# Measuring the density of high-viscosity creams and ointments using DS7800

## Introduction

Measuring the density of **high-viscosity samples** such as ointments, creams and pastes in the lab is often very time-consuming and is usually performed pycnometrically. However, you can save time by using the **DS7800** density meter by A.KRÜSS.
This eliminates the time-consuming procedure of tempering the samples.

## Task

Three different samples with viscosities of between 7000 and 20000 mPa·s were measured at a temperature of 20 °C. Cosmetic or medicinal personal grooming products, such as foot balm, callus removal cream and horse balm were used.
The samples must be loaded into the measuring cell of the DS7800, ensuring that there are no gas bubbles. The following procedure is recommended:


DS7800 Density Meter

## Preparation

- Set the density meter to 20 °C and check the air values (target 0.0012 g/cm3).
- Take a 5 ml syringe and pull out the plunger. Using a spatula, fill the syringe with ointment, working from the back. The sample can be pushed into the front part of the syringe using a glass rod. Approximately 4 ml is required. (The sample can also be degased in an ultrasonic bath). Re-insert the plunger into the syringe.
- Slowly push the contents of the syringe into the flexural resonator. Check for any air bubbles using the viewing window. Once the sample is halfway into the flexural resonator, attach a silicon pipe to the DS7800 outlet and seal with a plug. This means that when refilling, a certain pressure level is achieved that prevents the formation of air bubbles.
- Once full, wait for a stable measurement value. This may take a few minutes because viscous samples take a long time to reach temperature equilibrium. Several determinations may be performed by feeding in more samples from the back.

## Cleaning

The measuring cell must be cleaned and dried after each measurement. The cell is suitable for convenient, manual cleaning (but it can also be cleaned using a filling pump with low-viscosity samples).

- Remove plug.
- Squirt out the remainder of the sample.
- Using the syringe, squirt 3 10 ml measures of rinsing solution (warm if possible) into the measuring cell.
- Then rinse with 3 10 ml measures of distilled water.
- Finally, insert 1 5 ml measure of Ethanol into the measuring cell.
- The integrated air pump dries the measuring cell in approximately 4 minutes, the air value is checked once the waiting time has elapsed (0.0012 g/cm3).

The measuring instrument is now ready for the next measurement.

## Result

The DS7800 density meter is also suitable for use with high-viscosity samples.

- The measurement accuracy is ±0.001 g/cm3 or better due to unavoidable air pockets.
- The measurement including cleaning can be performed in just a few minutes.
- Unlike with pycnometric measurements, the results can be logged and filed easily.
- Time-consuming tempering procedures are eliminated.

## Note

The DS7800 is also suitable for other high-viscosity samples, such as from the food or homecare industry.