

VISCOSITY EZ CUPS

The new EZ™ Viscosity Cup Series was designed to comply with all ASTM D4212 Standard requirements.

Efflux Time and Centistokes

The EZ Viscosity Cup is a measurement device widely used to measure viscosity. It is a stainless steel cup with a tiny hole drilled in the center of the bottom of it. There are five cup specifications (No. 1 - No. 5): use large number cup sizes when viscosity is high, use low number cup sizes when viscosity is low. To determine the viscosity of a liquid, the cup is dipped and completely filled with the substance. After lifting the cup out of the substance, the user measures the time until the liquid streaming out of it breaks up: this is the corresponding "efflux time."

Poise is the fundamental unit of viscosity (100 centipoise = 1 poise). It is a defined mechanical measurement of the resistance of a liquid to flow where gravity is not a factor. However, gravity is the driving force causing liquid in the viscosity cup to flow through the orifice. A high-density material will flow from a cup in a shorter time than a low-density material of the same viscosity.

Centistoke is the unit of reference in oil viscosity cup measurements (100 centistokes = 1 stoke). Stoke is defined as poise divided by density (or weight per gallon times 0.120).

Each EZ Viscosity Cup is furnished with a chart for the conversion between efflux time in seconds (to the nearest tenth of a second) to viscosity in centistokes. This chart is particularly useful in determining efflux time in seconds when viscosity in centistokes is known.

Calibration and Certification

All EZ Viscosity Cups are calibrated. If a certificate of calibration is required, it may be ordered at an additional charge. This certificate contains information on actual cup calibration with standard oils traceable to the National Institute of Standards and Technology. The certification also complies with ANSI/NCSL Z540-1 and MIL-STD-45662A requirements.



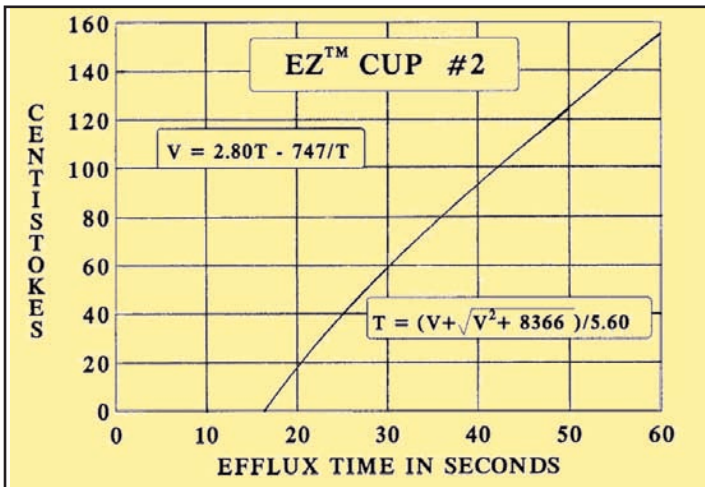
EZ Viscosity Cup Set with Stand

EZ Viscosity Cups are manufactured to tight mechanical tolerances to insure that each cup is correctly produced and that all cups are identical. The following chart provides operating range specifications, cup mid-range sensitivity and recommended calibration oils. Following this chart is a sample graph and mathematical formula that relate efflux time in seconds to centistokes viscosity.

OPERATING RANGE SPECIFICATIONS TABLE				
Cup Number	Range in Seconds	Range in Centistokes	Mid-Range Sensitivity*	Calibration Oil Number/Centistokes**
1	40 - 60	10 - 36	1.3	G-10/19
2	20 - 60	19 - 156	3.3	G-60/117
3	12 - 60	64 - 596	10.5	G-200/458
4	10 - 60	79 - 784	13.9	G-200/458
5	10 - 60	161 - 1401	24.2	G-350/878

*Stated as centistokes per second of efflux time

**Centistokes values are nominal: the actual values are printed on the labels



Viscosity in Centistokes vs. Efflux Time in Seconds

Technical Information

The above graph relates viscosity in centistokes to efflux time in seconds for the EZ Viscosity Cup No. 2. (There is a similar chart for each of the five cups of the EZ Series.) The charts may be used for determining the approximate relationship between these factors, but usually reference will be made to the table that is furnished with each EZ Viscosity Cup, giving the relationship to the nearest tenth of a second. If there is a need to determine the relationship beyond the range of the table, the mathematical formulas shown on the graphs may be used.

Use Standard "G" Series Calibration Oils for EZ Viscosity Cup Calibration



EZ Viscosity Cup Set with Stand and Calibration Oil

These oils are produced in accordance with the following standards to be used with EZ Cups: ISO 9002:1994; EN ISO 29002:1994; BS EN ISO 9002:1994; ANSI/ASQC Q9002:1994.

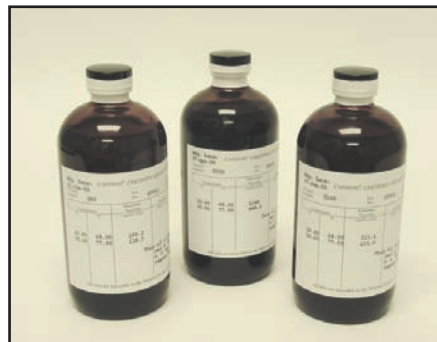
Standard "G" Series Calibrating Oils

Reference	Oil Number	Use with Cup Number	Nominal Centistokes* at 25°C/77°F
VI3803	G10	1	35
VI3815	G60	2	120
VI3821	G200	3 and 4	230
VI3825	G350	5	880

*The certified value is printed on the container label.

Note: A graph is furnished with each cup showing efflux time of the "G" oil at 20-27°C.

Cup to Oil Selection Guide



Available in 16 oz/473 ml Containers

Use only "G" Series calibration oils to calibrate EZ Viscosity Cups. Silicone fluids should not be used to calibrate viscosity cups: they change the interface between the cup surface and the test material, thereby changing the cup calibration. The following is taken from ASTM D 445: "Viscometers used for silicone fluids should be reserved for the exclusive use of such fluids. Solvent washed from these viscometers should not be used for cleaning other viscometers."

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