2017 TACTILE INSTRUMENTS

VISCOMETERS

RHEOMETERS

TEXTURE ANALYZER

TEMPERATURE CONTROL

MEASURING GEOMETRIES

LAMY RHEOLOGY INSTRUMENTS

LAMY RHEOLOGY is the first French manufacturer of measuring instruments for laboratories, research and industry.

LAMY RHEOLOGY is a family-owned and run company that has become the French leader in the rheometer and viscometer market; in 2015, the company is celebrating its 60th birthday. Established by Jean Lamy in 1955, the firm was taken over by his daughter, Danielle Lamy in 1986, then by his grandchildren, Sophie and Eric Martino in 2006, whose takeover marks the completion of a process initiated in the early 90s: for nearly 10 years, LAMY RHEOLOGY has been manufacturing its entire range of products in this way.

The firm, from the Rhône-Alpes, is the only French manufacturer of rheometers and viscometers. It takes advantage of being "Made in France", not for its label, but for its real quality ethics. Generation after generation, it has stayed true to this course of action and because of this the company has established itself as a key player in the industry, recognised for the team's commitment.

The satisfaction of our customers is our priority.

60 years of groundbreaking first and innovative thinking.

LAMY RHEOLOGY
is ISO 9001 certified

News in 2017

CONE-PLATE RHEOMETER

RM 200 TOUCH CP 4000
WITH AUTOMATED GAP

We have developped for you the RM200 CP4000 Cone-Plate Rheometer essential to optimize your rheological measurement. Due to their automated gap, this instrument guarantees to you one perfect simple using. This new RM200 TOUCH Cone-Plate Rheometer owns one AC265 coupling that combines robustness and precision. Your activity domain is cosmetology, pharmacy, paints, inks, coatings or teaching ?
This new Cone-Plate Rheometer was designed for you ■

COME QUICKLY DISCOVER THE FEATURES OF THIS RHEOMETER PAGE 32 TO 33

INNOVATION

NEW DESIGN FOR THE **TEX'AN TOUCH** TEXTURE ANALYSER

LAMY RHEOLOGY OFFERS ITS New texture analyzer the TEX'AN TOUCH,
There is the first Texturometer to propose visualize curves during measurements without the use of external software. Ideal for measuring the consistency, elasticity and stickiness of numerous products.
The TEX'AN TOUCH has a temperature of the sample acquisition and allows all the sensory analysis tests such as TPA or Bloom cycle tests. It is available with a choice of interchangeable load cells ranging from 1 kg to 50 kg. We offer a wide range of standard measurement or measuring probes.
Robust, versatile with an attractive price, the TOUCH TEX'AN is manufactured in France;
TEX'AN TOUCH, texture analyzer essential in quality control as R & D ■

VISCOSITY

B-ONE TOUCH

Viscometer and set of spindles included*

SPRINGLESS INSTRUMENT FOR USE WITHOUT ADJUSTING LEVELS.

ON/OFFLIGHT SWITCH.

ROBUST AND PRACTICAL BAYONET FITTING.

* Spindles L 1 to 4 or R 2 to 7 (see page 58).

TOUCH THE VISCOSITY OF YOUR PRODUCTS WITH YOUR FINGERS

The B-One TOUCH has a 7" touch screen and comes with a stylus.
This easy-to-use screen lets you see all measurement parameters at the same time.

SPECIFICATIONS

TYPE OF INSTRUMENT	Rotating viscometer
ROTATION SPEEDS	Unlimited number of speeds between 0.3 and 250 rpm
TORQUE RANGE	From 0.05 to 13 mNm / From 0.005 to 0.8 mNm (LR VERSION)
ACCURACY	+/- 1 % of the full scale
REPEATABILITY	+/- 0.2 %
VISCOSITY RANGE	With L1 - L4 systems: 15 - 2 000 000 mPa.s With R 2 - 7 systems: 100 - 240 000 000 mPa.s
DISPLAY	7" Touch screen
DISPLAY SETTINGS	Viscosity - Speed - Torque - Time - Measuring geometry - Level of sensitivity - Date/ hour - Choice of viscosity units: cP or mPa.s - Language: French/English
SECURITY AND CONFIDENTIALITY	An "operator" function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code. There is also a protected mode that locks your measurement conditions.
SUPPLY VOLTAGE	90-240 VAC 50/60 Hz
WHAT BENEFITS ARE THERE FOR YOU?	The B-ONE TOUCH lets you set measuring times for thixotropic products. Kinematic viscosity when your product's density is inputted.
CARRY CASE	Optional
DIMENSIONS AND WEIGHT	Head: L180 x W135 x H250 mm / Hardened steel stand: L280 x W200 x H30 mm Stainless steel rod: Length 500 mm / Weight: 6.7 kg

ACTIVITY DOMAINS

FOOD INDUSTRY
COSMETICS PHARMACEUTICALS
PAINT / INK COATINGS
CHEMICAL / PETROLEUM PRODUCTS
CAR INDUSTRY
BUILDING MATERIALS
TEACHING

OPTIONAL MEASURING GEOMETRIES

Spindle KU 1-10:
viscosity range
20 - 5000 mPa.s
(40 - 140 KU)

PORTABLE B-ONE TOUCH

PORTABLE viscometer with carry case

YOUR MEASUREMENTS CAN BE CARRIED OUT CLOSED

Designed to directly control viscosity in process tanks or manufacturing workshops without needing to be plugged in, the Portable B-One Touch guarantees over an hour of measuring time with spindles adapted to your products.

SPECIFICATIONS

TYPE OF INSTRUMENT	Rotating viscometer
ROTATION SPEEDS	Unlimited number of speeds between 0.3 and 250 rpm
TORQUE RANGE	From 0.05 to 13 mNm
ACCURACY	+/- 1 % of the full scale
REPEATABILITY	+/- 0.2 %
VISCOSITY RANGE	100 - 24 000 000 mPa.s depending on the measuring geometry used
DISPLAY	7" Touch screen
DISPLAY SETTINGS	Viscosity - Speed - Torque - Time - Measuring geometry - Level of sensitivity Date/hour - Choice of viscosity units: cP or mPa.s - Language: French/English
SECURITY AND CONFIDENTIALITY	An "operator" function allows you to enter a username for you instrument. This user must then be identified using a 4-digit code. There is also a protected mode that locks your measurement conditions.
SUPPLY VOLTAGE	90-240 VAC 50/60 Hz
WHAT BENEFITS ARE THERE FOR YOU?	The Portable B-ONE TOUCH gives you with an hour of measuring time. Set measuring times for your thixotropic products. Get kinematic viscosity by inputting the density of your product.
CARRY CASE	Included
DIMENSIONS AND WEIGHT	Head: Ø 85 mm Height: 310 mm / Box: L265 x W125 x H65 mm / Weight: 2 kg

ACTIVITY DOMAINS

FOOD INDUSTRY
COSMETICS PHARMACEUTICALS
PAINT / INK COATINGS
CHEMICAL / PETROLEUM PRODUCTS
CAR INDUSTRY
BUILDING MATERIALS
TEACHING

OPTIONAL MEASURING GEOMETRIES

- Spindles L 1 - 4
- Spindles R 2 - 7
- Spindles MK DIN 1 - 3
- Spindles BV 1 - 1000
- Spindles MK-R2 to R5

(see pages 54 to 61)

FIRST TOUCH

Viscometer with temperature sensor

PRECISION RELIABILITY AND NEW DESIGN WITH A 7" TOUCH SCREEN AT A REASONABLE COST.

FOR CONNECTED MEASUREMENTS, THE FIRST TOUCH HAS THE FOLLOWING OUTPUTS: USB / USB HOST / RS232 / LAN.

ACCURATE TEMPERATURE READING THROUGH THE PT100 SENSOR.

THE FIRST TOUCH IS AVAILABLE IN LR VERSION

For your ultra-sensitive measurements, the First Touch features a torque range of 0.005 to 0.8 mNm. With this innovation you can take advantage of this resolution without the burdens of using spring technology.

SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer

ROTATION SPEEDS
Unlimited number of speeds between 0.3 and 250 rpm

TORQUE RANGE
From 0.05 to 13 mNm / From 0.005 to 0.8 mNm (LR VERSION)

TEMPERATURE
The FIRST TOUCH has a PT100 sensor which indicates temperatures between -50 °C to + 300 °C.

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0.2 %

VISCOSITY RANGE
3 - 240 000 000 mPa.s depending on the measuring geometry used.

DISPLAY
7" Touch screen

DISPLAY SETTINGS:
Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s
Language: French/English

SECURITY AND CONFIDENTIALITY
An "operator" function allows you to enter a username for your instrument.
This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
You can connect a USB printer. External control thanks to the optional VISCO RM software. The FIRST TOUCH lets you set measuring times for thixotropic products. Get kinematic viscosity by inputting the density of your product.

CARRY CASE
Optional

DIMENSIONS AND WEIGHT
Head: L180 x W135 x H250 mm
Hardened steel stand: L280 x W200 x H30 mm
Stainless steel rod: Length 500 mm / Weight: 6.7 kg

ACTIVITY DOMAINS

- FOOD INDUSTRY
- COSMETICS PHARMACEUTICALS
- PAINT / INK /COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- CAR INDUSTRY
- BUILDING MATERIALS
- TEACHING

OPTIONAL MEASURING GEOMETRIES

- Spindles L 1 to 4
- Spindle KU 1-10
- Spindles R 1 to 7
- Spindle 75Y
- Measuring system MS DIN 1 to 3
- Measuring system MS BV 1 to 1000

RM 100 TOUCH

Universal viscometer

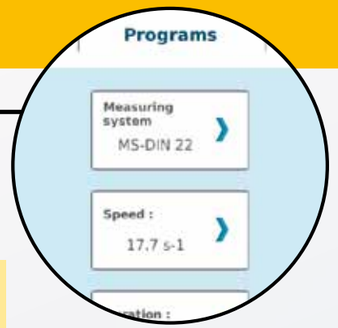
THE RM 100 TOUCH IS VERY INTUITIVE THANKS TO THE SMART DESIGN OF ITS 7" TOUCHSCREEN.

BACK UP AND TRANSFER YOUR DATA USING THE USB PORT.

THE RM 100 TOUCH MEETS STANDARDS ASTM/ISO 2555 DIN / ISO3219, MS-R WITH UD DISPLAY.

OUR EXPERTISE ENSURES YOUR RESULTS ARE RELIABLE

You can programme your measurement methods directly using RM 100 TOUCH'S touch screen, and back up your data so you can analyse or export them.



SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer

ROTATION SPEEDS
Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE
From 0.05 to 30 mNm / From 0.005 to 0.8 mNm (LR VERSION)

TEMPERATURE
The RM 100 TOUCH has a PT100 sensor which indicates temperatures between -50 °C to + 300 °C

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0.2 %

VISCOSITY RANGE
1 - 540 000 000 mPa.s depending on the measuring geometry used

DISPLAY
7" Touch screen

DISPLAY SETTINGS:
Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s
Language: French/English

SECURITY AND CONFIDENTIALITY
An "operator" function allows you to enter a username for you instrument.
This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Connect your RM 100 TOUCH to our temperature control systems (i.e.: EVA MS-R or DIN - PAGES 46 to 51). Memorise your measurement protocols directly on your viscometer. The RM 100 TOUCH lets you set measuring times for thixotropic products. You can connect a USB printer. External control thanks to the optional VISCO RM software.

CARRY CASE
Optional

DIMENSIONS AND WEIGHT
Head: L180 x W135 x H250 mm
Hardened steel stand: L280 x W200 x H30 mm
Stainless steel rod: Length 500 mm / Weight: 6.7 kg

ACTIVITY DOMAINS

- FOOD INDUSTRY
- COSMETICS PHARMACEUTICALS
- PAINT / INK /COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- CAR INDUSTRY
- BUILDING MATERIALS
- TEACHING

OPTIONAL MEASURING GEOMETRIES

- Spindles L 1 to 4 • Spindle KU 1-10
- Spindles R 1 to 7 • Spindle 75Y
- Measuring system MS DIN 1 to 3
- Measuring system MS BV 1 to 1000
- Measuring systems MS-R 1 to 5

Building APPLICATION

Measuring the viscosity of wall filler

USE

Measuring the viscosity of wall filler is often difficult: either the filler is too viscous for the instrument being used, or the geometry compounds the product during measurement. We have introduced a simple and effective technical solution for this application.

