

Protecting plumbing systems in caravan holiday homes and park homes against damage by freezing

'Winterising' by draining down

Without taking precautions, freezing is likely to damage the plumbing systems of caravan holiday homes and park homes left unoccupied over winter. The conventional method of protection is by draining down the plumbing system to remove most of the water from the pipes and other water fittings. The following interpretation and advice covers the requirements of the plumbing regulations/byelaws relating to preventing damage to these systems by freezing.

Q: Do the Water Supply (Water Fittings) Regulations/Scottish Water Byelaws apply to plumbing systems in caravan holiday homes and park homes?

A: Yes, if they are connected to a site water supply which is derived from the public water mains. The regulations apply to all parts of the water supply plumbing like pipes and valves, taps, showers, water heaters and water-using appliances like washing machines which convey or receive water which came from the public water mains. Touring caravans which temporarily link up directly to a site water supply tap or connector are also covered. If the touring caravan only uses a free-standing container of water, for example a 'roll-along' type container, which is filled from a tap and is then connected to the caravan, the caravan is not subject to these regulations.

Q: What do these regulations say about preventing freezing of pipes and appliances in my caravan holiday home or park home while it's unoccupied over the winter?

A: They say fittings must be protected against damage by freezing. This can be done by closing the stop valve to shut off the water supply and draining water out of the plumbing using suitably located drain taps, or by insulation, with trace heating if necessary. Also remember to protect the supply pipe where it comes out of the ground beneath the caravan or home by using adequate insulation with trace heating, if necessary.

Q: How do I use drain taps to drain down the plumbing?

A: First close the stop valve on the water pipe. This is usually found on the pipe near where it comes into the caravan or home from underground. Open the drain taps which are located at the low points on the plumbing system, collecting the water in a basin or other container if it doesn't drain safely away. Open all taps and other outlets like shower valves to encourage the system to drain. Operate the WC flush to empty the cistern and leave the float valve in the open position. If there is a washing machine, the hoses supplying it with water should be disconnected at the taps or valves controlling the flow and the water in the machine and the hoses should be drained out by lowering them into a shallow container. Open the tap or valve which controls the flow of water into the machine and leave it open. If there is a separate drain tap on the hot water storage tank, open it and drain it down.

For central heating systems which have a closed circuit carrying water to the radiators, either ensure this is protected by an antifreeze solution (see below) or drain it down by opening the drain taps and air vent valves on the radiators and opening the valve on the water 'topping up' point for the circuit (usually where the flexible 'filling loop' is connected temporarily for topping up). Arrange to collect the drained-out water in a suitable container to prevent damage to the floors or carpets.

Q: Opening the drain taps doesn't remove all the water from the system. Is this a problem and what else can be done?

A: Water expands when it freezes, but in partially filled pipes there can be room for it to expand without bursting the pipe. So having some water left in pipes may not cause damage if it freezes. Water trapped in taps and valves may be a problem if there isn't room for it to expand. Leaving taps and drain valves open helps. If necessary, you can use low pressure air to blow water out of taps, valves and drain points.

Q: Is using an electric air compressor allowed and does it introduce contaminants into the plumbing system?

A You can use an electric compressor, but it needs to be an 'oil-free' type to prevent oil vapour being blown in. The compressor should be equipped with a filter to remove dust etc. If it has a pressurised air receiver this should be 'blown down' regularly to remove any moisture. To avoid the risk of damaging the plumbing system if using air, the air pressure mustn't be too high. A maximum of around 3 bar (300kPa; 44 psi) is adequate, but do not use a greater air pressure than the maximum water pressure recommended by the caravan holiday home or park home manufacturer, which may be lower than 3 bar.

Using a hand-operated air pump may be preferred as it has none of these problems provided you store it and use it hygienically.

Q: How do I connect onto the plumbing to get the air into the pipes?

A: With taps and other outlets closed but the drain valves open, use a purpose-made adapter or a flexible tube pushed onto the tap outlets one at a time, open the tap and blow the water back out of the open drain point. Alternatively, connect to the drain point and blow water out of the outlets one at a time.

Q: How can I drain down the thermostatic mixing valve (TMV) in the shower, because some of them have non-return valves inside which trap water in the valve and pipes upstream of it?

