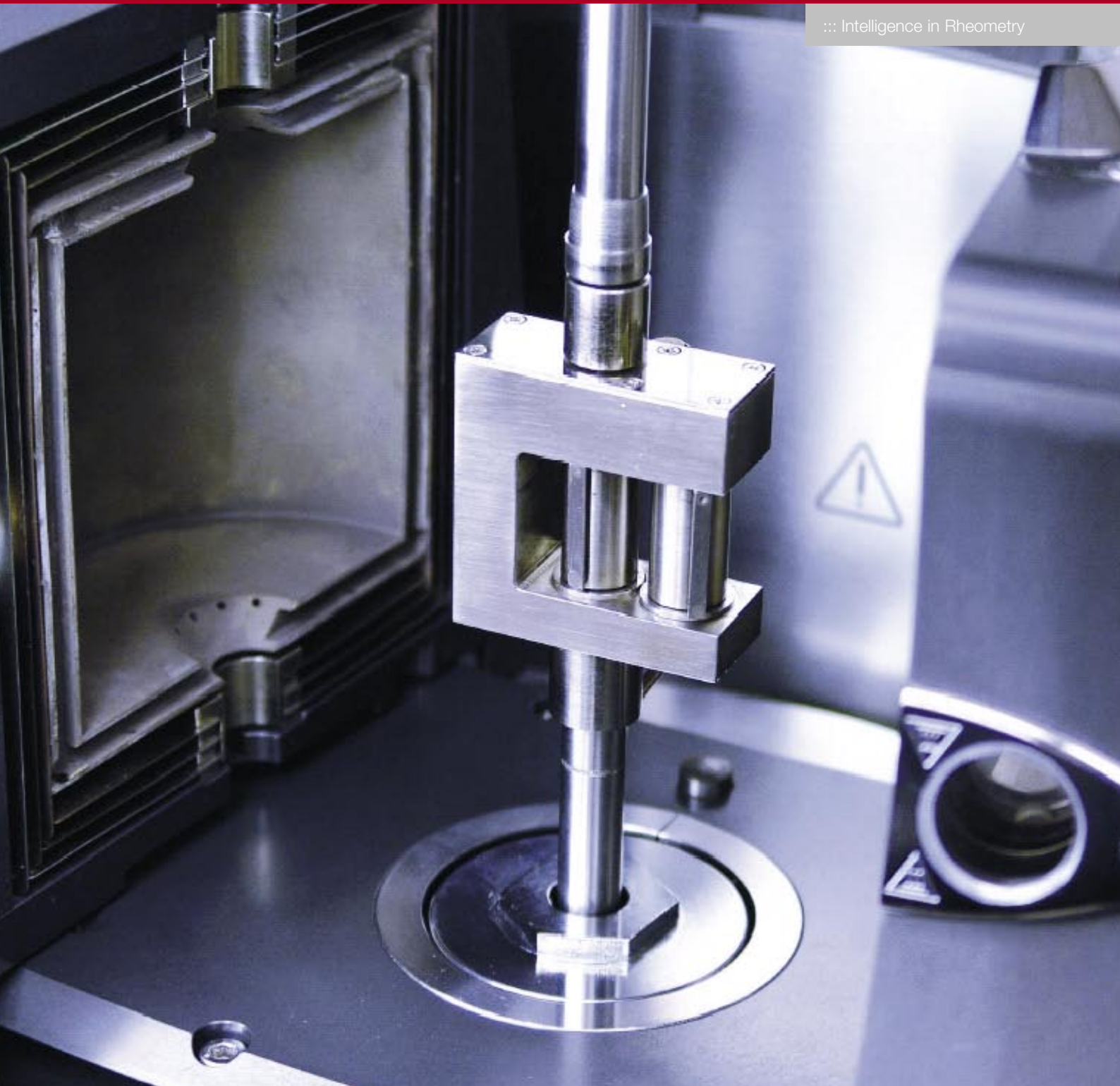




Anton Paar

::: Intelligence in Rheometry



SER - Extensional Rheology System

The SER - Extensional Rheology System turns your Physica MCR rheometer into a universal platform for extensional rheology.

