

viscometer

1 Free
Calibration
as per Brookfield Method using Master Viscometer

rheometer

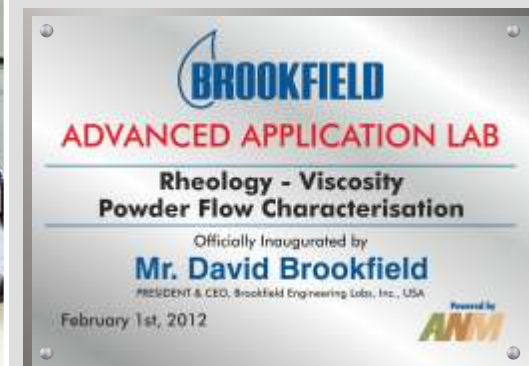
powder



Method Development

Application Support

Sample Trials





DV-II+™ Pro Viscometer

Our most versatile, continuous sensing viscometer has a new look!

Features and Benefits

- Displayed info:
 - Viscosity (cP or mPa•s) - Temp. (°C or °F) - Shear Rate /Stress
 - % Torque - Speed / spindle
- Built-in Options
 - Timed Tests - Choice of Units - Choice of Speeds
- Scroll Keys for Simple Selection of Speed & Spindle
- 54 selectable speeds provide superior range of viscosity / shear rate measurements
- Accuracy : ±1.0% of range
- Repeatability : ±0.2%
- Built-in RTD Temperature Probe
- Auto range showing
 - Full Scale Range (FSR) at 100%
 - Maximum viscosity measured with Spindle / Speed combination
- Bi-directional RS-232 PC Interface provides optional computer control and automatic data gathering capability
- Download custom test programs with DV Loader software (included with instrument)

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVDV-II+ P	1†	6M	.01-200	54
RVDV-II+ P	100††	40M	.01-200	54
HADV-II+ P	200††	80M	.01-200	54
HBDV-II+ P	800††	320M	.01-200	54

† 1 cP achieved with UL Adapter accessory. 15 cP on LV with standard spindles.
 †† Minimum viscosity is achieved with optional RV/HA/HB-1 spindle.
 M = 1 million cP = Centipoise mPa•s = Millipascal•seconds



Free
RHEOCALC32
Software

DV-I™ Prime Viscometer

The only viscometer in its class to offer continuous sensing and data display!

Features and Benefits

- Displayed Info:
 - Viscosity (cP or mPa•s) - % Torque - Speed/Spindle
 - Temperature (°C or °F)
 if optional RTD Temperature Probe is installed
- RS-232 PC interface for use with optional Wingather Software
- Analog outputs for recording torque and temperature
- 18 speeds provide great range capability
- Direct access to time measurement function (time to torque, time to stop)
- Accuracy: ±1.0% of range
- Repeatability: ±0.2%
- Output connection to printer
- Auto Range Showing
 - Full scale range (FSR) at 100%
 - Maximum viscosity measured with Spindle/Speed combination
- Scroll Keys for Simple Selection of Speed & Spindle
- Optional RTD Temperature Probe DVP-94Y
 - Instrument must be configured upon purchase.
- Temperature off-set capability to ±1°C

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVDV-IP	1*	2M	.3-100	18
RVDV-IP	100	13M	.3-100	18
HADV-IP	200	26M	.3-100	18
HBDV-IP	800	104M	.3-100	18

* Minimum ranges can be extended to as low as 1 cP with the use of Brookfield Accessories

** Standard torque range values

M = 1 million cP = Centipoise mPa•s = Millipascal•seconds



DV-E Viscometer

our lowest cost digital viscometer

Features and Benefits

- No calculations required
 - Direct reading of viscosity in cP or mPa•s
- Displayed Info:
 - Viscosity (cP or mPa•s) - % Torque - Speed/Spindle
- Easy-to-Use:
 - Flip a switch - Turn a knob
- Spindle/Speed Selection
- Flip to "Speed"
 - Turn the knob - Choose RPM
- Flip to "Spindle"
 - Turn the knob - Choose spindle
- Auto Range push for determining full scale range (FSR) viscosity
- 18 Speeds for complete range capability
- Accuracy: ±1.0% of range
- Repeatability: ±0.2%

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVDV-E	1†	2M	.3-100	18
RVDV-E	100††	13M	.3-100	18
HADV-E	200††	26M	.3-100	18
HBDV-E	800††	104M	.3-100	18

† 1 cP achieved with UL Adapter accessory. 15 cP on LV with standard spindles.

