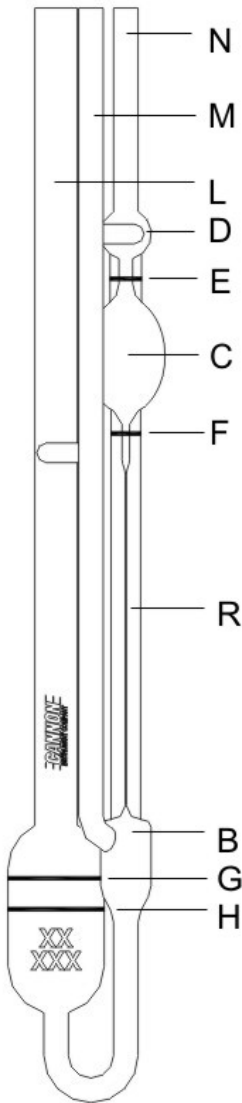


Instructions for the use of The Ubbelohde Viscometer



See also ASTM D 445, D 446 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 introducing sample through tube L into the lower reservoir; introduce enough sample to bring the level between lines G and H.
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. Place a finger over tube M and apply suction to tube N until the liquid reaches the center of bulb D. Remove suction from tube N. Remove finger from tube M, and immediately place it over tube N until the sample drops away from the lower end of the capillary into bulb B. Then remove finger 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.
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.

Ubbelohde Type For Transparent Liquids

RECOMMENDED VISCOSITY RANGES FOR THE
UBBELOHDE VISCOMETER

Size	Kinematic Viscosity Range			
	mm ² /s ² , (cSt/s)		mm ² /s, (cSt)	
0	0.001	0.3	to	1
0C	0.003	0.6	to	3
0B	0.005	1	to	5
1	0.01	2	to	10
1C	0.03	6	to	30
1B	0.05	10	to	50
2	0.1	20	to	100
2C	0.3	60	to	300
2B	0.5	100	to	500
3	1.0	200	to	1000
3C	3.0	600	to	3000
3B	5.0	1000	to	5000
4	10	2000	to	10000
4C	30	6000	to	30000
4B	50	10000	to	50000
5	100	20000	to	100000

The combined expanded¹ uncertainty with 95% confidence of the calibration measurements relative to the primary standard is as follows:

Range of Constants mm ² /s ²	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.

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