Rheometer accessories

Overview sample covers with integrated solvent trap

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A series of universal sample covers is available for the Thermo Scientific™ HAAKE™ Rheometers. All sample covers can be used with parallel plates or cone & plate as well as coaxial cylinder geometries.

The use of a sample cover is recommended for measurements at temperatures above and below ambient conditions, when an inert gas atmosphere is required or to prevent solvent evaporation. Sample covers are available in three different versions (Figure1):

- A two-piece sample cover equipped with built in solvent trap and inert gas connector made of PEEK (Polyetheretherketone) with a temperature resistance up to 250 °C. The recommended maximum temperature for this type of covers is around 80°C.
- An insulated sample cover with an inner layer made of Ampcoly© that is in direct contact with the lower temperature control module and conducts heat to the upper part of the geometry. The middle layer made of Teflon© provides good insulation and the outer metal layer additional robustness. The insulated sample cover reduces the temperature offset and provides a more homogeneous temperature distribution in the sample. The insulated sample cover is mounted directly to the instrument head of the rheometer via a guide bar*. A comfortable sliding mechanism allows for easy access to the sample for example during trimming and centers the cover automatically on the lower part when in measuring position. The insulated sample cover includes an inert gas connection port as well as a built in solvent trap. It can be used in a temperature range from -40 °C up to 200 °C. The recommended upper limit is 120 °C. At higher temperatures an active upper temperature control module should be used.
- A transparent sample cover made of glass allows for visual control of the sample during the measurement and provides insulation of the sample against ambient conditions at the same time. The transparent sample cover is equipped with a

*Necessary accessory: Holder for guide bar (different order numbers depending on the rheometer model).

connector for inert gas as well as a built in inner solvent trap. The transparent sample cover is also available with a guide bar for direct mounting to the rheometer*. The transparent sample cover can be used up to 400 °C.

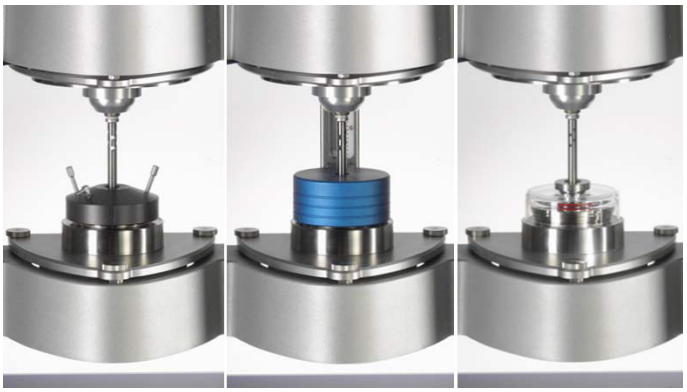

Figure 1. Overview of available sample covers (from left to right): PEEK sample cover, insulated sample cover, transparent glass sample cover.

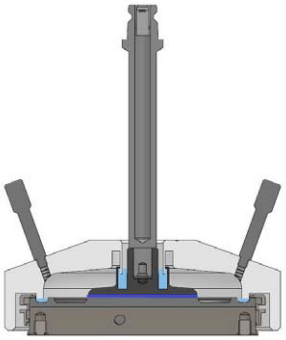

Figure 2. PEEK sample cover with inner and outer solvent trap.

When testing samples that are prone to dry out or have volatile components, the use of the integrated solvent traps is recommended. All sample covers are equipped with an inner and outer solvent trap** (Figure 2). The inner solvent trap consists of a small fluid reservoir on the shaft of every standard geometry rotor and a thin ring inside the sample cover. The fluid reservoir is filled with a low viscous oil or a suitable solvent and when the sample cover is put in place, the thin ring dips into the fluid without touching the rotor directly.

The outer solvent trap consists of a ring channel on the lower measuring plate and a corresponding ring on the inner outside of the sample cover. The ring channel is filled with a suitable solvent before putting the cover in place. Solvent that is evaporating from the solvent traps will create a saturated atmosphere under the cover and will prevent sample evaporation and dry out. Figure 3 shows the results of an oscillation time test for a shower gel at 40 °C. The test was performed with and without using a PEEK sample cover with solvent trap. Without sample cover and solvent trap the effects of sample evaporation and drying out become visible almost immediately after starting the test. With sample cover and solvent trap the sample shows only little change over a test duration of one hour.

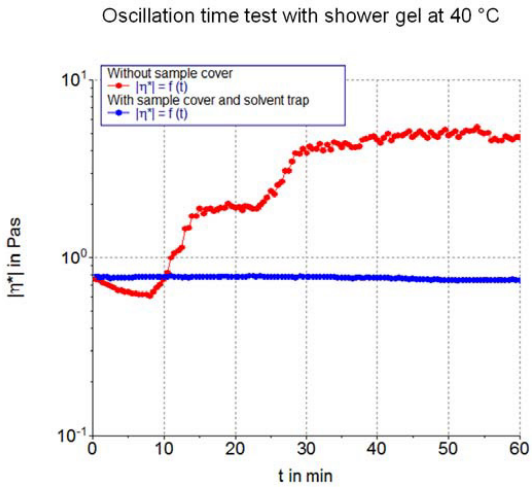

Figure 3. Oscillation time test with shower gel at 40 °C. The results of a test performed with (blue symbols) and without (red symbols) sample cover and solvent trap are shown.

Product specifications

Sample cover	Temperature resistance	Recommended temperature range
Made of of PEEK	up to 240 °C	up to 80 °C
Made of glass	up to 400 °C	up to 80 °C
Insulated sample cover TM-IN-H	up to 200 °C	up to 120 °C

Ordering information

Rheometer models	Sample cover	Order number
HAAKE MARS iQ series***	Made of glass	222-2386
	Insulated sample cover TM-IN-H	222-2385
HAAKE MARS 40/60****	Made of glass	222-2180
	Insulated sample cover TM-IN-H	222-2181
Universal version for all models (without guide bar)	Made of glass	222-1900
	Made of PEEK	222-2163

Necessary accessory: rheometer specific holder for quide bar ***222-2384, ****222-1902.***adapter 222-2290 required.

** Transparent sample cover only with inner solvent trap.

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