

Canadian Plumbing Code – Maximum Hot Water Temperature

THE CHANGE

The National Research Council (NRC) Standing Committee on Building and Plumbing Services recently adopted a change to the Plumbing Code that requires water supplied by fittings in residential buildings to be limited to a maximum of 49° C (120° F). This requirement can be met either by a master mixing valve at the heater or by mixing valves fitted at each outlet. Setting the temperature to 49° C (120° F) at the water heater is not deemed to be acceptable.

The anticipated wording for the Code is as follows:

2.10.7 Maximum Temperature of Hot Water

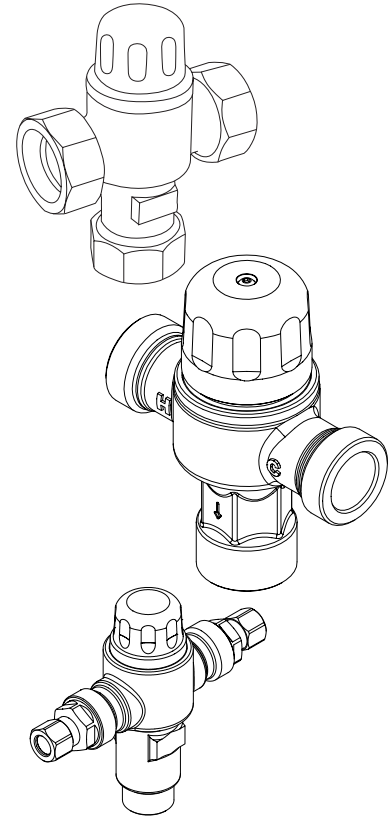
- (1) *Except as provided in Sentence (2), the maximum temperature of hot water supplied by fittings to fixtures in residential occupancy shall not exceed 49° C.*
- (2) *Sentence (1) does not apply to hot water supplied to installed dishwashers or clothes washers.*

A-2.10.7 Maximum Temperature of Hot Water

Hot water delivered at 60° C will severely burn human skin in 1 to 5 seconds. At 49° C, the time for a full thickness scald burn to occur is 10 minutes. Children, elderly persons and persons with disabilities are most at risk.

There are several ways of achieving the objective of Article 2.10.7. Automatic compensating mixing valves or other devices can be installed at each fixture or a master automatic compensating mixing valve can be used to meet the objective. These valves are adjustable and can be set to deliver water at a maximum set point.

Storing water at temperatures below 55° C in the hot water tank may lead to the survival and or growth of bacteria. This concern should be addressed in designing hot water delivery systems because the actual water temperature within the tank can vary from the thermostat setting. Precautions have to be taken to ensure that bacteria contamination of the hot water delivery system is minimized.



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IMPLEMENTATION DATE

It is expected that the final approval for the code change will be obtained in January 2004 and that it will then be issued as an interim change. The change will then be implemented by mid 2004.

This change will be adopted only for new construction. However, it does not set the accepted best practice for water temperature control for all water heater installations.

REASONS FOR THE CHANGE

1. SCALDING

High water temperatures are dangerous! The higher the water temperature the shorter the time taken to scald. It is commonly accepted that water temperatures higher than 49° C (120° F) should not be available at outlets used for bathing purposes. At 49° C (120° F) it takes approximately 5 minutes to sustain a full thickness burn. An increase to only 55° C (131° F) dramatically reduces the time for a full thickness burn to less than 1 second in a child!

2. LEGIONELLA BACTERIA

This bacteria thrives in warm water environments (i.e. 49° C (120° F) or less), and is thus a potential problem in hot water distribution systems. Water stored at 49° C (120° F) or less can provide ideal conditions for the growth of legionella bacteria within the water heater. It is necessary to store water at 60° C (140° F) or higher to minimize the bacteria growth.

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COMPLYING WITH CODE

The Code suggests two methods of complying with the new requirement:

- (1) A master automatic compensating mixing valve installed at the water heater, or
- (2) Automatic compensating mixing valves or other devices installed at each fixture.

These valves are adjustable and can be set to deliver water at a maximum setting.

Option 1, the master mixing valve, is the simpler and more economical solution. A single valve fitted at the heater can control the water temperature to the whole installation.

Notes:

- (a) Regardless of which method of compliance is selected, it is recommended that an automatic compensating shower valve be fitted in each shower fixture. A shower valve will compensate for localized changes in supply pressures that may give rise to thermal shock conditions at the shower (e.g. a flushed toilet that "steals" some of the cold supply to the shower).
- (b) If desired, hot water can be supplied directly from the heater to dishwashers and clothes washers.

