

The hardness of water is due to the presence of calcium and magnesium minerals that are naturally present in the water. Rain water is naturally soft but hard water is formed when water passes through or over limestone or chalk and calcium and magnesium iron dissolve into the water. The usual signs of a hard water supply are scaling inside kettles, poor lathering of soaps and scum.

## What is water hardness?

Hard water is formed when water passes through or over limestone or chalk areas and calcium and magnesium ions dissolve into the water.

The hardness is made up of two parts: temporary (carbonate) and permanent (non-carbonate) hardness. When water is boiled, calcium carbonate scale can form, which can deposit on things like kettle elements. The scale will not stick to kettles that have a plastic polypropylene lining but will float on the surface. The permanent hardness that comprises calcium and magnesium sulphate does not go on to form scale when heated or boiled.

## How is water hardness measured?

Hardness is usually expressed in terms of the equivalent quantity of calcium carbonate ( $\text{CaCO}_3$ ) in milligrams per litre or parts per million. You may also see hardness expressed as Degrees of hardness in Clark (English) degrees, French or German degrees or as milligrams per litre as calcium (Ca). Interconversion between the different measurements can be made by using the appropriate conversion factors below.

**Table 1 Conversion factors**

To convert mg $\text{CaCO}_3$ / litre to:		
mg Calcium/litre	Multiply by	0.4
Clark degrees	Multiply by	0.07
French degrees	Multiply by	0.1
German degrees	Multiply by	0.056

There are no universally agreed criteria for hard or soft water. United Utilities have recently changed how we describe the hardness of water. The words we use to describe the hardness of your water supply may have changed but the hardness, or the amount of calcium carbonate, has not.

Table 2 gives an indication of the equivalents of calcium and calcium carbonate and the relative degree of hardness.

**Table 2 Drinking water hardness**

mg $\text{CaCO}_3$ /l	Clark Degrees	French Degrees	German Degrees	mg Ca/l	Hardness
0 - 50	0 - 3.5	0 - 5	0 - 2.8	0 - 20	Soft
51 - 100	3.6 - 7.0	5.1 - 10	2.9 - 5.6	21 - 40	Moderately soft
101 - 150	7.1 - 10.5	10.1 - 15	5.7 - 8.4	41 - 60	Slightly hard
151 - 200	10.6 - 14	15.1 - 20	8.5 - 11.2	61 - 80	Moderately hard
201 - 300	14.1 - 21	20.1 - 30	11.3 - 16.8	81 - 120	Hard
>300	>21	>30	>16.8	>120	Very hard

For further information



[unitedutilities.com/waterquality](http://unitedutilities.com/waterquality)



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The Drinking Water Inspectorate is responsible for regulating the quality of public water supplies.

Visit their website at:  
[www.dwi.gov.uk](http://www.dwi.gov.uk)

## Water quality standards

Water with a hardness of value of 200 mg/l or higher (measured as calcium carbonate) will produce scale, but soft water with a value of 100 mg/l (as calcium carbonate) or less can be more corrosive to pipes.

Consumers who move from a hard to a soft water area or vice versa may notice a difference in the taste of the water (especially in tea) or in limescale.

Many brands of bottled water are moderately hard.

## Can hard water be softened?

No water supply in the North West is artificially softened by United Utilities

Water can be softened artificially by the installation of a water softener or the use of certain 'jug type' filters. Medical experts recommend that a non-softened supply is maintained for drinking purposes because softened water may contain high levels of sodium.

Softeners should be fitted after the drinking water tap and comply with the requirements of the Water Supply (Water Fittings) Regulations 1999. They should be maintained in accordance with manufacturers' instructions.

## Your water quality

If you're interested in finding out more about the quality of your drinking water, please visit [unitedutilities.com/waterquality](https://www.unitedutilities.com/waterquality) and enter your postcode. We'll tell you where your water comes from, together with other information such as its hardness.

### About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.