

# **Kinematic Viscosity**

# Kinematic Viscosity



Let us be your partners  
in the viscosity  
measurement

To all our clients,

Today's business world requests new challenges and further reaction to the market requirements. Fungilab's aim, as a leading viscosity technology company, is to become an expertise partner in the viscosity world to offer you our best products and services.

To provide you and your customers with this necessary attention and a expertise support, Fungilab offers a wide range of products for the measuring of the kinematic viscosity of your products.

Our kinematic series include: the Höppler viscometer or the Viscoball viscometer, for the measurement of the low viscosity liquids in all industries; capillary viscometer series and baths, in accordance to ASTM and DIN methods, to obtain the most accurate viscosity of your liquids; and flow cup viscometers, suitable for paints, inks, varnishes and similar products.

The wide range of viscosity products and accessories that Fungilab offers, including our rotational viscometer series, rheometers and standard oils, confirms Fungilab as your expertise and leading partner for the viscosity measurement.

[www.fungilab.com](http://www.fungilab.com)

# Viscoball

Measures accurately the viscosity of transparent Newtonian liquids and gases (with a special glass ball)

## 2 YEARS WARRANTY

### Standard Delivery

Set of 6 balls/ Control thermometer (-1° to 26°) / Cleaning tools / Calibration sheet / User manual

### Extra Accessories

Circulating temperature bath / Viscosity standard fluids for calibration / Special temperature probes



Changeable angle



Fixed angle

**NEW** ◀  
CHANGEABLE ANGLE

**FIXED ANGLE** ◀  
Complies with  
DIN 53015 / ISO 12058



## Viscoball

### Main Features

- > High accuracy through improved visibility of falling ball.
- > Minimized test time due to accurate return run of the ball.
- > Reduced cost of ownership through increased life time of falling tube.
- > Extended re-calibration periods through improved bearing support.

The **Viscoball** viscometer is mainly used for low viscosity substances such as used in:

- > Mineral oil industry (oils, liquid hydrocarbons, ...).
- > Food industry (sugar solution, beer, milk, gelatine, fruit juice, ...).
- > Chemical industry (polymer solutions, solvents, resin solutions, latex dispersions, adhesive solutions, ...).
- > Cosmetic/Pharmaceutical industry (raw materials, glycerine, emulsions, suspensions, solutions, extracts, ...).
- > Petroleum industry (light crude, machine oil, crude petroleum, ...).
- > Fuels (petrol, diesel oil, paraffin, ...).
- > Paper industry (emulsions, pigment dispersion, paper additives, ...).
- > Paints and varnishes (printing inks, varnishes, water lacquers, inks, ...).
- > Detergents (liquid washing agents, washing-up liquids, tenside solutions, ...).

### Measuring principle

The rolling and sliding movements of a ball through the sample liquid are timed in an inclined cylindrical measuring tube. The sample viscosity is correlated to the time the ball requires to traverse a definite distance. By turning the measuring tube upside down again the return of the ball may also be used for an additional measurement applying the return constant. The test results are given as dynamic viscosity in the internationally standardized, absolute units of mPa·s.

### Technical data

- > Viscosity range 0.5-10<sup>5</sup> mPa·s (cP)
- > Temperature range -20°C up to +120°C
- > Reproducibility Better than 0.5%
- > Comparability Better than 1%
- > Materials
  - Balls 1,2 and G, Borosilicate glass
  - Balls 3 and 4, Nickel iron alloy
  - Balls 5 and 6, stainless steel

The instrument is supplied with 6 balls, control thermometer (-1 to +26°C) cleaning tools, calibration sheet and instruction manual.

> On request:

Glass thermometer for different temperature ranges

- V91002 Glass thermometer +24 to +51 °C, div. 0.1 °C
- V91003 Glass thermometer +49 to +76 °C, div. 0.1 °C
- V91004 Glass thermometer +74 to +101 °C, div. 0.1 °C
- V91005 Glass thermometer +99 to +126 °C, div. 0.1 °C
- V91107 Ball G for gas measurements

Different viscosity standard oils are available for calibration.

Complies with DIN 53015 / ISO 12058

### Measuring Range

Ball	Viscosity range (mPa·s)
1	0.6 to 10
2	7 to 130
3	30 to 700
4	5.800 to 10.000
5	800 to 10.000
6	6.000 to 75.000



Kit of 6 balls supplied in the case.



