Anton Paar

Rheological Characterization **up to 1,800 °C**

High-Temperature Rheology

Anton Paar's high-temperature rheology portfolio enables you to run rheological tests, dynamic-mechanical analysis and liquid density measurements of samples up to 1,800 °C.

Anton Paar: Rheology at the highest temperatures.

FIND OUT MORE

www.anton-paar.com/ apd-rheometers

Beyond rheometry: Advanced material characterization at elevated temperatures

High-temperature rheometer systems from Anton Paar detect the broadest possible range of viscosities, from highly viscous samples like glass approaching the glass transition temperature, to low viscous materials like metal melts. Determining exact viscosity values at different temperatures – from room temperature to 1,800 °C (1,730 °C sample temperature) – is not a guessing game anymore. Anton Paar rheometer systems provide absolute values, which help you save time and money because you can design your production process as efficiently as possible. The possibility to perform dynamic-mechanical analysis, liquid density measurement, powder rheology and more, enables you to characterize your samples more comprehensively using only one device.

Metals and alloys

→ Measure your metal melt at viscosities as low as 1 mPa.s but also characterize the semi-solid state and crystallization behavior at viscosities up to 10^8 Pa.s.

→ Characterize the behavior of your metal powder using the powder shear cell.

→ Analyze solid-solid transition, softening and more by applying dynamic-mechanical analysis in torsion, tension, bending and compression up to 1,000 °C.

→ Investigate the liquid density of your metal melt at a sample temperature up to 1,730 °C.

Glass

→ Measure the viscosity of your glass melt in a broad temperature range up to the highest viscosities of 10^8 Pa.s.

→ Measure in compliance with ASTM C965 and ISO 7884.

→ Perform dynamic-mechanical analysis of your glass sample at up to 1,000 °C, allowing beam bending, fiber elongation and compression testing.

→ Predict your material's behavior at varying conditions using the oscillation mode. This gives insight into a material's viscoelastic properties and frequency-dependent glass transition and enables characterization beyond viscometric fixed points.

Salt melts

→ Determine melting behavior thanks to the normal force sensor in the rheometer head.

→ Measure viscosities as low as 1 mPa.s, and characterize the crystallization/freezing behavior during cooling.

→ Develop new materials with better performance, heat transfer, and energy storage applications like salt melts containing nanoparticles and characterize their changed rheological behavior.

→ Investigate molten salts under inert conditions, by either flushing the measuring cell with inert gas or operating the whole setup in a glovebox filled with e.g. argon.

→ Characterize the liquid density of your salt melt at different temperatures for better process design.

Slags

→ Determine break temperatures and thereby characterize the solidification behavior. This knowledge will help you define operation temperatures.

→ Inspect your material's viscoelastic properties with the oscillation mode and gain insight into the frequency-dependent crystallization of your slag.

→ Measure across different physical states of the sample and create data which cannot be covered by models predicting only viscosity. The wide torque and viscosity range in combination with the oscillatory mode enables characterization of the slag from a liquid to a solid state.