Bohlin
CVO

CVO

Rheological instruments backed
with rheological experience

Malvern

A practical rheometer system in your laboratory. Whether your needs are for high use, busy Quality Control or for bespoke user-defined measurement procedures, the Bohlin CVO is an instrument you can rely on. Compact and spill resistant with a membrane keypad the CVO's designed for easy set up and control. The CVO accepts interchangeable temperature control units and the options for extended shear rate and quantitative normal force are also available.

Complete rheology

- **Integrated, computer controlled systems**
  optimises sensitivity and minimises cabling and inter-connections

- **Automatic gap zeroing and adjustment**
  with an integrated axial force sensor and precision stepper motor to control the gap precisely, easily and reproducibly

- **Thermal mode**
  automatically compensates for expansion during temperature sweeps and ensures that the gap remains constant

- **Axial force mode**
  allows a pre-programmed normal force to be applied to the test sample (available with normal force option)

- **Sample loading**
  is controlled using programmable descent rate to limit normal stresses imposed on the sample

- **Unique air bearings**
  robust, porous design which is completely impervious to particle contamination. These bearings offer low inertia for oscillation data, low drag for viscometry data and negligible rotational torque errors

- **Wide torque range and measurement**
  accurately achieved because the motor design delivers a linear torque response over decades without drift. Low motor inertia and drive circuitry offer rapid transient response and wide operating frequency range

- **Microstrain position sensing**
  with a digital resolution of 10^7 parts per revolution and no signal drift to enable analysis of even weakly structured materials within their linear response region

- **Broad speed range**
  with high resolution position sensing to ensure excellent performance across the entire speed range
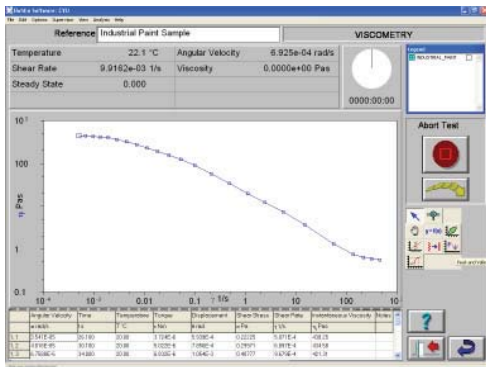
Applications

- **Coatings**
- **Adhesives**
- **Cosmetics**
- **Personal care products**
- **Foods**
- **Composites**
- **Petrochemicals**
- **Polymers**
- **Pharmaceuticals**
- **Asphalt**

Software to make it happen

Windows™ compatible software is provided with every Bohlin CVO delivering the ease of use and user-defined flexibility professionals around the world have come to expect.

Viscometry mode *measures viscosity as a function of shear stress or shear rate. Measurements include single value of shear rate (or stress), table of shear rates (or stresses), continuous shear rate (or stress) ramp (including yield stress) and complex shear rate (or stress) profile. Temperature control can be isothermal (time sweep), or follow defined gradients or step changes.*
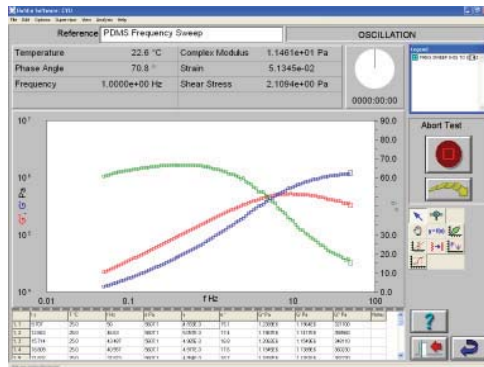