†† Minimum viscosity is achieved with optional RV/HA/HB-1 spindle.

M = 1 million cP = Centipoise mPa•s = Millipascal•seconds



Dial Reading Viscometer

our original...over 75 years!

Features and Benefits

- The Worldwide Standard Viscometer
- Easy-to-Select Speeds
- Electronic Drive means quiet, reliable operation
- Analog display
 - Shows % Torque
 - Use Factor Finder to convert reading to centipoise
- Simple-to-use, easy setup
- 2-Year Limited Warranty
- Available in explosion proof U.L. Class 1, Group D locations (w/o Electronic Drive)
- Accuracy: $\pm 1.0\%$ of range
- Repeatability: $\pm 0.2\%$

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVT	1†	2M	.3-60	8
RVT	100††	8M	.5-100	10
HAT	200††	16M	.5-100	10
HBT	800††	64M	.5-100	10

† 1 cP achieved with UL Adapter accessory. 15 cP on LV with standard spindles.
 †† Minimum viscosity is achieved with optional RV/HA/HB-1 spindle.
 M = 1 million cP = Centipoise mPa•s = Millipascal•seconds

YR-1™ Yield Stress Rheometer

a low-cost QC tool to enhance material characterization

Features and Benefits

- Displayed Information:
 - Yield Stress (Pa or dynes/cm²)
 - % Torque
- EZ-Yield Software included for use with a PC
- Temperature Probe included (not shown)
- Vane Spindle Geometry works with thin to highly viscous materials (Does not disturb sample during spindle insertion)
- Choice of Spindle Sizes to fit any sample container
- Ideal for QC
- User-friendly Keypad and display for stand-alone operation
- Simple to use
- Excellent repeatability
- Affordable



KU-2™ Viscometer

for Paints, Coatings and Inks

Features and Benefits

- ASTM D562 Compatible (industry specification)
- Easy to use: no weights, simplifies an established test procedure
- LED Display Info:
 - Krebs Units
 - Gram Units (Weight)
 - Centipoise*
 - Select Krebs or Grams or Centipoise
- Lock-In Test Results with Hold Switch
- Accuracy: $\pm 1.0\%$ of range
- Repeatability: $\pm 0.5\%$
- Standard Krebs Spindle
- Measurement range: 40 to 141 KU, 32 to 1099 gm, and 27 to 5274 cP*
- Printer Connection for automatic test documentation
- Adapter provided for 1/2 Pint, Pint, & Quart Containers

*Centipoise values based on the conversion from Krebs Units as defined in the ASTM D562.



Wells/Brookfield Cone & Plate

for Small Samples

Features and Benefits

- Determine absolute viscosity of small samples (0.5 – 2.0 mL)
- Available in these models
 - DV-III Ultra Rheometer
 - DV-II+Pro Viscometer
 - DV-I Prime Viscometer
- Accuracy: $\pm 1.0\%$ of range
- Temperature range 1°C to 100°C
- Repeatability: $\pm 0.2\%$
- Electronic Gap Adjustment™
 - Simplified setup - Accurate - Easy-to-use
- RTD Temperature Sensor in Sample Cup (Optional) provides direct measurement of sample temperature
- Control Sample Temperature using a Brookfield circulating water bath
- Rapid temperature control due to small sample size
- Precise shear rates for determining a material's flow curve behavior

MODEL	VISCOSITY RANGE* cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVDV-III UCP	.1	92K	.01-250	2.6K
LVDV-II+PCP	.2	92K	.01-200	54
LVDV-IPCP	.3	30K	.3-100	18
RVDV-IIIUCP	1	983K	.01-250	2.6K
RVDV-II+ PCP	1.6	983K	.01-200	54
RVDV-IPCP	3	327K	.3-100	18
HADV-III UCP	2.6	2M	.01-250	2.6K
HADV-II+ PCP	3	2M	.01-200	54
HADV-I P CP	6.6	655K	.3-100	18
HBDV-III UCP	10.5	7.8M	.01-250	2.6K
HBDV-II+ PCP	13	7.8M	.01-200	54
HBDV-I P CP	26	2.6M	.3-100	18

M = 1 million K = 1 thousand cP = Centipoise mPa•s = Millipascal•seconds
 mL = Milliliter N = RPM e.g. Spindle CPE-40 7.50 x 10 (rpm) = 75.0 sec⁻¹
 * Dependant upon cone selected



