

EZ™ Zahn (ASTM) Series Dip Cup

3% Guaranteed Tolerance Complies with & Exceeds ASTM D4212

- Oils used to standardize EZ Cups are produced in accordance with ISO/IEC 17025, ISO Guide 34, ISO 9001.
- The EZ Cup formula for each cup of the series matches the applicable ASTM formula in D4212 at the recommended calibration level.
- EZ Cups are compatible to ASTM D1084 Viscosity of Adhesives and ASTM D816.
- Conversion table relating efflux time in seconds, to the nearest tenth of a second, to viscosity in centistokes furnished with each EZ™ Cup.
- EZ Cup calibration is traceable to the National Institute of Standards and Technology.
- Calibration and Certification procedures qualify under ANSI/NCCL Z540 or MIL-STD-45662A as applicable.
- The EZ Cup is not matched by any other cup of its type, either with respect to the advantages listed above, in highest quality of workmanship or in continuing quality control procedures.
- All stainless steel cup and handle.
- The finest, most reliable, calibrated & documented cup on the market.



Features

- EZ Cup orifices are machined rather than drilled to insure exact centering in the cup hemisphere base and a minimum of burr formation. This insures an orifice of specified length and a correct symmetrical efflux stream.
- The EZ Cup support rods are offset from the side of the cup and secured to the cup sidewall below the cup rim. This eliminates errors due to test material drainage from support surfaces.
- The increased separation width of the support rods by over 20% and the lowering of weld to the cup provide best possible conditions for cleaning.

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Technical Data

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Cup Number	Seconds Range	Centistoke Range	Midrange Sensitivity ¹	Calibration Oil Number ²
1	40 to 60	10 to 36	1.3	G-10/19
2	20 to 60	19 to 156	3.3	G-60/117
3	12 to 60	64 to 596	10.5	G-200/458
4	10 to 60	79 to 784	13.9	G-200/458
5	10 to 60	161 to 1401	24.2	G-350/878

¹ Stated as centistokes per second of efflux time.
² Centistoke values are nominal - actual values printed on labels

Continuing Improvements

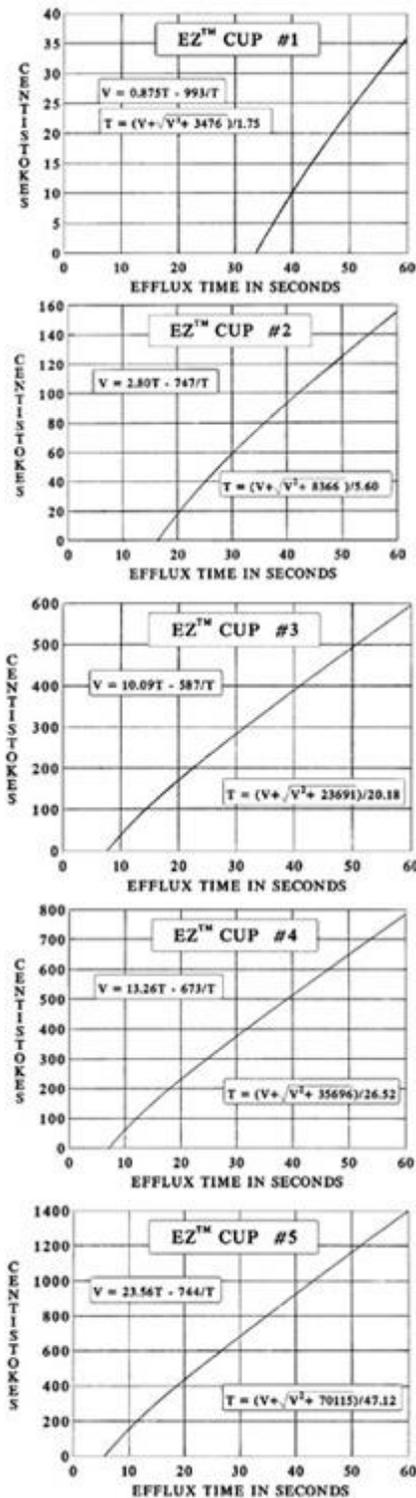
The EZ Viscosity Cup Series is a logical and necessary outgrowth of the standardization studies on the Zahn Signature and similar cups for the promotion of this most popular type of viscosity measuring instrument as a national and international standard. Not only has this cup been improved with respect to earlier produced cups and designed to comply to the requirements of ASTM D4212 but, in addition, each EZ Cup is furnished with a table which permits conversion between efflux time in seconds to the nearest tenth of a second to viscosity in centistokes. This table is particularly useful in determining efflux time in seconds when viscosity in centistokes is known.

