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Hard water or water hardness is caused by the amount of minerals present. This is a natural occurrence in the geology of the landscape. We're unable to control water hardness as it’s a characteristic of the water at the source. Most of the water in the South-East of England is hard in nature. Research shows that minerals in hard water is good for us, especially for our bones. It’s not considered harmful. Skip to main content Official websites use .gov A .gov website belongs to an official government organization in the United States. Secure .gov websites use HTTPS A lock () or https:// means you’ve safely connected to the .gov website. Share sensitive information only on official, secure websites. Water hardness is caused by dissolved calcium and magnesium. Depending on local geology the hardness of the water supply will vary. The hardness of water, expressed in mg/l CaCO3 (calcium carbonate), can be classified as shown below: Table 1 Hardness of Water Water Hardness (mg/l CaCO3) Soft up to 100 Slightly hard 100 – 150 Moderately hard 150 – 200 Hard 200 – 300 Very hard More than 300 This map shows typical hardness of water supplies in England and Wales. For an accurate measurement ask your water company directly because there are areas with local variation not represented by the map. Hard water causes scaling in hot water systems, kettles, electric irons and domestic appliances. Scaling is defined as deposits of calcium and magnesium that build up on heating elements over time. Scaling of heating elements shortens their life and makes appliances less efficient. Hard water produces less lather from soap, washing up liquid and washing powders. It also leaves ‘tide marks’ on basins, sinks, baths and toilets and a scum on the surface of hot drinks, especially tea brewed in the cup with a teabag (due to the air and oils in the tea). The Drinking Water Directive and the UK drinking water quality regulations do not specify standards for hardness, calcium or magnesium. The World Health Organisation Guidelines 2017 identified that water with a hardness of value of 200 mg/l or higher (measured as CaCO3 calcium carbonate) will produce scale and soft water with a value of 100 mg/l (as CaCO3 calcium carbonate) or less will be more corrosive to pipework. Where water companies artificially soften water before putting it into supply, it is recommended that they maintain a minimum total hardness of 150 mg/l (as CaCO3 calcium carbonate). This is because there is some limited evidence of a relationship between water hardness and cardiovascular health which may be related to the beneficial properties of magnesium and calcium in the diet. Softening can be achieved by lime-soda softening, where the addition of lime (Ca(OH)2) and sodium carbonate (Na2CO3) to the water causes the hardness compounds to precipitate. An alternative method, common in domestic water softeners, is ion-exchange (base exchange), whereby the calcium and magnesium ions in the water are replaced by sodium ions. Where water is softened in this way by base exchange softening it is important to provide an unsoftened outlet for drinking purposes. Installation of a softener just before the hot water tank or boiler is a more economical method for preventing precipitation of hardness salts (limescale) than softening the whole supply. Some devices are sold on the basis that they produce a magnetic field which reduces scaling by altering the shape of the crystals from needle like to rhomboid – which means they are less adherent to the heating elements in boilers. These devices do not soften the water. The science behind them is based on continuous water flow and they were designed originally for large industrial water systems, not for the household situation, where water tends not to flow for up to eight hours in 24 hours (at night). If you are considering purchasing such a device it is recommended you do so only on a sale or return basis, and that you request data on performance in the home setting. Some activated carbon jug filters also contain ion exchange resin beads which alter the “temporary” hardness of water so that the filtered water has a lower tendency to form scum on the top of hot drinks like tea and they may minimise scale build up in kettles. These devices do not alter the permanent hardness of the water. “Temporary hardness” is water hardness due to the presence of calcium and magnesium carbonates and bicarbonates. These can be removed from the water by boiling, forming scale. This is a matter of personal choice. If you live in a hard water area, then a softener will improve the efficiency and increase the life of domestic appliances. It will make lathering easier and reduce tide marks on sanitary ware. If you do install a water softener, it is very important that you make sure that it is correctly installed, and you do not soften the water to the tap in your kitchen which is used for drinking and cooking. This is because most water softeners work by replacing the hardness with sodium. Too much sodium can be a problem for premature babies because their kidneys are not good at filtering it out of the blood, and for people who are on a low sodium (low salt) diet. Artificially softened water may also be aggressive to plumbing causing leaching of copper and lead. When purchasing