Glass Thermometer detail included in the standard delivery.



Cleaning tool detail is also added in the standard delivery.



Pincers to grab up the balls after the set is used.



# Ubbelohde Capillary Viscometers

## UBBELOHDE

These FUNGILAB glass capillary viscometers allow to determine viscosities using ASTM and DIN testing methods. All capillary viscometers are supplied with the calibration certificate issued in accordance with the conditions of accreditation granted by a National Metrological Register which has assessed the measurement capability of the laboratory, the test uncertainty and its traceability to recognized international standards UKAS.

**UBBELOHDE ASTM** (ASTM D445-446, ASTM D2515, ISO 3104-3105 and UNE 400313)

**UBBELOHDE DIN** (DIN 51562 Part 1, ISO 3105 and UNE 400313)

Ubbelohde Viscometers are used to determine kinematic viscosity of transparent Newtonian liquids. Sample volume: aprox. 15 ml. Precision:  $\pm 0.2\%$ .

Code	Description	Viscosity range	Code	Description	Viscosity range
CV003-001	Ubbelohde ASTM size 0	0.3 - 1 cSt	CV003-100	Ubbelohde DIN size 0	0.35 to 1 cSt
CV003-002	Ubbelohde ASTM size 0C	0.6 to 3 cSt	CV003-101	Ubbelohde DIN size 0c	0.7 to 3 cSt
CV003-003	Ubbelohde ASTM size 0B	1 to 5 cSt	CV003-102	Ubbelohde DIN size 0a	1 to 5 cSt
CV003-004	Ubbelohde ASTM size 1	2 to 10 cSt	CV003-103	Ubbelohde DIN size I	2 to 10 cSt
CV003-005	Ubbelohde ASTM size 1C	6 to 30 cSt	CV003-104	Ubbelohde DIN size Ic	6 to 30 cSt
CV003-006	Ubbelohde ASTM size 1B	10 to 50 cSt	CV003-111	Ubbelohde DIN size Ia	10 to 50 cSt
CV003-007	Ubbelohde ASTM size 2	20 to 100 cSt	CV003-105	Ubbelohde DIN size II	20 to 100 cSt
CV003-008	Ubbelohde ASTM size 2C	60 to 300 cSt	CV003-106	Ubbelohde DIN size IIc	6 to 30 cSt
CV003-009	Ubbelohde ASTM size 2B	100 to 500 cSt	CV003-112	Ubbelohde DIN size IIa	100 to 500 cSt
CV003-010	Ubbelohde ASTM size 3	200 to 1,000 cSt	CV003-107	Ubbelohde DIN size III	200 to 1,000 cSt
CV003-011	Ubbelohde ASTM size 3C	600 to 3,000 cSt	CV003-108	Ubbelohde DIN size IIIc	600 to 3,000 cSt
CV003-012	Ubbelohde ASTM size 3B	1,000 to 5,000 cSt	CV003-113	Ubbelohde DIN size IIIa	1000 to 5,000 cSt
CV003-013	Ubbelohde ASTM size 4	2,000 to 10,000 cSt	CV003-109	Ubbelohde DIN size IV	2,000 to 10,000 cSt
CV003-014	Ubbelohde ASTM size 4C	6,000 to 30,000 cSt	CV003-110	Ubbelohde DIN size IVc	6,000 to 30,000 cSt
CV003-015	Ubbelohde ASTM size 4B	10,000 to 50,000 cSt	CV003-114	Ubbelohde DIN size IVa	10,000 to 50,000 cSt
CV003-016	Ubbelohde ASTM size 5	20,000 to 100,000 cSt			

\* Fungilab offers many types of glass capillary viscometers that are not listed in our catalog. We can also manufacture glass capillary viscometers with customer-specified constants. Viscometers with special constants, added temps, and before/after data are available by special order. For further information contact Fungilab.

## Cannon-Fenske Capillary Viscometers



### CANNON-FENSKE OPAQUE

ASTM D-445-446, ASTM D2515, ISO 3104-3105 and UNE 400313

Cannon-Fenske Opaque Viscometers (reverse flow type) are used for dark Newtonian liquids; especially suitable for liquids so dark in colour that cannot be seen in a Cannon-Fenske routine viscometer. Also used to study shearing stress and shearing rate. Sample volume: approx. 12 ml. Precision:  $\pm 0.3\%$ . Value indicated at  $40^{\circ}\text{C}$  and  $100^{\circ}\text{C}$  in both bulbs.

