

## Domestic Hot Water

Domestic hot water is supplied in schools in a variety of ways, including:

- A centralised hot water cylinder located in a boiler/plant room with distribution pipework around the school. The cylinder is heated indirectly by the main space heating boilers. It may also have one or more electric immersion elements. This type of arrangement is common in houses. The cylinder probably has five or more pipes connected to it.
- A stand-alone centralised water heater located in a boiler/plant room with distribution pipework around the school. This heats the domestic hot water only, using gas, oil or electricity and is not connected to the main space heating system. They rarely include electric immersion elements. It probably has no more than four pipes connected to it and perhaps as few as two.
- Local electric water heaters, usually serving sinks or basins in one room and perhaps adjacent rooms. They may be wall hung at high level in classrooms or storerooms, or mounted below sinks in cupboards or in toilets.
- In addition, water boilers are used in many staff rooms and serveries for making hot drinks. These are usually electric.



Stand-alone centralised water heater

Centralised systems heated by the space heating boilers often include electric immersion heating elements as a backup. These electric elements can be more economic to use when the space heating is off in warmer weather.

The main causes of energy being wasted in schools for domestic hot water purposes are:

- Time clocks are set incorrectly or are non-existent and water heaters are left on when the school is closed.
- Insulation on hot water cylinders and pipes is missing or damaged.
- Old fashioned taps are used which deliver an unnecessarily high flow rate. Push taps are more efficient.
- Dripping hot taps.

- Thermostats have been set too high.
- Maintenance has not been carried out i.e. servicing of boilers or cylinders.

Energy losses can be reduced by setting the hot water thermostat to 60-65°C. This should be sufficient to kill off most bacteria, such as legionella, that may be in the water. Anything over this temperature is wasteful of energy. Do not turn the thermostat down below 55°C as bacteria such as legionella may be able to survive in the water below this temperature and will breed at lower temperatures.

Ask your caretaker or maintenance contractor to check that the pipe work and hot water cylinders have adequate levels of insulation on them.

When purchasing new equipment, make sure it is energy efficient. This will save money and is better for the environment.

## Energy saving tips for domestic hot water systems

### General tips for all domestic systems

If the system is in relatively good condition you can do the following to help save energy:

- Ensure the system is not running outside school hours.
- Make sure time clocks are correctly set regarding time and day of the week and on/off times.
- Install a 7-day time clock if there are no time clocks. Ensure it is the type which can be set for different times each day of the week.
- Ensure the hot water cylinder thermostat is set to 60-65°C and not any higher.
- Ensure hot taps are not dripping.
- Consider installing water conserving push-taps on basins.



Hot water boiler

## Centralised hot water cylinder

For a centralised system, you can also try the following to save energy:

- Have the main space heating boiler serviced each summer.
- Ensure the circulating pump is controlled by a time clock and does not run outside school hours.

## Stand-alone centralised water heater

If the system is in a relatively good condition you can try the following to help save energy:

- Ensure the boiler and pumps are not running outside school hours.
- If the system is old or in a very poor condition, consideration should be given to replacing the system, especially if it is more than 20 years old. Most systems have a nameplate on the front, side or back showing model number, capacity and year of manufacturer.

## Local electric water heater



Local electric water heater

Try doing the following to help save energy:

- These systems often have no time clocks, or the time clocks are incorrectly set, or no one knows where the time clocks are located. If the latter is the case, the next time there is an electrician in the school, ask them where the time clock is located.
- Ensure that thermostats are working correctly on the electric water heater or it may continue to heat the water to too high a temperature. When the water gets too hot it is 'dumped' through an expansion pipe to a

drain. Look for signs of water being wasted due to high temperature in the system.

- If a sink or basin has been made redundant, and a water heater is present make sure it is turned off.
- Turn off electric water heaters during the holidays.

## Helpful hints

**Do** - Install push type spray percussion taps which turn off automatically.

**Don't** - Leave taps running unnecessarily when washing hands, or equipment.

**Do** - Ensure every water heater has a 7-day time clock

## Hot water boilers for drinking water

Water boilers are commonly found in staff rooms and can cost €150 per year or more to run.



Hot water boiler

- Fit 7-day time clocks on units which do not have them to save on overnight and weekend energy consumption.

- In schools with small staff rooms, consider installing smaller units, with capacity of 2-5 litres, or use a kettle.
- Remember to switch off during the holiday periods.
- Use a kettle when staff numbers are low e.g. when only some staff are present. Don't fill the kettle to maximum capacity each time you boil it, just fill it to meet the demand at that time. A smaller amount of water will boil more quickly and use less energy.

## Anti-scald devices

Sometimes known as thermostatic mixing valves, anti-scald devices are fitted at sinks, basins and showers to prevent scalds from hot water.

To protect students and staff from being scalded, the Department of Education has guidelines to limit the delivery temperature of hot water in schools. For new and replacement installations, the temperature of the hot water at the outlet of all sanitary ware fixtures in schools should not exceed 43°C. The temperature at which the water is stored still remains at a recommended 60-65°C. Remember, heating water to higher temperatures is a waste of energy.

Where domestic hot water is heated and stored, a thermostatic mixing valve can be installed close to the sink or wash hand basin. These valves mix the hot water with cold water, and limit the temperature of the water flowing from the hot tap.

## Legionellae awareness

Legionnaires' disease is a potentially fatal form of pneumonia. People may get infected when they breathe in tiny water droplets (aerosols) or droplet nuclei (particles left after the water has evaporated) contaminated with elevated concentrations of *Legionella* bacteria.

Legionella bacteria grow best between temperatures of 20°C – 45°C with optimum growth temperature being 35°C – 40°C. High temperatures (minimum 60°C) kill the bacteria.

For further details and a general overview of Legionnaires' disease and advice aimed at employers and persons who have responsibility and control of a place of work see the following information sheet  
[https://www.hsa.ie/eng/publications\\_and\\_forms/publications/biological\\_agents/legionnaires\\_disease.pdf](https://www.hsa.ie/eng/publications_and_forms/publications/biological_agents/legionnaires_disease.pdf)

## Maintenance

- Manufacturers recommend that you have your boilers inspected and maintained at least once a year.
- Check that there are no leaks in the system. Look for signs of surface water on the floor of the boiler house. This may be a sign that there is a leak.
- Some electric hot water heaters have a sacrificial anode built in to the unit. These anodes help eliminate internal damage due to particles in the water. It is recommended that these be checked every year. Check for lime scale formation and replace as necessary. Soften the water if necessary.
- Check all safety valves for signs of leaks or damage annually.
- Check pipe work for signs of damaged insulation. Also check that storage water heaters' insulation has not been damaged and replace as necessary.