a water softener, we advise that you buy it from a reputable supplier. It should be installed only by a qualified plumber who is a member of a recognised Trade Association, such as the Institute of Plumbing. We also advise that you consider putting in place a maintenance contract to ensure the softener continues to operate correctly and does not become a hygiene hazard. Nobody wants to have hard water in the house. Damage to internal piping, appliances, limescale build-up, and skin irritation are just a few problems that hard water causes. In order to figure out if our water is too hard, we have to consult the water hardness scale (preferably a hard water ppm chart we list below). Example of white stains hard water causes. Limescale build-up in internal piping is extremely problematic. According to the water hardness scale, more than 85% of US households have hard water in their piping. How to know if you have hard water? Simple: The water hardness scale is a benchmark on how hard our water is. Here is a quick hard water ppm chart that gives you a spectrum of water hardness in parts per million (ppm): Scale Of Water Hardness (From Soft To Very Hard Water) The internationally recognized water hardness scale recognizes 4 water hardness classes; from soft, moderately hard, hard, to very hard. By definition, water hardness is the total sum of molar concentrations of calcium ions (Ca2+) and magnesium ions (Mg2+). We have there three main units with which we denote water hardness: Parts per million or PPM is equivalent to 1 mg/L CaCO3 (calcium carbonate). This is the same as mg/L (even if the ions are not specified; could be calcium ions, magnesium ions, or both). PPM is also equivalent to American degrees. Grains per gallon or GPG. Millimoles of calcium carbonate (CaCO3) per liter or mmol/L. We also have other less-known units, such as degrees of general hardness (dGH or German degrees), Clark degrees or English degrees, French degrees, and so on. In the US, the unit of water hardness is usually parts per million (ppm) or grains per gallon (GPG). Here is the full water hardness scale (including hard water ppm chart) according to the USGS: Classification Hardness (PPM) Hardness (GPG) Hardness (mmol/L) Soft 0–60 0–3.50 0–0.60 Moderately hard 61–120 3.56-7.01 0.61–1.20 Hard 121–180 7.06-10.51 1.21–1.80 Very hard ≥ 181 ≥ 10.57 ≥ 1.81 mmol/L is a metric unit, usually in use outside of the US. How to tell if you have hard water? First, you have to measure the water hardness with a water hardness test. You can get it online for less than $20. If you measure that your water hardness is below 60 ppm or 3.50 GPG, you don’t have to worry about hard water. By classification, you have soft water. The reality is worse: More than 90% of people find that their water is either moderately hard, hard, or very hard. Essentially, getting a 100+ ppm water hardness is not unusual; it’s actually very common. What To Do If You Find Out You Have Hard Water? The easiest thing is to just ignore the problem. That’s not recommended. The immediate effects of using hard water might be apparent on your skin or on your dishes, and faucets. Hard water with a high concentration of calcium and magnesium ions causes white stains pretty much everywhere. The more concerning are the long-term effects. Hard water will eventually lead to limescale build-up in your piping, washing machine, and so on, thereby limiting the lifespan of essential plumbing. Here’s the deal: You might not like it but fighting hard water is a smart long-term decision. Pretty much the only way that is very effective at softening water and eliminating all the problems that come with it is by installing a water softener. You can find a list of the best water softeners here. These devices are designed to reduce the water hardness from 200, 300, or even 400 ppm to below 60 ppm. This process is simply called water softening. Hard water is more common than most people think. Over 80% of Americans live with it daily — and many don’t realize just how much it impacts things around the house. From cloudy glasses to dry skin and dull laundry, hard water causes everyday frustrations — but we often chalk them up to other issues. This guide sets the record straight. You’ll learn what hard water really is, how it’s measured, and how to decide if a softener makes sense for your home. Key Takeaways: Hard water that contains high levels of calcium and magnesium. It’s measured in GPG (grains per gallon) or mg/L (milligrams per liter). Soft water: 0–3 GPG / 0–60 mg/L Moderately hard: 3–7 GPG / 61–120 mg/L Hard water: 7–10 GPG / 121–180 mg/L Over 10 GPG is very hard — consider a water softener at this level. Water is hard when it contains high levels of naturally occurring minerals, largely calcium and magnesium. As rainwater and snow-melt seep into the soil, they pick up minerals from the surrounding rock. Groundwater is more likely to contain high level of hard minerals than surface water, but there are exceptions. The higher the mineral level, the harder your water is. Image Credits: USGS.GOV Water hardness is measured in milligrams per liter (mg/L), parts per million (ppm) or grains per gallon (GPG). The most commonly used measurement is grains per gallon (GPG), but conversion is easy. One part per million is equal to 1 mg/L, and one grain is equal to 17.1 parts per