Extensional rheology on Physica MCR rheometers

In the past, special instruments and sophisticated setups were used for investigations into extensional rheology. Today such experiments can also be performed using the Physica MCR rheometers from Anton Paar in combination with the SER – Extensional Rheology System. The SER system, developed by Dr. Martin Sendmanat, is an accessory for the Physica MCR series which turns the conventional rheometer into a universal testing platform for extensional rheology. The combination of SER system and convection oven enables extensional measurements of melt and solid, filled and unfilled, cured and uncured polymers over a very wide range of temperatures and kinematic deformations.

Principle

The technology incorporates two counter rotating wind-up drums that allow for truly uniform extensional deformation during the measurement. The small sample volume can be fixed by two clamps. Besides the characterization of polymeric materials in uniaxial extension, the SER system can be used for solid tensile, pear and peel testing as well as friction testing.

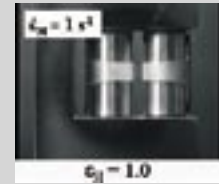
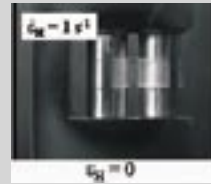
Software and firmware integration

The SER system is completely integrated in the firmware and software of the Physica MCR rheometer. All necessary extensional settings can be done in the software. The resulting extensional properties are directly presentable in the software without further analysis.

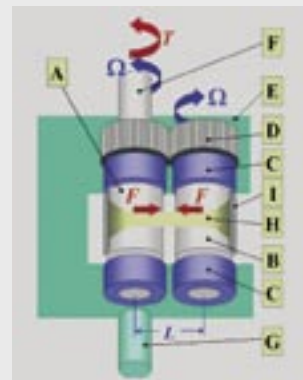
A unique feature of the Physica MCR enables the setting of exponential decay of torque, making extensional creep measurements possible.

Features and benefits

- ▶ Extensional rheology on a Physica MCR rheometer
- ▶ Full integration of the SER system in firmware and software
- ▶ Uniaxial extension measurements possible as well as solid tensile, pear and peel, and friction testing.
- ▶ Setting of exponential decay of torque for extensional creep experiments
- ▶ Deformation area stays on spot – visualisation of the experiment possible

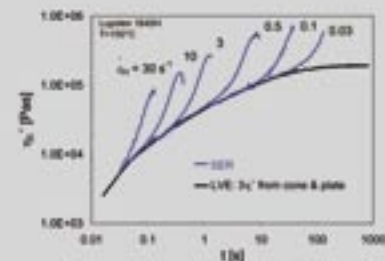


Visualization of an extensional experiment on a polyolefin melt



- A Master drum
- B Slave drum
- C Ball bearings
- D Intermeshing gears
- E Chassis
- F Torque shaft
- G Fixture
- H Sample

Schematic setup of the SER – Extensional Rheology System



Lupolen 1840H measured at different hencky strain rates compared to cone and plate measurements in oscillation.

Specifications SER - Extensional Rheology System

Maximum recommended Hencky strain	20 s ⁻¹
Maximum Hencky strain per drum revolution	4 s ⁻¹
Operating temperature	0 °C to 250 °C
Wind-up drum diameter	10.31 mm
Stretch zone gage length	12.72 mm

Specifications - sample

Minimum shear viscosity in extension mode	~10 000 Pas
Sample mass	5 - 200 mg
Recommended sample width	1 - 12.7 mm
Recommended sample thickness	0.05 - 1 mm

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Instruments for:

Density & concentration measurement	Colloid science
Rheology and viscometry	X-ray structure analysis
Sample preparation	CO ₂ measurement
Microwave synthesis	High-precision temperature measurement

Specifications subject to change without notice.

Your distributor: