Low-torque Cone and Plate Viscometer

BGD 182-1

Product Description

Paints and inks often exhibit different shear rates from manufacturing to application. As typical non-Newtonian fluids, paints and inks show varying viscosity characteristics at different shear rates. Generally, paints are at a low shear rate when stored, transported, leveled, or sagged. They experience medium shear rates when pumped, dipped, or mixed at low speeds. During high-speed dispersion, rolling, spraying, and brush coating, they are subjected to high shear rates, generally ranging from 9000 s^{-1} to 12000 s^{-1}. Therefore, understanding the rheological characteristics of paints or inks at such high shear rates requires the use of a cone-and-plate viscometer for measurement.

The BGD 182 Cone-and-plate Viscometer uses a specially angled conical spindle, which generates a very high shear rate on the sample under the high-speed drive of a stepper motor. It conforms to ISO 2884-1: "Paints and varnishes — Determination of viscosity using rotary viscometers — Part 1: Cone-and-plate viscometer operated at a high rate of shear."

Standards

ISO 2884-1 (Paints and varnishes - Determination of viscosity using rotary viscometers - Part 1: Cone-and-plate viscometer operated at a high rate of shear)

Technical Specification

- 7-inch touch screen: Menu operation with rich display content (measurement values, spindle number, speed, shear rate, etc.), simple and convenient to operate
- Durable metal shell: Handle for lifting, precise and fast positioning, high reliability
- Carefully designed electrical part: Ensures high reliability, precision, stability, and ease of use
- ARM chip processor: Faster data processing speed
- High precision linear calibration: Ensures higher measurement accuracy through multiple point interpolation
- Stepless speed adjustment: Allows operators to choose different shear rates based on the sample's actual application

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conditions

- Continuous viscosity measurement: Many viscosity units can be freely interchanged
- Automatic measurement alarm: Alerts when the measurement exceeds the range
- High-speed data transmission interface: Ensures fast and stable communication between the instrument and the computer
- Data storage and export: External USB function
- Built-in high-precision PT100 temperature sensor: Provides high temperature control accuracy and stability
- Temperature calibration function: Ensures precise and reliable temperature control
- Simple calibration function: Users can quickly calibrate the instrument with one bottle of standard oil using the built-in calibration menu
- Data collection and analysis software: Option to thoroughly analyze the sample's rheological features

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Main Technical Parameters

- Adjustable Speed Range: 5 rpm to 1000 rpm (continuously variable, @1 rpm)
- Measurement Error: < 2% of full scale
- Sample Volume: < 2 ml (see the table below for details)
- Two built-in temperature control options:
  - 5°C-75°C (L type / Low temperature)
  - 50°C-235°C (H type / High temperature)
- Temperature Resolution: 1°C
- Temperature Control Accuracy: ±0.5°C (L type); ±1°C (H type up to 150°C) or ±2°C (H type above 150°C)
- Rotors: 10 types available (corresponding shear rates and measurement ranges are shown in the table below)

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Spindle Types and Measurement Ranges										
Spindle Type	CAP-01	CAP-02	CAP-03	CAP-04	CAP-05	CAP-06	CAP-07	CAP-08	CAP-09	CAP-10
Sample Size	67 µL	38 µL	24 µL	134 µL	67 µL	30 µL	1,700 µL	400 µL	100 µL	170 µL
Shear Rate Range (S^{-1})	66.5-13,300	66.5-13,300	66.5-13,300	16.5-3,300	16.5-3,300	16.5-3,300	13-2,000	13-2,000	25-2,000	25-5,000
BGD 182-1 Measurement Range (mPa.s)	20-1,600	20-3,200	20-6,600	20-13,000	20-26,000	20-66,000	20-2,600	20-10,800	20-44,000	20-4,400
BGD 182-2 Measurement Range (mPa.s)	20-37,500	40-75,000	100-150,000	100-300,000	300-600,000	800-1,500,000	78-62,500	313-250,000	125-1,000,000	100-10,000

Note: *How to calculate the shear rate?*

- *13.33 × the current speed (for CAP-01 to CAP-03)*
- *3.33 × the current speed (for CAP-04 to CAP-06)*
- *2 × the current speed (for CAP-07 to CAP-09)*
- *5 × the current speed (for CAP-10?*

- Power Supply: AC 220V, 50Hz/60Hz, max current ~1.5A
- Overall Size: 275 mm × 210 mm × 460 mm (L × W × H)
- Net Weight: 12 kg

Ordering information: BGD 182-1 Low-Torque Cone and Plate Viscometer

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Accessoires

- CAP-SERIES - Cone & Plate Viscometer Spindle CAP-Spindles 1-10

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