A It may be possible to drain it by removing the thermostatic cartridge; manufacturers' advice should be followed. Alternatively, it may be necessary to remove the valve from the wall and manually drain the water out of it or store it in a frost-free place.

Q: Having left the caravan drained down over the winter, what should I do to the water supply before using it again?

A Check all the outlets and drain taps are closed before using the stop valve to turn on the water. Partially open each outlet in turn and expel the air, then increase the flow and flush the water to waste for about a minute. Operate the temperature control of the shower mixer valve to draw water from both feed pipes.

If the central heating system has been drained down, close the drain outlets and air vent valves, connect the temporary filling loop to the topping up point and open the connecting valve to recharge the closed circuit. It will be necessary to carefully open the air vent valve on each radiator to allow the air trapped inside to escape. If the local pressure is much greater than the recommended operating pressure for the closed circuit, take care not to over-pressurise the closed circuit when using the filling loop, which could happen if you just leave the connection open. It's a case of fill a bit, then vent a bit, turning off the filling loop in between. When filled and re-pressurised to the manufacturer's recommended pressure, close the valve on the topping up point and remove the filling loop. (It's illegal to leave the filling loop connected permanently).

Q: Does the water supply plumbing system need to be disinfected after the winter draindown?

A Disinfection isn't usually required. The low temperatures should prevent problems with bacterial growth over the winter even though some moisture is left in the pipes. The mains water being flushed through the pipes usually has a background level of chlorine disinfectant already in it and experience shows that flushing is usually enough to prepare the system for regular use.

Q: At other times of year, does the plumbing need regular flushing if it's left unused for lengthy periods?

A There's no hard and fast rule, but when unused for long periods it's recommended to flush pipework every four weeks or so to clear the water which has been standing in the pipes, if this can be arranged. Pipework should certainly be well flushed when first returning to use the home after a long break. At any time of year, when taking up residence after not using the water for more than four or five days, it's a good idea to run the drinking water taps for a few moments to draw fresh water through to them, using the water for another purpose if possible.

If a system hasn't been used for a very long time, or if there are unusual circumstances which increase the risk of contamination, the local Water Supplier might require disinfection. Please ask your local water supplier if in doubt.

Q: I've been warned that it's illegal and dangerous to fill the water supply plumbing system full of antifreeze solution and leave it over winter to stop it freezing. What's the problem?

A The regulations say it's illegal to use water fittings to add a contaminant to drinking water systems. Adding antifreeze to the whole plumbing system of the individual caravan or park home, including the drinking water taps, contaminates drinking water. If someone inadvertently drank the dosed water it could seriously affect them. Drinking antifreeze has caused deafness, blindness and kidney damage. So doing this is not only a criminal offence, but it risks people's health.

Q: Am I allowed to use antifreeze in the central heating system circuit to stop it freezing?

A Yes. Water in the central heating system circulates through the boiler and the radiators in a closed circuit which is not connected to the rest of the plumbing system. You are allowed to add antifreeze through the connection normally used for topping up the closed circuit with water. This is because water in the closed circuit is not used for drinking purposes and does not have to be of drinking quality. The use of a temporary filling loop to top up or re-pressurise a dosed closed circuit is also accepted, provided the filling loop has a double check valve (double 'non-return' valve) to prevent backflow whilst it is briefly connected and the filling loop is disconnected immediately after use.

Q: Can I put diluted antifreeze in the WC bowl and sink waste traps to stop them freezing?

A Water in WC 'U' bend and the waste traps under sinks, baths and showers is part of the waste water system which doesn't come under the Water Fittings Regulations/Byelaws. So these regulations don't affect you if you do this. However, flushing antifreeze into the foul water drains might require permission from the wastewater service company whose sewers take the waste away. It might affect septic tanks where park operators use these, so it's best to check with these organisations first before doing this.

WRAS offers a technical enquiry service on the regulations and byelaws. Further information about how the Water Fittings Regulations affect caravan holiday home and park home users is in a WRAS booklet entitled "Holiday and Residential Parks". This can be read and downloaded free of charge from the WRAS website (www.wras.co.uk/publications) or a hard copy can be provided on request via telephone (01495 248454) or email (info@wras.co.uk).