Designation: D 1259 – 85 (Reapproved 1994)

AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

Standard Test Methods for Nonvolatile Content of Resin Solutions[1]

This standard is issued under the fixed designation D 1259; 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.

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

1. Scope

1.1 These test methods cover the determination of nonvolatile content of solutions of resins in volatile organic solvents.

1.2 Two test methods are included as follows:

1.2.1 *Test Method A*—For solutions of non-heat-reactive resins. These solutions contain resins that remain stable and release the solvent under conditions of the test. Examples are ester gums and alkyds.

1.2.2 *Test Method B*—For two types of solutions:

1.2.2.1 Solutions of heat-reactive resins. These solutions contain resins that undergo condensation or other reactions under the influence of heat. Examples include the formaldehyde reaction products of urea, melamine, and phenols.

1.2.2.2 Solutions that release solvent slowly. Examples include epoxy resin solutions.

1.3 Test Methods A and B differ primarily in the drying times and types of oven used.

1.4 *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 Methods

2.1 In both test methods, a weighed specimen of resin solution is spread under pressure between two weighed sheets of aluminum or tin foil. The coated foil sheets are separated and then dried. The weight of residue is determined and the nonvolatile content is calculated. The test method is unique in that it provides for drying of a very thin film of resin, thus minimizing chances for volatiles to be trapped and held during the heating operation.

2.2 Either a gravity-convection or a forced-ventilation oven and a 30-min heating period at 105°C are used in Test Method A.

2.3 A forced-ventilation oven and a 2-h heating period at 105°C are used in Test Method B.

3. Significance and Use

3.1 The nonvolatile content of resin solutions is useful to coatings producers and users for the determination of the total solids available for film formation and for the estimation of the volatile organic content.

TEST METHOD A—NON-HEAT-REACTIVE RESIN SOLUTIONS

4. Apparatus

4.1 *Ovens*:

4.1.1 Gravity-convection type, maintained at 105 ± 2°C, with vents open.

4.1.2 Forced-ventilation type, maintained at 105 ± 2°C. For ovens with adjustable air flow rate, set the control damper at 50 %.

4.2 *Aluminum or Tin Foil*,[2] from 0.0015 to 0.0020 in. (38 to 50 µm) in thickness. Either one piece 6 by 12 in. (150 by 300 mm), or two 6 by 6-in. (150 by 150-mm) pieces may be used. The foil must be perfectly smooth; if it becomes wrinkled during the initial handling, roll smooth as directed in 5.2.

4.3 *Plate Glass*—Two pieces about 3⁄16 in. (5 mm) thick; one piece 5½ by 5½ in. (140 by 140 mm) and one piece 7 by 7 in. (180 by 180 mm).

4.4 *Device for Weighing Specimens*[3]—Apparatus that will prevent loss of volatile matter during the weighing operation such as any of the following, or equivalent:

4.4.1 *Syringe*, Luer, 2 or 5-mL capacity,

4.4.2 *Weighing Buret*, Smith, 10-mL capacity, or

4.4.3 *Bulb Pipet*, dropping, with 50-mL Erlenmeyer flask.

4.5 *Roller, for Smoothing Foil*—Use a ground and polished cylinder, preferably stainless steel, approximately 7 in. (180 mm) long and 2 in. (50 mm) in diameter.

4.6 *Foil Trays*, two types as follows:

4.6.1 Trays measuring 6½ by 12 in. (165 by 300 mm), for use with 6 by 12-in. foil, constructed from No. 22-gage

[1] These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

Current edition approved Nov. 29, 1985. Published January 1986. Originally published as D 1259 – 53. Last previous edition D 1259 – 61 (1980)ε1.

[2] Aluminum foil available from Thomas Scientific Co., P.O. Box 99, Swedesboro, NJ 08085; or from Sargent and Welch Scientific Co., 7300 North Linder Ave., Skokie, IL 60077 has been found satisfactory for this purpose.

Tin foil available from J. T. Baker Co., North Broad St., North Philipsburg, NJ 08865 has been found satisfactory for this purpose.

[3] A Smith weighing buret is available from Ace Glass Co., 1430 Northwest Blvd., Vineland, NJ 08360. The bulb pipet is available from Thomas Scientific Co. or from Fisher Scientific Co.