CAP1000+™ and CAP2000+™

Cone & Plate Viscometers

Features and Benefits

- Keypad for direct input of test parameters
- Cone Spindle is easily removed for cleaning
- Easy-to-use Control Handle for accurate, automatic cone positioning
- Designed to handle repetitive testing in production environments with easy setup and cleaning
- 4-Line display allows simultaneous viewing of all test parameters
- Choice of instruments:
 - CAP1000+ (single speed)
 - CAP2000+ (variable speed)
- Automatic cone / gap positioning
- Small sample size (less than 1mL)
- Built-in Peltier Plate for temperature control of sample:
 - L Series: 5°C — 75°C
 - H Series: 50°C — 235°C

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
CAP 1000+	Ask for details	900/750	2	
CAP 2000+	Ask for details	5-1k	995	

* Dependant on cone selected.
M = 1 million K = 1 thousand cP = Centipoise mPa•s = Millipascal•seconds



Optional
CAPCALC32
Software

DV-III™ Ultra Rheometer

for measuring viscosity and yield stress

Features and Benefits

- The "all-in-one" tool to easily predict a material's complete flow behavior
- Displayed Info:
 - Viscosity (cP or mPa•s) - Temp. (°C or °F) - Shear Rate/Stress
 - % Torque - Speed/Spindle - Step Program Status
 - Math Model Calculations
- 2600 Speeds to characterize a wide range of flow behavior
- Built-in math models for data analysis in stand-alone mode, e.g. Casson, Bingham, Power Law
- Analyze characteristics such as yield stress, flow curves, (mixing, pumping, spraying), leveling and recovery
- Download custom test programs with RheoLoader software (included with instrument)
- Bi-directional RS-232 PC interface provides optional computer control and automatic data gathering capability
- Complete computer control using optional Rheocalc32 software lets you control all aspects of rheological testing directly from the computer
- Built-in RTD temperature probe

MODEL	VISCOSITY RANGE cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
LVDV-IIIU	1†	6M	.01-250	2.6K
RVDV-IIIU	100††	40M	.01-250	2.6K
HADV-IIIU	200††	80M	.01-250	2.6K
HBDV-IIIU	800††	320M	.01-250	2.6K
5*HBDV-IIIU	4K	1.6B	.01-250	2.6K

† 1 cP achieved with UL Adapter accessory. 15 cP on LV with standard spindles.
†† Minimum viscosity is achieved with optional RV/HA/HB-1 spindle.
B = 1 Billion M = 1 million K = 1 thousand cP = Centipoise
mPa•s = Millipascal•seconds

- Stand-alone programming: Enter test method steps, temperature requirements, start program, see results on built-in display
- Accuracy: ±1.0% of range • Repeatability: ±0.2%
- USB Connectivity



Full Graphic Display Programmable Controller shown



Temperature Control

You need to control sample temperature during viscosity measurements

Temperature control during viscosity measurement helps insure accurate test results. The addition of a Brookfield circulating water bath is a smart investment. The Brookfield TC Series Circulating Water Baths are uniquely configured for use with your Brookfield Viscometer or Rheometer.

Programmable Controllers

- offer the highest level of performance, flexibility, and control for the most demanding applications.
 - Full graphic display with help menus
 - Intuitive, one-touch control
 - Time and temperature programming with data logging
 - RS-232 Interface – Use with Rheocalc™ or RheoVision™ Software
 - Built-in service reminder
 - Five speed pump control



Digital Controllers

- have easy-to-use controls. Just dial in your set-point and push a button, you're done!
 - LED readout displays set point and fluid temperature
 - 3 adjustable temperature pre-sets
 - Unique rotary control allows rapid set-point adjustments
 - Two speed pump



Model	Temp.	Temp.	Temp.	Reservoir Capacity
	Low Range	High Range	Stability†	
TC-602P	-20°C	+200°C	0.01°C	6.0 ltrs.
TC-602D	-20°C	+150°C	0.05°C	6.0 ltrs.
TC-502P	-20°C	+200°C	0.01°C	6.0 ltrs.
TC-502D	-20°C	+150°C	0.05°C	6.0 ltrs.
TC-202P*	-20°C	+150°C	0.01°C	10.0 ltrs.
TC-202D*	-20°C	+150°C	0.05°C	10.0 ltrs.
TC-102P*	-20°C	+200°C	0.01°C	6.0 ltrs.
TC-102D*	-20°C	+150°C	0.05°C	6.0 ltrs.
TC-351	-20°C	N/A	N/A	N/A

*For use at lower temperatures, use the built-in tap water cooling, or use model TC-351 Cooler for control to -20°C.

