



Designation: D 4242 – 91 (Reapproved 1995)^{ε1}

Standard Test Method for Glass Plate Flow for Thermosetting Coating Powders¹

This standard is issued under the fixed designation D 4242; 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.

^{ε1} NOTE—Editorial changes were made throughout in November 1995.

1. Scope

1.1 This test method measures the molten flow of thermosetting coating powders used for electrical insulation.

1.2 *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 to determine the applicability of regulatory limitations prior to use.* A specific hazard statement is given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²

D 792 Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement²

D 1898 Practice for Sampling of Plastics²

D 2436 Specification for Forced-Convection Laboratory Ovens for Electrical Insulation³

2.2 Other Document:

AISI C1018⁴

3. Terminology

3.1 Definition:

3.1.1 *coating powder, n*—a heat-fusible, finely divided, solid, resinous material used to form electrical insulating coatings.

3.1.1.1 *Discussion*—The coating powder may contain fillers, colorants, curing agents, etc., consistent with producing the desired coating. The powders are applied by various methods such as spraying, sprinkling, or dipping. Usually hot parts are used. Heat causes the powder to melt and flow into a dense coating.

4. Summary of Test Method

4.1 A pellet of specified size and weight is pressed from the test powder and placed upon a preheated glass plate in an oven. The plate is kept in a horizontal position for a short time and then tilted to a 60° angle from horizontal. After flow has stopped, the plate is removed from the oven, allowed to cool, and the distance of flow is measured.

5. Significance and Use

5.1 This test method is used to determine the molten flow of coating powders when heated to specified elevated temperatures. This test method determines flow characteristics under minimal shear stress and without regard to time. This test method is useful for specification and quality-control purposes.

6. Apparatus

6.1 *Glass Plate*, single-thickness clean glass microscope slides 50 by 150 by 1 mm (2 by 6 by 0.040 in.).

6.2 *Scale*, calibrated in millimetres.

6.3 *Oven*, with forced convection capable of maintaining 135 to 176 ± 1°C (275 to 350 ± 2°F) as described in Specification to D2436.

6.4 *Balance*, accurate to ± 0.01 g.

6.5 *Stopwatch or Timer*, accurate to 0.1 s.

6.6 *Pellet Mold*, as shown in Fig. 1.

6.7 *Hydraulic Press*, having a load capacity of 5 kN (1000 lbf) and a load indicator having an accuracy of ± 0.2 kN (± 40 lbf).

6.8 *Glass Plate Holder*, as shown in Fig. 2.

6.9 *Flexible Wire*, about 1 m (1 yd) long and about 0.35 mm (0.014 in.) in diameter for tripping the apparatus.

7. Hazards

7.1 **Warning**—Provide adequate ventilation and avoid breathing the dust or fumes and contact with the skin since many of the reactive materials used in coating powders have been reported to be toxic or to cause irritation to sensitive skin.

8. Sampling

8.1 Sample in accordance with Method A of Practice

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.51 on Powder Coatings.

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² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ Available from American Iron & Steel Inst., Box 311, Matawan, NJ 07747.