

HSE safety alert Scalding risk from domestic hot water systems

HSE is issuing this safety alert to individual homeowners, tenants, landlords and the plumbing industry. This is to raise awareness of a rare but potentially serious scalding risk from domestic hot water systems which include a fixed all-electric or part-electric immersion heater in conjunction with a plastic cold water storage cistern or 'tank' located in the roof space.

The alert follows two strikingly similar fatal incidents in the last four years where a large volume of near boiling water poured through bedroom ceilings onto occupants sleeping below.

Particular consideration should be given to systems over 10 years old and systems where homeowners and landlords may have other reason to suspect the adequacy of the initial installation or any subsequent work.

An overheating immersion cylinder will normally show obvious warning signs. Serious incidents like these are therefore likely to be extremely rare. However, there are a number of steps that can be taken to reduce the risk:

1. Occupants should be aware of warning signs (such as excessive noise from the hot water cylinder) indicating possible thermostat failure and overheating of the water in the cylinder; see [Annex A](#).
2. Storage cisterns should be installed on an adequate supporting base. The incidents that prompted this alert occurred primarily because the plastic storage cisterns were not supported across their entire area. In other words, the base of the cistern protruded over the edge of the base support board. See [Annex A](#) for further information.
3. A safety cut-out feature, independent of the immersion heater thermostat, can be fitted to limit the temperature of the stored water, should the thermostat fail. See [Annex A](#) for further information.

NB: The risk is greatest when cisterns are located above bedrooms. This is most likely in houses built between 1945 and 1975. Very often these homes have or used to have a back boiler. If the cylinder is located in a bedroom it is probable that the cistern may be directly above it. Whenever a galvanised (metal) cistern is replaced by a plastic one, the thermostat to the immersion heater should be examined and preferably replaced by one with a safety cut-out. See Annex A for further information.

Annex A

1. Typical warning signs include:
 - o Excessively hot water coming out of the hot water taps;
 - o Excessive noise or 'bubbling' from the hot water cylinder;
 - o Hot water coming out of certain cold water taps (some storage cisterns also feed cold water taps in the bathroom);
 - o Steam/moisture in the roof space.

In such circumstances the householder or tenant should switch off the immersion heater system. Tenants should alert their landlord. Advice from a competent person such as a qualified plumber should be sought if necessary.

2. British Standard BS4213:2004 'Cisterns for domestic use – Cold water storage and combined feed and expansion (thermoplastic) cisterns up to 500 l – Specification' quotes

15mm or greater thickness marine plywood as a typically suitable material for a base support board and states that:

‘the base of the cistern should be fully supported over its whole area by a durable, rigid, flat and level platform...’

Replacing a base support is not a straightforward task and should be done by a competent person such as a qualified plumber.

3. Various safety cut-out devices are available which may be single-use (i.e. must be replaced after they have been activated), or, manually resettable. For many systems a simple option would be to replace the existing thermostat with a ‘dual rod’ thermostat, where the independent safety cut-out is integrated into the overall thermostat unit. Advice should be sought from a competent person such as a plumber or electrician if necessary.

Since 01/04/2004, the fitting of such a feature has been recommended in relation to any repair, replacement or installation work on domestic immersion heaters (British Standard BS EN 60335-2-73:2003 ‘Household and similar electrical appliances – Safety : Particular requirements for fixed immersion heaters’ refers).