**Tap water connection required.

N/A - Not Applicable

†Temperature stability may vary depending on bath volume, surface area, insulation and type of fluid.

Note: 1. Specify voltage and frequency when ordering.



R /S-CPS Plus™ Rheometers

Cone/Plate & Plate/Plate Systems DIN Geometry for small samples and wide shear rate ranges
For Viscosity & Rheology of Cream, Paste, Syrup, Slurries, Liquids, Inks, etc.

Features and Benefits

- Controlled shear stress/shear rate operation makes it easy to study material behavior from initial yield to flow curve response
- User-friendly keypad and display for stand-alone operation
- Rheology software for PC control and data acquisition / analysis
- Very small sample size permits rapid test set up and clean up
- Temperature control choice of Bath or Peltier Device
- Quick connect coupling system easy spindle attachment

MODEL	VISCOSITY RANGE* cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
R/S-CPS Cone/Plate	10	3.2M	0-1000	>10K
R/S-CPS Plate/Plate	10	9.9M	0-1000	>10K

R/S-CC™ Plus Rheometer

Coaxial Cylinder DIN / ISO Geometries for single point QC or full rheological profiling
For Viscosity & Rheology of Liquids, Paste, Slurries, Foods, etc.

Features and Benefits

- Controlled shear stress/shear rate operation makes it easy to study material behavior from initial yield to flow curve response
- Rheology Software for PC control and data acquisition/analysis
- Temperatures from -20°C to 180°C
- Quick Connect Coupling for easy bob (spindle) attachment
- Temperature Control by Direct immersion in bath
 - External circulation using the FTK Water Jacket

MODEL	VISCOSITY RANGE* cP(mPa•S)		SPEEDS	
	Min.	Max.	RPM	Number of increments
R/S-CC Coaxial Cylinder	1	30M	0-1000	>10K



R/S-SST Plus™ Rheometer

Soft Solids Tester for Viscosity & Rheology of pastes, slurries and materials with particulates
(Gypsum-ASTM C474)

Features and Benefits

- Measured Values
 - Yield Stress
 - Recovery
 - Shear Modulus
 - Creep
- Quantifies meaningful properties like stiffness, wobbliness, sloppiness, consistency and texture
- Capable of measurements in BU units for highly viscous materials such as joint compound for gypsum
- Vane Spindle Geometry
 - Quick-Connect coupling
 - Easy-to-test method
 - Allows spindle insertion without compromising sample structure
- Coaxial Cylinders can also be used for complete flow curve analysis

MODEL	Shear Stress (Pa)	
	Min.	Max.
R/S SST Soft Solids Tester	6	109K



PFT™ Powder Flow Tester

Quick & Easy Analysis of Powder Flow behavior using proven scientific method AST D6128, USP 1174 method

The PFT Powder Flow Tester brings quick and easy analysis of powder flow behavior in industrial processing equipment. Evaluate powder discharge from storage containers. Use as QC check for incoming materials. Rapidly characterize new formulations for flowability and adjust composition to match flow behavior of established products.

Data Output:

- Flow Index for Powder Flowability
- Bulk Density Curve (Initial Pour Density & Tap Density)
- Arching Dimension (Index)
- Rathole Diameter
- Hopper Half Angle
- Gravity Chute Angle (Wall Friction Angle)

PFT Powder Flow Tester Specifications

Load for Vertical Axis Compression:	7 kg — Accuracy $\pm 0.6\%$ FSR
Axial Speeds:	0.1mm/second up to 5mm/second
Distance:	Accuracy $\pm 0.3\text{mm}$
Torque:	$\pm 7.0 \text{ N}\cdot\text{m}$ — Accuracy $\pm 1.2\%$ FSR
Sample Volume	230 CC or 36 CC Small Volume Cells

* Requires Part No. DVP-94Y † Requires Part No. PFT-607Y

It has been estimated that powders account for 80% of materials used in industry. Handling and processing powders, particulates and granules is central to the manufacturing industry, but has traditionally been fraught with problems due to their unpredictable and irregular behavior, specifically with respect to flowability. With so many raw materials, semi-finished and finished products in powder form, manufacturing companies stand to gain significant manufacturing and commercial benefits from improvements in the assessment of powder flow. Recent technological developments are now poised to deliver those advantages.

