Overview | Moisture Analysers

Moisture analysers or balances are used to measure moisture content for an array of substances. It helps industries in achieving product consistency, ensuring compliance with standards and enhancing overall quality.

Moisture Analaysers work on the 'Loss on Drying' principle:

- A sample is weighed
- The sample is subjected to controlled heat and airflow
- As the moisture evaporates, the analyser measures the weight loss, calculating the moisture content

The most well known types of moisture analysers are the Halogen and Infrared type, that use halogen bulbs to heat and dry samples or infrared lamps respectively. Halogen are the most popular option due to their versatility, accuracy, speed and ease of use.

LabCo Scientific distribute the MS, MF, ML Halogen Moisture Analysers Manufactured by AND in Japan.

INDUSTRIES & APPLICATIONS

FOOD & BEVERAGE

Determining the optimal moisture in food products to enhance taste, texture and shelf life.

- Grain & Cereal Production & Milling
- Meat Processing
- Dairy Products
- Snack Foods (chips, pretzels)
- Beverage Production
- Coffee Roasting
- Pet Food
- Spices & Seasoning

PHARMACEUTICAL

Ensuring the quality and efficacy of medications.

- Drug Formulation
- Quality Control of Raw Materials
- Tablet & Capsule Production
- Powder Blending
- Research & Development

POLYMERS

Evaluating moisture levels to prevent defects.

- Raw Material Inspection
- Injection Moulding
- Extrusion Processes
- Blow Moulding
- Thermoforming
- Polymer Blending
- Resin Drying

ENVIROMENTAL MONITORING

Analysing soil, sludge and waste samples.

- Soil Analysis
- Wastewater Treatment
- Air Quality Monitoring
- Environmental Research
- Construction Materials Testing
- Agriculture & Crop Monitoring
- Landfill Monitoring

PAPER & PACKAGING

Analysing pulp, paper and paperboard to produce the desired thickness, strength and printability.

- Paper Production
- Paper Recycling
- Packaging Materials
  - For Food & Pharmaceutical Companies
- Adhesive Applications
- Tissue & Hygiene products

A&D Moisture Analyser

FEATURES + BENEFITS

Fast and Uniform Heating
Halogen lamps and the uniquely designed Secondary Radiation Assist (SRA) filter allow for shorter measurement time, thanks to fast and uniform heating.

High Repeatability
The Super Hybrid Sensor (SHS) allows for ultra accurate moisture content determination, even when weighing a small sample.

Low Moisture Content Measurement
MS-70 measures the moisture content at 0.001% resolution suitable for low moisture content samples as well as the Karl Fischer method, yet requires no special knowledge or training and produces no harmful waste.

Accuracy Checking
Sodium Tartrate Dihydrate is a chemical material that has a stable moisture content of 15.66%+0.3/–0.1 and thus is best to use for accuracy checking to maintain the reference value of the analyser (Supplied as standard with MS &MF models).

Memory Function
Stores up to 20 predetermined measurement conditions, which saves time and prevents the user from making an error. For measurement results, up to 100 results can be stored and output at once. (MF & ML models store less - refer to technical specifications).

Four Measurement Programs
Four choices of measurement programs: Automatic, Quick, Timer and Manual Mode are provided.

Low Maintenance
The halogen lamp is user replaceable without any downtime and has a protective chamber for easy cleaning (Lamp life 5,000 hours).

Conforms to GLP Standards

Additional features available for MS model only

Real-time graph display software
WinCT-Moisture is an original software application designed to display a graph of moisture content rate change while measuring with a connected PC.