EQUIPMENT

Viscometer: **RM100 TOUCH**

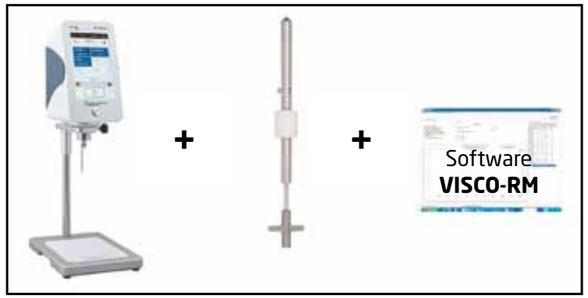
Measuring spindle: **MK-R4**

Software: **VISCO-RM**

Temperature Control System: **NONE**

Shear rate: **2 s-1**

Temperature: **room temp**

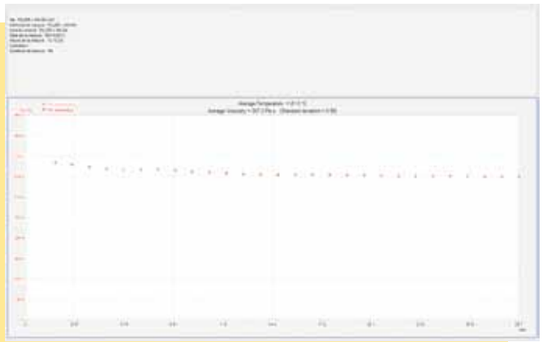


METHOD

A pot of wall filler is placed directly under the RM100 TOUCH viscometer equipped with the blade spindle MK-R4. The measuring bob's height and centering are adjusted in the sample and the time function starts being measured at a shear rate of 2 s-1 for 30 seconds, to check that the measurement is stable and consistent.

RESULTS

Measurement is instantaneous and gives a viscosity of 347 Pa·s at 2 s-1. The measured torque corresponds to 8% of the RM100 TOUCH's measurement range; this leaves a large margin of working on more viscous products in the same conditions.



The spindle does not remove any product during rotation, the measurement is stable throughout the shear time.

It is therefore possible to easily measure products as complex in terms of texture as mortar, and other primers.

Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

Chemical APPLICATION

Kinetics viscosity / Temperature on resins

USE

Measuring the changes in resins' dynamic viscosity over a range of temperatures from 70 to 105°C and comparing them.

EQUIPMENT

Viscometer: **RM100 TOUCH**

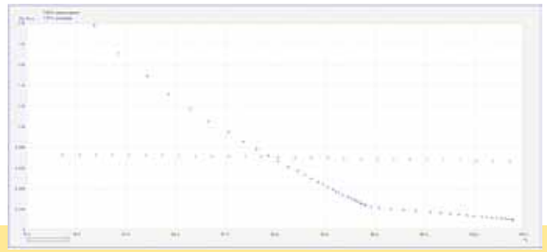
Measuring system: **MS-C with disposable aluminium cups**

Software: **VISCO-RM**

Temperature Control System: **four RT-1**

Shear rate: **50 s-1**

Plage de Température : **70-105°C**



METHOD

Set the sample contained in cup C at a temperature of 70°C for 10 minutes in the RT-1 oven;

The measurement consists of increasing the temperature of the RT-1 oven from 70°C to 105°C, and measuring viscosity based on times of 10 minutes, using the VISCO-RM software which leads the RM100 TOUCH viscometer at a shear rate of 50 s-1.

The resulting curve shows changes in kinetics viscosity based on temperature.

Comparing several products by superimposing the curves will show the ability of the products to withstand significant changes in temperature in terms of their viscosity.

RESULTS

Resin A is sensitive to changes in temperature: it is very fluid at high temperatures >95°C, but becomes very viscous when it cools down, passing from 200 mPa.s at 95°C to 2000 mPa.s at 78°C. Resin B however, responds completely differently, with a relatively stable viscosity, in this temperature range, of around 700 mPa.s.

Depending on the usage temperature of these resins, their viscosity could be completely inverted:

A is much more viscous than B up to 85°C, and B become more viscous than A upwards of 95°C.

For both resins to be used in a risk-free way, they must be worked with at 90°C.

Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

PORTABLE RM 100 TOUCH

Universal PORTABLE viscometer with carry case

MEMORISE YOUR METHODS AND DATA FROM THE 7" TOUCH SCREEN.

RECORD THE SAMPLE'S TEMPERATURE USING THE PT100 SENSOR.

EASY TO CARRY THANKS TO ITS CASE.

SAVE YOUR DATA OF MEASUREMENTS ON SITE

Carry out measurements directly while being produced and save your results on a USB stick thanks to the Portable RM 100 Touch.

SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer

ROTATION SPEEDS
Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE
From 0.05 to 30 mNm

TEMPERATURE
The Portable RM 100 TOUCH has a PT100 sensor which indicates temperatures between -50 °C to + 300 °C

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0.2 %

VISCOSITY RANGE
1 - 540 000 000 mPa.s depending on the measuring geometry used

DISPLAY
7" Touch screen

DISPLAY SETTINGS:
Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s
Charge level indication - Language: French/English

SECURITY AND CONFIDENTIALITY
An "operator" function allows you to enter a username for your instrument.
This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
The Portable RM 100 TOUCH gives you with an hour of measuring time.
Save your measurement protocols directly on your viscometer. The Portable RM 100 TOUCH lets you set measuring times for thixotropic products.
You can connect a USB printer. External control thanks to the optional VISCO RM software.

CARRY CASE
Included

DIMENSIONS AND WEIGHT
Head: Ø 85 mm Height: 310 mm / Box: L265 x W125 x H65 mm / Weight: 2 kg

ACTIVITY DOMAINS

- FOOD INDUSTRY
- COSMETICS PHARMACEUTICALS
- PAINT / INK /COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- BUILDING MATERIALS

OPTIONAL MEASURING GEOMETRIES

- Spindles L 1 to 4
- Spindle KU 1-10
- Spindles R 1 to 7
- Spindle 75Y
- Measuring system MS DIN 1 to 3
- Measuring system MS BV 1 to 1000
- Measuring systems MS-R 1 to 5

RM 100 TOUCH GEL TIMER

Viscometer - Gel timer*

BENEFIT FROM EFFECTIVE QUALITY CONTROL WHEN TRACKING YOUR SAMPLES CROSS LINKING.

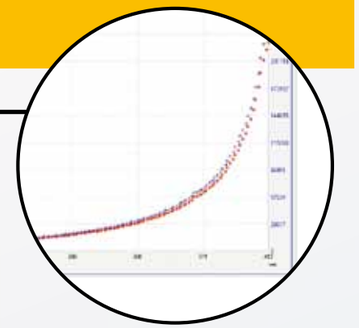
USE YOUR VISCOMETER AS A GEL TIMER.

EASY AND PRACTICAL USE WITH DISPOSABLE HOOKS AND CUPS.

*Also available in temperature control version from room T° to 300°C.

DETERMINE THE GEL TIMES OF YOUR RESINS AND SCALABLE PRODUCTS

The RM 100 TOUCH GEL TIMER is ideal for monitoring viscosity changes in your products up to a solid state.



SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer / gel timer

ROTATION SPEEDS
Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE
From 0.05 to 40 mNm

TEMPERATURE
The RM 100 TOUCH GEL TIMER has a PT100 sensor which indicates temperatures between -50 °C to + 300 °C.
Also available in temperature control version from room T° to 300°C.

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0.2 %

VISCOSITY RANGE
100 - 15 500 000 mPa.s depending on the speed used

DISPLAY
7" Touch screen

DISPLAY SETTINGS:
Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s
Language: French/English

SECURITY AND CONFIDENTIALITY
An "operator" function allows you to enter a username for your instrument.
This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Take advantage of the external control of your RM 100 TOUCH GEL TIMER thanks to the VISCO RM software INCLUDED Use of disposable cups.

CARRY CASE: Optional for measuring head only

DIMENSIONS AND WEIGHT
Head: L180 x W135 x H250 mm
Stand for GEL TIMER: L280 x W200 x H630 mm/
Weight: 15 kg

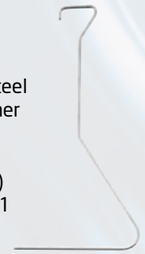
ACTIVITY DOMAINS

- PAINT / INK / COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- BUILDING MATERIALS
- FOOD INDUSTRY

OPTIONAL ACCESSORIES AVAILABLE

- Disposable aluminium cups (set of 100) - Ref. 700010

- Stainless Steel wire gel timer measuring hook 316l (set of 100) Ref. 700011



RM 100 TOUCH CP 2000

Cone-Plate Viscometer with cone included*

CHOOSE THE RM 100 TOUCH VISCOMETER ASSOCIATED WITH THE CP 2000 CONE-PLATE STAND TO OPTIMIZE YOUR MEASUREMENTS.

CONTROL YOUR PRODUCTS UP TO MORE THAN 10 000 S-1 AS PER THE ICI METHOD.

GET OPTIMAL PRECISION WITH TEMPERATURE CONTROL AT 0.1°C.

ACTIVITY DOMAINS

- PAINT / INK / COATINGS
- CHEMICAL / PETROLEUM PRODUCTS

OPTIONAL MEASURING GEOMETRIES

* Cone to be defined in table CP 2000, page 21.

CONE PLATE VISCOMETER THAT ADAPTS TO YOUR PRODUCTS CONSTRAINTS

If you find your products difficult to clean or you have small quantities of samples, choose the RM 100 TOUCH + CP 2000.

SPECIFICATIONS

TYPE OF INSTRUMENT: Cone-plate rotating viscometer

ROTATION SPEEDS: Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE: From 0.05 to 30 mNm

TEMPERATURE
Cone Plate stand CP 2000: 5 to 80 °C through Peltier effect
Cone Plate stand CP 2000H: room temperature to 300 °C through electric heating

ACCURACY: +/- 1 % of the full scale | **REPEATABILITY**: +/- 0.2 %

VISCOSITY RANGE: 5 - 15 000 000 mPa.s depending on the cone used

DISPLAY: 7" Touch screen

DISPLAY SETTINGS: Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s - Language: French/English

SECURITY AND CONFIDENTIALITY: An "operator" function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE: 90-240 VAC 50/60 Hz for both supplies | **ANALOG OUTPUT:** 4 - 20 mA Torque range to be defined by user

PC CONNECTIONS: RS232 Port and USB | **PRINTER CONNECTION:** USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Measure viscosity with a sample of less than 1ml. Quick warming and cleaning. Save your measurement protocols directly on your viscometer.
The RM 100 TOUCH lets you set measuring times for thixotropic products. You can connect a USB printer.
External control thanks to the optional VISCO RM software.

CARRY CASE: Optional for measuring head only

DIMENSIONS AND WEIGHT: Head: L180 x W135 x H250 mm - Stand for CP 2000: L300 x W490 x H630 mm
Weight: 22 kg

CP 2000 MEASURING CONES


MK-CP 2005


MK-CP 4020

NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
MK-CP 2005	422005	Ø 20 mm α 0,5°	0,018	50 - 3 000 000 mPa.s
MK-CP 2445	422445	Ø 24 mm α 0,45°	0,030	20 - 2 000 000 mPa.s
MK-CP 2020	422020	Ø 20 mm α 2°	0,075	100 - 15 000 000 mPa.s
MK-CP 4005	424005	Ø 40 mm α 0,5°	0,150	6 - 450 000 mPa.s
MK-CP 4020	424020	Ø 40 mm α 2°	0,60	15 - 1 900 000 mPa.s

RM100 i TOUCH

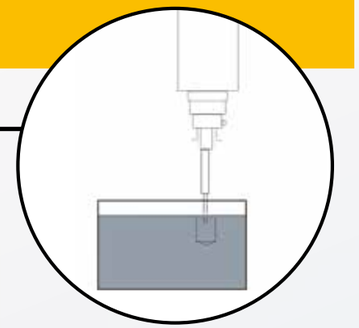
Immersion industrial viscometer

THE RM 100 i TOUCH GUARANTEES INDUSTRIAL MEASUREMENTS IDENTICAL TO IN A LABORATORY IN IMMERSION TANKS.

THE DISTANCE BETWEEN MEASURING HEAD AND THE BOX BEING FROM 5 TO 15 METERS, THE RM 100 i TOUCH FITS PERFECTLY TO YOUR VARIOUS LOCATIONS. BOTH INSTRUMENTS HAVE A 4.20 MA ANALOG SIGNAL THAT MEANS YOUR MEASUREMENTS CAN BE CONTINUOUSLY MONITORED.

IMPLEMENTATION OF RM100i TOUCH

RM100 i TOUCH viscometer measures the viscosity of your product by immersion in a constant level tank.



SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer in immersion tank

ROTATION SPEEDS
Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE
From 0.05 to 30 mNm

TEMPERATURE
The RM 100 i TOUCH can be equipped with an optional PT100 sensor which indicates temperatures between -50 °C to + 300 °C

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0,2 %

VISCOSITY RANGE
1 - 540 000 000 mPa.s depending on the measuring geometry

DISPLAY
7" Touch screen

DISPLAY SETTINGS
Viscosity - Speed - Torque - Time - Measuring geometry - Level of sensitivity -Temperature (if sensor connected) - Date/hour - Choice of viscosity units: cP or mPa.s - Language: French/English

SECURITY AND CONFIDENTIALITY
An «operator» function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Save your measurement protocols directly on your viscometer.
You can connect a USB printer. External control thanks to the optional VISCO RM software.

DIMENSIONS AND WEIGHT
Head: Diameter 85 mm Height 180 mm
Box: L120 x W145 x H261mm
Weight: 3 kg

ACTIVITY DOMAINS

- FOOD INDUSTRY
- COSMETICS PHARMACY
- PAINT / INK / COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- BUILDING MATERIALS

OPTIONAL MEASURING GEOMETRIES

RM100 i TOUCH

- Spindles L 1 to 4
- Spindles R 1 to 7
- Measuring system MS DIN 1 to 3
- Measuring system MS BV 1 to 1000
- Measuring system FANN R1-B1
- Measuring system MS-R 1 to 5

RM100 L TOUCH

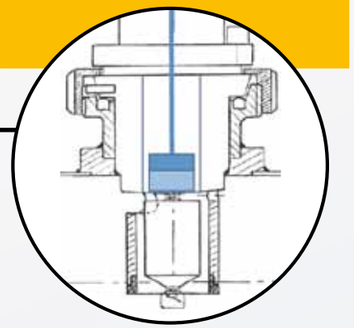
On-line industrial viscometer

THE RM 100 L TOUCH CAN BE INSTALLED DIRECTLY ON YOUR PRODUCTION LINES; ITS MAGNETIC COUPLING PRINCIPLE PROVIDES THE PERFECT SEAL

THE DISTANCE BETWEEN MEASURING HEAD AND THE BOX BEING FROM 5 TO 15 METERS, THE RM 100 L TOUCH FITS PERFECTLY TO YOUR VARIOUS LOCATIONS. BOTH INSTRUMENTS HAVE A 4.20 MA ANALOG SIGNAL THAT MEANS YOUR MEASUREMENTS CAN BE CONTINUOUSLY MONITORED.

RM100 L TOUCH HAS A PERFECT SEALING OF THE MEASUREMENT CELL THROUGH A MAGNETIC COUPLING

Your product can not go back in the measuring head.



SPECIFICATIONS

TYPE OF INSTRUMENT
Rotating viscometer on the production line

ROTATION SPEEDS
Unlimited number of speeds between 5 and 600 rpm

TORQUE RANGE
From 0.25 to 13 mNm

TEMPERATURE
An external PT 100 sensor can be connected to the RM 100 L TOUCH for readings between -20°C to 100°C (sensor not included)

ACCURACY
+/- 1 % of the full scale

REPEATABILITY
+/- 0,2 %

VISCOSITY RANGE
2 - 650 000 mPa.s depending on the measuring geometry.

DISPLAY
7" Touch screen

DISPLAY SETTINGS
Viscosity - Speed - Torque - Time - Measuring geometry - Level of sensitivity -Temperature (if sensor connected) - Date/hour - Choice of viscosity units: cP or mPa.s - Language: French/English

SECURITY AND CONFIDENTIALITY
An «operator» function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code.
There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

ANALOG OUTPUT
4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS
RS232 Port and USB

PRINTER CONNECTION
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Carry out your rheological curves continuously on your production line. No disassembly required for the RM 100 L TOUCH during the cleaning phases of your production lines.

DIMENSIONS AND WEIGHT
Head: Diameter 85 mm Height 312 mm
Box: L120 x W145 x H261mm
Weight: 4 kg

ACTIVITY DOMAINS

- FOOD INDUSTRY
- COSMETICS PHARMACY
- PAINT / INK / COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- BUILDING MATERIALS

OPTIONAL MEASURING GEOMETRIES

RM100 L TOUCH

- Bobs
  MK-24 / MK-30 / MK-31 / MK-2015
- Installation cell
  CD75 / LD75 / CD50 / LD100 / CD25

RHEOLOGY

RM 200 TOUCH

Universal rheometer with carry case

THE 7" COLOUR TOUCH SCREEN PROVIDES COMFORT TO YOUR WORK AND GIVES A CLEAR VIEW OF METHODS AND TEST RESULTS.

SEE YIELD RATES AND THIXOTROPY VALUES DIRECTLY ON YOUR RM 200 TOUCH RHEOMETER.

THE RM 200 TOUCH RHEOMETER OFFERS A CHOICE OF FITTING SYSTEMS FOR YOUR GEOMETRIES: BAYONET FITTING OR AC115 COUPLING.

ACTIVITY DOMAINS

- CAR INDUSTRY
- TEACHING
- CHOCOLATE
- FOOD INDUSTRY
- COSMETICS PHARMACY
- PAINT / INK / COATINGS
- CHEMICAL / PETROLEUM PRODUCTS
- BUILDING MATERIALS

OPTIONAL MEASURING GEOMETRIES

RM200 TOUCH BAYONET FITTING

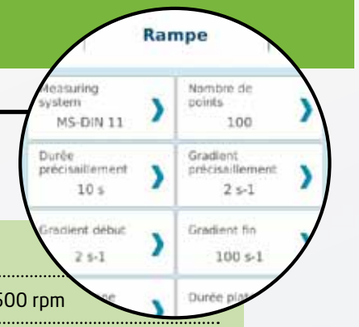
- Spindles L 1 to 4
- Spindles R 1 to 7
- Measuring system CHOCOLATE MS-C
- Measuring system MS DIN 1 to 3
- Measuring system MS-R 1 to 5
- Measuring system MS BV 1 to 1000

RM200 TOUCH ACC 115

- Find the AC115 measuring geometries on page 60.

RHEOLOGY: A BREEZE!

Carry out your flow curves directly on your RM200 TOUCH rheometer, without needing to be connected to a computer, for precise quality control that is both simple and effective.



SPECIFICATIONS

TYPE OF INSTRUMENT	Rotating rheometer with imposed speeds
ROTATION SPEEDS	Unlimited number of speeds between 0.3 and 1500 rpm
TORQUE RANGE	From 0.05 to 30 mNm / From 0.005 to 0.8 mNm (LR VERSION) From 0.05 to 40 mNm (AC 115 VERSION)
TEMPERATURE	The RM 200 TOUCH has a PT100 sensor which indicates temperatures between -50 °C to + 300 °C
ACCURACY	+/- 1 % of the full scale
REPEATABILITY	+/- 0.2 %
VISCOSITY RANGE	1 - 540 000 000 mPa.s depending on the measuring geometry used
DISPLAY	7" Touch screen
DISPLAY SETTINGS	Viscosity - Speed - Torque - Temperature - Time - Measuring geometry Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s Language: French/English
DISPLAY SETTINGS IN FLOW MODE	Plastic Viscosity - Yield Value - Thixotropy - Choice of model: Newton - Bingham - Casson - Ostwald
SECURITY AND CONFIDENTIALITY	An "operator" function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code. There is also a protected mode that locks your measurement conditions.
SUPPLY VOLTAGE	90-240 VAC 50/60 Hz
ANALOG OUTPUT	4 - 20 mA / Torque range to be defined by user
PC CONNECTIONS	RS232 Port and USB
PRINTER CONNECTION	USB Host Port - Compatible PCL/5
WHAT BENEFITS ARE THERE FOR YOU?	Save your flow curves and calculate your rheological parameters directly without needing a computer. Choose your attachment system tailored to your product constraints. Connect your RM 200 TOUCH to our temperature control systems (e.g.: EVA MS-R or DIN - PAGES 46 to 47). The RM200 TOUCH lets you set measuring times for thixotropic products. You can connect a USB printer. External control thanks to the optional RHEOMATIC P software. Achieve kinematic viscosity by inputting the density of your product.
CARRY CASE	Included
DIMENSIONS AND WEIGHT	Head: L180 x W135 x H250 mm / Hardened steel stand: L280 x W200 x H30 mm / Stainless steel rod: Length 500 mm / Weight: 6.7 kg

Chocolat APPLICATION

Chocolate rheology according to the IOCCC standard

USE

This measuring Method enables to find Plastic Viscosity and Yield Value on chocolate samples at 40°C, according OICCC standard.

EQUIPMENT

Rheometer: **RM200 TOUCH**

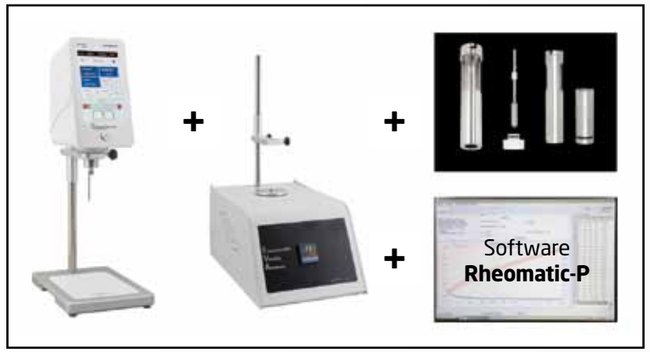
Measuring system: **MS-C or MS-DIN11**

Software: **Rheomatic-P**

Temperature Control: **EVA-DIN PeLtier Air-Air**

Shear rate range: **5 to 50 s-1**

Temperature: **40 °C**



METHOD

Pre-shearing of 15 minutes of the sample at 40°C including in the C or DIN11 cup, installed into the Peltier Air-Air temperature control unit; this system don't use water or liquid circulation, just ambient air. The OICCC 1973 standard advice to realize a Step by Step ramp from 5 to 50s-1 at 40°C +/- 0.1°C. The reached curve is then fitted with CASSON or CHOCOLATE model, in order to calculate the following parameters: Yield Value in Pa and Plastic Viscosity in Pa.s that are the characteristics of plastic shear-thinning fluids, with yield value.

RESULTS

Example of measurement on milk chocolate:

T°C = 39.9°C

Yield Value = 9.3 Pa

Plastic Viscosity (CASSON) = 1.42 Pa.s

Correlation factor: R = 1.000

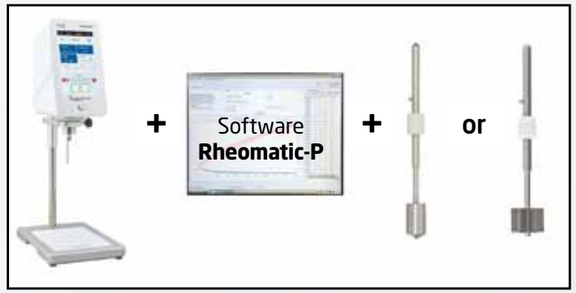
Do not hesitate to get in touch with us for more information: **Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com**

Food industry APPLICATION

Choosing the best spindle to analyze yoghurt

USE

Non-blended set yoghurt has a gelified texture at rest which can be a problem during viscosity measurements using cylindrical spindles. This study shows the impimpact of choosing a measuring system to analyze such a product. A flow curve in geometric mode enables the rheological behaviour of this product to be viewed from 0 to 100 s-1 with a very slow shear rate progression. The aim is to determine the best geometry for which the product will not "break" when the speed is increased.



EQUIPMENT

Rheometer:
RM200 TOUCH

Measuring system:
MS-DIN13 and MK-VANE 6P

Software:
Rheomatic-P

Temperature Control:
none

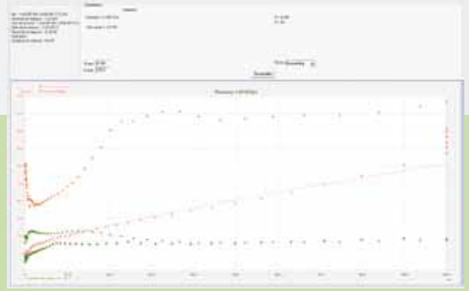
Shear rate range:
from 0.1 to 100 s-1

Temperature: **17.5°C**

METHOD

As soon as it is removed from the refrigerator, the yoghurt is delicately placed into the DIN1 cup, then a shear rate ramp of 0.1 to 100 s-1 is carried out according to a logarithmic progression. Correlation of the Casson Model up to 100 s-1 means that it can be determined if the product responds to shearing all along the curve or not.

