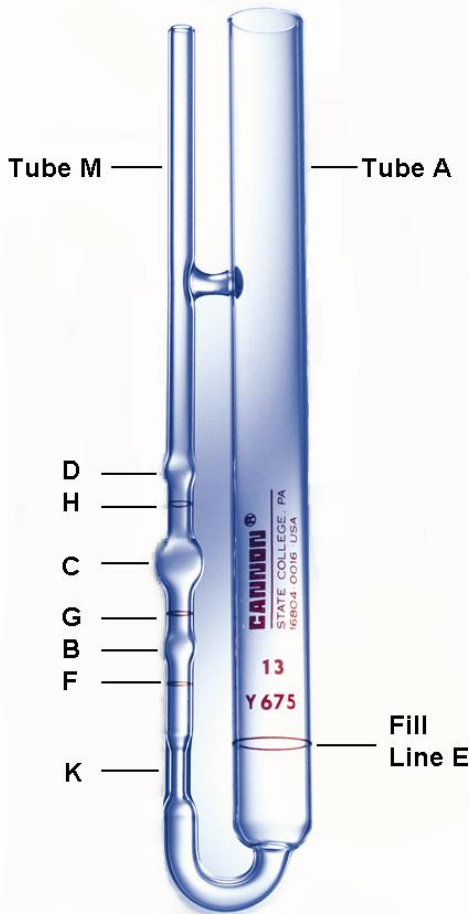


# Instructions for the use of The Cannon-Manning Vacuum Viscometer

See also ASTM D 2171



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.

Charge the viscometer by pouring the sample into filling tube A to  $\pm 2$  mm of fill line E.

Insert the viscometer in a holder, and insert viscometer into a constant temperature bath. Position the viscometer vertically in the bath so that the uppermost timing mark is at least 2 cm below the surface of the bath liquid.

Establish a 40.0 kPa (300 mm Hg) vacuum in the vacuum system and connect the system to tube M of the viscometer with a 3-way toggle valve closed in the line leading to the viscometer. Excellent pressure regulators are available from the Cannon Instrument Company.

After the viscometer has been in the bath for 30 minutes, start the flow of sample upward through capillary K by opening the toggle valve to the vacuum system.

Measure to within 0.1 second the time required for the leading edge of the meniscus to pass between timing marks F and G, and with a second stop watch marks G and H. Close the toggle valve.

Calculate the viscosity of the sample in poise by multiplying the fill time for each bulb by the viscometer constant for each bulb.

A check run may be made by repeating steps 1 thru 7, or in a duplicate viscometer.

For convenience, it is recommended to keep the flow times between 60 and 400 seconds.

## RECOMMENDED VISCOSITY RANGES FOR THE CANNON-MANNING VACUUM VISCOMETERS

Size	Viscosity Range, Pa·s
4	0.0036 to 0.08
5	0.012 to 0.24
6	0.036 to 0.8
7	0.12 to 2.4
8	0.36 to 8.0
9	1.2 to 24
10	3.6 to 80
11	12 to 240
12	36 to 800
13	120 to 2400
14	360 to 8000

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

Size	Combined Expanded Uncertainty
6 - 11	0.80%
12	0.94%
13	1.2%
14	1.5%

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

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

THIS PRODUCT WAS CALIBRATED WITHIN A QUALITY SYSTEM WHICH IS REGISTERED TO ISO 9001:2000.

CANNON INSTRUMENT COMPANY

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