million. According to the US Geological Survey (USGS) water hardness scale: Soft water = 0 – 60 mg/L or 0 – 3.5 GPG Moderately hard water = 61 to 120 mg/L or 3.5 – 7 GPG Hard water = 121 to 180 mg/L or 7 – 10.5 GPG Very hard water = levels above 181 mg/L or more than 10.5 GPG Other hardness scales designate levels above 15 GPG as extremely hard water. There’s no ideal hardness level — only one at which you’re satisfied with your water quality. But in general, the consequences of hard water become noticeable at 7 GPG — more than that, and it’s time to consider action. The good news about hard water is that it’s not a health risk. In fact, research suggests it has modest health benefits. Hardness minerals consist primarily of calcium carbonate and magnesium, minerals the human body needs to stay healthy. Calcium plays an important role in muscle and heart health, while magnesium is essential for nerve function and blood pressure control. But while they’re good for your body, what minerals do to your home is another story. The term “hardness” was coined to describe water that’s hard to wash in. Soap reacts to dissolved minerals like oil to water, so detergents don’t lather effectively. Common signs of hard water that you can see or feel include: Dingy laundry Dry hair and itchy skin Spotty dishes Decreased water pressure Crusty faucets and soap scum residue left on bathtubs and glass shower doors But ultimately, it’s what you can’t see that can hurt you. Dissolved calcium and magnesium create limescale, a mineral buildup in water pipes and appliances, such as dishwashers and washing machines. Corrosive, solid deposits clog pipes and damage water heaters, increasing energy use by up to 30 percent. Cleaning soap scum and managing dry skin are just nuisance issues. But between using more soap, paying higher utility bills and replacing appliances prematurely, hard water can take a toll on your budget. Did you know that it can cost up to $1500 to replace an electric hot water heater? The USGS maps water hardness nationwide, but levels are just estimates and can vary widely by neighborhood. Don’t depend on them to guide your water treatment decisions. If you drink from a municipal water supply, call your local treatment authorities. Water systems keep a close eye on hardness levels because they affect water chemistry management. If you have a well, measuring water hardness has never been easier. You can purchase water hardness test strips or opt for laboratory testing. We like Simple Lab’s water hardness test kit because it’s affordable, easy to use, and accurate. The results are reported in GPG and include objective recommendations for water softeners — a plus if you’ve never had your water tested before. Can you use a TDS (total dissolved solids) meter to test water hardness? We don’t recommend it. TDS meters measure the electrical conductivity of water, so they pick up any substance with a charge, including chemicals and other dissolved minerals. The results, therefore, will reflect more than hardness and will be less accurate than necessary to make water treatment decisions. Should you choose to install a water softener, we recommend using a TDS meter or hard water test strip to check its performance occasionally. But you need to know exactly how many grains of hardness are in your water to purchase the right size softening system. When you need actionable results, a lab testing kit is the most accurate way to measure water hardness. If your water hardness is below 7 GPG or 60 milligrams per liter, you may not benefit from a water softener. Some experts, however, suggest that concentrations as low as 3 GPG can create limescale, even though it’s not considered hard water. Whether you choose to soften moderately hard water is a matter of preference. But very hard water can be costly, so it’s worth reducing high concentrations of minerals to acceptable levels. Before you commit, it’s worth weighing the benefits and potential drawbacks. From better-tasting water to added maintenance, here’s how the pros and cons of softening stack up. Pros Cons Improves Water TasteRemoves minerals that cause bitter or metallic flavors, making water taste better. Higher Operating CostsYou’ll spend $250–$400 per year on salt, plus extra water used during regeneration. Protects AppliancesPrevents limescale buildup in water heaters, dishwashers, and pipes. Adds Sodium to WaterSoftened water contains trace sodium, which may be a concern for sensitive individuals. Saves Time & EffortReduces soap scum and mineral stains, making cleaning easier and faster. Environmental ImpactBrine discharge can harm local water systems and delicate ecosystems. Lowers Utility BillsSoft water helps appliances run more efficiently, reducing energy costs over time. Not Always LegalSalt-based softeners are restricted or banned in some drought-prone regions. Not sold on salt-based softeners? If you’re looking for a more sustainable, low-maintenance alternative, a salt-free water conditioner might be the better fit. It won’t remove minerals — but it can still help minimize limescale without adding sodium or wasting water. Whether you choose to soften your water or enjoy it as-is, we recommend learning more about your water chemistry, including its hardness level. As times change, so may your softening needs. Water hardness is one of the most