Density measurement based on the flexural resonator principle
Cleaning recommendation for the DS7800

Introduction

Careful, regular cleaning of the measurement cell in the density measurement device **DS7800** (Fig. 1) is the basic requirement for reliable, precise density measurement. For density measurement devices that operate according to the flexural resonator principle, it is not possible to mechanically clean the fine glass capillaries. Therefore, the following guide gives useful information and procedures for chemical cleaning.

When and how often to clean

If a sample remains in the measuring cell for a long time, deposits will appear, which are hard to remove afterwards. Therefore, the most important recommendation is to clean immediately after each series of measurements.

Then check the reference value, usually water (0.9982 g/cm³ at 20 °C) or air (0.0012 g/cm³ at 20 °C).

Fig. 1: Digital Density Measurement Device DS7800

Recommended cleaning substances

Usually, cleaning is done with distilled water. For hydrophobic samples, alcohol or white spirits are recommended. You will find some examples in Table 1.

In certain cases it can be advisable to work with a commercial laboratory cleanser. Suitable glass cleaners containing enzymes are Mucasol®, Tergazyme®, or Aconox®, for example. When using these, you must absolutely follow the manufacturer's dilution recommendations. Mucasol®, for example, should be used as a 3% solution and Tergazyme® and Aconox® as 1% solutions.

Never let strongly alkaline laboratory cleansers (pH>10.5) work for more than a few limits, and only at temparatures under 25 °C, because these cleansers attack the glass surface. This makes itself noticeable in the form of measured values that are too high. The flexural resonator must absolutely be adjusted in such a case.

At least 150ml of water is needed to rinse it out afterwards. This can be done either with a syringe or with the metering pump that is part of the device. Cleaning with a syringe has the advantage that strong back and forth pulling of the plunger in resonator will generate bubbles. This leads to a greater cleaning effect by way of shearing.

Table 1: Suitable cleaning substances

Sample	Cleaner 1	Cleaner 2
Fragrances and scents	Isopropanol	-
Beer, beer worts	Water, Mucasol®	Ethanol
Ethylene glycol Brake fluid	Xylol	-
Cleaner	Water	Ethanol
Motor oils and greases	White spirits	Acetone
Polyamids	Kresol	-
Salad dressing Mayonnaise	Whyte spirits	Acetone
Spirits	Ethanol	-
Juices, soft drinks	Water	Ethanol
Fuels	Petroleum ether	Acetone
Waxes, paraffins	Toluene	Xylol

Drying

For safe drying, first spray in or suction a volatile solvent such as ethanol or acetone. Then connect the drying tube and start the drying pump.

These drying times (Table 2) are sufficient for 20 °C:

Table 2: Recommended drying times

Solvent	Drying time [s]
Acetone	60
Xylol, toluene, white spirits	60
Ethanol, isopropanol	180
Water	360

Cleaning and drying times can be preset in the **DS7800**, easily and specifically to each product. Drying can also be skipped if a new sample fluid is used to rinse after cleaning.

Please note:

For proteins, sugar or other organic residues, never use high-percentage alcohol as the first cleaner. This would lead to deposits building up in the glass tube, and these are extremely hard to remove.