



Designation: D2556 – 11

# Standard Test Method for Apparent Viscosity of Adhesives Having Shear-Rate- Dependent Flow Properties<sup>1</sup>

This standard is issued under the fixed designation D2556; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope

1.1 This test method covers the measurement of the apparent viscosity of shear-rate-dependent adhesives.

1.2 The values stated in SI units are to be regarded as standard. The values given 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. Referenced Documents

- 2.1 *ASTM Standards*:<sup>2</sup>  
[D907 Terminology of Adhesives](#)

## 3. Terminology

### 3.1 Definitions:

3.1.1 Many terms in this test method are defined in Terminology [D907](#).

3.1.2 *Newtonian behavior, n*—the property of a liquid in which its viscosity is constant over a stated range of strain rates. (Compare *non-Newtonian behavior*.)

3.1.3 *non-Newtonian behavior, n*—the property of a liquid in which its viscosity is not constant over a stated range of strain rates.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *apparent viscosity, n*—resistance to shear at a given rate of shear, expressed as viscosity in absolute units.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee [D14](#) on Adhesives and is the direct responsibility of Subcommittee [D14.10](#) on Working Properties.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

## 4. Significance and Use

4.1 The principle of measurement is based upon a reversible isothermal change in apparent viscosity with change in rate of shear.

4.2 Measurement is performed with a spindle, disk, T-bar, or coaxial cylinder rotational viscometer under standardized conditions with rigid control of the time intervals of measurement. Readings are obtained on the viscometer dial scale at the end of 1 min for each rotational speed. Changes from the lowest speed to the highest speed, and return to the lowest speed, are made without stopping the instrument.

## 5. Apparatus

5.1 *Viscometer*—The apparatus consists of a spindle,<sup>3</sup> disk,<sup>3</sup> T-bar,<sup>3</sup> or coaxial-type viscometer with appropriate spindles, disks, T-bars, or cylinders. Do not use a scored, warped, or otherwise damaged spindle, disk, T-bar, or cylinder. Except when using the coaxial cylinder-type viscometer, the size of container to be used is determined by mutual agreement. Some instruments have two concentric scales, and care is to be taken to read the pointer on the correct scale.

5.2 *Supporting Stand*<sup>4</sup>—Use a support for the viscometer which consists of a suitable stand with a supporting arm capable of being lowered or raised either manually or mechanically.

5.3 *Thermometer*—Use a precision thermometer, with graduations not greater than 0.2°C (0.5°F), for temperature measurements.

## 6. Conditioning

6.1 Condition the adhesive sample and instrument at  $23 \pm 0.5^\circ\text{C}$  ( $73.4 \pm 1.0^\circ\text{F}$ ) (or other temperature agreed upon between the adhesive vendor and the purchaser) at least 16 h.

<sup>3</sup> The Brookfield Synchro-Lectric, Dial Reading or Digital Viscometers (or Rheometers), Ranges Models LV, RV, HA or HB have been found satisfactory for this purpose and are available from the Brookfield Engineering Laboratories, Middleboro, MA.

<sup>4</sup> The Brookfield Helipath Stand or other commercially available stands may be used.