Rheological investigation

Submersion flow cell

Modular accessory for Thermo Scientific HAAKE MARS Rheometer

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Keywords

HAAKE MARS Rheometer, sample with liquid contact, drying behavior at negative pressure, immobilization cell

Figure 1. Components of the measuring cell (from left to right, top to bottom): measuring cell with hose connectors for a circulator, serrated measuring plate and perforated plate, mounting ring with 3 thumbscrews, two-parts sample hood.

Introduction

A measuring cell for measurements on a semi-solid with liquid contact is available for the Thermo Scientific™ HAAKE™ Rheometers. The measuring cell is designed for use on all temperature modules on which a lower plate (of a plate -plate measuring geometry) can be mounted. In principle, it corresponds to a plate-plate measuring geometry with a diameter of 35 mm with an interchangeable lower plate. Depending on the application, different lower plates are available: a plate with a deep perforated serration, a perforated plate and a plate consisting of a porous frit. A special two-parts sample hood is part of the delivery. The measuring cell is designed for the temperature range from 5 °C to 50 °C.

Applications

The serrated plate can be used to analyze the viscoelastic properties of a semi-solid material under ''ambient conditions'', i.e. in contact with a liquid. The serration of the plate has a width of 0.5 mm and a depth of 1 mm. There are small holes in the recessed part of the serration through which a liquid can flow in or out. The measuring cell can either be filled with a liquid from above or liquid can flow through the two hose connectors on the measuring cell.

For the rheological investigation of the drying of a sample, the so-called immobilization test, a porous frit (diameter 50 mm, height 2 mm) or a perforated plate can be used as the lower plate. The sample is applied to such a lower perforated plate on a carrier material (e.g. paper substrate). During the measurement, the solvent is removed from the sample by negative pressure under the plate.

The measuring cell can be used in a variety of ways thanks to the interchangeable lower plate. For example, it is suitable for applications in pharmaceutics and cosmetics, where the interaction between creams and ointments with (human) skin or the stickiness of plasters under the influence of (liquid) skin secretions are investigated. The rheological behavior of food can be analyzed depending on the pH value of the environment. Thanks to the capability of the HAAKE MARS Rheometer to preset or measure normal forces, chewing processes can be simulated. Further application examples can be found in the field of coatings, e.g. the drying behavior of dispersions such as paper coatings.

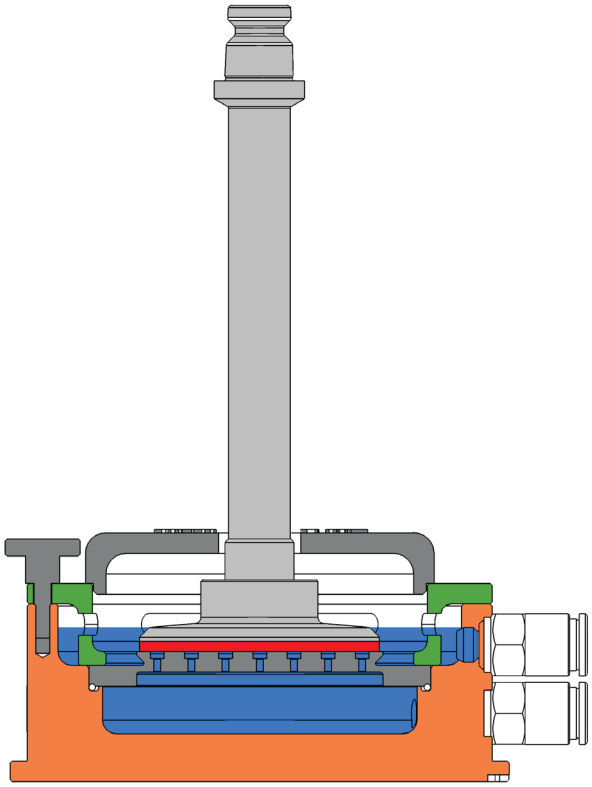

Figure 2. Cross-section through the measuring cell.

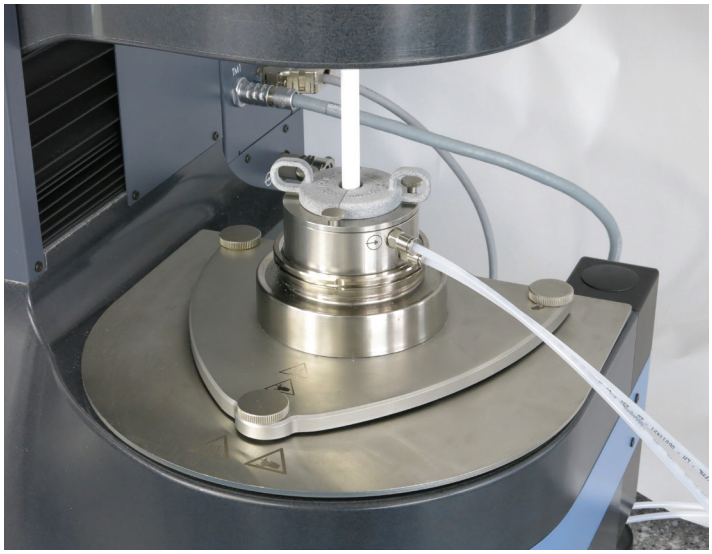

Figure 3. Thermo Scientific™ HAAKE™ MARS™ iQ Rheometer with submersion flow cell, adapted to a standard temperature module, with rotor in measuring position and two-part sample hood.

Order information

Description	Order no.
Submersion flow cell for mounting on a standard temperature module with connectors for a circulator, incl. an interchangeable serrated lower measuring plate with a diameter of 35 mm and two-part sample hood	222-2012
Serrated Rotor P35 SE/Ti with ‘‘Connect Assist’’ (Quick coupling with automatic recognition) and ceramic shaft	222-2092
Perforated plate for immobilization test with negative pressure	222-2621
Two-parts sample hood (spare part)	222-2622

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