RESULTS



The curves obtained for the same yoghurt with the two spindles results in some significant differences:

With the VANE 6 blades, the rising curve reflects the "gel" rupturing, characteristic of non-blended yoghurt, and the descending curve presents a Casson-type shear-thinning profile, with a YV of 13 Pa and a plastic viscosity of 360 mPa.s, which reveals its behaviour in the mouth.

With the 13-system, the rising curve is flat and shear stress seems to decrease when shear rate increases. In addition, the Casson correlation is not as good on the descending curve (R = 0.721 against 0.988 for the "VANE" measurement).

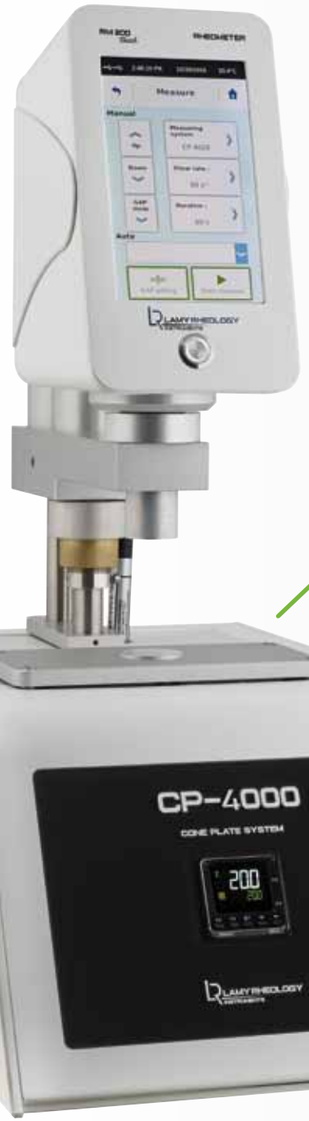
In conclusion, this study shows the importance of choosing the right geometry based on the nature of the product to be measured. In this case, the VANE 6 Blades stops the sample from compounding and lets the shear to be spread through the product.

Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

RM 200 TOUCH CP 4000

Cone-Plate Rheometer with automated gap

CHOOSE RM 200 TOUCH RHEOMETER COUPLING WITH CP 4000 CONE-PLATE TO OPTIMIZE YOUR RHEOLOGICAL STUDIES.



RM 200 TOUCH CP 4000 OWNS ONE AC 265 COUPLING HEAVY DUTY AND SO PRECISE.

OBTAIN ONE OPTIMAL ACCURACY DUE TO THE TEMPERATURE ADJUSTMENT AT 0,1°C.

ACTIVITY DOMAINS

- TEACHING
- COSMETICS PHARMACY
- PAINT / INK / COATINGS

MAKE YOUR RHEOLOGICAL MEASUREMENT EASILY

RM 200 TOUCH CP 4000 enables one automated gap adjustement for cones and plates you are using with.

SPECIFICATIONS

TYPE OF INSTRUMENT: Rotating rheometer with imposed speeds

ROTATION SPEEDS: Unlimited number of speeds between 0.3 and 1500 rpm

TORQUE RANGE: From 0.05 to 40 mNm

TEMPERATURE
Cone Plate stand CP 4000: 5 to 80 °C through Peltier effect
Cone Plate stand CP 4000H: room temperature to 300 °C through electric heating

ACCURACY: +/- 1 % of the full scale

REPEATABILITY: +/- 0.2 %

VISCOSITY RANGE: 1 - 15 000 000 mPa.s depending on the measuring geometry used

DISPLAY: 7" Touch screen

DISPLAY SETTINGS: Viscosity - Speed - Torque - Temperature - Time - Measuring geometry
Level of sensitivity - Date/hour - Choice of viscosity units: cP or mPa.s - Language: French/English

SECURITY AND CONFIDENTIALITY:
An "operator" function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code. There is also a protected mode that locks your measurement conditions.

SUPPLY VOLTAGE: 90-240 VAC 50/60 Hz

ANALOG OUTPUT: 4 - 20 mA
Torque range to be defined by user

PC CONNECTIONS: Port RS232 et USB

CONNEXION IMPRIMANTE:
USB Host Port - Compatible PCL/5

WHAT BENEFITS ARE THERE FOR YOU?
Save your flow curves and calculate your rheological parameters directly without needing a computer. Gap automated adjustment. You can connect a USB printer. External control thanks to the optional RHEOMATIC P software.

CARRY CASE: Included only for the head of RM 200 TOUCH

DIMENSIONS AND WEIGHT: Head: L180 x W135 x H250 mm / CP 4000 : L300 x W490 x H630 mm / Weight: 22 kg

CP 4000 AC265 MEASURING CONES

NAME	REF.	DIM. (mm)	VOL. (mL)	VISCOSITY RANGE
MK-CP 2020 AC265	265202	Ø 20 mm α 2°	0,075	100 - 15 000 000 mPa.s
MK-CP 4020 AC265	265402	Ø 40 mm α 2°	0,60	15 - 1 900 000 mPa.s
MK-CP 6020 AC265	265602	Ø 60 mm α 2°	2	5 - 590 000 mPa.s

Cosmetic APPLICATION

Rheology of “Baby” and “Adult” Shampoo

USE

Cosmetic products have different rheological behaviours depending on how they were formulated and on their use.
A comparison of two different shampoos, i.e. Baby and Adult as in this example, is characteristic of this.

EQUIPMENT

Rheometer: **RM200 TOUCH CP 4000**

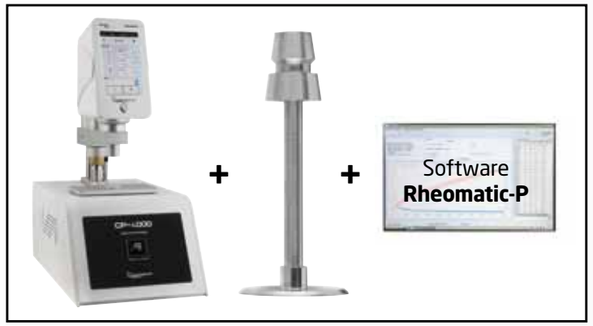
Measuring system: **Cone CP 4020 AC 265**

Software: **Rheomatic-P**

Temperature Control: **CP 4000 Peltier**

Shear rate range: **0.5 to 200 s-1**

Temperature: **23°C**



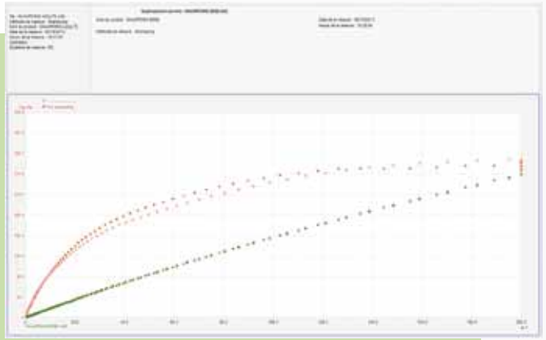
METHOD

After quickly warming of 1 ml of sample at 23°C with CP 4000 Peltier a flow curve from 0.5 to 200 s-1 is created from the Rheomatic-P software. The resulting flow curve shows the influence of shear rate on a product’s viscosity. When the shear stress curve (Tau = f(D)) is a straight line through 0, the product is Newtonian and if the rheological profile is a curve, viscosity decreases under the effect of speed, the product is shear-thinning.

RESULTS

These two samples clearly show that “Baby” shampoo keeps the same viscosity whatever shearing it suffers, while “Adult” shampoo comes out of the bottle with a texture that is 4 times more viscous, becoming more fluid as soon as it is used, up to a viscosity that is 20 times lower than “Baby” shampoo, which will obviously be less requested.

The target audience of the two products being different, each of their requested profiles is suitable to their use.



Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

Coating APPLICATION

Acrylic and oil-based paint rheology

USE

Water-based and solvent coatings have significant various rheological behavior and the analysis of their flow curve in function of shear rate variation enables to perfectly adjust their formulation in order that user has the same easy of use and also to limit the flowing too.

EQUIPMENT

Rheometer: **RM200 TOUCH CP 4000**

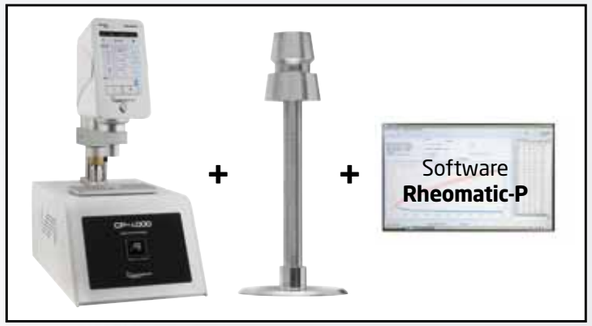
Measuring system: **Cone CP 4020 AC 265**

Software: **Rheomatic-P**

Temperature Control: **CP 4000 Peltier**

Shear rate range: **0.5 to 1000 s-1**

Temperature: **23 °C**

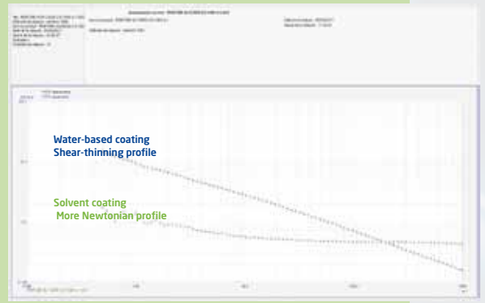


METHOD

After quickly warming of 1 ml of sample at 23°C with CP 4000 Peltier, start a flow curve from 0.5 to 1000 s-1 with Rheomatic-P software. The issued Flow curve shows influence of shear rate on the viscosity of sample. The speed rampe nables to follow evolution of viscosity from as we left from the pot (D < 2 s-1) until a shear rate closed to this of application (1000 s-1) and then compare quickly and efficiently the products between them.

RESULTS

Solvent coating has a relatively flat profile, then its viscosity doesn’t change so much between rest state and application shearing. The Water-based coating viscosity decrease a lot with a 6 times more higher at rest state and become so fluid through the shearing in order to give a 3 times lower viscosity under application (viscosity at 1000 s-1) than solvent one. This shear-thinning behavior assure one application facility and warranty a good rest structure, symbolized by the Yield Value of this product as indication of limit of flowing.



Do not hesitate to get in touch with us for more information: **Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com**

TEXTURES

TEX'AN TOUCH

Texture Analyzer with 7" colour screen

BECAUSE TEXTURE DEPENDS ON TEMPERATURE, THE TEX'AN TOUCH GIVES YOU PRECISE AND RELIABLE RESULTS THANKS TO ITS PT100 SENSOR.

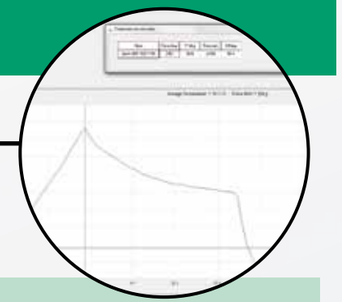
TEX'AN TOUCH'S 7 " TOUCH SCREEN ENABLES PERFECT AND INSTANT VIEWING OF THE CURVES FROM YOUR SENSORY TESTS.

THE TEX'AN TOUCH IS IDEAL FOR YOUR CONSISTENT, ELASTIC AND ADHESIVE PRODUCTS.
THERE ARE DIFFERENT OPERATING MODES AVAILABLE TO YOU:

- COMPRESSION,
- TRACTION,
- RELAXATION,
- TPA CYCLE.

YOUR CURVES IN LIVE

Directly vizualize the curve measurement on the 7" screen of TEX'AN TOUCH without software and computer connexion.