The benefits of accurately characterizing powder flow measurement can far outweigh this investment of time.

New product development/benchmarking:

Product development teams can evaluate new excipients, active ingredients and formulations, predicting their behavior prior to commencing large-scale production. They can also check how new powders interact with existing constituents. This speeds up development time and minimizes "trial and error" tactics; especially important when active ingredients are extremely valuable and may have only been produced in small quantities.

Improving quality:

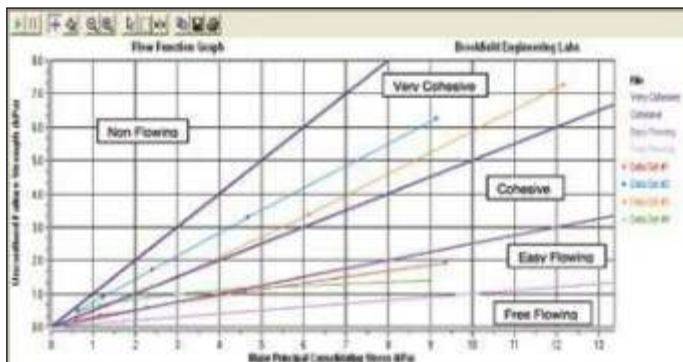
Predictable powder flow enables constituent selection, manufacturing procedures and equipment to be optimized. This in turn maximizes speed of production, reduces the risk of stoppages and improves blend quality, filling procedures and end product quality.

Delivering cost-savings:

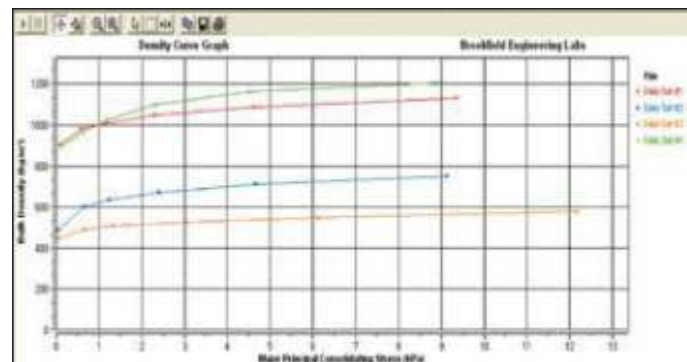
As costs are required to be driven down, the substitution of expensive constituents with lower cost powders is an attractive prospect. Although these substitutes may be produced to the same specification as the original substance, they may not necessarily store, convey and process as easily. Discovering this after production has started would incur downtime and additional cost. Final product quality may also be compromised.

Applications

- Top Particle Size: 5 mm, 90% < 3 mm
- Beverage Mixes
- Construction Materials:
- Cement
- Fly ash
- Gypsum
- Hydrated Lime
- Cosmetics
- Detergents
- Foods:
- Cereal
- Chocolate
- Flour
- Seasonings
- Spices & Flavorings
- Minerals
- Pharmaceuticals
- Starch



Flow Function Graph (230cc Trough)



Bulk Density Graph (230cc Trough)



Thermosel™

for Elevated Temperature Testing

Features and Benefits

- Compatible with standard Brookfield Viscometers and DV-III Ultra Rheometers
Note: requires optional cable DVP-141
- Provides control of sample temperature up to +300°C
- EZ-Lock Option: Thermosel is now available with special EZ-Lock spindle coupling for use on standard Brookfield Viscometers/Rheometers already equipped with the EZ-Lock feature
- Thermo Container (Heating chamber)
- Temperature Ramping between set points is possible if used with Rheocalc (DV-III Ultra & DV-II+Pro) Software
Note: requires optional cable HT-106
- Computer Controlled when used with DV-II+Pro or DV-III Ultra and Rheocalc32 Software (HT-106 cable required)
- Programmable Temperature Controller offers single set point or up to 10 programmable set points
- Direct Temperature Control Possible with DV-III Ultra Rheometer

Standard Sample Chamber with embedded temp. probe provides direct temperature measurement of sample



Disposable Sample Chamber (Requires SSA-DCU Water Jacket)

Small Sample Adapter™

for rheological evaluation where sample volume is limited

Designed to provide an alternative for those customers having limited sample sizes (2 to 16ml)

Features and Benefits

- Cylindrical geometry provides calculable shear rates.
- Optional RTD Temperature Sensor embedded in Sample Chamber provides accurate monitoring of sample temperature during viscosity measurement.
- Simple attachment to any standard Brookfield Viscometer or DV-III U Rheometer
- Complete with choice of 1 sample chamber and spindle, water jacket, attachment hardware and storage case.

