

Supplementary heat sources (wetbacks and solar hot water) and the risk of legionnaires' disease

Information sheet

Source: Plumbers Gasfitters and Drainlayers Board Technical Help Desk – 12 September 2018.

Legionnaires' disease is a severe form of pneumonia (lung inflammation usually caused by infection). It is caused by a bacterium known as legionella.

Although legionnaires' disease primarily affects the lungs, it occasionally can cause infections in wounds and in other parts of the body, including the heart. It is potentially very serious.

Clause G12 of the New Zealand Building Code states that a hot water system must be capable of being controlled to prevent the growth of legionella bacteria.

A heat disinfection method is generally considered the most effective way of achieving this.

Generally, with a storage hot water cylinder, disinfection is achieved by having the water heated to 60 degrees or higher. As 60+ degrees can cause severe burns for users (especially children), G12/AS1 requires that the temperature of the water at any sanitary fitting be delivered at no more than 55 degrees (45 degrees in some more vulnerable situations). This is achieved by means of a tempering valve, which takes the 60+ degrees water from the cylinder and injects cold water to lower it for delivery.

However, there are several areas where adequate protection has been omitted or is no longer functioning. In some circumstances, this may be due to an inadequate design, in other circumstances it may be due to a property owner tampering with the system. One example is in a flow and return hot water system such as a ring main. Legionella bacteria may develop in the flow and return system when it is supplied with tempered water from the hot water cylinder, which is less than 60 degrees.

A way to prevent legionella developing in a ring main is by installing a UV filter in the flow and return hot water system. Another way is to supply the flow and return system with un-tempered water (above 60 degrees) and then temper the water at the outlets that require it.

Another example is when a hot water cylinder has solar water heating. Generally, in this type of system an electrical element, as well as the solar water heating, is used to heat the water in the hot water cylinder.

A normal, traditional system will only require a single tempering valve at the outlet from the cylinder.

However, what can sometimes happen is that the property owner may turn off the electricity to the hot water cylinder and rely solely on the solar or wetback water heating. Often the electricity is turned off in an attempt to save money, however, the risk is that the system does not heat the water adequately to prevent legionella developing.

G12/AS2 3.5 gives multiple methods for protecting water from the growth of legionella bacteria when solar or a fire wetback is used as a heating source.

If the system does rely on an electric element to supplement the solar system heating the water, then it is important that the property owner is made aware of the need for the heat disinfection of the water and advised that the power should remain on. The same principle applies if a wetback is used as the main heating source, a controlled supplementary heating system should be included such as an electric element.

As the electric element is controlled by a thermostat, the power will only switch on if the temperature in the cylinder drops below 60 degrees. If the solar system or the wetback is maintaining a temperature above 60 degrees, the element will not switch on.

Associated resource:

<https://www.building.govt.nz/building-code-compliance/>