SPECIFICATIONS

TYPE OF INSTRUMENT	Texture Analyzer operating in Compression and Traction
CHOICE OF SENSORS	10 N (1 kg), Resolution 0.001 N (0.1 g) 20 N (2 kg), Resolution 0.001 N (0.1 g) 50 N (5 kg), Resolution 0.001 N (0.1 g) 250 N (20 kg), Resolution 0.01 N (1 g) 500 N (50 kg), Resolution 0.01 N (1 g)
ACCURACY	+/- 0.05 % of the full scale
SPEED RANGE	From 0.1 to 10 mm/s +/-0.2 %
MOTION	Height: 240 mm / Resolution: 0.01 mm
TEMPERATURE	The TEX'AN TOUCH has a Pt100 sensor to measure your sample's temperature from -20 to 120 °C
DISPLAY	7" Touch screen
DISPLAY SETTINGS	Force - Speed - Distance - Temperature - Time - Measuring probe - Level of sensitivity Date/hour - Choice of force units: gram or Newton - Language: French/English
SECURITY AND CONFIDENTIALITY	An "operator" function allows you to enter a username for your instrument. This user must then be identified using a 4-digit code. There is also a protected mode that locks your measurement conditions.
SUPPLY VOLTAGE	90-240 VAC 50/60 Hz
PC CONNECTIONS	RS232 Port and USB - Compatible PCL/5
PRINTER CONNECTION	USB Host Port
WHAT BENEFITS ARE THERE FOR YOU?	Integrated adjustable turntable: diam. 160 mm. Table for attaching inserts: 120 x 220 mm. Available Operating Modes: Compression - Relaxation -Traction - TPA Cycle - Penetrometry and relative compression mode also. Large selection of probes available and custom probes can be made with choice of material, shape and size according to your criteria. The TEX'AN TOUCH has a large 7" colour touch screen which allows comfortable use and optimal viewing of measurements. Storage of your measuring methods. Data can be backed up and exported using a USB key. External control thanks to the optional TEX'AN DRIVE software.
DIMENSIONS AND WEIGHT	L300 x W500 x H600 mm Weight: 21 kg

ACTIVITY DOMAINS

FOOD INDUSTRY · COSMETICS PHARMACY · BUILDING MATERIALS · TEACHING

TEXTURE ANALYZER

PROBES FOR TEX'AN TOUCH

NAME MATERIAL	REF.	Ø (mm)	HEIGHT (mm)	INTEREST FOR	
½ SPHERICAL PROBE 316L Stainless Steel	130019 130049	30 40	-	Elasticity Measure	
PLATE PROBE 316L Stainless Steel	130080 130101	34 50	-	Adhesiveness Measure Spinning Low thickness sample	
BLOOM PROBE PLEXIGLASS	130046	12.7	30	Bloom Gel Strength test	
CYLINDRICAL PROBE 316L Stainless Steel 316L Stainless Steel/PEEK 316L Stainless Steel	130037 130118 130066	25 30 55	40 30 35	Firmness Measure, Breaking Force	
CONICAL PROBE 316L Stainless Steel	130020 130047	25 30	20° Cone 45° Cone	Breaking Force, Hardness	
NEEDLE PROBE 316L Stainless Steel	130077 130063 130078	2 3 4	35 35 35	Penetrometry, Internal Firmness	
DUAL CONE 316L Stainless Steel	130048	65	Angles α1 90° α2 30°	Internal Firmness, Penetrometry	
CLEAVER PROBE 316L Stainless Steel	130064	L. 25 mm	60° Angle	Breaking Force, Knack	

CELL FOR TEX'AN TOUCH

NAME MATERIAL	REF.	DIMENSIONS(mm)	INTEREST FOR
TENSILE FIXTURE ALUMINIUM	130092	Bit Width 60 mm Maximum Tension 160 mm	Tensile force
3 POINTS BEND FIXTURE ALUMINIUM	130091	Cylinder Width 80 mm Sample Maximum Length 200 mm	Breaking force, Friability, Springiness
KRAMER CELL **5 BLADES** ALUMINIUM + PLEXIGLASS	130094	Cell Length 60 mm Width 60 mm Height 65 mm	Hardness and tenderness on small samples
OTTAWA CELL ALUMINIUM + PLEXIGLASS	130065	Cell Length 60 mm Width 60 mm Height 65 mm	Extrusion of soft samples
WARNER-BRATZLER CELL ALUMINIUM	130074	-	Cutting blade fine
VOLODKEVICH CELL ALUMINIUM	On request	-	Tooth cutting

TEX'AN CELL ON REQUEST

WE REALIZE ALL OF YOUR WISHING
PROBES ON REQUEST

Pharmacopoeia APPLICATION

BLOOM test on gelatine

USE

Measuring gel power using a compression test or BLOOM value, allows gel consistency to be quantified, in a simple and perfectly defined way according to European pharmacopoeia.

EQUIPMENT

Texture Analyzer: **TEX'AN TOUCH 20 N**

Probe: **BLOOM cylinder (diameter: 12.7 mm)**

Software: **TEX'AN Drive (optional)**

Temperature recording: **Pt100**

Compression speed: **0.5 mm/s**

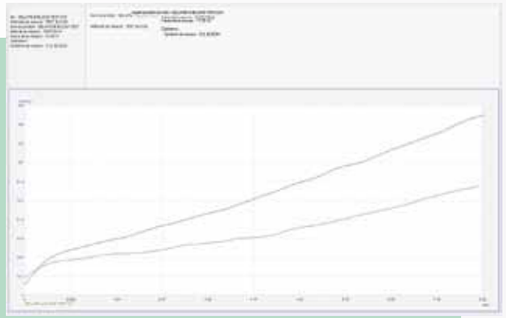
Compression distance: **4 mm**

METHOD

After the gel is made, in a bottle of 59mm diameter (+/- 1mm) and 85mm height, start compression at 0.5 mm/s for 4 mm of penetration with the Bloom cylinder at the centre. Maximum Force (Fmax) measured and expressed in grams is the consistency of the gel.

RESULTS

The Force=f(time) curve is traced, if the TEX'AN TOUCH is led through the software and the Fmax value for each sample is measured. In manual mode, the Fmax is automatically displayed on the TEX'AN TOUCH screen after measurement finishes. In this example, the Fmax values range from 88g to 142g for gel B. This quick and easy method means the consistency of gelified or pasty products can be differentiated easily.



Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

Cosmetic APPLICATION

Complete texture of styling gel

USE

CRT (Compression-Relaxation-Traction) Tests measure the Consistency, Elasticity and Adhesiveness of a product.
It enables relevant parameters to be selected to define a product's texture, and which will be related to its hardness, cohesion, and adhesiveness or free-running nature.

EQUIPMENT

Texture Analyzer:
TEX'AN TOUCH 50 N

Probe:
½ Spherical probe

Software:
TEX'AN Drive

Temperature recording:
Pt100

Compression speed:
1 mm/s

Compression distance:
10 mm

Relaxation time:
20 sec

Traction speed:
2 mm/s

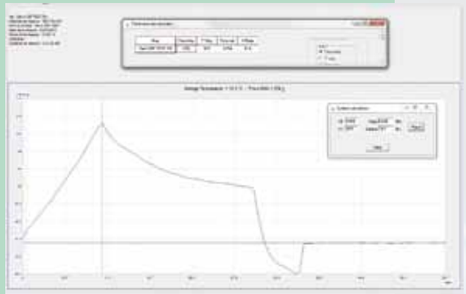
METHOD

A test of 3 consecutive phases is carried out: Compression followed by a Relaxation phase without movement where the reaction force (elastic thrust) of the sample is measured, then the probe is lifted while the fluid's Traction force is measured, indicating its adhesiveness.

RESULTS

The 3 phases are identified on the curve
Force =f(time) The calculated parameters are:

- Fmax = 253g which is the product's consistency in terms of defined compression (probe and distance)
- % Relaxation = 51% which is inversely proportional to the product's elasticity
- Fmin = -70 g which reflects the traction or adhesion force of the product on the probe when it is brought out of the sample.



It will therefore be easy to compare and rank different textures of products according to their response curve and the quantified values of these parameters.

Do not hesitate to get in touch with us for more information:
Phone: +33 (0)4 78 08 54 06 / contact@lamyrheology.com

TEMPERATURE SETTING

EVA MS-DIN

Operational with the MS-DIN measuring geometries*

USE YOUR FIRST TOUCH, RM 100 TOUCH OR RM 200 TOUCH** IN CONJUNCTION WITH EVA MS-DIN TO ACHIEVE THERMOSTATIC MEASUREMENT RESULTS OF YOUR SAMPLES.

OPT FOR HIGH PERFORMANCE BY PELTIER EFFECT WITHOUT LIQUID
FOR QUICKLY HEATING AND COOLING YOUR SAMPLES.

SPECIFICATIONS

TYPE OF INSTRUMENT
Temperature control system by PELTIER effect for the MS-DIN ISO 3219 measuring system

TEMPERATURE
From 12 to 65 °C +/- 0.2 °C

DIGITAL DISPLAY
Setup and real temperature of the EVA system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
L300 x W490 x H570 mm / Weight: 16 kg

ACTIVITY DOMAINS

FOOD INDUSTRY
COSMETICS / PHARMACEUTICALS
PAINT / INK COATINGS
CHEMICAL / PETROLEUM PRODUCTS
CAR INDUSTRY
CHOCOLATE
TEACHING

* Optional, page 54. ** Instruments sold separately.

EVA MS-R

Operational with the MS-R2 to R5 measuring geometries*

THE EVA MS-R SYSTEM CAN ACCOMMODATE 2 INSTRUMENTS** ALLOWING YOU TO FULLY OPTIMISE YOUR WORKSPACE.

WITH THE EVA MS-R SYSTEM, YOU HAVE THE OPTION OF HAVING 9 SAMPLES ON THE PELTIER THERMOSTATED PLATE.

SPECIFICATIONS

TYPE OF INSTRUMENT
Temperature control system by PELTIER effect for the MB-2 and MB-3 measuring cup

TEMPERATURE
From 17 to 45 °C +/- 0.2 °C

DIGITAL DISPLAY
Setup and real temperature of the EVA system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
L300 x W490 x H570 mm / Weight: 15 kg

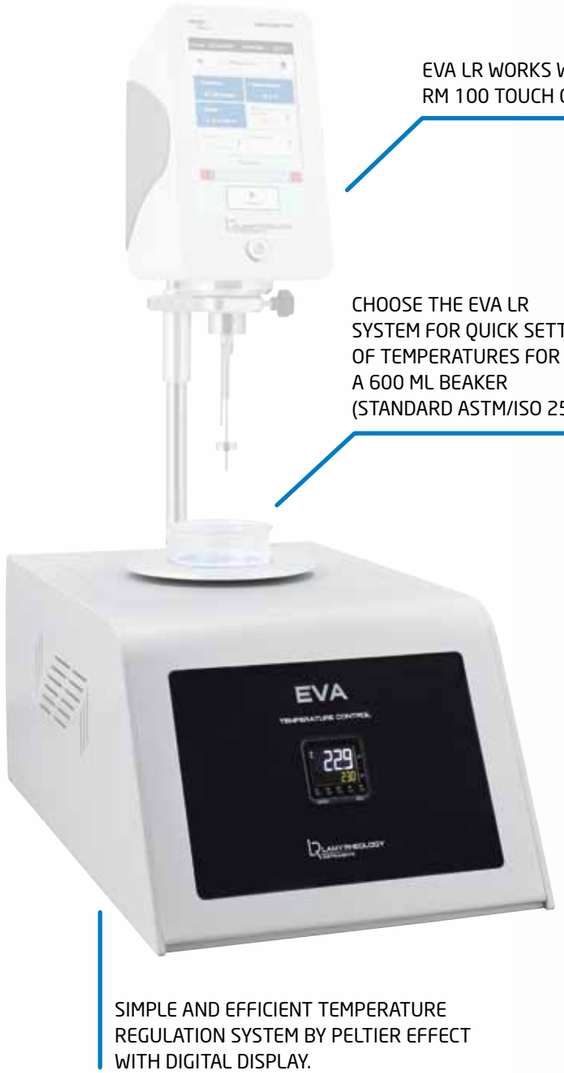
ACTIVITY DOMAINS

FOOD INDUSTRY
COSMETICS / PHARMACEUTICALS
PAINT / INK COATINGS
CHEMICAL / PETROLEUM PRODUCTS
CAR INDUSTRY
BUILDING MATERIALS

* Optional, page 55. ** Instruments sold separately.

EVA LR

Working with measuring spindles R-1 to R-7* and L-1 to L-4*



EVA LR WORKS WITH FIRST TOUCH, RM 100 TOUCH OR RM 200 TOUCH**.

CHOOSE THE EVA LR SYSTEM FOR QUICK SETTING OF TEMPERATURES FOR A 600 ML BEAKER (STANDARD ASTM/ISO 2555).

SIMPLE AND EFFICIENT TEMPERATURE REGULATION SYSTEM BY PELTIER EFFECT WITH DIGITAL DISPLAY.

SPECIFICATIONS

TYPE OF INSTRUMENT
Temperature control system by PELTIER effect for the 600-ml measuring beaker (standard ASTM/ISO2555)

TEMPERATURE
From 15 to 45 °C +/- 0.2 °C

DIGITAL DISPLAY
Setup and real temperature of the EVA system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
L300 x W490 x H570 mm / Weight: 16 kg

ACTIVITY DOMAINS

FOOD INDUSTRY
COSMETICS / PHARMACEUTICALS
PAINT / INK COATINGS
CHEMICAL / PETROLEUM PRODUCTS
CAR INDUSTRY
TEACHING

* Optional, page 58. ** Instruments sold separately.

