing homes, and specialised homes for older people or people with disability. If a person living in your home is at a higher risk of burns due to age or disability, you might also choose to reduce hot water in the bathroom to 45°C, or even lower.

How can the temperature of hot water be controlled?

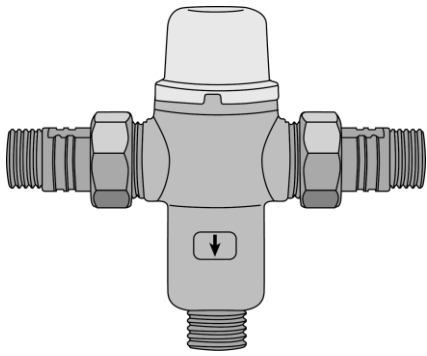
The temperature of hot water needs to be reduced from the safe storage temperature of at least 60°C, to the safer 50°C (or lower) hot water delivered in the bathroom.

Some modern water heaters, usually continuous flow units, are set in the factory to deliver hot water at a temperature of 50°C. This means that all hot water taps connected to the water heater will have water supplied at 50°C or less. This might include the hot water taps in the kitchen and laundry. These hot water heaters will be marked:

WARNING: THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50°C IN ACCORDANCE WITH AS 3498. REFER TO AS/NZS 3500.4, LOCAL REQUIREMENTS AND INSTALLATION INSTRUCTIONS TO DETERMINE IF ADDITIONAL DELIVERY TEMPERATURE CONTROL IS REQUIRED

Other hot water heaters are not set to supply water at 50°C. In this case, extra temperature control devices are needed to reduce the hot water temperature to 50°C for the bathroom. They can also be used to further reduce the hot water temperature, for people at high risk of burns. The two types of temperature control devices are tempering valves and thermostatic mixing valves. They are installed in the water pipes by a plumber.

Tempering Valves



Example of a Tempering Valve

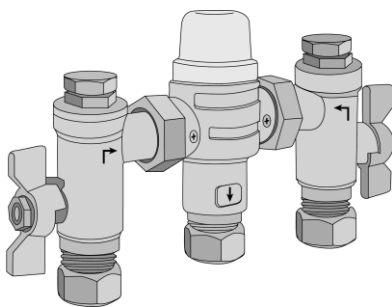
A tempering valve is a mixing valve for hot water supply pipes. It is used to lower the temperature of the supplied hot water before it is delivered to the outlet. The hot water in the pipe is mixed with enough cold water to help avoid hot water burns if the cold-water tap is accidentally turned down too low or turned off.

You can choose the number and location of tempering valves to control whether hot water is lowered only for the bathroom, or in the kitchen and laundry as well. Usually, tempering valves are installed near the hot water service, so hot water is limited to a safer temperature throughout the home.

Tempering valves are usually set to 50°C. However, they can be set to 45°C or lower, if they are close to the hot water outlet. You might choose to set tempering valves to this lower temperature if a person living in your home is at a higher risk of burns.

A tempering valve must be installed by a licensed plumber. Any tempering valves installed in your home need to be tested every year. You will need to book the plumber and keep his certificate in a safe place. Depending on the system you purchased, the warranty could be from 1 to 3 years. When your system is inspected, please discuss with your plumber when your system or its critical parts should be replaced.

Thermostatic Mixing Valves



Example of a Thermostatic Mixing Valve

A thermostatic mixing valve (TMV) is a mixing valve used to lower the temperature of the supplied hot water at the outlet. The TMV blends enough cold water with the hot water so it is safe to use for washing and bathing.

You might choose to install TMVs, if a person living in your home has difficulty adjusting the water temperature for showering and bathing, or cannot get out of the water if it is too hot.

The TMV should be installed close to each hot water outlet that needs the hot water at a safe temperature for use.

A TMV must be installed by a licensed plumber, and in some states the plumber is required special accreditation. The TMV needs to be tested every year and have the critical parts replaced every five years.

Bathroom hot water safety - Checklist

This checklist will help you to check whether the hot water in your home is a safe temperature for everyone living there. If you need help with the questions, you could ask a licensed plumber.

Checking whether your hot water is a safe temperature to reduce the risk of burns

Is hot water delivered to each of your bathroom basins, bathtubs and showers at a temperature no higher than 50°C,

- by a hot water heater with this label?

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- using a tempering valve on the water pipe?

If the hot water in your bathroom is delivered hotter than 50°C,

- could you replace your hot water heater with one that delivers hot water at 50°C, OR
- have a tempering valve installed by a plumber to lower the hot water to 50°C?

Are you concerned about the risk of hot water burns in other areas of your home:

- at the kitchen sink?
- at the laundry sink?

If your hot water heater is not set to deliver hot water at 50°C to your whole home,

- could you have a tempering valve installed by a plumber, so hot water is delivered to these areas at 50°C?

Making hot water even safer for people at higher risk of burns

Does anyone who lives or stays at your home have a higher risk of serious burns, due to:

- thinner or more sensitive skin?
- difficulty using hot water taps?
- difficulty moving out of water that is too hot?

If anyone in your home at a higher risk of burns needs hot water at lower temperature,

- could you have a plumber install tempering valves set to 45°C or lower in the bathroom, the kitchen and laundry to reduce the risk of burns?
- could you have a plumber install TMVs to reduce the hot water delivered in the bathroom, the kitchen and laundry, to a temperature safe for use?

Keeping your hot water at a safe temperature to reduce the risk of burns

Do you have the supplier's maintenance instructions for your :

- hot water heater?
- any tempering valves or TMVs?

If you have tempering valves or TMVs,

- are they tested by a plumber once every year?
- are the critical parts replaced by a plumber every five years?

If it is too difficult for you to get a plumber to replace critical parts every five years and do testing every year,

- could your family, a friend or a carer help you to get a plumber to do this? OR
- could a home maintenance service help you to get a plumber to do this? OR
- could you replace your hot water heater with one that is set to limit the delivered hot water to 50°C?

Where can I find more information?

- The HMinfo Summary Bulletin: *Regulatory requirements for controlling water temperature in bathrooms*, available from the HMinfo website: www.homemods.info
- *National Construction Code Series 2016, Volume 3, Plumbing Code of Australia*, available from the ABCB website: www.abcb.gov.au
- Australian Standards, available from the SAI Global Store website: infostore.saiglobal.com
 - *AS 4032.1-2005 Water supply - Valves for the control of heated water supply temperatures, Part 1: Thermostatic mixing valves - Materials design and performance requirements*
 - *AS 4032.2-2005 (R 2015) Water supply—Valves for the control of hot water supply temperatures, Part 2: Tempering valves and end-of-line temperature-actuated devices*
 - *AS 4032.3-2004 Water supply - Valves for the control of hot water supply temperatures, Part 3: Requirements for field testing, maintenance or replacement of thermostatic mixing valves, tempering valves and end of line temperature control devices*

- *AS 3498-2009 Authorization requirements for plumbing products - Water heaters and hot-water storage tanks*
- *AS/NZS 3500.4:2015 Plumbing and drainage Heated water services*
- A licensed plumber
- Other Home Modification resources on the HMinfo website: www.homemods.info

***This information was correct at time of printing.*