

# Solids clamping tool for Dynamic Mechanical Thermal Analysis (DMTA)

## In combination with HAAKE MARS Rheometers

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### Keywords

Dynamic Mechanical Thermal Analysis (DMTA), Solids clamping tool, HAAKE MARS Rheometer, Controlled Test Chamber, DIN/ISO 6721-1

A solids clamping tool for measurements according to DIN/ISO 6721-1 is available for the Thermo Scientific™ HAAKE™ MARS™ Rheometers in combination with controlled test chamber (CTC) (Figure 1). It consists of an upper and a lower clamp, each equipped with two moving jaws, which guarantee an automatic centering of the sample relative to the rheometer motor axis (Figure 2). The automatic clamping force adjustment and a simple semi-automatic gap adjustment for a wide range of sample thicknesses allow to measure over a wide temperature range in one run without ever losing the grip on the sample.

The jaws are easy to remove for cleaning and exchange. Jaws with different profiles for different sample stiffness (soft, medium, hard) are available.

Rectangular specimen with a width from 5.0 to 12.7 mm, a thickness from 0.15 to 4.0 mm and a maximum length of 68 mm can be tested with the solids clamping tool.

In order to position differently dimensioned specimens in the center of test chamber, the bottom clamp can be adjusted in height. Thus all samples are always exposed to the same extremely low temperature gradient within the tests chamber. During the measurement the temperature is measured close to the sample center by a flexible temperature sensor.

Figure 3 shows the results of a dynamic mechanical thermal analysis of a polyether ether ketone (PEEK) performed with the solids clamping tool. One method to determine the glass transition of a material is to use the maximum value in

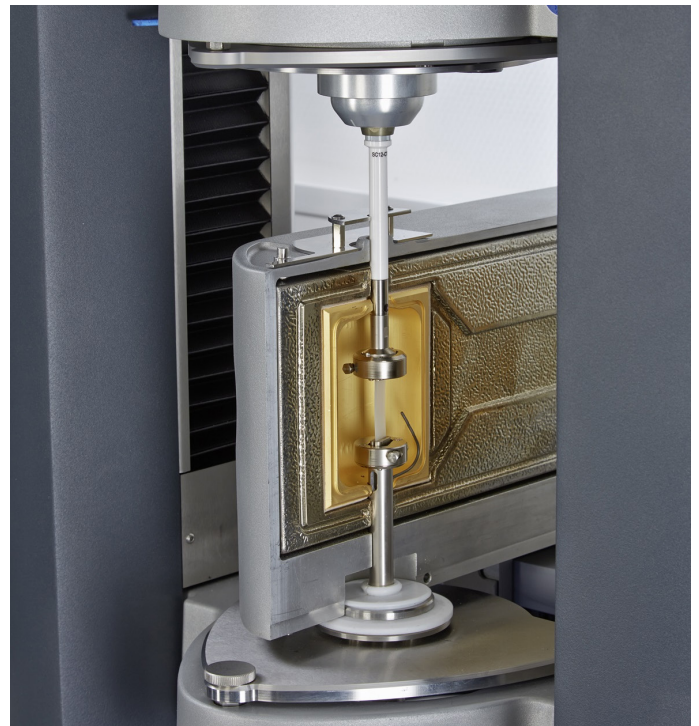


Figure 1: HAAKE MARS Rheometer with controlled test chamber and solids clamping tool.

G" of a dynamic mechanical thermal analysis. For the PEEK this method gives a glass transition of 158 °C.

The solids clamps are available in two versions. On the hand with a threaded coupling for the previous HAAKE MARS models and on the other hand with quick fit coupling and automatic recognition for HAAKE MARS models 40 and 60.

For an easier handling an additional triangular base plate is recommended on which the lower holder of the solids clamping tool is adapted. This additional plate saves time for changing from the solids clamping tool to regular cone & plate or parallel plate geometries.

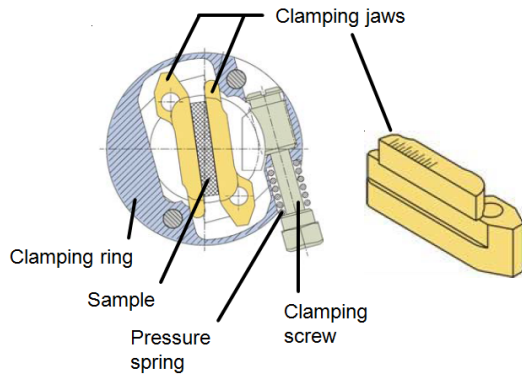


Figure 2: Technical drawing of solids clamping tool.

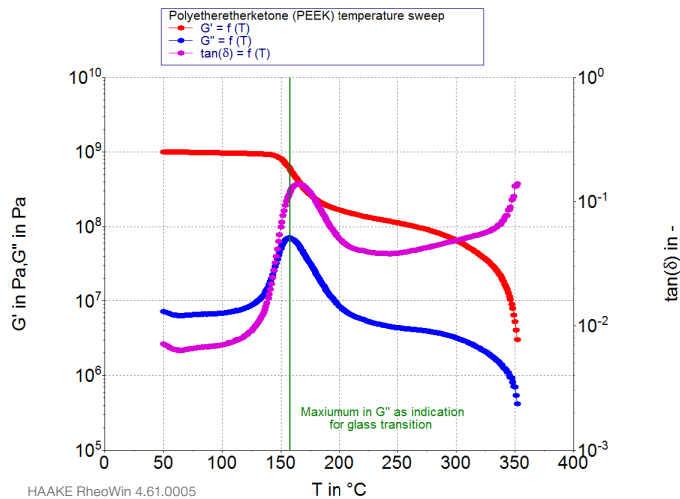


Figure 3: Dynamic mechanical analysis with Polyether ether ketone (PEEK).



Figure 4: Solids clamping tool with temperature sensor, spacer and tool.

Solids clamp consisting of an upper and a lower holder, incl. temperature sensor, set of jaws for medium samples (4 pcs.), spacers and screw drivers (Figure 4).

Table 1. Ordering information - Solids clamp

Product	Order no.
For HAAKE MARS Rheometer models I, II, III	222-1734
For HAAKE MARS models 40 & 60 with "Connect Assist"	222-2231

Table 2. Ordering information - Optional accessories

Product	Order no.
Jaws for soft samples (4 pcs.)	222-1781
Jaws for medium samples (4 pcs.)	222-1782
Jaws for hard samples (4 pcs.)	222-1783
Triangular adapter plate for CTC measuring geometries	222-1856

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