

## THE IMPORTANCE OF DESCALING

### WHAT IS SCALE?

Scale can also be known as lime scale, calcium, or lime. It occurs when a build-up of mineral deposits in water form a noticeable white crust on the heating element.

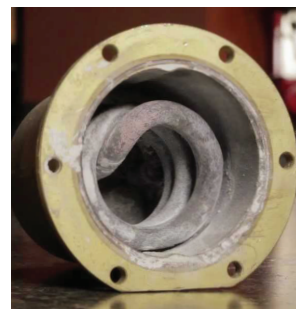
In many areas, water quality is a significant problem affecting the efficient operation of an espresso machine. Given that water constitutes 98% of an espresso it is not surprising that the water quality issue must be addressed. Water quality relates to three factors - particulate matter like sediment, chemicals such as chlorine, and naturally occurring elements.

All these factors may vary throughout the year, season to season, and as authorities source water from different areas, making it essential to provide treatment to address each factor. Let's look at each factor, the problem and the treatment.

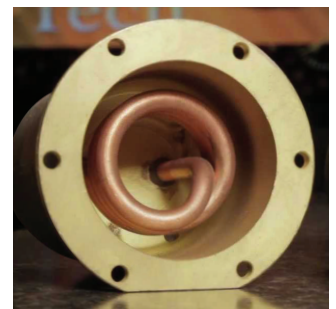
### PARTICULATE MATTER LIKE SEDIMENT

These are very small particles suspended in the water, often giving water a cloudy appearance. Without treatment these particles block the very fine jets and shower screen holes, affecting machine performance and altering the coffee taste.

A filter of 5 micron or less on the water line to the machine will remove the particulate matter, however the filter must be changed regularly.



Scaled Boiler



Descaled Boiler

### CHEMICALS SUCH AS CHLORINE

Chemicals in water can naturally occur or may be treatment chemicals, like chlorine. They affect the taste, appearance and odour of water and this will be transferred to the coffee. Filtration treatment can be highly effective in safely removing these chemicals provided it is the correct filter and is regularly replaced.

### NATURALLY OCCURRING ELEMENTS THAT CAUSE HARD WATER SCALE

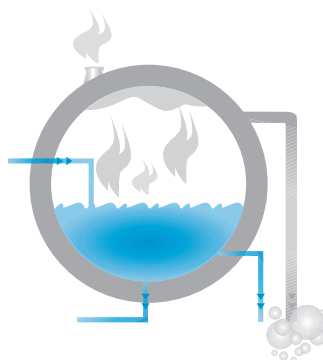
Many areas have high levels of calcium carbonate and magnesium carbonate in the water which becomes a scale "crust" on surfaces when water is heated. As calcium and magnesium carbonate are soluble and do not affect the colour or appearance of water, they cannot be removed by filtration.

Scale occurs on the boiler, the heating element, and the pipe and jet network in an espresso machine, and affects machine performance eventually machine failure if not treated.



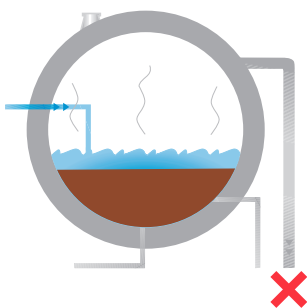
## WHY DESCALE?

Scale build-up causes equipment downtime leading to increased machine service frequency, more part replacements and a shortened machine lifespan. Scale build up also reduces the quality of espresso flavour. Once scale has formed in the boiler and pipe network, it can only be removed by the use of specific acidic descaling chemicals.



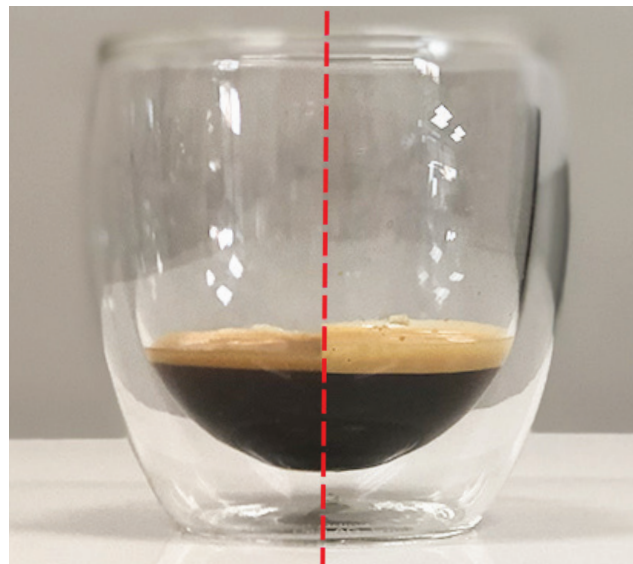
### 1. Scale free boiler:

- Pressure able to build-up
- Steam wand works effectively
- Hot water is able to drain



### 2. Scaled up boiler:

- Lack of pressure
- Steam wand not working
- Unable to drain
- Taints taste
- Won't heat correctly



Before descaling

After descaling

## HOW DOES SCALE IMPACT YOUR ESPRESSO?

Scale build-up in the boiler obstructs water from direct contact with the heat source, impairing the boiler's ability to heat water effectively. When water is unable to reach the optimal brewing temperature the flavour of the beans cannot be properly extracted, leading to a colder, less flavourful espresso. Flaky particles of scale may also appear in your espresso, affecting espresso flavour.

When a scaled boiler is not heating water to the optimal brewing temperature, the crema is also impacted. Crema is the even layer of fine, golden foam that rests on top of an espresso shot and it's seen as an important part of the espresso flavour and texture. A good crema is flavourful, foamy and lingers for around two minutes. A crema affected by scale will be thinner, less rich in colour and will dissipate much quicker.





## WHAT IS THE DIFFERENCE BETWEEN AN ESPRESSO CLEANER AND A DESCALER?

Espresso machine cleaners are alkaline, therefore while they are effective removing coffee oils, they will have little impact on scale removal.

The correct use of a descaler will remove the scale from the boiler and machine pipe work, improving machine performance, reducing service costs and downtime, and most importantly providing you with a quality espresso.



## METHODS OF SCALE CONTROL

Water softening and reverse osmosis water treatment are two other methods of controlling scale.

Water softeners replace the calcium and magnesium carbonate with sodium carbonate which does not form a scale crust at boiling point. To remain effective, water softeners must be regenerated with salt regularly. It is the sodium chloride (common salt) that exchanges the sodium ions for the problem calcium and magnesium ions.

Reverse osmosis (RO) water treatment is a filtration technique that removes practically all particulate, chemicals and water scale elements from the water, making it almost pure water. Four problems exist for using this technique to solve the water hardness problem.

1. The equipment is expensive to install.
2. It is very wasteful using large amounts of water in the process of delivering the RO water.
3. Many coffee experts believe it imparts a 'flat' taste to espresso. Ideally, some level of water hardness is desirable for taste.
4. RO water has been found to be corrosive to equipment. The pure water has a tendency to take up elements and this causes corrosion of metals.

## IN SUMMARY, WATER IS A VITAL INGREDIENT FOR GOOD COFFEE

1. Always use an activated carbon water filter of 5 micron or less to remove particulate and chemicals from the water.
2. Don't be fooled into thinking either a normal water filter or espresso machine cleaner will prevent or remove hard water scale – they won't! Select a special water filter with built in scale inhibitor chemicals or install a water softener (as well as the activated carbon water filter) and keep the equipment maintained. The use of water hardness test kits will keep you alert to when the water softener needs re-generation with salt.
3. If hard water scale has built up speak to your specialty coffee or equipment supplier about the correct descaling product and method.