Calibration of the heater temperature
With the temperature calibrator (optional), calibration result can be output in the format that conforms to GLP, GMP, ISO

OPERATION

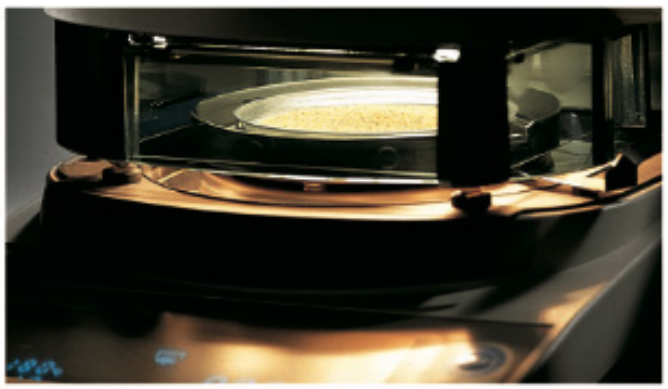
Large VFD Display
The settings displayed on the screen are: Measurement, setting value, change in moisture content, action status, data number.

Selectable Heating Mode
Choose from standard, quick, step and ramp heating modes for the most suitable measurement (ML has Standard and Quick heating modes only).

Easy Handling
The specially designed handle on the sample pan makes it easy and safe to move it in and out of the unit without the risk of burns.

Additionally, there's a convenient wing handle for effortlessly opening and closing the heater cover.

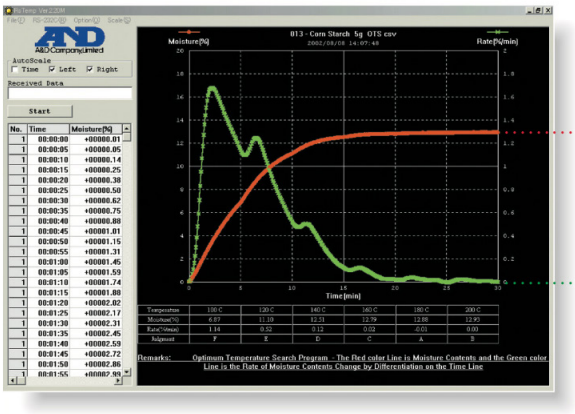
Progress Window for Real Time Visibility
Users can monitor the progress of the moisture analysis in real-time, allowing for immediate feedback on the process. This can be particularly useful for ensuring that the analysis is proceeding as expected and for catching any issues early.



WinCT-Moisture Software

WinCT–Moisture software allows data measured by the Moisture Analysers to be easily displayed on your computer.

Note - All models come with RS-232C as standard.



Displays moisture rate changes over time in a graph, in real time

Measures moisture rate quickly with excellent accuracy

Heats at the highest temperature without changing the physical properties of the sample and provides measurements with good repeatability

Automatically determines the most suitable heating conditions in a short time

Automatically changes the heat applied by the set increments and interval time within a range of 30°C - 200°C.

Shows sample data summary

Provides a data summary for the sample with the results of moisture rate change for the representative material's measurement

GET THE BEST OUT OF YOUR MOISTURE ANALYSER

To get the best out of your moisture analyser, you can do the following:

- Follow the instructions provided by the manufacturer
- Calibrate regularly
- Make sure the food sample is at room temperature before testing.
- Sample preparation: If required, cut the sample into small pieces so that it will fit into the analyser pan properly.
- Grind the food into a powder if necessary.
- Be careful not to overload the moisture analyser test pan.

TECHNICAL & ORDERING INFORMATION

MS-70

MF-50

BEST SELLER

ML-50

BONUS Compact Balance with purchase!

