

Chemical free  
water solutions

**HYDROSMART™**

that don't  
cost the earth

## European Lab Tests Explained

With reference to the European Lab Tests, there are several important factors to be considered.

### Hardness

In the first paragraph the comparison between dH (German Hardness and English Hardness) is explained.

The English measure of Hardness is closely related to pH and is a measure of the mineral content of the water.

The German hardness standard, dH, is the one largely adopted by the brewing industry. German hardness is a measure not only of the mineral content but also of the crystal size as it is only the large, reactive, crystals, such as  $\text{CaCO}_3$  and  $\text{CaHCO}_3$ , that deposit as scale or scum and it is these that enzymes have to bind up before detergency can take place.

From the Turbidity table it can be seen that there is virtually no change in the pH throughout the 2 month trial period where as the dH dropped from 7.25 to 5.25 within the first thirty minutes and the progressively down to 4.25 within a week.

This is because the particle size has been reduced below 4 microns and crystalline structures have become very small and non reactive.

The German Laboratory trial was conducted on a hot water service using mains supply water. The hot product water flows to other parts of the building and eventually to the drains.

The 41% improvement in water softness occurred within a week however at this point the descaling process was just beginning to take place, which meant that the test water not only contained minerals from the water supply but also was loaded by minerals being taken back into the flow by the de-scaling process. Had the dH been taken two months down the track, even lower dH readings would have been recorded.

### Calcium ppm

The calcium levels in the water flow averaged around the 350-ppm mark, (351.66), throughout the trial period and shows a normal variance for a mains water supply.

### Turbidity

Turbidity is a measure of the amount of solids or minerals suspended in the water flow. Conventionally, Turbidity is also related to water clarity as the presence of suspended solids

and large crystalline structures make the water appear cloudy. This is because large particles absorb, refract and scatter the light, so light transmission is greatly reduced and the water becomes opaque or discoloured.

The mains water in the test was fairly hard and most of the crystalline structures had deposited out and a low turbidity reading was observed prior to the test.

After Hydrosmart treatment the turbidity increases by 90% almost immediately but as readings were only taken at 5 day intervals, (except in the case of dH where readings were taken daily for the first week of the trial), the first recorded reading of 95%, was 5 days after the commencement of the trial. In spite of the high turbidity reading the water remained crystal clear as the minerals, now suspended in the water were so small, that there was no perceptible absorption or scattering of light. Water clarity was not only maintained, but also improved.

After five days descaling would be in full progress and the water would not only contain minerals from the supply but broken down scale that had been deposited on the pipe work and water using equipment over a number of years. The depth of scale chart confirms this, showing a reduction of scale from 1.3mm to 0.3mm in the first 30 days, which matches the reduction in turbidity to 45%.

This is highly significant for using Hydrosmart treatment in conjunction with UV systems. This is because:

- 1) The water clarity allows good UV light transmission.
- 2) The sub 4-micron particle size is too small for bacterial shielding to take place.
- 3) The Hydrosmart system progressively removes scale and biofilms from the surfaces adjacent to the UV source and reflective surfaces allowing the UV system to operate at design specifications until mechanical failure of the light source occurs.

Important Note: Hydrosmart uses very precise computer generated resonance frequencies, which can be corrupted by external electromagnetic fields. It is very important to keep these at least a meter away from the Hydrosmart antennae and the treated water flow. UV systems frequently use ballast resistors or starters in their housing and these have to be relocated a meter away from the tubes and any treated water pipes.

## **% of Calcium in Suspension**

This table shows that prior to Hydrosmart treatment all the calcium in the flow was depositing on the water pipes and equipment.

As soon as Hydrosmart treatment is applied, all of the calcium remains in suspension in a tiny non-reactive particle size and none is being deposited as scale.