



Water samples are tested using several methods, depending on the physical and chemical properties to be determined.

Total Hardness:

The sum of permanent hardness and temporary hardness. Our recommended maximum total hardness no more than 60 ppm.

- Determined by titration with EDTA solution and an indicator.

Temporary Hardness:

The hardness caused by presence of Calcium and / or Magnesium Bicarbonates.

- For sites with Coffee machines you would typically look for a Temporary hardness of around 80ppm. Check with your Coffee provider for best results.
- For sites with Steam ovens you will need a Temporary hardness lower than 40ppm.
- For sites with Glass washers or Ice machines you will need a Temporary hardness lower than 20ppm
- Determined by titration using dilute Sulphuric Acid and Bromcresol-Green-Methyl-Red indicator.

Permanent Hardness:

Hardness caused by metal sulphates, eg: Magnesium Sulphate and Calcium Sulphate, as well as the only very slightly soluble Calcium and Magnesium Carbonates.

- Determined by the equation: Permanent hardness = Total Hardness – Temporary Hardness.



Continued overleaf...

Water Tests Explained

pH:

A measure of how Acidic / Basic the water is. pH values less than 7.0 are 'Acidic' and those greater than 7.0 are 'Basic'. Pure water has a neutral pH of 7.0, but due to dissolved carbon dioxide from the atmosphere it is often less than this value. Treated water through Ion-Exchange resin tends to be slightly acidic as hydrogen atoms (H+) are sometimes attracted to the resin causing a negative charge in the water, making the water slightly acidic.

Treated water should read no lower than pH 4.0.

- **Determined by using a glass pH probe.**

TDS:

(Total Dissolved Solids) The total amount of all dissolved minerals in water.

In Steam generating equipment the lower the TDS the better, once the water has been taken away anything that is left in the water will stick to the machine. Some machines will use conductivity sensors to measure the level of water in the tank and will therefore need some minerals in the water to be able to sense a water level. Reverse Osmosis can take the water down to a TDS of 0 ppm, Customised water is possible by reintroducing minerals after the filter, Siliphos for example, is used as a remineralisation option.

Water with a TDS of 0 ppm can be corrosive to brass fittings.

If equipment is not properly flushed or washed down the TDS can be unusually high as the water has boiled off leaving the minerals and making the water more and more concentrated as time goes on.

- **Determined by measurement of the conductivity of water. By application of a factor yields a value in 'Parts per Million' (PPM).**

Silica:

(Silicon Dioxide) Caused by natural geology in reservoirs. The scaling potential of Silica is exacerbated by the presence of metal ions in the water, particularly Iron which should be below 0.03ppm. Silica scale can be notoriously difficult to remove once deposited.

Any amount of Silica will cause scale in a machine when Iron is present, if no iron is present then anything above 10 Mg/l would be considered high.

- **Determined by colourimetric means by using a Photometer.**

Chloride:

Caused by dissolved salts and very common in mains water. Can cause catastrophic corrosion and rusting of Stainless Steel as well as Mild Steel. There is no safe level of Chlorides in water, drinking water regulations typically state that Chloride levels should be below 75 Mg/l and you will start to taste salt with Chloride levels above around 200 Mg/l. Particular types of Chloride corrosion will attack 304 and 316 grades of Stainless Steel, especially at joints, bends and welds.

Higher temperatures of water, higher concentrations of chlorides and lower pH levels of water will all speed up the corrosion process.

Steam oven Manufacturers will recommend input water to have a Chloride level of less than

20 - 30 Mg/l but realistically you may see corrosion with anything above 5 Mg/l.

- **Determined by conversion to insoluble Silver Chloride and measurement of the turbidity using a Photometer.**

Iron:

Often caused by the internal corrosion of old Iron pipework or inferior Stainless Steel as well as natural ground geology sources. It will cause unsightly yellow brown water in higher concentrations and black deposits / scum in cups of tea due to the formation of Iron tannates. It has been known to cause an off egg smell in water. Iron can also lead to the premature exhaustion of Ion Exchange filters and the binding of filters which utilize carbon blocks.

Our recommended maximum Iron content in water is 0.03 Mg/l.

- **Determined by colourimetric means using a Photometer.**

Copper:

Often caused by leaching of inferior Brass fittings or from corrosion of Copper pipes due to high Chloride content. It causes an unsightly blue staining of sinks and faucets, blue flakes in cups of tea and coffee and sometimes a metallic taste and smell.

Copper content can lead to the premature exhaustion of Ion Exchange filters.

- **Determined by colourimetric means using a Photometer.**

Manganese:

Caused by the natural geology of reservoirs or by underground pollution. It causes unsightly yellow brown water, stains on washed fabric in higher concentrations and black deposits / scum in cups of tea due to the formation of Manganese Oxides.

Manganese can cause an unpleasant taste and odor in water with concentrations greater than 0.01mg/l.

- **Determined by colourimetric means using a Photometer.**