Enhanced UL Adapter™

ideal for low viscosity materials

Features and Benefits

- Reduces measuring range to as low as 1 cP, depending on viscometer used
- Simple attachment to a standard Brookfield Viscometer or DV-III Ultra Rheometer
- Small sample size: 16 mL
- Cylindrical geometry provides defined shear rates for detailed product analysis
- Removable cap of low density polyethylene can be considered disposable for one-time use if required
- Stainless steel parts are easily cleaned



Helipath Stand™

designed for measurement of non-flowing substances

Features and Benefits

- For viscosity/consistency measurement of gels, pastes, creams, putty, gelatin and other non-flowing substances.
- A Brookfield Viscometer or Rheometer is mounted on the Helipath drive motor and a T-bar spindle is attached to the viscometer using a special coupling. The drive motor slowly lowers or raises the viscometer so that the T-bar spindle creates a helical path through the test sample thus eliminating the problem of "channeling".
- Compatible with standard Brookfield Viscometers and DV-III Ultra Rheometers
- Simple to set up and clean
- Provides a solution for hard-to-measure materials
- Complete with drive motor, 6 T-bar spindles with coupling, case, lab stand, rod and base



Vane Spindles

for Foods, Cosmetics, Sealants...

...for use with paste-like materials, gels and fluids where suspended solids migrate away from the measurement surface of standard spindles.

Features and Benefits

- Minimal disruption of sample during spindle immersion
- Keeps particles in suspension during testing cycle
- Viscosity data includes complete flow curve analysis when software is used
- Provides information on yield behavior at low rotational speeds
- Follows industry recommendations on length/diameter ratios for vane spindles
- 3-piece spindle set for versatile range capability
- Optional V-74 and V-75 spindles for even greater range capability and immersion into small size sample containers



Silicone Viscosity Standards

Provide a convenient reliable way to verify the calibration of Brookfield Laboratory Viscometer / Rheometer.

(Viscosity Standards are Calibrated at 25°C & supplied along with NIST Traceable Certificate in 500 ml bottle.)

General Purpose Silicone Fluids

Part No.	Nominal Viscosity cP (mPa·s)	Temp °C
5 cps	5	25°C
10 cps	10	25°C
50 cps	50	25°C
100 cps	100	25°C
500 cps	500	25°C
1000 cps	1,000	25°C
5000 cps	5,000	25°C
12500 cps	12,500	25°C
30000 cps	30,000	25°C
60000 cps	60,000	25°C
100000 cps	100,000	25°C



(Note: Special Oil Viscosity Standards available on request for CAP, R/S, C/P, KU Viscometers / Rheometers)



(Note: Special standards available on request for specific viscosity or specific temp.)

Brookfield Advanced Application Laboratory

“ The opening of this Advanced Lab will help the Brookfield customers in India with Application Support & Product Demonstration ”



“ The Lab will serve our customers in West Asia, Africa & the ASEAN nations as a knowledge resource centre for Viscosity, Rheology & Powder Flow Analysis ”

ESTEEMED CUSTOMERS



What is the objective of the laboratory?

- To establish a long term service and application support commitment to our valued customers.
- The laboratory will be utilised for demonstrating various applications of instruments/equipments, providing training to customers and also helping them with method development and trouble shooting.
- To provide quality solutions in terms of assessing a complete satisfaction before investing into the product.

What is the Current Laboratory Setup?

- The instruments available are: UV, HPLC, GC, Viscometers, Rheometers, Powder Flow Tester, PCR, Rotary Evaporator, Centrifuge, Balances, etc...

What is the uniqueness of Brookfield's product in the laboratory?

- Customers will be benefited as they will be able to see the instruments and check its utility before it is installed in their own laboratory.
- As part of customer support, customer's analysis of customer's sample will be done on the instrument available in the laboratory.
- With this facility customers can recruit their lab chemist for advanced level hands-on training on high-end analytical instruments.