

# Water composition and the benefits of stainless steel

Poor water composition can directly affect the performance and life expectancy of water heaters and storage products. As experts in heating and hot water, we explore the effects water composition can have on DHW products and discuss the benefits of stainless steel in product selection.

## KEY BENEFITS OF STAINLESS STEEL



**LONG SERVICE LIFE**



**VALUE FOR MONEY**



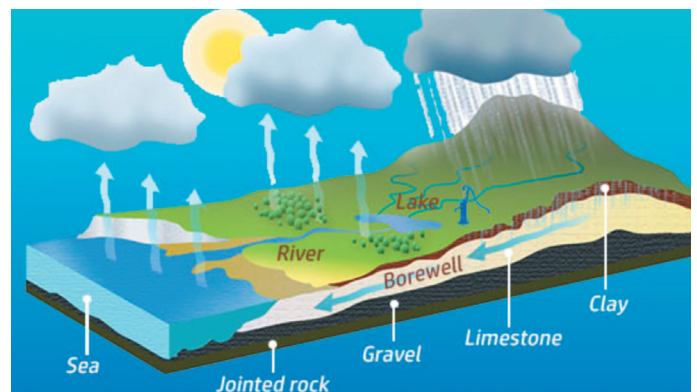
**BETTER TECHNICAL PERFORMANCE**



**DURABLE AND RELIABLE**

## DIFFERENT WATER COMPOSITION

Starting its journey as rainwater, which is soft and acidic, water moves through the soil under the force of gravity towards rivers and streams, as part of the infiltration process.



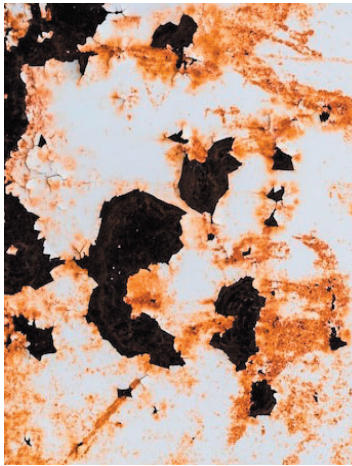
Largely dependent on region, water composition is determined by the amount of minerals (such as calcium and magnesium bicarbonates) that dissolve in this rainwater as it passes through the ground.

When rainwater lands in an area with porous rock such as chalk and limestone, the water penetrates the ground as it passes through and collects and dissolves particles and minerals such as calcium and magnesium. This raises the hardness level of water and is more prevalent in the South and East of England.

In contrast, when water falls on non-porous rock, such as granite, the water cannot penetrate the ground and cannot pick up any particles. As a result, water stays soft. Regions in the North and West of the UK are typically much softer than the rest of the UK, with a hardness measurement of 100 parts per million (ppm) or less.

Different water composition can have a huge impact on the service life of a storage vessel, which can heavily influence the total cost of ownership.

## SCALE BUILD-UP



In hard water areas, scale occurs when water is heated and excess minerals in the water accumulate and become drawn to the hottest point, which is often the tank surface and the heat exchanger. With the scale acting as an insulator, this means more heat will be required to permeate

the scale and heat the water. As a result, heat-up times will start to lengthen, as well as recovery times which will see more energy used for the same output. With approximately every 1mm of scale reducing efficiency by 7-10%, this is an important consideration in terms of running costs. Moreover, as the metal underneath the scale eventually starts to corrode due to the increasingly acidic conditions, an eventual breakdown is likely. Here, stainless steel offers a durable first line of defence. Offering high thermal expansion rates which help to repel scale deposits, product efficiency and longevity can be considerably increased.

## CORROSION

When it comes to corrosion, there is a risk of efficiency loss, increased maintenance and ultimately plant shutdown. Enamelled or glass lined steel products are widely used throughout the UK, however additional measures need to be taken to reduce the risk of corrosion as the tank material cannot resist corrosion by itself.

An anode protection can be inserted into the water for added protection, but a more sensible and reliable option would be to choose a durable material that can withstand these conditions and provide better resistance to attack. The use of 316L stainless steel offers consistent performance under stress caused by harsh operating conditions. Our range of stainless steel hot water cylinders and condensing water heaters with tank-in-tank technology, such as the WaterMaster Evo, are constructed from high grade 316L austenitic stainless steel, do not require anode protection and are designed to reduce maintenance and increase system lifespan.

## THE BENEFITS OF USING STAINLESS STEEL

When it comes to tackling the different issues commonly associated with water composition and DHW systems, the biggest advantage of utilising stainless steel is its durability. Robust and sturdy, due to the composition of corrosion-resistant alloys, stainless steel products often have a longer warranty, such as our five-year warranty. Also, as no lining needs to be applied to the inside of a stainless steel vessel, this reduces the risk of imperfections and small crevices from appearing, which can cause water to become stagnant and corrode over time.

Offering relatively low maintenance, their smooth surface also makes them easy to clean, which can help to minimise the risk of scale build-up and sediment accumulation.

Lastly, from a practical point of view, stainless steel products have the added advantage of being lighter in weight, which makes them easier to transport, handle and install.

Explore this topic in more detail in our latest CIBSE CPD module.

**Contact a member of our expert team today to discuss your next project requirements.**