HT500 Model 510g x 0.1g

Login to check prices

PRODUCT CODE / MODEL NUMBER	MS-70	MF-50	ML-50
MEASUREMENT METHOD	400W straight halogen lamp heating system with SRA filter and SHS weighing technology		
MAX SAMPLE WEIGHT CAPACITY	71g	51g	
WEIGHT RESOLUTION	0.0001g	0.002g	0.005g
MOISTURE CONTENT DISPLAY	0.001%/0.01%/0.1%	0.20%	0.5%
MOISTURE CONTENT ACCURACY (STANDARD DEVIATION)	0.05%	0.20%	0.5%
	0.01%	0.05%	0.1%
HEATING TECHHNOLOGY	Halogen lamp (Straight type, 400 Watt max, 5,000 hours)		
DRYING TEMPERATURE (1˚C INCREMENT)	30 - 200˚C	50 - 200˚C	
MEMORY OF MEASUREMENT PROGRAMS	20 sets	10 sets	5 sets
MEASUREMENT PROGRAMS	Automatic Mode / Quick Mode / Timer Mode / Manual Mode		
MEASUREMENT MODE	Moisture content (Wet or Dry base) / Dry content / Ratio / Weight		
HEATING MODE	Standard / Quick / Step / Ramp		Standard / Quick
DISPLAY TYPE	Large VFD		
INTERFACE	RS-232C Standard		
DATA MEMORY FUNCTION	100	50	30
OPERATING TEMPERATURE	5 - 40˚C (41-104˚F) less than 85% RH		
GLP/GMP/ISO	Available		
SELF CHECK FUNCTION	Standard		
COMMUNICATION SOFTWARE	WinCT-Moisture Standard	WinCT Standard	—
SAMPLE PAN SIZE	Ø85mm		
POWER	AC 100V to 120V (3A) or AC 200V to 240V (1.5A), 50/60 Hz, Approx. 400W		
PHYSICAL DIMENSION/WEIGHT	215mm (W) x 320mm (D) x 173mm (H) / Approx. 6kg		
STANDARD ACCESSORIES	Sample Pans 85mm re-usable (20x for MS/MF and 10x for ML)		
	Pan Handles (2x for MS/MF, 1x for ML) | Tweezers (for MS/MF)		
	Spoon (for MS/MF) | 30g of Sodium Tartrate Dihydrate for (MS/MF)		
	CD-ROM (WinCT-Moisture for MS) | Glass Fibre Sheet (for MS/MF)		
	RS-232C Cable (for MS) | Display Cover | Dust Cover (for MS/MF)		
	Instruction Manual | Quick Reference Card | Power Cable | Fuse		

Specifications are subject to change for improvement without notice.

Overview | Viscometers

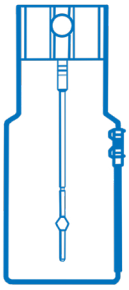
A viscometer is a precision instrument designed for measuring the viscosity of various fluids, including substances like paint, coatings, plastics, food products, and creams. Viscosity quantifies a liquid's inherent resistance to flow, providing valuable insights into its thickness or thinness. This parameter holds immense significance across diverse industries, as it directly influences product quality, consistency, and overall performance.

LabCo® Scientific is proud to supply IKA® Rotational Viscometers based on the SEARLE principle. Having quickly gained recognition for their cutting-edge technology, precision, and ease of use. IKA's modern features and exceptional reliability make these viscometers stand out from the crowd.

VARIATIONS

The below Viscometers are the most widely used:

Rotational Viscometer



Rotational viscometers are suitable for both Newtonian and Non-Newtonian fluids.

A rotational viscometer operates by immersing a spindle into a liquid to assess its viscosity. The viscometer starts by rotating the spindle at a controlled speed. As the spindle rotates, it encounters resistance from the liquid, and this resistance, often referred to as torque, is measured by the viscometer.

The viscometer calculates the viscosity of the liquid based on the recorded torque and the rotational speed. With the IKA® ROTAVISC, all calculations happen automatically, no further manual settings are necessary.

The higher the torque required to maintain the rotation at a specified speed, the more viscous or thicker the liquid.

Capillary Tube Viscometer

A capillary tube (or U-Tube) viscometer operates on the principle of fluid flowing through a narrow tube, known as a capillary.

When a Newtonian liquid is introduced into the capillary tube, gravity or an external force, such as a piston, applies pressure to the liquid. As the liquid flows through the narrow capillary, it experiences resistance due to the tube's small diameter.

The rate of flow is determined by the viscosity of the liquid; thicker, more viscous liquids flow more slowly through the capillary compared to thinner ones.

By measuring the time it takes for a specific volume of liquid to pass through the capillary under controlled conditions, the viscometer calculates the viscosity of the liquid.