### CANNON-FENSKE ROUTINE

ASTM D-445-446, ASTM D2515, ISO 3104-3105 and UNE 400313

Cannon-Fenske Routine Viscometers quickly and easily measure the viscosities of transparent Newtonian liquids. Sample volume: approx. 7 ml. Precision:  $\pm 0.2\%$ . With constant value indication at  $+40^{\circ}\text{C}$  and  $+100^{\circ}\text{C}$ .

All capillary viscometers are supplied with the calibration certificate issued in accordance with the conditions of accreditation granted by a National Metrological Register which has assessed the measurement capability of the laboratory, the test uncertainty and its traceability to recognized international standards UKAS.

Code	Description	Viscosity range
CV004-101	Cannon-Fenske Opaque size 25	0.5 - 2 cSt
CV004-102	Cannon-Fenske Opaque size 50	0.8 - 4 cSt
CV004-103	Cannon-Fenske Opaque size 75	1.6 - 8 cSt
CV004-104	Cannon-Fenske Opaque size 100	3 - 15 cSt
CV004-105	Cannon-Fenske Opaque size 150	7 - 35 cSt
CV004-106	Cannon-Fenske Opaque size 200	20 - 100 cSt
CV004-107	Cannon-Fenske Opaque size 300	50 - 200 cSt
CV004-108	Cannon-Fenske Opaque size 350	100 - 500 cSt
CV004-109	Cannon-Fenske Opaque size 400	240 - 1.200 cSt
CV004-110	Cannon-Fenske Opaque size 450	500 - 2.500 cSt
CV004-111	Cannon-Fenske Opaque size 500	1.600 - 8.000 cSt
CV004-112	Cannon-Fenske Opaque size 600	4.000 - 20.000 cSt

Code	Description	Viscosity range
CV004-201	Cannon-Fenske Routine size 25	0.5 - 2 cSt
CV004-202	Cannon-Fenske Routine size 50	0.8 - 4 cSt
CV004-203	Cannon-Fenske Routine size 75	1.6 - 8 cSt
CV004-204	Cannon-Fenske Routine size 100	3 - 15 cSt
CV004-205	Cannon-Fenske Routine size 150	7 - 35 cSt
CV004-206	Cannon-Fenske Routine size 200	20 - 100 cSt
CV004-207	Cannon-Fenske Routine size 300	50 - 200 cSt
CV004-208	Cannon-Fenske Routine size 350	100 - 500 cSt
CV004-209	Cannon-Fenske Routine size 400	240 - 1.200 cSt
CV004-210	Cannon-Fenske Routine size 450	500 - 2.500 cSt
CV004-211	Cannon-Fenske Routine size 500	1.600 - 8.000 cSt
CV004-212	Cannon-Fenske Routine size 600	4.000 - 20.000 cSt

\* Fungilab offers many types of glass capillary viscometers that are not listed in our catalog. We can also manufacture glass capillary viscometers with customer-specified constants. Viscometers with special constants, added temps, and before/after data are available by special order. For further information contact Fungilab.



# BS/U-Tube and BS/IP/RF U-Tube Capillary Viscometers

## BS/U-Tube Viscometers for Transparent Liquids

BS, ASTM D-445, D446, ISO 3104, ISO 3105 and UNE 400313  
 Made of borosilicate glass, and non-alterable timing marks. With constant value at 40°C and 100°C into the calibration certificate. Precision:  $\pm 0.2\%$ .

## BS/IP/RF U-Tube Reverse Flow Viscometers for Opaque Liquids

BS-IP-RF, ASTM D-445, D446, ISO 3104, ISO 3105 and UNE 400313  
 Made of borosilicate glass, and non-alterable timing marks. With constant value at 40°C and 100°C into the calibration certificate. Precision:  $\pm 0.3\%$ .

All capillary viscometers are supplied with the calibration certificate issued in accordance with the conditions of accreditation granted by a National Metrological Register which has assessed the measurement capability of the laboratory, the test uncertainty and its traceability to recognized international standards UKAS.

