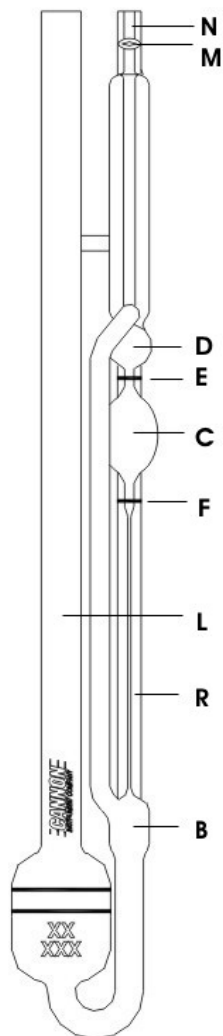


# Instructions for the use of The Cannon-Ubbelohde Viscometer

See also ASTM D 445, D 446, ISO 3104 and ISO 3105



1. Clean the viscometer using suitable solvents, and by passing clean, dry, filtered air through the instrument to remove the final traces of solvents. Periodically, traces of organic deposits should be removed with chromic acid or non-chromium cleaning solution.
2. If there is a possibility of lint, dust, or other solid material in the liquid sample, filter the sample through a fritted glass filter or fine mesh screen.
3. Charge the viscometer by pouring enough sample through tube L to fill the lower reservoir until the liquid meniscus is between the minimum and maximum fill lines marked on the reservoir.
4. Place the viscometer into the holder and insert it into the constant temperature bath. Vertically align the viscometer in the bath if a self-aligning holder has not been used.
5. Allow approximately 20 minutes for the sample to come to the bath temperature.
6. Seal the branching vent tube M with a finger or stopper and apply suction to tube N until the liquid reaches the center of bulb D. Remove suction from tube N. Remove seal from vent tube M, and immediately seal tube N until the sample drops away from the lower end of the capillary R into bulb B. Then remove seal and measure the efflux time.
7. To measure the efflux time, allow the liquid sample to flow freely down past mark E, measuring the time for the meniscus to pass from mark E to mark F to the nearest 0.1 second or 0.01 second.
8. Calculate the kinematic viscosity of the sample by multiplying the efflux time by the viscometer constant.
9. Without recharging the viscometer, make check determinations by repeating steps 6 to 8.

RECOMMENDED VISCOSITY RANGES FOR THE  
CANNON-UBBELOHDE VISCOMETERS

Size	Kinematic Viscosity Range	
	mm <sup>2</sup> /s <sup>2</sup> , (cSt/s)	mm <sup>2</sup> /s, (cSt)
25	0.002	0.5 to 2
50	0.004	0.8 to 4
75	0.008	1.6 to 8
100	0.015	3 to 15
150	0.035	7 to 35
200	0.1	20 to 100
300	0.25	50 to 250
350	0.5	100 to 500
400	1.2	240 to 1200
450	2.5	500 to 2500
500	8	1600 to 8000
600	20	4000 to 20000
650	45	9000 to 45000
700	100	20000 to 100000

The combined expanded<sup>1</sup> uncertainty with 95% confidence of the calibration measurements relative to the primary standard is as follows:

Range of Constants mm <sup>2</sup> /s <sup>2</sup>	Expanded Combined Uncertainty
<0.025	0.16%
0.025-0.25	0.22%
0.25-2.5	0.29%
2.5-25	0.38%
>25	0.44%

The assigned uncertainty of the primary viscosity standard at 20°C is ±0.17%. See ISO 3666.

<sup>1</sup>An expanded uncertainty U is determined by multiplying the combined standard uncertainty u<sub>c</sub> by a coverage factor k: U = k u<sub>c</sub> where k = 2. See NIST Technical Note 1297, 1994 edition, *Guidelines for evaluation and Expressing the Uncertainty of NIST Measurement Results*

THIS PRODUCT WAS CALIBRATED WITHIN A QUALITY SYSTEM WHICH IS REGISTERED TO ISO 9002.