RT-1

Electric high-temperature oven

THE RT-1 HIGH-TEMPERATURE OVEN CAN ACCOMMODATE YOUR FIRST TOUCH, RM 100 TOUCH OR RM 200 TOUCH*.

OUR PRACTICAL SOLUTION TO AVOID CLEANING: DISPOSABLE CUPS.

GET THE RT-1 OVEN BECAUSE OF ITS LOW-COST EFFICIENCY.

SPECIFICATIONS

TYPE OF INSTRUMENT
Electric oven for measuring geometries MS-DIN, MS-C, and MS-C with disposable cups

TEMPERATURE
Room temperature to 300 °C +/- 0.2°C

DIGITAL DISPLAY
Setup and real temperature of the RT-1 system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
Box L140 x W260 x H120 mm
Oven Diameter 180 mm x Height 220 mm
Weight: 16 kg

ACTIVITY DOMAINS

CHEMICAL / PETROLEUM PRODUCTS
PAINT / INK COATINGS

* Instruments sold separately.

RT-3

High temperature electric oven with viscometer centring and adjustment

PAIR YOUR FIRST TOUCH, RM 100 TOUCH OR RM 200 TOUCH* TO THE RT-3 HIGH TEMPERATURE OVEN AND CARRY OUT YOUR MEASUREMENTS WITH PRECISION.

THE STRUCTURE OF THE RT-3 OVEN PROVIDES PERFECT CENTERING AND IMMERSION THAT PROMOTES THE USE OF CONE-PLATE GEOMETRIES SUCH AS COAXIAL CYLINDERS.

SPECIFICATIONS

TYPE OF INSTRUMENT
Electric oven for measuring geometries MS-RT II B, C or D with disposable cups or Cone-Plate Geometries

TEMPERATURE
Room temperature to 300 °C +/- 0.2°C

DIGITAL DISPLAY
Setup and real temperature of the EVA system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
Box L140 x W260 x H120 mm
Stand: L240 x W284 x H655 mm
Weight: 20 kg

THE RT-3 OVEN USES ALUMINIUM DISPOSABLE CUPS MB-B, C OR D. ITS TECHNICAL QUALITY SPECIFICATIONS MAKE THE RT-3 SYSTEM THE BENCHMARK OF HIGH-TEMPERATURE SYSTEMS.

ACTIVITY DOMAINS

CHEMICAL / PETROLEUM PRODUCTS

PAINT / INK COATINGS

* Instruments sold separately.

CP-1

Peltier effect Cone Plate stand*

THE CP-1 CONE-PLATE STAND GIVES YOU THE OPTION OF PAIRING IT WITH YOUR FIRST TOUCH, RM 100 TOUCH OR RM 200 TOUCH**.

SPECIFICATIONS

TYPE OF INSTRUMENT
Cone-Plate stand with temperature control by Peltier effect without circulating fluid

TEMPERATURE
From 5 to 80°C +/- 0,2 °C with Peltier Air-Air
Peltier Liquid Option: from -20 to 120 °C depending on the temperature of the connected bath (not included)

DIGITAL DISPLAY
Setup and real temperature of the CP-1 system

SUPPLY VOLTAGE
90-240 VAC 50/60 Hz

DIMENSIONS AND WEIGHT
L300 x W490 x H570 mm
Weight: 16 kg

CONTROLLING BY PELTIER EFFECT WITHOUT LIQUID CIRCULATING THE CP-1 CONE-PLATE STAND IS DEDICATED TO RHEOLOGICAL MEASUREMENTS NEEDING QUICK CHANGES TO TEMPERATURE OR WITH SMALL SAMPLE QUANTITIES.

ACTIVITY DOMAINS

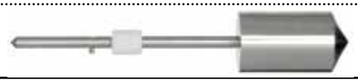
CHEMICAL / PETROLEUM PRODUCTS

PAINT / INK COATINGS

* Optional geometries, page 61. ** Instruments sold separately.

MEASURING GEOMETRIES

MS-DIN/ISO 3219 Coaxial cylinders measuring system*

NAME	REF	Ø (mm)	VOL (mL)	VISCOSITY RANGE	
MK - DIN 1	112820	30	-	3 - 1 000 000 mPa.s	
MK - DIN 2	112821	24	-	10 - 5 400 000 mPa.s	
MK - DIN 3	112822	14	-	50 - 42 000 000 mPa.s	
MK - DIN 9	111875	31,5	-	1 - 350 000 mPa.s	
Tube DIN 1	112932	32,5	15-25	-	
Tube DIN 2	112937	26	12-18	-	
Tube DIN 3	112938	15	5-10	-	
DIN 1 Tube	112872	-	-	-	
DIN 2 Tube	112877	-	-	-	
DIN 3 Tube	112878	-	-		
Mooney Tube	112874	-	-	-	
DIN 1 S Tube	112933	32,5	15-25	-	
DIN 2 S Tube	112948	26	12-18	-	
DIN 3 S Tube	112944	15	5-10	-	

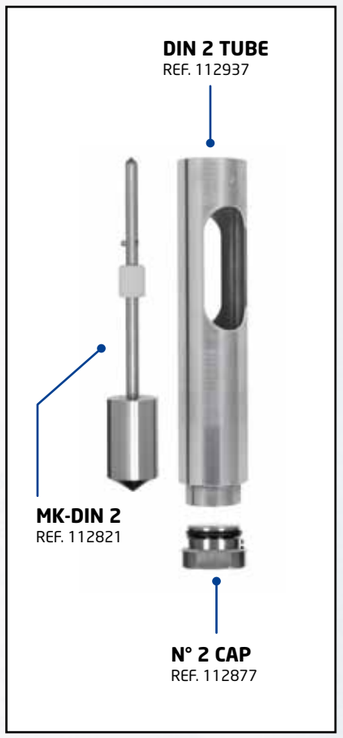
* Each component (spindles, tubes and caps) can be purchased and used separately according to your user requirements and your products.

MS-DIN / ISO 3219 MEASURING SYSTEM

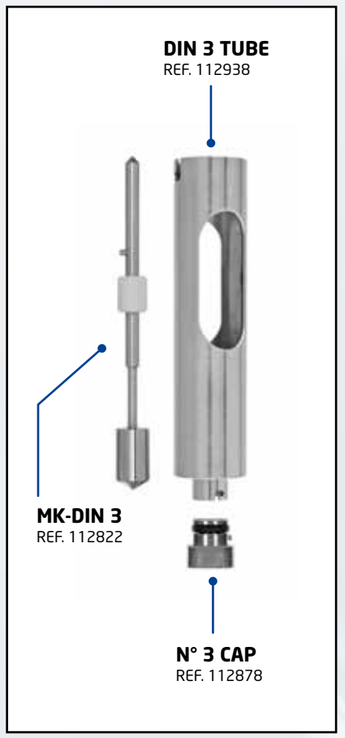
Coaxial cylinder measuring system according to the DIN/ISO 3219 standard.
Each component : bob, tube and cap can be bought and used separately, depending on using or product requirements. MS-DIN measuring systems could be thermostated with EVA MS-DIN.

DIN 11 MEASURING SYSTEM
REF. 112801

DIN 22 MEASURING SYSTEM
REF. 112804



DIN 33 MEASURING SYSTEM
REF. 112805



* Each component (spindles, tubes and caps) can be purchased and used separately according to your user requirements and your products.

MS-R 1 à 5

"Anchor" type measuring system*

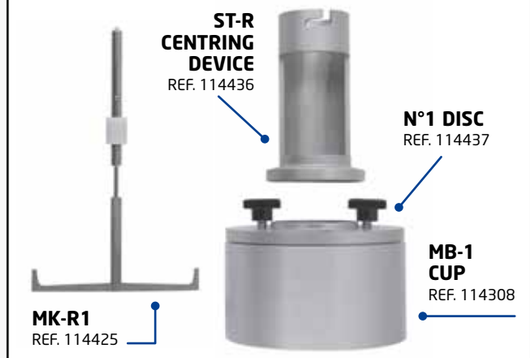
	NOM	REF.	DIM. (mm)	VOL. (mL)	PLAGE DE VISCOSITÉS
	**MK-R1**	114425	W 93	-	1 - 40 mPa.s
	**MK-R2**	114426	W 46	-	40 - 700 mPa.s
	**MK-R3**	114427	W 23	-	300 - 20 000 000 mPa.s
	**MK-R4**	114428	W 20	-	2 500 - 120 000 000 mPa.s
	**MK-R5**	114429	Ø 5	-	10 000 - 510 000 000 mPa.s
	**MB-1 cup**	114308	Ø 98	320	-
	**MB-2 cup**	114311	Ø 54	60	-
	**MB-3 cup**	114314	Ø 36	25	-
	**ST-R centring device**	114436	For centring cups MB-1, 2, 3		-
	**N°1 centring disk**	114437	For centring cup MB-1		-
	**MS-R 1-5 in case**	111949	Complete system		1 - 510 000 000 mPa.s

* Measuring system suitable for measuring the viscosity of heterogeneous products. Standard geometry for cosmetics, the food industry and paint.

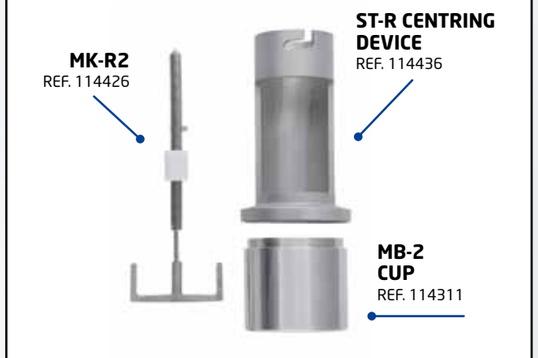
MS-R 1 À 5 MEASURING SYSTEMS

Paddle measuring system recognise as the standard for numerous viscosity measurements in the cosmetics and paints industries. This system is also perfectly suited for measuring the viscosity of heterogeneous products or fluids containing lumps, for example, in food and beverage or mineral chemistry industries.

