

# Certificate of Calibration

Viscometer No. <sup>A</sup> 63

BS / U-Tube Viscometer  
(Standard Test ASTM D 445, D 2170 and ISO 3104)

Viscometer Constant 0.002788 mm<sup>2</sup>/s<sup>2</sup>, (cSt/s)

The viscometer constant is the same at all temperatures.

To obtain kinematic viscosity in mm<sup>2</sup>/s (cSt) multiply the efflux time in seconds by the viscometer constant. To obtain viscosity in mPa·s, multiply the kinematic viscosity by the density in g/mL.

Kinematic viscosities of the standards used in calibrating were established in Master Viscometers as described in Ind. Eng. Chem. Anal. Ed. 16, 708(1944), ASTM D 2162, and the Journal of Research of the National Bureau of Standards, Vol. 52, No. 3, March 1954, Research Paper 2479.

Kinematic viscosities are based on the primary viscosity standard, water, at 20°C (ITS-90). The internationally accepted value for the viscosity of water at 20°C (ITS-90) is 1.0016 mPa·s or kinematic viscosity is 1.0034 mm<sup>2</sup>/s as listed in ISO 3666. The gravitational constant, g, is 980.1 cm/sec<sup>2</sup> at the Cannon Instrument Company. The gravitational constant varies up to 0.1% in the United States. To make this small correction in the viscometer constant, multiply the above viscometer constant by the factor [g(at your laboratory) /980.1]. The calibration data below are traceable to the National Institute of Standards and Technology. Temperature measurement is traceable to NIST (Test No. 260470).

## CALIBRATION DATA AT 40°C

<u>Viscosity Standard</u>	<u>Kinematic Viscosity mm<sup>2</sup>/s, (cSt)</u>	<u>Efflux Time Seconds</u>	<u>Constant mm<sup>2</sup>/s<sup>2</sup>, (cSt/s)</u>
0104	1.0289	369.05	0.002788
0105	2.258	809.96	0.002788

Average = 0.002788

Calibrated by 525070 VSM on 02-may-01 under supervision of 

Please note: This calibration remains valid for 10 years unless (1) the viscometer has been damaged or (2) materials which chemically attack borosilicate glass (e.g., hydrofluoric acid or highly alkaline solutions) have been used. Nonetheless, it is recommended that the calibration be verified with kinematic viscosity standards periodically; if a change in calibration is indicated, carefully examine all sources of error, including especially temperature measurement since most apparent changes in calibration of the viscometer are due to errors in temperature measurement.

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The S.I. unit of kinematic viscosity is 1 meter squared per second, and is equal to 10<sup>4</sup> stokes. The S.I. unit of viscosity is 1 pascal second, and is equal to 10 poises. One centistokes is equal to one millimeter squared per second.