important criteria determining its consumer properties. Forming insoluble mineral deposits on the inner surface of electrical appliances and industrial equipment, it leads to deterioration of their operational characteristics. To assess the quality of water, the permissible limits of the indicator are established. Formation of salts determining water hardness How hardness salts are formed Water is a universal solvent. The composition of natural sources is formed depending on the type of terrain. Water with dissolved carbon dioxide penetrates into the soil, passes through the thickness of geological rocks – gypsum, dolomite, calcite, erodes them, enriching with organic and mineral substances, metal ions. They make up the total mineralization of water(TDS). Calcium and magnesium cations predominate among them, their total value gives the total hardness of water. It is divided into two types: temporary (carbonate); permanent (non-carbonate). The formula for total hardness is as follows: Zho = [Ca2+] + [Mg2+] = Zhk + Zhnk Classification of water hardness Carbonate hardness is due to the presence of hydrocarbonates Ca(HCO3)2 and Mg(HCO3)2. They are easily removed from solution, forming an insoluble precipitate on boiling. The second type of hardness determines the content of soluble salts in water, which cannot be removed by heating. To eliminate permanent hardness, various methods are used, which will be described later in the article. Unlike underground sources, surface water contains fewer salts, since it is constantly diluted by precipitation. The level of hardness in them is a variable value. It reaches its maximum values in winter, and during floods it decreases. In groundwater, this indicator is more stable. Units of measurement Salt concentration is measured in milligram equivalents per liter: 1 mg-eq/L = 20.04 mg Ca2+ and 12.16 mg Mg2+. In the international SI system, the indicator is numerically expressed in moles per meter3 (mol/m3). In our country, degrees of hardness are used, 1 ºJ = 1 mg-eq/L or 0.5 mmol/L. Hardness degrees are also used in other countries, but differ in numerical values: German hardness degree 1ºdH = 10 mg/L CaO or 7.194 mg/L MgO; French 1ºfH = 10 mg/L CaCO3; English 1ºClark = 14.254 mg/L CaCO3; American 1 gpg = 17.12 mg/L CaCO3. Table of water hardness measurement units in different countries To convert to other units of measurement, it is more convenient to use another American unit – PPM (PPM), which is equal to 1 mg/L CaCO3. Hence: 1ºdH = 17.9 ppm; 1ºfH = 10.0 ppm; 1ºClark = 14.25 ppm; 1º gpg = 17.1 ppm; 1ºÆ = 50.05 ppm. To convert ppm to our convenient ºÆ degrees of hardness, we can use a converter. A scale can be used to convert between degrees: 1 ºJ = 2.804 ºdH = 3.5 ºClark = 5.005 ºfH = 2.924 gpg = 50.05ppm. Hardness standards According to the parameter of total hardness, water is distinguished: soft – up to 4 ºJ; medium hardness – from 4 to 8 ºJ; hard water – more than 8 ºJ. The diversity of natural conditions in Russia makes it impossible to establish uniform hardness standards for all regions. The maximum permissible concentration (MPC) of Ca2+ varies widely depending on local conditions. Table of water hardness classification However, drinking water standards do not differ much from the WHO (World Health Organization) settings. As a national standard, GOST 31954-2012 has been in force in our country since 01.01.2014. It takes into account the main international norms on water quality and methods of analysis. The standard applies to all underground and surface sources. Table 1. Normative values of calcium and magnesium concentrations in drinking water № Norm. document Product Ca, mg/l Mg, mg/l Degrees, ºJ 1 СанПин_2.1.4.1074-01,GN_2.1.5.1315-03 Drinking water Not regulated Not regulated 7 2 SanPin 2.1.4.1116-02 Bottled water 25-130 5 – 65 1,5-7 3 WHO standards Drinking water 20-80 10 – 30 Not proposed The composition of water is governed by the hardness scale depending on the intended use: acceptable value for tap water – 300 ppm or 6 ºJ; optimal value for natural water bodies – within 400 ppm or 8 ºJ; the maximum allowable hardness level is 500 ppm, 10 ºJ; life-threatening salt concentrations – more than 500 ppm, > 10 ºJ. Particularly strict requirements are imposed on water that is supplied to heating boilers at power plants – the indicator of total hardness cannot exceed 0.05-0.1 mg-eq/l. How to calculate hardness at home Increased hardness is not expressed by any external signs – smell, color, consistency. It is evidenced by: forming scale on the bottom of the kettle; poor foaming of detergents; white streaks on the shower head in the bathroom. Scale forming in the kettle indicates increased water hardness The exact composition of water can only be found out with the help of analysis. But at home there is a simple way to determine the hardness of tap water with a small error of 1-2 degrees. For the experiment you will need: a piece of laundry soap, a small volume of distilled water, electronic scales, a container, a cylindrical glass, a ruler. Finely grate 1 g of laundry soap and dissolve it in 3-4 tablespoons of slightly heated distilled water. If you do not have a kitchen scale at hand, you can be guided by eye – half a teaspoon without the top. Pour distilled water into the glass with soap solution so that the height of the liquid column