

**QUESTION:**

Low temperature heating systems will only have a maximum primary flow temperature of 55°C, how can legionella protection be ensured to hot water storage tanks in such a system?

**ANSWER:**

Legionella ceases to multiply in hot water systems above 50°C but is not actively killed until a hot water temperature of 60°C is achieved for a minimum of 10 minutes. Hotter temperatures will kill the bacteria in a shorter time. Hence, current legionella guidance is to store at >60°C or “pasteurise” the hot water store at >60°C for at least an hour once per week.

It is clear a primary flow temperature of max. 55°C will not achieve this guidance. However, the max 55°C requirement only applies to the space heating circuit, it is acceptable to raise the primary flow temperature for the purposes of heating domestic hot water. Boilers are available that can provide different space and domestic hot water (DHW) flow temperatures to overcome this issue. We recommend that your boiler supplier be contacted for further advice on such appliances.

Should the boiler selected not be able to provide a dual temperature primary flow temperature, other means of “boosting” the hot water store temperature will be necessary. Most indirectly heated hot water storage vessels are also fitted with an electric immersion heater. This can be set up to raise the store temperature to >60°C on a periodic basis (once per week is recommended to minimise costs and energy use). We would recommend that this be done after heating by the boiler (so the temperature rise is minimised) and during an overnight period to avoid any draw offs while the system is “pasteurised”. This may also enable an off-peak electricity tariff to be used.

Heat pump systems in many cases also operate with lower temperature primary flows than a conventional boiler. Heat pump systems will usually also have a hot water store so the scenario discussed above will also occur in these systems. Most heat pump control systems will have an anti-legionella cycle which will periodically raise the hot water storage temperature to >60°C by using either the immersion heater in the storage vessel or by an in-line flow heater in the primary circuit. The heat pump supplier should be consulted to ensure the anti-legionella cycle is correctly set up during commissioning.

It should also be remembered that storing hot water at a lower temperature will lower the energy content of the store meaning less “usable” hot water (usually at approx. 40°C) can be output from the store. Depending on usage requirements a slightly larger hot water storage vessel may be required than with a conventional boiler. Contact your hot water storage vessel supplier for further advice.