Code	Description	Viscosity range
CV006-101	U-Tube Type BS/U size A	0.9 - 3 cSt
CV006-102	U-Tube Type BS/U size B	2 - 10 cSt
CV006-103	U-Tube Type BS/U size C	6 - 30 cSt
CV006-104	U-Tube Type BS/U size D	20 - 100 cSt
CV006-105	U-Tube Type BS/U size E	60 - 300 cSt
CV006-106	U-Tube Type BS/U size F	200 - 1.000 cSt
CV006-107	U-Tube Type BS/U size G	600 - 3.000 cSt
CV006-008	U-Tube Type BS/U size H	2.000 - 10.000 cSt

Code	Description	Viscosity range
CV006-001	U-Tube Reverse Flow BS/IP/RF size 1	0.6 - 3 cSt
CV006-002	U-Tube Reverse Flow BS/IP/RF size 2	2 - 10 cSt
CV006-003	U-Tube Reverse Flow BS/IP/RF size 3	6 - 30 cSt
CV006-004	U-Tube Reverse Flow BS/IP/RF size 4	20 - 100 cSt
CV006-005	U-Tube Reverse Flow BS/IP/RF size 5	60 - 300 cSt
CV006-006	U-Tube Reverse Flow BS/IP/RF size 6	200 - 1.000 cSt
CV006-007	U-Tube Reverse Flow BS/IP/RF size 7	600 - 3.000 cSt
CV006-008	U-Tube Reverse Flow BS/IP/RF size 8	2.000 - 10.000 cSt
CV006-009	U-Tube Reverse Flow BS/IP/RF size 9	6.000 - 30.000 cSt
CV006-010	U-Tube Reverse Flow BS/IP/RF size 10	20.000 - 100.000 cSt
CV006-011	U-Tube Reverse Flow BS/IP/RF size 11	60.000 - 300.000 cSt

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## Thermocap Plus

Precision bath,  
temperature  
controlled for  
capillary viscometers.



## Thermocap Plus

Precision Viscometer Bath, suitable for capillary viscometers Cannon-Fenske, Ubbelohde, Ostwald, tube BS U, Cannon-Manning semimicro, Ubbelohde BS/IP/SL, BS/IP/SL (S) and BS/IP/MSL.

### Technical Features:

- > Temperature range: room temp. +5°C to 150°C
- > Temperature stability: +/- 0.03 °C
- > Temperature reading: Digital
- > Temperature sensor: PID
- > Heating power: 2.0 kW
- > Pump power: Pressure: 0.3 bar, Flow: 14 L/min
- > Conforms to the DIN 12876-1 III Class regulation
- > Protection against temperature excess and low liquid level
- > Supplied at 190 V - 230 V, 50/60 Hz
- > Aluminum treated lid with five holes for capillaries
- > Supplied with five independent universal supports, made of Delrin treated plastic
- > Bath capacity: 20 liters (made of borosilicate glass)
- > Manufactured for the glass viscometers calibration conform to ISO 3105, ASTM D455, ASTM D2515 and UNE 400313.

Ref. B150V20



Universal support for capillary viscometers, manufactured in PTFE, stainless steel AISI 304 subjection clamp. Indicated for:

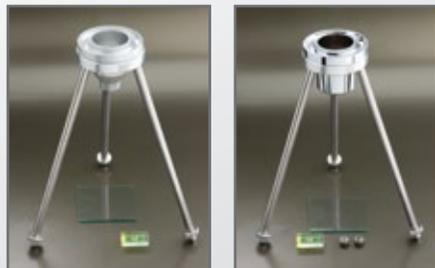
- > Cannon-Fenske Routine
- > Cannon-Fenske Opaque
- > Ubbelohde
- > Ostwald
- > BS U Tube

\* Additional Fungilab Kinematic baths series are available.  
Please, for further information contact Fungilab.

# Flow Cup Viscometers



Flow Cup Viscometers with Tripod support



STANDARDS: ISO 2431, ASTM D-1200

Flow cup viscometers provide kinematic viscosity data. The measured kinematic viscosity is generally expressed in seconds (s) flow time when the fluid is flowing through an orifice at a specified temperature. Thanks to the conversion equations the viscosity is calculated from the flow time to centistokes (cSt). The calibration certificates are supplied with the cups.

