

Laboratory still limescale-free – and no acid attack!

Supplies of distilled water are a regular requirement in chemistry laboratories. Many produce it using domestic water straight from the tap.

The chemistry lab of The Royal Military College, Shrivenham is no exception and uses 10 litre capacity stills which are electrically heated. However, just like many other towns which lie to the south and east of the Humber to Severn line, Shrivenham has a hard water supply. Whenever hard water is heated, there is a risk of limescale deposits building up very rapidly.

This was the case for the Shrivenham scientists who regularly dismantled their stills and used acid to clean heavy scale encrustation from the glass vessels and electric heating elements. Repeated

acid cleaning had also pitted the outer metal surface of each element, effectively reducing its life. It was important to use non-chemical products to treat the hard water, but none Shrivenham had tested worked effectively before. A **HydroFLOW** HS34 unit was recommended.

Being chemists with access to sophisticated equipment, the Shrivenham team decided to carry out some comparative performance tests but using the **same still**.

Starting from the still in a completely clean condition, observations would be made using a **HydroFLOW** unit over a 6 week period. The still would then be cleaned, re-used for a second 6 week period without **HydroFLOW** and fresh measurements taken. Scanning electron microscope and X-ray



diffraction test equipment was available. This confirmed that calcium carbonate crystals form immediately following the super-saturation point of the heated water.

In the case of **HydroFLOW**, crystals were initiated more quickly and grew larger, with the salts crystallising onto these '**HydroFLOW** crystals' rather than onto the glass or electric element. Further, the water was maintained at saturation point.

HydroFLOW completely removed the need for acid cleaning, with the consequent health and safety precautions. The need to dismantle the still was also obviated.

The Royal Military College chemists are very grateful to have these repetitive chores removed from their work schedule.

Having passed the tests of demanding military scientists with flying colours, **HydroFLOW** HS34 units have been permanently fitted to all laboratory stills.

Before



After



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CASE STUDY