corresponds to the percentage of fatty acids indicated on the bar of soap. If 72%, the height of the water column should be 72 mm from the bottom of the beaker, but not from the surface of the table. Pour 0.5 liters of tap water into a container and, stirring gently, pour a thin stream of soap solution into it. First, flakes, bubbles will appear in the water, then – a persistent white foam. It indicates that all the salts are already bound. Calculate the number of centimeters of water column overflowed into the container, you can subtract the height of the remaining soap solution from the original: hn= hi – ho, where: hn – height of the column of the overflowed solution; hi – height of the water column of the initial soap solution; ho – height of the column of the residual soap solution. Each centimeter of solution poured into the container corresponds to 2ºdH. The value coincides with the German unit of hardness. For example, 4.6 centimeters have been poured from a beaker, which corresponds to 9.2 dH. You can use the table to convert the results obtained into mg-eq/l, and a calculator for exact results. № Degrees dH Hardness level Indicator in mg-eq/l 1 0 – 4 Very soft Up to 1.4 2 5 – 11 Soft 1,8 – 4,0 3 12 – 22 Medium 4,3-8,0 4 22 – 34 Hard 8,0-12 5 More than 34 Very stiff Above 12 You can get a more accurate result with electronic testers like the TDS-3. They analyze water for hardness and acidity, displaying the results on the screen as RRM or pH. You can convert the RRM units to ºJ with a calculator. A quick and easy way to get the data is to use a digital hardness tester If you want to get a detailed analysis of water in a well or borehole, you can do it with the “Well-1” kit. The “Skvazhina-1” kit can determine water quality by several parameters Another simple and inexpensive way to determine the quality of water – test strips. Quickly get a result about the hardness of water can be test strips Effect of water On the human body To date, there are no serious studies confirming the harmful effects of hard water on the living organism. But it is known that prolonged consumption of water with an increased level of hardness, contributes to the development of urolithiasis. The body does not have time to eliminate excess trace elements, which leads to the appearance of urinary stones, kidney stones and deposits in the joints. Water quality is also of hygienic importance. Soap, reacting with calcium and magnesium salts, destroys the protective layer of the skin, causing irritation or allergies. Hair becomes dry and brittle. At the same time, calcium and magnesium are important trace elements for human life: The daily allowance of calcium is 1000 mg; magnesium – 400 mg. Daily allowance of trace elements and their importance for humans Deficiency of these elements can cause serious disorders in the body. According to studies conducted by WHO noted that the consumption of excessively soft water leads to the leaching of salts from the body and changes in the water-salt balance. In regions where soft water is used: an increase in cardiovascular diseases; an increase in the number of fractures in children and a decrease in the weight of newborns. WHO indicates that the presence of salts in water should be considered a prerequisite for the normal vital activity of the body. On Technique Hardness salts cause a lot of problems associated with the use of household appliances and industrial equipment: Too soft water has a negative effect on appliances, increasing the risk of corrosion of pipes due to low alkalinity. Therefore, it is necessary to maintain the correct balance of water-salt composition. Methods of water softening There are various ways to reduce hardness. The choice is determined depending on the initial quality of water, its purpose and conditions of use. Thermal method Boiling is the simplest and most affordable way to eliminate carbonate hardness. It is suitable for small volumes of water that are used for household needs. However, the method does not eliminate all hardness salts, and dishes will have to be descaled. Filtration Not so long ago, a water softening filter represented an impressive installation. Modern technology and materials have made it possible to create compact purification systems that give water softness, easily fitting under the sink in the kitchen. Replacement filter cartridges, in addition to softening water, remove odors and impurities. Proper selection of filters and timely replacement guarantee quality water purification from the water supply, well or borehole. One of the modern complex systems are filters “Barrier”. Compact filter Barrier EXPERT SLIM Hardness with three stages of purification Chemical methods To precipitate hardness salts, special reagents are added to the water – slaked lime, soda, polyphosphates. The method is effective for industrial use. Its main disadvantage is the need for further utilization of waste. Water after such treatment is unsuitable for food purposes. Ion exchange Filtration through ion exchange resins is successfully used in industry. The principle is based on the replacement of alkaline earth metal cations by sodium and hydrogen ions in a column with fine-grained backfill. A solution of table salt is used to regenerate the spent resin. If the water hardness level changes, manual adjustment of the settings is