

Rheometers

Viscoelastic standard for checking the rheometer functionality

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The functionality and/or calibration of a rheometer should be checked regularly. Checking a rheometer is usually and most easily done by measuring a suitable sample in an oscillatory test.

A suitable sample is a long-term, stable polymers for which the modulus values (storage modulus G' and loss modulus G'') are certified for one or several frequencies and temperatures.

The viscoelastic sample from Thermo Fisher Scientific is delivered with certified crossover parameters at 20 °C. In an oscillatory test, the frequency dependence of the storage modulus G' and the storage modulus G'' are measured and the crossover is calculated. The determined crossover modulus G^x has an uncertainty of +/- 5 % and the crossover frequency f have an uncertainty of +/- 0.1 Hz. Depending on the type of rheometer and the accessories used, the total deviation from the stated values can be larger. This is especially the case if the rheometer does not have an automatic measuring gap setting and furthermore if no temperature calibration has been carried out in the measuring gap.¹

The crossover parameters determined with the rheometer must be in the range of the certified values by taking the uncertainty into account. In this case, it is guaranteed that the rheometer works accurately. Instrument related faults can be excluded. Experimental results are also influenced by the sample handling and the filling of the measuring geometry. How to reduce handling related faults is summarized in an application report.²

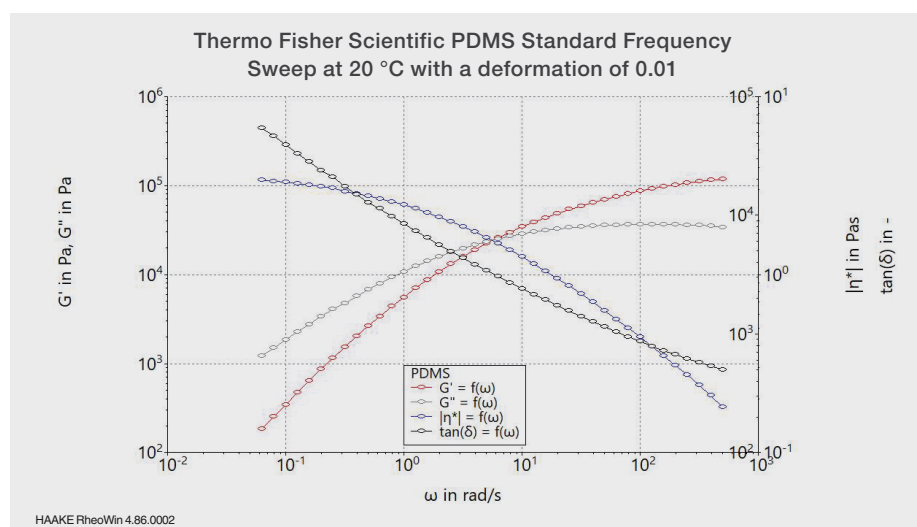


Figure 1: Typical frequency sweep on PDMS with crossover.

Ordering information

Product	Cat. No
PDMS (Polydimethylsiloxane) 50 ml, viscoelastic material with certified crossover at 20 °C: values of the frequency and crossover modules	082-5491

References

1. Klaus Oldörp, Thermo Fisher Scientific application note V264 "Testing a viscoelastic PDMS standard in oscillation," Karlsruhe, Germany.
2. Cornelia Küchenmeister-Lehrheuer and Klaus Oldörp, Thermo Fisher Scientific application note V248 "Well Prepared—Good Results," Karlsruhe, Germany.

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