Falling Ball Viscometer

A falling ball viscometer operates on the principle of measuring the resistance of typically Newtonian fluid to the motion of a sphere, usually a ball or a cylinder, as it descends through the liquid.

When the ball is released from a certain height above the liquid's surface, gravity pulls it downward.

The liquid's viscosity determines the extent to which the ball is slowed down during its descent. Thicker, more viscous fluids exert a greater drag force on the falling object, causing it to descend more slowly, while thinner fluids allow for quicker descent.

By measuring the time it takes for the ball to travel a specified distance through the liquid under controlled conditions, the viscometer calculates the viscosity of the fluid.

Newtonian Fluids
Have a constant viscosity, meaning their thickness or resistance to flow doesn't change with the force you apply. The faster you push or stir them, the more they flow, but their behaviour remains predictable, e.g. water

Non-Newtonian Fluids
Change their viscosity depending on the force or stress applied to them (shear thinning or shear thickening), e.g. ketchup

Viscometer | IKA® ROTAVISC

IKA ROTAVISC lo-vi
Viscosity measuring range: 1 to 6,000,000 mPas

IKA ROTAVISC me-vi
Viscosity measuring range: 100 to 40,000,000 mPas

IKA ROTAVISC hi-vi I
Viscosity measuring range: 200 to 80,000,000 mPas

IKA ROTAVISC hi-vi II
Viscosity measuring range: 800 to 320,000,000 mPas

Unsure which model will suit your application?

Simply complete this form and our experts will be in touch.

PRODUCT CODE	DESCRIPTION	VISCOSITY RANGE	PACK SIZE
00250003101	ROTAVISC lo-vi	1 to 6,000,000mPas	Each
00250003111	ROTAVISC me-vi	100 to 40,000,000mPas	Each
00250003121	ROTAVISC hi-vi I	200 to 80,000,000mPas	Each
00250003131	ROTAVISC hi-vi II	800 to 320,000,000mPas	Each

Login to check prices

Included in delivery: Viscometer, Rotastand, Relevant spindle set, PT100.8 Temperature Sensor, Guard Rail & USB cable.

Applications & Industries

PERSONAL CARE / COSMETICS

Viscometers ensure that cosmetic formulations achieve the desired texture and consistency, vital for a positive user experience. From hair care products to skincare serums and fragrances, rotational viscometers play a pivotal role in quality control, enabling manufacturers to create products that offer optimal performance and customer satisfaction.

Typical Applications

- Shampoo & Conditioner
- Toothpaste Manufacturing
- Hair Care Products
- Sunscreen & Skincare Products
- Fragrance Productions

PHARMACEUTICAL

Viscometers are essential for formulating medications, topical ointments, and suspensions with exacting viscosity specifications. Additionally, they are crucial in parenteral formulation, biopharmaceutical research, and process optimisation, ensuring that IV drugs, biologics, and protein solutions adhere to critical viscosity ranges for safe and effective administration.

Quality control across pharmaceutical production further relies on rotational viscometers to meet regulatory requirements and uphold product integrity.

Typical Applications

- Pharmaceutical Formulations
- Oral Care Products
- Gels for wound care
- Parenteral Formulations
- Quality Control

FOOD & BEVERAGE

Food and beverage manufacturers depend on rotational viscometers to maintain the quality and consistency of their products, ensuring they possess the desired texture and flow properties. Viscometers play an important role in quality control as it enables manufacturers to adhere to strict industry standards and regulatory requirements.

- Quality Control
- Quality Assurance
- Product Development
- Process Optimisation

Typical Applications

- Sauces and Gravies
- Ketchup and Mustard
- Chocolate
- Batters
- Dairy Products
- Fruit Juices
- Smoothies
- Syrups
- Protein Shakes

PAINTS & COATINGS

This sectors deal with materials that have a wide range of viscosities, and precise viscosity control is critical for consistent application, durability, and appearance.

Viscometers help to maintain the ideal viscosity of formulations, ensuring that paints, coatings, adhesives, etc. can be applied smoothly and evenly, whether on walls, paper, or other surfaces.