necessary. Ion exchange filter design Physical methods These methods are based on the processes of electrodialysis, ultrasound action, electromagnetic pulses. Hardness salts are converted into a modified state in which they do not crystallize into a solid precipitate, but form unstable compounds. The use of ultrasonic and electromagnetic waves additionally promotes the detachment of already existing scale. Membrane method This method of purification has another name – reverse osmosis. Water under high pressure is passed through a filter with microscopic cells and is completely purified from chemical impurities, suspended particles, bacteria. The quality of the obtained water is close to distilled water. Additional mineralization is required for its use. The disadvantage of the method is its high cost. Water purification system with reverse osmosis for home use Bottom line When assessing the quality of water, it is important to consider not only the level of hardness and the likelihood of scale formation, but also the corrosivity. Proper assessment will allow you to choose an effective set of measures for water treatment. Water hardness is old, it was in use for hundreds of years and played a fundamental role in water testing and water quality. The first test of water hardness was invented by Thomas Clark in 1770, with a solution of soap, which measured water’s hardness. He noticed that soap would lather badly in hard water because of insoluble soap scum, and well in soft.Yet another important historical breakthrough was the knowledge that mineral-rich water was good for us. Natural mineral springs were also attractive as healers in the 18th and 19th centuries, and most people travelled there to enjoy them. It was thought that minerals like calcium and magnesium in the water were healthy, particularly for digestive problems and skin infections.When 20th-century water treatment and distribution improved, the focus was no longer on mineral water, but on clean water. Hard water in Brooklyn was a health concern, because hard water has the ability to affect the taste, smell and appearance of water and leads to scale accumulation in pipes and plumbing. Hard water also makes soap and detergent less effective, which means more water and cost.Water softening – the mineral removal from the water that is used in water treatment plants to get rid of these issues. You can soften water with the help of ion exchange resin or lime softening, which can take calcium and magnesium ions and swap them out for sodium or potassium ions. The process causes less hardness and more pure water. Water hardness is another factor that you should be aware of when getting school water testing services. It causes scaling, degrades soaps and detergents, and affects water taste, smell, and texture. Hard water often tastes metallic or bitter and is hard to smell. As these minerals are dissipated, it can also look cloudy or hazy, which is not good.Water hardness is not only physical but also can be medically harmful for people with kidney problems or high blood pressure. The calcium and magnesium in hard water make some people develop kidney stones and increase blood pressure.In addition, water hardness impacts water treatment efficiency such as reverse osmosis (RO) and nanofiltration (NF). They use semi-permeable membranes to flush out minerals, but calcium and magnesium ions in the water can foul and clog membranes. This erodes the system and costs more to maintain, which is why water testing for school is very important for hardness. When hard water is heated it forms a white calcium deposit known as limescale. It can leave a hard white coating inside your kettle, kitchen appliances and heating system. You might also see limescale coating the surface of hot drinks, like tea or coffee. Hard water can also reduce the effectiveness of detergents and soaps, meaning you need to use more.Use these tips to help prevent limescale build-up in your hot water appliances and systems. Always follow the manufacturer's instructions for any of your appliances.Kettles or other drinking water boilers Use a stainless steel descaler or scale collector in your kettle. Rinse plastic kettles regularly if limescale is floating on the surface. Don't leave leftover boiled water sitting in the kettle. Regularly descale your kettle, ask your local hardware store for advice.Hot water heating systemsIf your heating system replaces water lost from the system with fresh water, limescale may build up. This can cause your heating pipes to rattle or your radiators to take longer than usual to heat. Heating systems that use the same water in a closed loop don't usually get limescale.If you are concerned, talk to your plumber. You can also lower the temperature setting of your water heater to help reduce limescale build-up.Washing machines and dishwashersDishwashers often have built-in water softeners to prevent limescale. You can also use water-softening products in your washing machine. Always follow the manufacturer's instructions.Install a softening unitIf you find hard water is a problem in your home you can install a domestic softening unit. Talk to your local plumber or hardware store for advice. Uisce Éireann cannot recommend any particular units or guarantee their effectiveness.For more information visit the World Health Organisation (WHO) website.