Flow Cups
Models 243

testing equipment for quality management

ERICHSEN

Technical Description and Operating Instructions

DIN 53 211
ISO 2431
DIN EN ISO 2431

ASTM D 1200
SNV 37 110
SIS 18 41 15

A Simple Method
to Measure Viscosity

VISCOSITY CUPS, Models 243

Purpose and Application

Viscosity Cups remain the most important quick and simple method to measure the consistency of fluids in the laboratory and in production.

Viscosity Cups are, however, only suitable for lower viscosities and not for highly viscous substances such as pastes, etc.. The most accurate results are achieved with fluids within the range complying with Newton's Law.

Design Details

Viscosity Cups consist of a hollow cylinder which terminate in a nozzle in the bottom. Excess fluid is collected in a gutter channel.

In general, the Viscosity Cups are made of anodised aluminium and the nozzles of stainless steel. Only the low price model 243/I is made of Phenol resin (but still with stainless steel nozzle).

Measuring Principle

The viscosity is established in terms of the time in seconds in which a precisely controlled volume of fluid flows out through the nozzle of the viscosity cup.

Test Procedure

The general test process is described as follows:

- Level stand using spirit level
- Place cup in the stand or in the temperature control jacket
- Close nozzle
- Fill with fluid
- Wipe off surplus material across the edge of the cup with a glass plate, and close cup with glass plate
- Open nozzle
- Pull off glass plate horizontally and simultaneously set stop watch in motion
- At the first break off in the fluid flow stop stop watch and note time

Further details are described in the various standards. It is to be noted that the Cups are only calibrated for the specified ranges and for the specified flow times.

In addition, it is particularly important to follow the instructions concerning temperatures carefully. Only a very small difference could lead to considerable changes and hence wrong measuring results. Of particular importance is to understand that it is not sufficient just to make sure that the fluid is at the right temperature: the Viscosity Cup must also be at the correct temperature, if necessary by surrounding it with a temperature jacket so that the intended temperature is maintained. It is also essential to check the temperature of the jet of fluid coming out of the Cup, since it is at this point that the actual temperature of the fluid being measured can be established. Comparable, reproducible results are only possible if the temperature is kept fully under control.

Care and Maintenance

After making a measurement the flow cup - particularly the nozzle - must be carefully cleaned without, however, using any hard or sharp implements.

Important:

If remnants of fluid (paint) remain in the nozzle, the effective size of the nozzle will be altered and the cup can no longer give accurate measuring results.

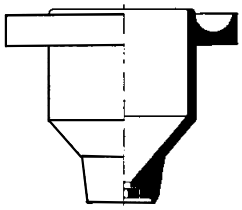
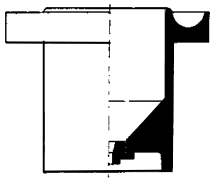
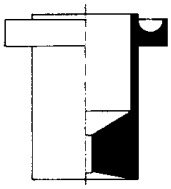
Reference Class:

All versions of Models 243/III and 243/VII as well as Model 243/II with nozzle dia. 4 mm are supplied with a Manufacturer's Certificate M in accordance with DIN 55 350-18 that includes among others the following information:

Flow time with percentage deviation from setting value, type of calibration oil, product identification, test equipments used with calibration status, date, name of inspector.

In the medium range of application the flow time is determined by means of a retraceably calibrated test oil. The maximum deviation from the setting value should not exceed 3 %.