This not only enhances the end-user experience but also prevents issues like uneven coverage, streaking, or dripping.

Typical Applications

- Paint Formulation
- Coating Thickness
- Adhesive Production
- Paint Spraying
- Curing & Drying
- Pigment Dispersion
- UV Curing
- Screen Printing
- Polymer Production
- Resin Formulation

LUBRICANTS & OIL

Viscometers allow manufacturers to measure and control the viscosity of lubricants, ensuring that they meet the specific requirements of engines, machinery, and industrial applications.

Proper viscosity ensures that lubricants flow smoothly, reduce friction, and provide effective lubrication, ultimately extending the lifespan of mechanical components and reducing wear and tear.

Typical Applications

- Engine Oil Quality Control
- Grease Manufacturing
- Oil Formulations
- Turbine Oil Performance
- Aviation Lubricants
- Marine Lubricants
- Hydraulic Fluids
- Used Oil Analysis

PAPER

Precise viscosity control is essential to achieving uniform paper quality, printability and coating applications, ultimately enhancing the overall products appearance and performance.

In a highly competitive market, the ability to consistently produce high quality paper products is paramount and viscometers are invaluable tools for achieving this level of precision and efficiency.

Typical Applications

- Pulp Viscosity
- Coating Formulations
- Ink Manufacturing
- Adhesive Application

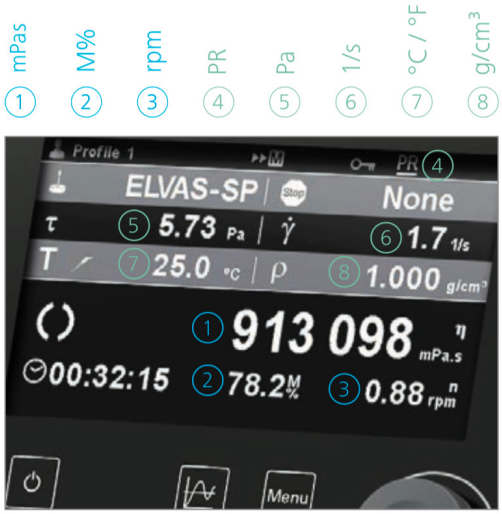
FEATURES + BENEFITS

Parameter Display

The generous 4.3" TFT display allows for an intuitive menu guidance
The large colour display offers multilingual menu guidance.

Parameters displayed:

1. Viscosity
2. Torque
3. Rotational Speed
4. Program Status
5. Shear Stress
6. Shear Rate
7. Temperature
8. Density



Precise Results From 0.01 – 200 RPM

The accuracy lies at +/- 1% of the maximum value of the measurement range. The reproducibility is +/- 0.2%.

Stepless Measurement

The rotation rate can be set steplessly from 0.01 to 200 rotations per minute over the entire measurement range. This allows the stepless programming of a flow curve.

Stepless Positioning

The ROTASTAND ensures perpendicular stability. The height of the viscometer can be adjusted to your preference.