According to the standards, there are several viscosity ranges available from 5 cSt. Flow cups made of anodized aluminium body with a stainless steel orifice.

Ensuring the accuracy of the test results, FUNGILAB recommends a periodic calibration check. You can check the viscosity results using the standard oils specially manufactured for these kind of viscometers (available under request), or sending the instrument to our calibration laboratories.

Industries like paint, ink, varnishes and similar products use this very easy to use flow cups to quickly calculate the viscosity.

## ISO 2431 Flow Cup Viscometers

Code	Model	Bore Ø mm	Viscosity range (cSt)
FCI003	Flow Cup Viscometer 3 ISO 2431	3	5 to 42
FCI004	Flow Cup Viscometer 4 ISO 2431	4	35 to 135
FCI005	Flow Cup Viscometer 5 ISO 2431	5	100 to 350
FCI006	Flow Cup Viscometer 6 ISO 2431	6	190 to 680
FCS	Tripod Support for Flow Cup Viscometer		
FCS-GL	Ergonomic Support for Flow Cup Viscometer		

The cups can be supplied separately or with an adjustable stand that includes a precision level and an overflow glass draw plate.

## ASTM D-1200 Flow Cup Viscometers (Ford Cup)

Code	Model	Bore Ø mm	Viscosity range (cSt)
FCA002	Flow Cup Viscometer 2 ASTM D-1200	2.53	25 to 120
FCA003	Flow Cup Viscometer 3 ASTM D-1200	3.40	40 to 220
FCA004	Flow Cup Viscometer 4 ASTM D-1200	4.12	70 to 370
FCA005	Flow Cup Viscometer 5 ASTM D-1200	5.20	200 to 1,200
FCS	Tripod Support for Flow Cup Viscometer		
FCS-GL	Ergonomic Support for Flow Cup Viscometer		

These types of flow cups are available in two options: with or without handle.

The cups without handle can be supplied separately or with an adjustable stand that includes a precision level and an overflow glass draw plate. The handle types are fitted directly into the liquid to fill in and calculate the flowing time. Thanks to its handle, this cup is very easy to use.

## Other Fungilab Products

### Fungicrom Separating Chambers (TLC)



Thin Layer Chromatography is like all chromatographic techniques, based on a multistage distribution process.

Code	Model
NPLAK	Chamber NORMAPLAK (with lid) 200x200 mm.
MPLAK	Chamber MULTIPLAK (with lid) 200x200 mm.
MIPLAK	Chamber MINIPLAK (with lid) 100x100mm.
RPLAK	Chamber ROLLERPLAK (with lid) 210x110 mm.
CNPLAK	Chamber NORMAPLAK (without lid)
CMPLAK	Chamber MULTIPLAK (without lid)
CMIPLAK	Chamber MINIPLAK (without lid)
CRPLAK	Chamber ROLLERPLAK (without lid)
T2020	Knob-lid for chambers 200x200 mm.
T1010	Knob-lid for chambers 100x100 mm.
RRL-P	Plastic Reagent Reservoir with lid (12 pcs.)

### TLC Spray unit

Ideal for spraying reagents and indicator solutions.

Spray nozzle made of PET, resistant against many acids and most solvents.

- > Tubing made of plastic, jet valve made of metal.
- > Propellant volume: sufficient for spraying 300ml. liquid.
- > Screw cap bottle 125 ml. made of PET.
- > Dimensions: W10 x H13 x D5 cm.
- > Delivery incl. jet valve 0.7 mm.



Leading Viscosity Technology

Products for Research, Analysis and Quality Control

**Office EUROPE**

C/Constitució 64, Pol. Ind. Les Grases, 08980 Sant Feliu de Llobregat, Barcelona  
T. +34 936 853 500 F. +34 936 853 750  
sales@fungilab.com

**Office USA**

Fungilab Inc.  
89 K Cabot Court, Hauppauge, New York 11788  
T. +1 631 750 6361 F. +1 631 750 6362  
sales@fungilab.us

**Office LATINOAMÉRICA**

Panamá, Distrito de Panamá, Corregimiento de Betania, Urb. El Dorado,  
Av. Miguel A. Brostella, C.C. Camino de Cruces, Piso 4, Local 400-1, Oficina #3  
skype. fungilab.pty  
latinoamerica@fungilab.com

**[www.fungilab.com](http://www.fungilab.com)**