Designation: F 1080 – 93 (Reapproved 2002)

Standard Test Method for Determining the Consistency of Viscous Liquids Using a Consistometer[1]

This standard is issued under the fixed designation F 1080; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes a procedure for the determination of the flow of a standard volume of a semisolid or thick liquid under its own weight.

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Summary of Test Method

2.1 A sample of the material to be tested is poured into a reservoir and the distance of flow in a horizontal direction is read from a ruled track after a fixed time following the materials release from the reservoir.

3. Significance and Use

3.1 This measurement of flow gives results that cannot be predicted with viscosity measurements, due to surface tension and density effects. The measured flow, is related to flow performance of viscous materials sprayed on aircraft surfaces or other large structures.

4. Apparatus

4.1 *Consistometer* constructed as described in Annex A1.

4.2 *Timing Device* accurate to ±1 s.

4.3 *Mixer* capable of 1600 r/min and fitted with a 25-mm (1-in.) diameter three-bladed propeller.

4.4 *Beaker*, 500-mL.

5. Procedure

5.1 Bring the material to be tested and the apparatus to the same ambient temperature in the range from 20 to 25°C (68 to 77°F).

5.2 Agitate 250 mL of the material to be tested using the mixer set at 1600 r/min, for 1 min ± 5 s, or until a vortex forms that indicates all of the sample has been exposed to shear. Avoid aeration of the sample as this may cause evaporation of solvents.

5.3 Place the consistometer on a level surface and adjust the leveling screws until the bubble is centered.

5.4 Close the consistometer gate and set the trigger.

5.5 Fill the consistometer reservoir with the material to be tested (approximately 100 mL), and level the surface with a spatula or a straight edge.

5.6 Start the test by simultaneously tripping the consistometer gate trigger and starting the timing device. At 5 min ± 1 s (unless otherwise specified), read the distance the material has flowed. Average the result to the nearest 0.5 cm by taking the maximum distance indicated in the center of the trough and adding this to the minimum distance at the edge of the trough and dividing the result by two.

6. Report

6.1 The report shall include the following:

6.1.1 Material name or reference, type and lot number.

6.1.2 Average distance of flow to nearest 0.5 cm.

6.1.3 Test temperature in °C to ±1°C.

6.1.4 Duration of test in minutes and seconds.

7. Precision and Bias

7.1 *Precision*:

7.1.1 *Reproducibility*—Viscous materials often vary in consistency dependent upon age, temperature, and shear history. Caution shall be exercised between laboratories regarding the history of a sample.

7.1.2 Duplicate results by the same operator on the same sample shall be within 0.5 cm.

7.2 *Bias*—No statement can be made regarding bias as there are no absolute nor widely accepted standards for the property measured by the consistometer.

8. Keywords

8.1 consistometer; liquids; viscous

[1] This practice is under the jurisdiction of ASTM Committee F07 on Aerospace and Aircraft and is the direct responsibility of Subcommittee F07.07 on Qualification Testing of Aircraft Cleaning Materials.

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ANNEX

(Mandatory Information)

A1. CONSISTOMETER

A1.1 Consistometer shown in Fig. A1.1. It consists of the following parts constructed of stainless steel.

A1.1.1 *Reservoir*, 4-cm high, 5-cm long, fitted with spring stainless steel trap door on one side.

A1.1.2 *Stainless Steel Track* with side walls (24 cm long, 5 cm wide) with ruled markings each ½ cm.

A1.1.3 *Leveling Device*, for proper leveling of track.

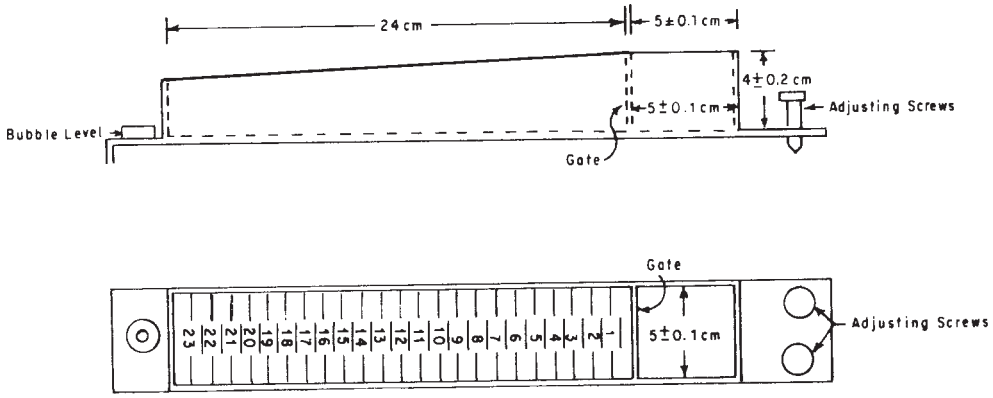

FIG. A1.1 Consistometer