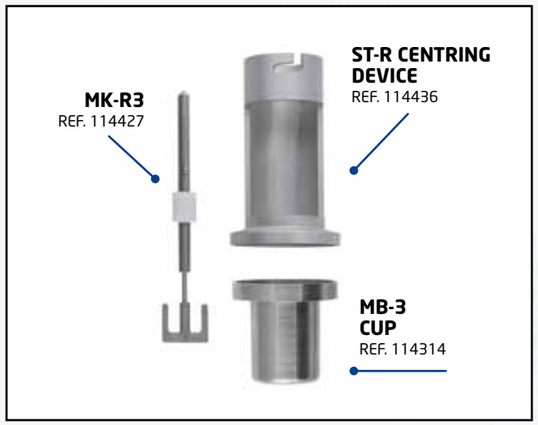
MS-R 1 MEASURING SYSTEM - REF. 114500



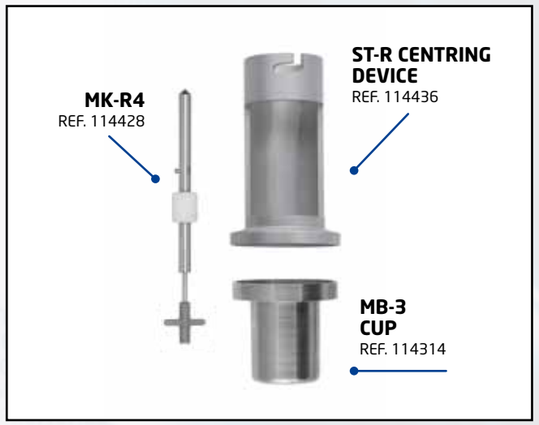
MS-R 2 MEASURING SYSTEM - REF. 114501



MS-R 3 MEASURING SYSTEM - REF. 114502



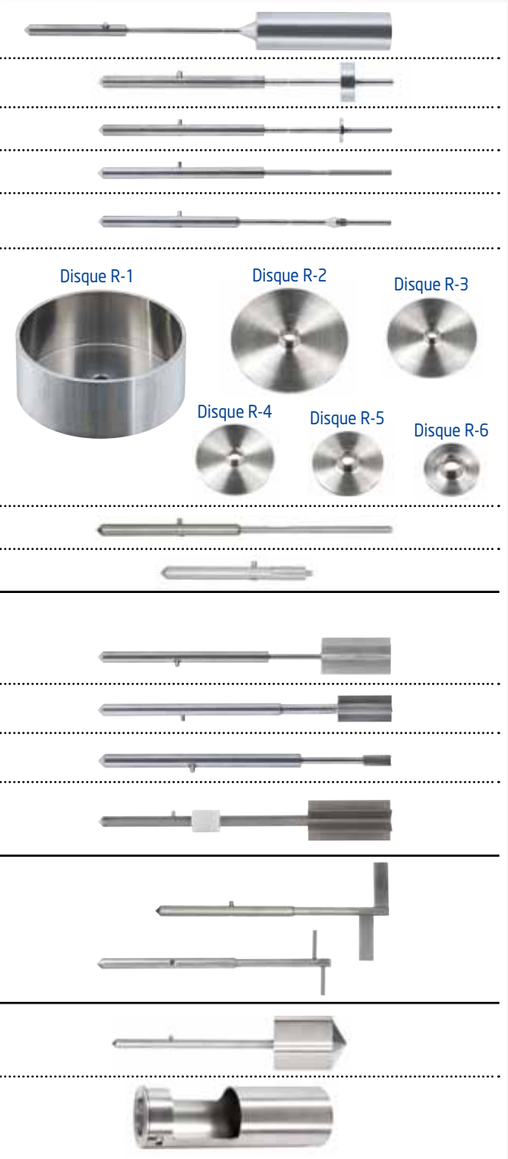
MS-R 4 MEASURING SYSTEM - REF. 114503



R-L/ISO 2555

Measuring spindles in stainless steel 316 L*

NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
L-1 spindle	111010	Ø 18.80 - L 65.1	600	15 - 20 000 mPa.s
L-2 spindle	111011	Ø 18.72 - L 6.86	600	50 - 130 000 mPa.s
L-3 spindle	111012	Ø 12.60 - L 1.78	600	200 - 500 000 mPa.s
L-4 spindle	111013	Ø 3.20 - L 31	600	1000 - 2 000 000 mPa.s
Axis R 1-6 without disc	111000	Threaded axis	-	-
R-1 Disc	111001	Ø 56.26	600	50 - 600 000 mPa.s
R-2 Disc	111002	Ø 46.93	600	100 - 2 400 000 mPa.s
R-3 Disc	111003	Ø 34.69	600	100 - 6 000 000 mPa.s
R-4 Disc	111004	Ø 27.30	600	200 - 12 000 000 mPa.s
R-5 Disc	111005	Ø 21.14	600	400 - 24 000 000 mPa.s
R-6 Disc	111006	Ø 14.62	600	1000 - 60 000 000 mPa.s
Axis R-7	111007	Ø 3.20	600	4 000 - 240 000 000 mPa.s
Axis L-R	111008	Adaptation axis	-	-
"VANE" Measuring spindles				
Vane 72	120017	Ø 21.67 - L 43.38	-	100 - 15 000 000 mPa.s
Vane 73	111108	Ø 12.67 - L 25.35	-	800 - 78 500 000 mPa.s
Vane 74	111115	Ø 5.89 - L 11.76	-	8 000 - 785 000 000 mPa.s
Vane 72 6 blades	111105	W 22	-	100 - 15 000 000 mPa.s
"KREBBS" Measuring spindles				
MK-KU 1-10	111100	W 53.98	250	20 - 5 000 mPa.s 40 - 140 KU
MK-75Y	111103	W 42.88	250	100 - 50 000 mPa.s
"FANN R1B1" Measuring spindles				
MK-R1B1	119001	Ø 34.49	-	2 - 800 000 mPa.s
MB-R1B1	119002	Ø 36.80	20	-



* These measuring spindles are intended for measuring viscosity in a 600 mL beaker. This system allows measurements according to the standard ASTM/ISO 2555.

MS-BV 1-1000

Measuring system using spindles in stainless steel 316 L*

NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
BV 1-100 AXIS	117102	-	-	-
BV centring device	117202	-	-	-
BV Disc n°1	117001	Ø 45	120	10 - 600 000 mPa.s
BV Disc n°10	117010	Ø 40	120	50 - 5 000 000 mPa.s
BV Disc n°100	117100	Ø 20	120	500 - 50 000 000 mPa.s
BV 1000 Axis	117101	Ø 4	120	5 000 - 510 000 000 mPa.s
150-ml glass beaker	117150	Ø 50-52	150	-
MS TI Tube	118001	Ø 50	150	-

* This system allows viscosity to be measured quickly and economically.

MS-C CHOCOLAT

Coaxial cylinders measuring system*

NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
MK-C	116002	Ø 13.60	-	50 - 17 000 000 mPa.s
C Tube with insert	116001	Ø 20	20	Fluid chocolate
DIN 1 Tube	112932	Ø 32.50	-	Viscous chocolate
C Insert	116004	Ø 20	20	Viscous chocolate
Delrin cap	116005	-	-	-
EVA 100	T950100	-	-	Thermostatisation cell by Peltier Effect for C Cup and DIN

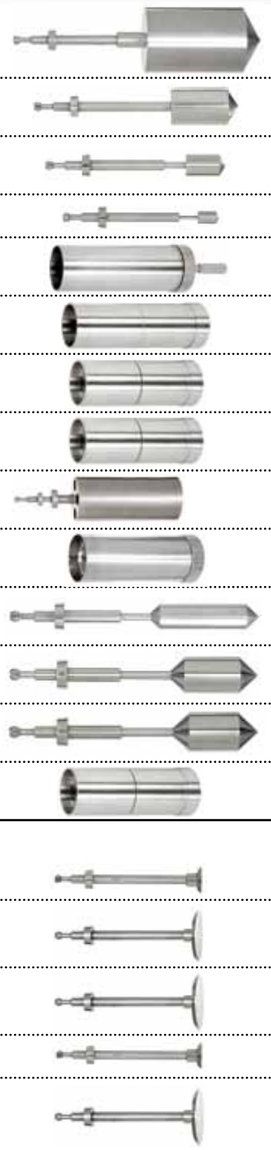
* Standardised by IOCCC for testing chocolate rheology as per the Casson method.

MEASURING GEOMETRIES

AC 115

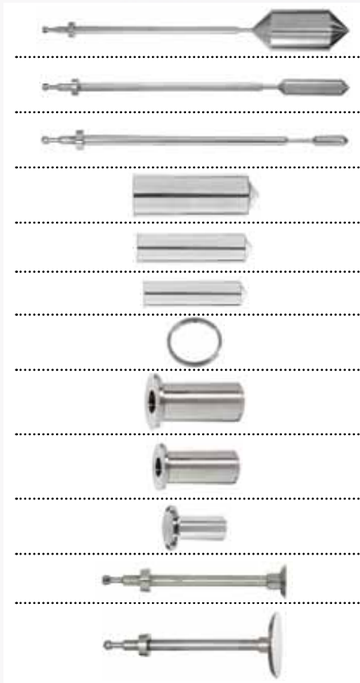
Coaxial cylinders and cone-plate measuring system

NAME	REF	DIM. (mm)	VOL.(mL)	VISCOSITY RANGE
MK-DIN 145	112504	Ø 45	-	10 - 300 000 mPa.s
MK-DIN 125	112503	Ø 25	-	6 - 1 700 000 mPa.s
MK-DIN 114	112502	Ø 14	-	35 - 10 000 000 mPa.s
MK-DIN 108	112501	Ø 8	-	180 - 50 000 000 mPa.s
MB-DIN 145T Cup	112512	Ø 48.50	100	-
MB-DIN 125T Cup	112511	Ø 27.50	20	-
MB-DIN 114T Cup	112510	Ø 15	5	-
MB-DIN 108T Cup	112509	Ø 8.50	2	-
MK-MS0	112702	Ø 46.50	-	1 - 28 000 mPa.s
MS-0 Cup	112701	Ø 50	20	-
MK-C	112525	Ø 13.60	-	50 - 5 000 000 mPa.s
MK-C2	112550	Ø 17.60	-	20 - 20 000 000 mPa.s
MK-C4	112552	Ø 19	-	10 - 9 000 000 mPa.s
MB-C Cup	112524	Ø 20	20	-
Cones for AC115 mounting system				
MK-CP 2020	432020	Ø 20 α 2°	0.075	100 - 15 000 000 mPa.s
MK-CP 4020	434020	Ø 40 α 2°	0.60	15 - 1 900 000 mPa.s
MK-CP 5020	435020	Ø 50 α 2°	1.15	10 - 1 000 000 mPa.s
MK-CP 2005	432005	Ø 20 α 0.5°	0.018	50 - 3 000 000 mPa.s
MK-CP 5005	435005	Ø 50 α 0.5°	0.30	40 - 250 000 mPa.s



RT-3

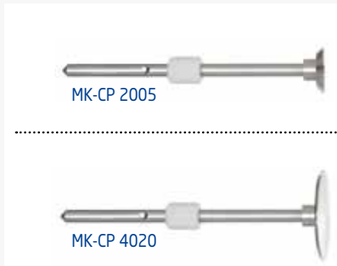
High temperature measuring system



NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
MK-RT II B	112570	Ø 30	-	10 - 5 500 000 mPa.s
MK-RT II C	112572	Ø 13.60	-	50 - 50 000 000 mPa.s
MK-RT II D	112573	Ø 7.50	-	2 000 - 500 000 000 mPa.s
MB-B Aluminium Cup	114318	Batch of 100	70	-
MB-C Aluminium Cup	114306	Batch of 100	20	-
MB-D Aluminium Cup	114319	Batch of 100	8	-
B ring	112611	-	-	-
C Insert	112612	-	-	-
D insert	112614	-	-	-
KP insert	112613	-	-	-
KP RT 2020 Cone	312020	Ø 20 α 2°	0.075	100 - 8 000 000 mPa.s
KP RT 5020 Cone	315020	Ø 50 α 2°	1.14	10 - 1 000 000 mPa.s

CP-1 / CP-2000

Cone-Plate measuring system



NAME	REF	DIM. (mm)	VOL (mL)	VISCOSITY RANGE
MK-CP 2005	422005	Ø 20 mm α 0.5°	0.018	50 - 3 000 000 mPa.s
MK-CP 2445	422445	Ø 24 mm α 0.45°	0.030	20 - 2 000 000 mPa.s
MK-CP 2020	422020	Ø 20 mm α 2°	0.075	100 - 15 000 000 mPa.s
MK-CP 4005	424005	Ø 40 mm α 0.5°	0.150	6 - 450 000 mPa.s
MK-CP 4020	424020	Ø 40 mm α 2°	0.60	15 - 1 900 000 mPa.s

MEASURING GEOMETRIES

MEASURING GEOMETRIES

CUSTOMER SERVICES

CHECKS-CALIBRATIONS AND MAINTENANCE

Guaranteed smooth running of your instruments.

Planned calibration and preventive maintenance, carried out by our trained and certified technicians, are essential to guarantee your instruments run smoothly so that productivity is increased and reliable, accurate measurements are obtained.

So you can benefit from our technicians' experience, we offer:

- Calibration with validation certificates (assessment of your device and free quote),
- Annual maintenance contract on your site,
- Provision of verification oils,
- Tests according to your conditions of use.

ALL OF OUR INSTRUMENTS ARE GUARANTEED FOR 2 YEARS

Calibration oils available in sizes 100 - 250 - 500 ml.

SILICONE OIL	NOMINAL VISCOSITY
Oil 5 mPa.s	5 mPa.s to 23°C
Oil 50 mPa.s	50 mPa.s to 23°C
Oil 100 mPa.s	100 mPa.s to 23°C
Oil 500 mPa.s	500 mPa.s to 23°C
Oil 750 mPa.s	750 mPa.s to 40°C
Oil 1000 mPa.s	1000 mPa.s to 23°C
Oil 5000 mPa.s	5000 mPa.s to 23°C

We propose also NIST certified calibration oils, on request.

TRAINING

Four values to meet your training needs

LAMY RHEOLOGY understands these challenges and the ongoing support requirements of our customers. Our team brings you in-depth expertise and a comprehensive training offer targeting the following 4 key values, which are essential in every laboratory and industrial environment in the world.

- AVAILABILITY: our engineers will propose regular visits so you can optimise your products and they will help you set the perfect measurement conditions.
- PERFORMANCE: our instruments are demonstrated using your samples to help you choose the right equipment for your needs.
- COMPLIANCE: IQ procedures are complied with: a technician will take charge of documenting the installation so that you can start using your equipment immediately. OQ Procedures: verification that results are obtained from the first measurement by ensuring that the equipment meets specifications in the given environment.
- EXPERTISE: rheology training sessions applied in the business: understand and explain physical phenomenon revealed by the rheological behavior and texture analyses of your formulations.