VISCOSITY CUPS, Models 243

	MODEL No. (Material)	STANDARD	NOZZLE dia/No.	MEASURING RANGE
	243/I (Phenol resin)	technically equivalent to DIN 53 211	2 mm 3 mm 4 mm 6 mm 8 mm	22 - 55 mm²/s 45 - 300 mm²/s 90 - 682 mm²/s 300 - 1200 mm²/s 500 - 2000 mm²/s
	243/II (Alu anodised)	technically equivalent DIN 53 211	2 mm 3 mm 6 mm 8 mm	22 - 55 mm²/s 45 - 300 mm²/s 300 - 1200 mm²/s 500 - 2000 mm²/s
	243/II/4 (Alu anodised)	DIN 53 211 SNV 37 110 SIS 184 115	4 mm	90 - 682 mm²/s
	243/III (Alu anodised)	ASTM D 1200 *	Nr. 2 (2.5 mm) Nr. 3 (3.4 mm) Nr. 4 (4.1 mm) Nr. 5 (5.2 mm)	32 - 118 mm²/s 31 - 215 mm²/s 59 - 367 mm²/s 217 - 1185 mm²/s
	243/VII (Alu anodised)	ISO 2431 EN ISO 2431	3 mm 4 mm 5 mm 6 mm	8 - 42 mm²/s 34 - 135 mm²/s 91 - 325 mm²/s 188 - 684 mm²/s

* The ASTM D 1200 Standard stipulates a maximum allowed flow time tolerance of ± 10%.
Each model 243/III is always manufactured within a maximum flow time tolerance of ± 6.5%!

Accessories

Stand
Three legged stand suitable for all flow cups listed, with spirit level.

Temperature Control Jacket
Available for Models 243/II, 243/III and 243/VII.

Thermometer
To DIN 12 755,
Scale 0 - 50°C, read off accuracy 0.2°C.

Digital Stop Watch
with calibration certificate; LCD, indication range: 9 hours, 59 minutes, 59,99 seconds;
height of digits: 8 mm, two-button operation.

CUPTIMER 243-T
Opto-electronic measuring instrument for the exact determination of the flow time using standardised flow cups.

Viscosity Nomogram, Model 458
To read off the various viscosity scales such as,, for example DIN, Ford, ISO, etc., in absolute viscosity values, and also for temperature correction for the measured value.

ViscoSoft ® 460 -FC
Software for rapid conversion between viscosity and efflux time to be used with standardized flow cups.

VISCOSITY CUPS, Models 243

Ordering Information

Product Name	Nozzle Dia.	Order No.	Remarks
Model 243/I	2 mm	0024.01.31	of Phenol resin,
Model 243/I	3 mm	0024.05.31	Manufacturer's Test
Model 243/I	4 mm	0024.02.31	Certificate M
Model 243/I	6 mm	0024.03.31	upon request
Model 243/I	8 mm	0024.04.31	
Model 243/II	2 mm	0064.01.31	of Anodised Aluminium,
Model 243/II	3 mm	0064.05.31	Manufacturer's Test
Model 243/II	6 mm	0064.03.31	Certificate M
Model 243/II	8 mm	0064.04.31	upon request
Model 243/II	4 mm	0064.02.31	of Anodised Aluminium with Manufacturer's Test Certificate M
ditto		0249.01.32	with official Test Certificate issued by DKD
Temperature jacket		0483.01.32	for Model 243/II
Model 243/III	No. 2	0060.01.31	
Model 243/III	No. 3	0060.01.31	with Manufacturer's Test Certificate M
Model 243/III	No. 4	0060.03.31	
Model 243/III	No. 5	0060.04.31	
Temperature jacket		0483.02.32	for Model 243/III
Model 243/VII	3 mm	0061.01.31	
Model 243/VII	4 mm	0061.02.31	of Anodised Aluminium,
Model 243/VII	5 mm	0061.04.31	with Manufacturer's Test Certificate M
Model 243/VII	6 mm	0061.03.31	
Model 243/VII	3 mm	0250.01.32	
Model 243/VII	4 mm	0250.02.32	with official Test Certificate issued by DKD
Model 243/VII	5 mm	0250.09.32	
Model 243/VII	6 mm	0250.03.32	
Temperature jacket		0483.01.32	for Modell 243/VII
Stand with spirit level		0478.01.32	
Thermometer		570911341	
Digital Stop Watch		560911241	with calibration certificate
Spare Glass plate		610911941	

For information on our DIP FLOW CUPS we refer to our Brochure No. 321/322/343.

The right of technical modifications is reserved.
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