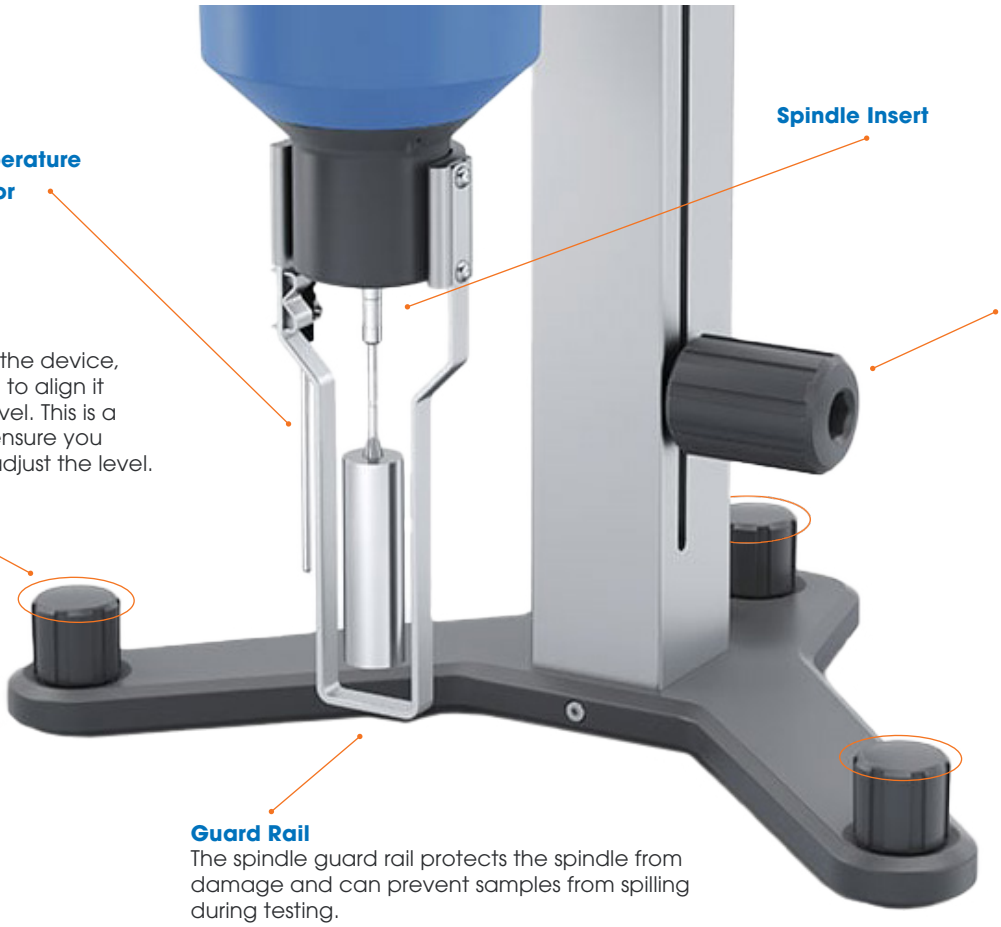
Temperature Control

A temperature sensor is included in the scope of delivery as it's recommended to measure the viscosity in relation to a temperature value. It is possible to measure samples from -100˚C to 300˚C by using suitable accessories.

Three Measuring Modes

Available for different applications: Accurate, Balance and Fast.
Ten different programs and ramps can also be stored.

OPERATION



INSERT THE SPINDLE

There are multiple ways to insert the spindle. Thread adaption, which does not require accessories or you can choose the quick connector or hook connector (available as accessories).

To avoid air bubbles on the spindle, tilt and immerse the spindle into the fluid at a 45˚C angle before attaching (figure 1).

Thread adaption does not require additional accessories. Secure and slightly lift the coupling shaft with one hand and screw the spindle (left hand thread) with your other hand (figure 2).

! Lifting the coupling shaft simultaneously while screwing on the spindle is essential to prevent damage to internal parts.

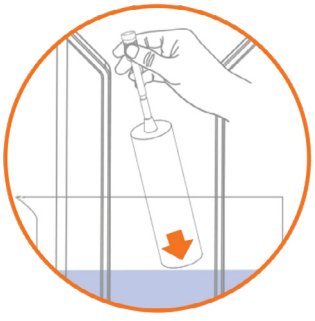


Figure 1

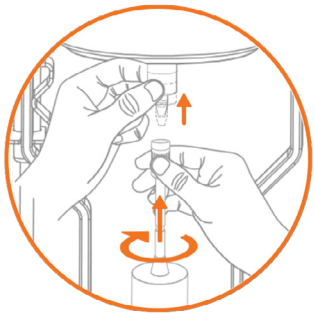


Figure 2

For Best Results:

- Use a standard 600mL low form beaker
- Fluid in the beaker should reach the indentation level on the spindle shaft
- Maintain a constant temperature
- Ensure there are no air bubbles attached to the spindle
- The spindle bottom should be >10mm away from the bottom of the beaker