For those users who require documented certification of their measuring equipment, the EZ™ cups may be ordered, at an additional charge, with a CERTIFICATE of CALIBRATION . This document contains not only information on actual cup calibration with standard oils traceable to the National Institute of Standards and Technology but in addition, this certification also complies to conditions and procedures under the requirements of ANSI/NCSL Z540 or ISO/IEC 17025, ISO 9001 as applicable.

The EZ™ cups are produced to very close mechanical tolerance in elaborate jigs and fixtures. Such equipment not only insures that each cup is correctly produced but also that all cups are identical. All parts of the cup are of stainless steel except for the name plate. The following table provides operating range specifications, cup midrange sensitivity and recommended calibrating oils . Following this table are graphs and mathematical formulas that relate efflux time in seconds to centistoke viscosity.

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Technical Information



The POISE is the fundamental unit of viscosity. It is a defined mechanical measurement of the resistance of a liquid to flow where gravity is not a factor. 100 CENTIPOISE = 1 POISE. However, gravity is the driving force causing liquid in a 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.

The STROKE is defined as the POISE divided by density (or weight per gallon times 0.120). 100 CENTISTOKES = 1 STROKE. The CENTISTROKE is the unit of reference in all viscosity cup measurements.

The graphs at the left of this page and on the preceding page relate viscosity in CENTISTOKES to efflux time in SECONDS for each of the five cups of the EZ™ series. The graphs may be used for determining the rough relationship between these factors but usually reference will be made to the table that is furnished with each EZ™ cup which gives the relationship to the nearest tenth second. If there is a necessity to determine the relationship beyond the range of the table, the mathematical formulas shown on the graphs may be used.

The first of the formulas shown on the graph is used when efflux SECONDS is known. As an example assume 42.5 SECONDS in the No. 2 EZ™ Cup. Multiply 42.5 by 2.80 and the result is 119. Divide 747 by 42.5, which is 17.6 and subtract this value from 119. The result is 101, the CENTISTROKE value of 42.5 SECONDS efflux time from this cup.

The second of the formulas shown on the graph is used when the CENTISTROKE value is known. As an example, assume 825 CENTISTOKES in the No 5 EZ™ Cup. Square 825, which is 680625 and add 70115 for a total of 750740. Take the square root of this value, which is 866 and add 825 for a total of 1691. Divide 1691 by 47.12 and the result is 35.90 SECONDS, the efflux time value of 825 CENTISTOKES from this cup.

General Instructions

1. Select the proper number cup to be used from the Specification Table, which is dependent on the expected viscosity range of the material to be measured.
2. Insure that the cup is clean and that there is no residual dried material in or around the orifice.
3. Adjust the temperature, if necessary, of the test material.
4. Completely immerse the cup into the material to be measured in a location free from bubbles or foam, holding the cup vertically by means of the stainless steel split key ring.
5. Measure and record the temperature of the material that is encompassed by the cup.
6. Hold cup vertically by inserting index finger into handle ring. In a quick, steady motion, lift the cup out of the sample material, starting the timer when the top edge of the cup breaks the surface. During the flow time, hold the cup no more than 6" above the level of the sample material.
7. Stop the timer when the first definite break in the stream at the base of the cup is observed.
8. Record the number of seconds of efflux time, temperature and the cup number. (Example: No. 2 EZ™ Dip Cup, 48.1 seconds at 25.1°C.) As an option to the preceding step, refer to the conversion table furnished with the cup and as indicated on the following page, determine the centistoke viscosity for the measured efflux time in seconds and record this value and the measured temperature. (Example: 119.1 centistokes at 25.1°C.)
9. Promptly clean the cup unless it will be used immediately for a rerun of the same material. (Use a length of nylon fishing line to clean the orifice.)