



No. 2204

KRK high shear viscosimeter

Along with the progress in coating technology, especially with diversification of coating types, high speed processing and upgrading of quality, coating material needs to meet severe requirements in flowability, leveling and stability to various outer factors. Consequently, flowability tests for coating materials in the range of high speeds are indispensable to monitor problems at the high speed blade coater and roll coater. With the KRK high shearing viscosimeter, it is possible to faithfully reproduce the operation of a practical machine in the laboratory, and to grasp behaviors at speeds of 1×10^5 /second, encompassing a wide range of elemental researches, such as solving troubles and development of new coating materials. This machine is designed to test not only the materials in the category of high speed and high shearing, as well as those of low speed and high viscosity, with a special function (optional) of low revolutions, 1/10 speed of the standard high speed (a range of 0 to 220 rpm.) which enables to test various kinds of materials in speed and shearing. The measurement ranges up to 4,000 poise liquids. This machine features an electronically controlled stepless speed change, allowing linear deceleration and acceleration up to the maximum speed of 8,800 rpm. The machine body is installed on a stable base, with almost no vibrations. This is a viscosimeter having an inner rotating cylinder, with a bob and a cup of high precision. Viscosity torque is detected by a strain gauge, and graphically displayed by the XY recorder via an amplifier. The system with a computer is able to calculate viscosity coefficient and shearing speed that are continually changing to display plastic viscosity and leveling index.



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Specimen: Newtonian liquid, Non-newtonian liquid (plasticity, pseudoplasticity, thixotropy, dilatancy)

Maximum shearing speed: 1.8×10^5 /second

Maximum viscosity: 2,000mPa · s (poise) (4,000 option)

Rotation speeds:

1st stage: low speed 0 to 220 rpm, high speed 0 to 2,200 rpm

2nd stage: low speed 0 to 440 rpm, high speed 0 to 4,400 rpm

3rd stage: low speed 0 to 660 rpm, high speed 0 to 6,600 rpm

4th stage: low speed 0 to 880 rpm, high speed 0 to 8,800 rpm

Cup: inner diameter 40 mm, effective depth 80.5 mm, material: stainless steel (SUS304)

Torque range: shifting in four stages 5, 10, 20, 50×10^4 dyn · cm/cm
 10, 20, 40, 100×10^4 (optional)

Strain gauge protector: overload prevention with a rotation angle limiter.

Torque detecting procedure: full scaling with a check box and calibration weight

Recorder: Model: XY recorder

Recording paper fixing: electrostatic suction

Effective recording area: 25 cm × 18 cm

Recording type: fiber pen, size A4

Optional: Heating and cooling with jacket

Power source: single-phase 200 / 220 VAC 50/60 Hz 10 A

Outer dimensions: Viscosimeter 500 × 500 × 860 mm

Control panel 600 × 610 × 920 mm

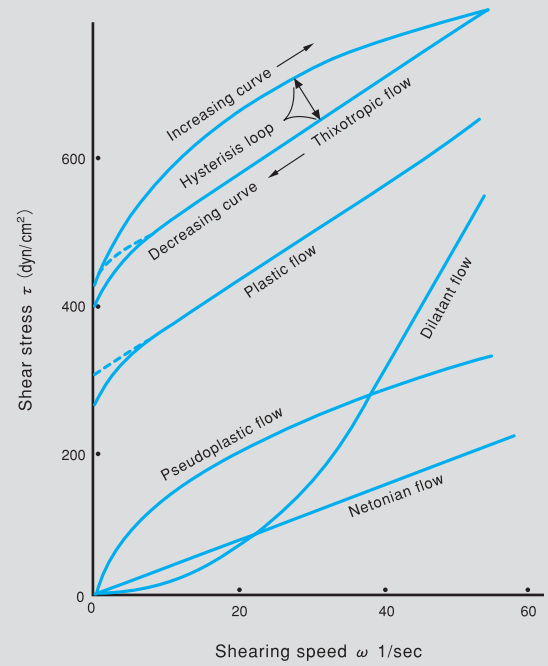
Instrument weight: Viscosimeter 120 kg

Control panel 85 kg

<Features>

1. Measurement ranging from low shearing/high viscosity to high shearing/low viscosity
2. A strain gauge is provided to detect adhesion torque to enable calibration with the standard weight.
3. Each machine is tested with the specified olive oil to draw a flowability diagram for comparison with the standard diagram.
4. The viscosimeter is equipped with a special drawer able to draw flow graphs correctly.
5. The speed change system with a static Leonard is used with a smooth and linear acceleration and deceleration ranging from 0 to 8,800 rpm for the bob shaft by the use of one stage acceleration transmission with a timing belt.
6. The rigid structure of the viscosimeter and the high precision bob/cup bearings minimize vibration during acceleration or deceleration.
7. The heating jacket controls the temperature of a specimen by letting hot water or cooled water flow in the outer circumference of the cup.
8. Since the viscosity coefficient of a specimen may be affected by changes in shearing speed along with time, this instrument has a function to control the shearing speed variation rate to achieve four kinds of uniform acceleration (selection of sweep times: 10, 20, 30, 40 seconds).

Type	Diameter (mm)	Effective length (mm)	Interval (mm)	Shape coefficient S	Max. circumferential speed (m/min)
A	39.0	50	0.5	0.0002	1078
B	∕	25	∕	0.0004	∕
C	∕	10	∕	0.00097	∕
D	30.0	25	5.0	0.0052	829
E	39.6	50	0.2	0.00008	1095
F	39.8	25	0.1	0.00008	1100



Theoretical graphs of Newtonian and Non-Newtonian flows