Oscillation mode *measure the dynamic viscoelastic properties as a function of frequency, Measurements include single frequency, frequency sweep, amplitude sweep, time sweep and temperature sweep (gradient, step change or profile). Tests can be performed at constant stress or constant strain amplitude using Auto-stress mode.*
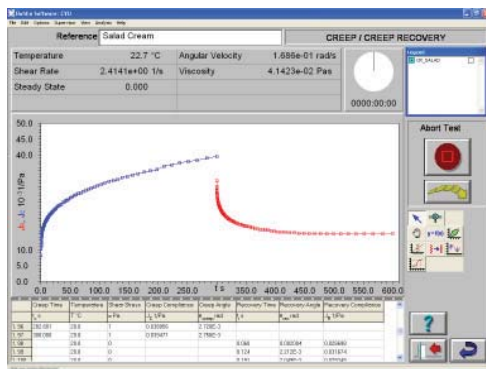
Creep mode *measures the creep compliance and recoverable compliance as function of time. User defined sampling modes can be set. Zero shear viscosity and yield stress can be determined.*

With options

Almost all rheological measurements require accurate temperature measurement and control. The CVO accepts a variety of temperature control units, which are easily interchangeable, to cover all applications. By virtue of the mounting system used, space and access for sample loading and trimming are not compromised when changing the temperature control system. Available units include a range of fluids circulators, Peltier devices (plate and cylinders), electrically heated plates and a forced gas oven with a liquid nitrogen cooling option. Bohlin temperature control units are fully controlled by the software and the instrument detects which type of units is installed considerably simplifying installation.
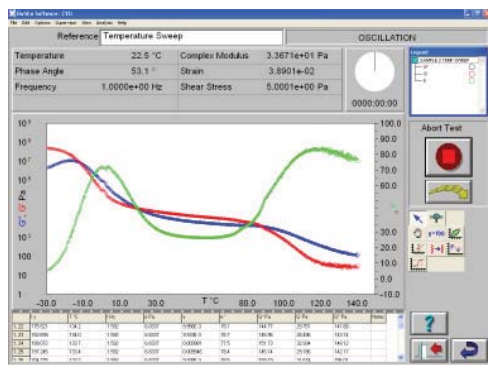
Overview

Bohlin CVO

Comprehensive rheological analysis

Torque range:	0.5µNm to 100mNm
Torque resolution:	1nNm
Position resolution:	0.9µrad
Frequency range:	10µHz to 100Hz
Controlled speed range (CR mode):	50mrad s^{-1} to 320rad s^{-1}
Measurable speed range (CS mode):	0.1µrad s^{-1} to 320rad s^{-1}
*Normal force N1 measurement range:**	0.001N to 20N
Temperature range (dependent on control used):	-150ºC to 550ºC*
	-40ºC to 450ºC

Temperature controls

Fluids Circulator:	-40ºC to 250ºC
ETO (Extended Temperature Option):	-15ºC to 300ºC
Melts Oven:	ambient to 450ºC
Peltier Plate:	-30ºC to 200ºC
Peltier Cylinder:	-20ºC to 180ºC
Universal Peltier Option – Coaxial Cylinder or Cone/Plate Geometries	
ETC (Extended Temperature Cell):	ambient to 550ºC*
ETC with optional LTU (Low Temperature Unit):	-150ºC to 550ºC*

*available if Normal Force option is fitted

Nominal operating voltage	110 or 220V
Size (with Peltier plate)	52cm (H) x 29cm (W) x 34cm (D)
Weight (with Peltier plate)	27kg

Optional equipment

Measuring Systems	
Vacuum Disposable Plates:	Peltier Plate, Melts Oven or ETO
High Pressure (Sealed Cell):	40bar pressure, 30ºC to 150ºC
High Pressure/High Temperature Cell:	300bar pressure, ambient to 300ºC
Optical UV Curing Cell	
Immobilisation Cell	
Electro-rheology Cell:	DC voltage up to c.10kV

Every Bohlin CVO from Malvern is backed with the technical and sales support of Malvern Instruments, the only material characterization company with the resources and equipment to measure particle size and shape, zeta potential and molecular weight as well as the expertise to advise on how these parameters influence rheological properties.

detailed specifications
at www.malvern.com

spectris

Malvern