BECAUSE UNDERSTANDING EACH AND EVERY ONE OF OUR CUSTOMERS MEANS WE CAN MEET EVERYONE'S EXPECTATIONS!

RHEOLOGY KNOWLEDGE

Dynamic viscosity: η (Eta)

It is defined by the NEWTON equation: and quantify measurement of internal friction of fluid. His determination needs to apply to the fluid a Shear rate (D), and to measure the resistant Shear stress (τ) to this rotation.

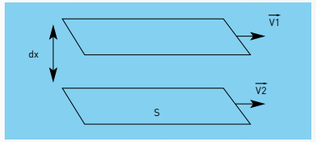
$\tau = \eta * D$ in **Pa.s**

For memory:
1 Pa.s = 10 Poises or
1 mPa.s = 1 cPoises

Shear rate: D (γ)

is the shearing which subjected by the product in the application. It is known for measurement geometries with small gap. It is not the speed of rotation of the bob (in rpm !).

Either a sheared fluid, by a laminar move (dV), between two parallel plates with a surface (S) and separate by a distance dx.



$D = dV / dx$ **in** s^{-1}

Shear stress: τ (Tau)

There is the shearing force (F), with which the sample answers to the shear rate (D), divided by the contact surface (S).

$\tau = F / S$ **in Pa** (N / m2)

Rheology:

There is the « science » of « flow ».

Associated physical measurements, realised with the hand of Rheometers, enables the visualisation of the behaviour of the product in various flow , temperature and time conditions .

Rheograms:

displayed curves of the flow behaviour of a fluid.

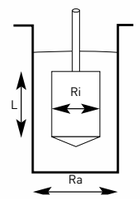
The curves $\tau = f(D)$ enables, by adapted fitting, the access to direct related parameters with the application.

Rotating viscometer:

a - With coaxial cylinders

The fluid is sheared between two coaxial cylinders, with radius Ri and Ra and a length L, by a laminar move which are breaking down in multi-layer with different angular speed from 0 (for the layer in contact with the fixed cylinder) to ω_0 (for the layer in contact with the rotating bob). The relative move of layers towards others give, a shear rate D and one Shear stress τ.

By imposing ω_0 and measuring M, the resisting torque to this rotation, we calculate D and τ according :



$\delta = Ra / Ri$ $\quad Ri / Ra \rightarrow 0.92$

Shear stress:

$T_{rep} = (1+\delta^2 / 2\,\delta^2) * (M / 2\pi L Ri^2)$

Shear rate:

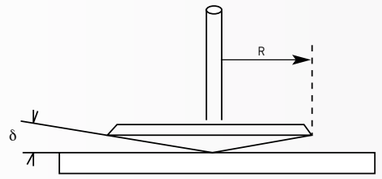
$D_{rep} = \omega * (1+ \delta 2\,) / (\delta 2 - 1)$

Rq : The determination of D is possible only if the gap is small. (i.e. DIN / ISO 3219 Standard).

b- With Cone-Plate :

The fluid is placed between a Plate and a Cone with angle δ (< 3°).

The cone, maintained to a constant speed induce a laminar shearing move. In those conditions, τ and D are constant in the gap, according :

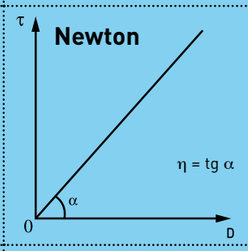
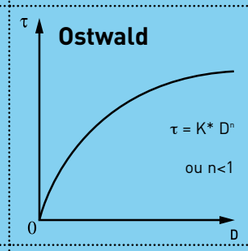
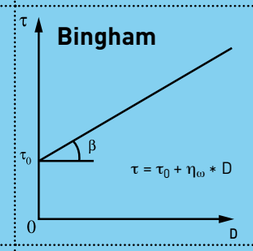
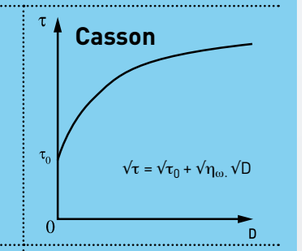
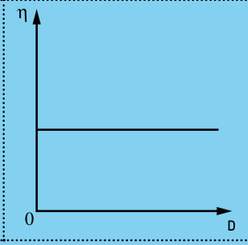
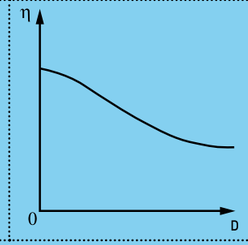
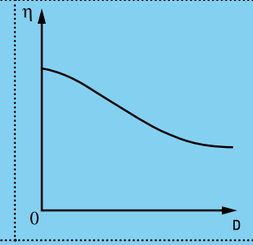
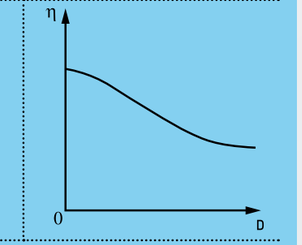


Shear stress / Shear rate

$T = 3M / 2\pi R^3$ / $D = \omega$ / arc δ

Rq : You would be vigilant on the sample volume including in the gap, because the great influence of the radius R on the τ value !

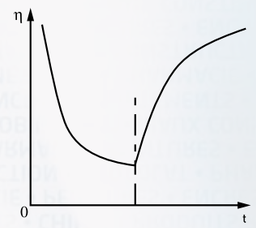
Study of different rheological behaviours

TYPE	NEWTONIAN	PSEUDO-PLASTIC	PLASTIC
Description	A sample is named newtonian when his viscosity stay constant, whatever the shear rate is. Iit is not necessary to define exactly the shear rate for the measurement. Just the temperature is important.	One pseudo-plastic sample has a viscosity which decrease when the shear rate increase: This flow behaviour is due to the molecules form and to their internal structure.	One sample presents a plastic behaviour, when his viscosity decrease when the shear rate increase, but from one original shear stress upper than 0, called YIELD VALUE (Tau 0), shear stress under which the product doesn't flow. It behave like a solid body.
Rheogram			 
Viscosity			 
Examples	• Water: 1 mPa.s to 20° C • Oils: 150 to 400 mPa.s (motor) 300 to 800 mPa.s (gears) • Mercury: 1,5 mPa.s • Gas: 0,01 to 0, 02 mPa.s	• Coating, • Varnish, • Cosmetics, • Mineral Suspensions....	• Toothpaste, • Ointment, • Grease, • All very concentrated suspensions....

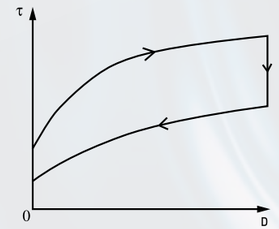
The thixotropy

One thixotropic product is a sample for which the variation of viscosity in function of shear rate is associated to a variation trough the time.

Owe talk about Thixotropy or Rheopexy, with the condition of REVERSIBLE Transformations: frozen or solidification.



Time of shearing Rest Time



Rheogram of thixotropic sample

Causes of thixotropy :

- Molecular structure
- « Château de cartes » with layers
- Particules mixing
- Ball loose Package...

CUSTOMER SERVICES

GLOSSARY

Adhesiveness: is the sticky power of a product. It is measured during a tension phase in texture analysis, by the negative force measured and also by the surface under the base line.

ASTM: American Society of Testing Materials. American organisation in charge of creating ASTM standards.

BINGHAM: model of rheological flow behaviour, characteristic of plastic products (shear-thinning with yield stress).

CASSON: model of rheological flow behaviour, allows the precise determination of non-linear plastic product's yield stress.

Centipoise (cP): measuring unit of dynamic viscosity in the MKSA system; equivalent to mPa.s in the SI system.

Coaxial cylinders: one cylinder with cap contains the product (cup) and one cylinder of a smaller size and another cylinder rotates inside (measuring bob) and imposes shear rate (D) known in the sample. (see DIN Standard).

Cone-plate: measuring geometry composed of one plate on which the product to be measured is placed and a low-angle cone (2° max), which shears the sample.

Consistency: notion of force with which a product resists compression. Quantified in texture analysis by Maximum Force that is measured during a compression phase.

Couette principle: principle of rheometer function in which the cup or the lower plate turns or oscillates, and the measuring bob or cot or upper plate measures torque. This principle lets you separate the part deforming the sample from the part that measures.

D (or $\dot{\gamma}$): shear rate actually subject to the fluid to be measured, expressed as s-1.

Dilatancy: increase of viscosity with the effect of rotation speed.

DIN: German Original Standard, specifying measuring geometries at a defined shear rate. Became ISO 3219.

Elasticity: Ability of a sample to recover its initial state after having been deformed. Inversely proportional to the relaxation % in texture analysis tests.

ETA (η, Dynamic Viscosity): quantifies a fluid's internal frictions; determined by the rotating principle: torque resistant to rotation; expressed in Pa·s.

K: consistency coefficient according to the Ostwald model; it shows a product's viscosity at 1 s-1.

KREBBS Unit: viscosity measuring unit obtained with a KU110 measuring bob, at 200 rpm.

M (mNm): measured torque in response to the rotation of the measuring bob, based on the product's viscosity.

Measuring bob (spindle): element immersed in fluid which rotates and measures the resistant torque of a product, according to the Searle principle.

Measuring geometry: set of spindles and cups or cones and plates used to measure viscosity. It enables, if well defined, to control the shear rate (D) subjected by the product.

N: rotation speed of motor, in rpm, which generates a shear rate (D) which depends on the measuring geometry used.

n: behaviour index of the Ostwald model; shows shear-thinning character of a product.

NEWTON: model of rheological behaviour model, characterising fluids for which only temperature has an influence on viscosity.

OSTWALD: model of rheological behaviour, characterising pseudo-plastic products: shear-thinning without yield stress

Pa·s: official measuring unit, in the SI system, of dynamic viscosity (Eta). For fluid products, mPa.s (=cP) is used. i.e.: Water viscosity at 20°C = 1 mPa.s. Peltier (effect): electric thermostatisation system through a quick exchange of calories between two plate elements.

Plastic: for a fluid with a viscosity that decreases linearly or not under the effect of increasing speed, and that has a non-zero yield rate.

Plate-plate: measuring geometry composed of a plate on which the product to be measured is placed and another upper rotative plate, which shears the sample, inserted into an adjustable gap (h).

Poise (P): measuring unit of dynamic viscosity in the MKSA system; equivalent to 0.1 Pa·s in the SI system.

Pseudo-plastic: for a fluid with a viscosity that decreases under the effect of increasing speed, and that does not have a non-zero yield rate (flows with gravity).

PT100: temperature sensor, indicating a sample's temperature.

Rheogram: flow curve obtained by a continuous ramp (or steps) of shear rates, it allows you to see a fluid's rheological behaviour.

Rheology: science of flow studying the deformation properties of fluids under various factors.

Rheometer: a measuring instrument for studying a fluid's flow behaviour.

Rheopexy: increase of viscosity over time, independent of speed.

s-1: unit of shear rate (D) that the sample is subject to in a defined geometry.

Sensorial analysis: series of sensorial tests: touch, taste and visual tests carried out by a panel of people who state the texture of a product and its acceptability according to predefined criteria.

Tau (τ, Shear stress): force by unit of surface with which the fluid responds to rotations; directly comes from measured torque and from the surface of the measuring bob used; express in Pa.

Texture: set of physical properties of a solid or pasty product, qualitatively characterised by sensorial analysis; mainly covers the notions of consistency, elasticity and adhesiveness.

Thermostatisation: maintenance of and setting of a sample's temperature; requires accessories such as baths, cryostats, thermostating cells.

Thixotropy: reversible decrease in viscosity, dependant on shear time and not on speed.

Viscometer: rotating measuring instrument that enables dynamic viscosity (Eta) to be measured, at one rotation speed (N) or a defined shear rate (D).

ν (Kinematic Viscosity): measure of internal resistance of a fluid; determined by flow principle. It includes the gravity of fluid, expressed in Stokes or cSt.

Yield stress (τ0): minimum force under which the fluid has a solid behaviour.

DISTRIBUTORS

Go to www.lamyrheology.com to see a list of our distributors

NOTES

NOTES

DOWNLOAD
OUR CATALOGUE
www.lamyrheology.com

CONTACT US:
contact@lamyrheology.com
Phone: +33 (0)4 78 08 54 06
Fax: +33 (0)4 78 08 69 44

LAMY RHEOLOGY
INSTRUMENTS