

PRECAUTIONS AGAINST FREEZING OF WATER IN PLUMBING SYSTEMS

1. The responsibility for protecting the water services in a domestic dwelling is that of the owner or occupier of the building. **Frost protection measures are required by law and are a condition of insurance cover.**
2. Pipes and fittings above the ceiling level insulation in roof spaces and outside the insulation envelope need to be insulated.
3. When buildings are left unoccupied the water system should be drained.
4. Consumers should make themselves aware of the location of stop valves, drain cocks etc., and should ensure that they are capable of being operated easily. It should also be noted that stop valves and drain cocks must be insulated to the same standard as is specified for the adjacent pipework.
5. While cold water fittings are mainly considered as being in need of protection against freezing, consideration should also be given to hot water fittings. While many hot water fittings are lagged to conserve loss of heat energy, the type of thickness of insulation may sometimes be considerably less than that recommended to minimise freezing of water in cold water fittings.
6. Consumers should ensure that the insulation above ceiling level is to the required thickness. Whilst conserving heat energy in the building below, this insulation intensifies the freezing of water fittings above the ceiling level insulation.
7. Other locations where freezing of water in fittings often occurs are, common corridors or stairwells of multi-story flats; outbuildings; water fittings located below ground floor suspended floors; and in basements used for storage. The introduction of ducting will increase the time before the onset of freezing. In many cases in the past, water fittings have had insufficient thermal insulation for the sustained low temperature conditions that have arisen.
8. **Even when a substantial thickness of insulation is provided, freezing of water in fittings cannot always be prevented if the low ambient air temperature continues for a day or more.**
9. It is essential, therefore, that for severe cold conditions the householder, or person in everyday charge of the property or person left in charge of empty buildings: **drains the water system completely if the building is to be left unattended during the winter period, particularly if there are water fittings located in the roof space or at other vulnerable points**

10. Smaller diameter pipes require a greater thickness of insulation. This is mainly because of the lower heat capacity of the smaller volume of water and reduced amount of material in the pipes. Ensure that insulation is carefully fitted round all fittings such as valves, bends, tees etc.
11. Cold water storage and feed and expansion cisterns should be protected against freezing. A minimum thickness of 9mm insulation is required.
12. All insulation should be sealed at the joints leaving the air vent to the cistern free and unobstructed.
13. The ceiling insulation below the immediate vicinity of a cold water cistern should be omitted to allow some heat to pass through to the cistern from below.
14. All water fittings in a roof space, irrespective of whether they are located near the eaves or elsewhere above, should be insulated for extreme exposure conditions. This includes pipes laid immediately above the ceiling where the ceiling insulation also passes over the pipes.
15. Frost protection to water supply systems in caravan parks, residential mobile homes, site amenity blocks, farm buildings, dairies and outbuildings etc. and all external pipework to standpipes, animal drinking troughs and bowls require particular attention.
16. Prolonged below-freezing air temperatures will eventually lower the temperature of water in the pipes or fittings to below freezing point regardless of the thickness of insulation provided. It is essential that unoccupied buildings, even if the absence is only for a day, should be provided with heating if only for part of the day, sufficient to maintain a minimum air temperature within every part of the building where water pipes and fittings are located, of at least 10°C.
17. All insulation material should be maintained in a dry state. This is particularly important for insulation to external and underground pipework, which should be protected with a waterproof casing or cover to exclude water.
18. Application of thermal insulation to domestic cold water and heating pipes should be in accordance with the table overleaf and installed in accordance with manufacturer's guidelines.

Pipe Size	Normal Conditions	External Conditions
Insulation Thickness	Insulation Thickness	
mm	mm	mm
15	25	32
22	19	25
28	19	25
35	9	13
42	9	13
54	9	9
76	9	9

19. Frost stats should be fitted to heating systems where the requirements for insulation and the insulation thickness identified in the above table cannot be applied.

20. In domestic premises having central heating programmed to satisfy the average 'on' 'off' requirements e.g. heating on at 06.30 hours and off at 22.30 hours, normal family use and heating cool-down will provide sufficient protection to all pipework located within the insulation envelope.