

# Facts on

## Water hardness

### What is hardness?

Hardness comes from naturally occurring calcium and magnesium mineral salts which are dissolved from the rocks through which rain water flows. Water is harder in chalk or limestone areas than those with insoluble rock such as granite. There are two types of hardness: temporary hardness which is released from water on boiling and forms a scum; and permanent hardness which is not removed by boiling.

### How is hardness measured?

Hardness is expressed as the equivalent amount of calcium carbonate in parts per million (mg/l). It can also be expressed in degrees. For example, the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer's instructions as there are also other units. The following table shows the normal ranges of hardness.

Hardness as CaCO <sub>3</sub> mg/l	Clark Degrees	Hardness Level
0 - 50	0 – 3.5	Soft
51 - 100	3.6 – 7.0	Moderately soft
101 - 150	7.1 – 10.5	Slightly hard
151 - 200	10.6 – 14.0	Moderately hard
201 - 300	14.1 – 21	Hard
Over 300	Over 21	Very hard

### Is hard water harmful to health?

No, not even very hard water. In fact there is evidence that calcium and other minerals in hard waters may be generally beneficial to health.

Some studies have shown that hard water may contribute to a worsening of existing eczema in some individuals. The reason for this is uncertain and the evidence is very limited. However, if a water softener is installed for this reason, the authorities still recommend that a drinking water tap that is not softened is retained.

### What are the standards for hardness?

There are no standards set in the UK regulations for water hardness. However, hardness should not normally exceed 500 mg/l for household use because some individuals can taste the minerals and it can cause a high level of scaling in pipes.

### What are the effects of hard water?

Hard water can cause scale to form in kettles, steam irons and around taps and shower heads. Also, using hard water for washing can require slightly more soap or washing powder and can leave a scum around basins and baths. Small traces of hardness scale can float on the surface of hot drinks. This is quite harmless. Washing powders and detergents are designed to wash perfectly well with hard water and most automatic dishwashers have built-in water softeners, to avoid "spotting" of crockery and glassware. Manufacturers' literature should give full operating instructions.

**What about water softeners?**

If you need a softener there are a number of reputable firms who could advise you on makes and models. Water softeners are usually plumbed direct into the supply of the appliances requiring softened water. They contain an ion-exchange resin to remove the hardness salts. These softeners can cause high levels of sodium in the water and it is strongly advised by medical experts that you keep a separate supply for drinking that has not passed through the softener.

Electromagnetic water conditioners are also available. These fit around the pipe and do not come into direct contact with the water. They do not remove the hardness salts, but claim to reduce scale formation. Reports on their performance have been variable, but the water treated by such devices is safe to drink.

Plumbed-in water softeners should be installed in accordance with the code of practice for water softeners published by British Water.

There is no approval system for the performance of the softeners themselves, although there is one for the constituent materials which come into contact with the water. Softeners made from approved materials are listed in the "Water Fittings and Materials Directory" available at [www.WRAS.co.uk](http://www.WRAS.co.uk)

**Is softened water harmful?**

Normally, no. However, a separate unsoftened tap should be provided for drinking water if an ion-exchange softener is fitted.

Do not use artificially softened water in babies' feeds or for people on a low sodium diet. Softened water is safe to use in some home brewing and wine-making. But for best results please follow advice from manufacturers of home brew and wine-making kits.

Avoid using softened water for watering plants, in car batteries and steam irons. Use rain water or tap water for watering plants and distilled water for batteries and steam irons.

**Does Hafren Dyfrdwy soften its supplies?**

No. Our customers would have to pay for what we feel to be an unnecessary process, when much of the water used in the home does not need to be softened.