TECHNICAL SPECIFICATIONS

Technical Data

DESCRIPTION	VALUES
Viscosity Accuracy	1%
Viscosity Repeatability	0.2%
Display	TFT
Motor Rating Output	4.8W
Working Temperature	min. -100°C max. +300°C
Speed	0.01 - 200rpm
Setting Accuracy Speed	0.01rpm
Temperature Measurement Resolution	0.1K
Connection for Ext. Temperature Sensor	PT 100
Graph Function Calibration Option (temperature) Overload Protection	Yes Yes Yes
Operating Mode	Timer and continuous operation
Attachment On Stand	Extension arm
Interfaces	USB, RS 232, Analog output

General Data

DESCRIPTION	VALUES
Weight	7.1kg
Dimensions (WxHxD)	351 x 629 x 372mm
Permissible Ambient Temperature	5 - 40°C
Permissible Relative Humidity	50%
Voltage	100 - 240V
Frequency	50 / 60Hz
Power Input	24W, Standby: 0.06W
Protection Class According to DIN EN 60529	IP 40

Measuring Range

PRODUCT NAME	MEASURING RANGE
ROTAVISC lo-vi	1 to 6,000,000mPas
ROTAVISC me-vi	100 to 40,000,000mPas
ROTAVISC hi-vi I	200 to 80,000,000mPas
ROTAVISC hi-vi II	800 to 320,000,000mPas

Technical Data for ROTASTAND

STROKE MAX.	200mm
DIAMETER	16mm
DYNAMIC LOAD	5kg
DIMENSIONS (W X H X D)	351 x 318 x 246mm
WEIGHT	4.8kg

ORDERING INFORMATION

PRODUCT CODE	DESCRIPTION	VISCOSITY RANGE	PACK SIZE
00250003101	ROTAVISC lo-vi	1 to 6,000,000mPas	Each
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Unsure which model will suit your application?

Simply complete this form and our experts will be in touch.

ACCESSORIES

VOLS-1 Adapter

Suited for expensive and valuable samples where very small volumes are used.

VAN-1 Vane Spindle Set

This set allows the viscosity measurement of products that are paste-like where suspended solids may move away from the spindle.

SAS-1 Spiral Adapter

Suited for very sticky samples.

Standard Silicone Oil

Check the measurement accuracy of your ROTAVISC. Various viscosities available. Certificate is included with delivery.

Temperature Sensor PT 100.8

Stainless steel, Ø3 mm, 75 mm

View the full list of spindles and accessories here

RESOURCES

ROTAVISC PROMO

MENU NAVIGATION

STAND ASSEMBLY

INSTALLATION GUIDE

FAQ

Which Viscometer is best for my sample?

- Lo-vi: Juices, Solvents, Edible Oils, Inks, Liquid Soap
- Me-vi: Paints, Varnishes, Mayonnaise, Dairy Products, Ketchup
- Hi-vi I & Hi-vi II: Pastes, Ointments, Molasses, Gels

How do I check the accuracy of my Viscometer?

You can check accuracy with the certified silicone oil standards supplied by IKA.

Why does the Viscometer measure different viscosities for the same sample?

Generally, viscosity is not a substance-specific constant. The viscosity describes a substance in a well defined state, for instance at temperature X and speed Y. There are samples which reduce their viscosity with increasing speed, like ketchup (shear thinning/ pseudoplastic). For other samples, the viscosity increases with increased speed like starch solutions (shear thickening). Newtonian samples such as water, silicone oil etc do not change their viscosity regardless if the speed increases or decreases.

How long does the measurement take?

To obtain a stable viscosity value, the spindle should have completed 3 to 4 full rotations in the sample. The lower the speed, the longer the measurement takes.

How much sample volume is needed?

The standard spindles in the scope of delivery are suitable for a volume of approx. 500mL in the 600mL beaker. Smaller volumes can be measured with adapters (e.g. VOLS-1).