



Designation: D 2091 – 96

Standard Test Method for Print Resistance of Lacquers¹

This standard is issued under the fixed designation D 2091; 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 This test method covers the resistance of dried lacquer films to imprinting.

1.2 The values stated in inch-pound units are to be regarded as the 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:

D 823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels²

D 1005 Test Methods for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers²

D 1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base²

D 1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base²

D 5235 Test Method for Microscopical Measurement of Dry Film Thickness of Coatings on Wool Products³

2.2 U.S. Federal Specifications:

CCC-C-419(f) Cloth, Duck, Cotton, Unbleached, Plied⁴

CCC-C-440(e) Cloth, Cheesecloth, Bleached and Unbleached⁴

3. Summary of Test Method

3.1 A weight presses a piece of fabric against the test surface. The surface is then examined and changes in appearance of the test surface are reported.

4. Significance and Use

4.1 An unsatisfactory appearance can result from pressure deformation of a film inherently too soft or containing residual solvent. This test method is primarily used to evaluate the resistance of a lacquer finish to printing under the conditions of packaging, shipping, and warehousing.

5. Apparatus and Materials

5.1 *Test Panels*—A plane surface consisting of wood, metal, paper supported on plate glass, plastic, or other surface with an area at least 100 % greater than the base of the weight. The planeness, smoothness, and composition should be agreed upon by the purchaser and the seller.

5.2 *Imprinting Fabric*, 8-oz Army duck, Type III, conforming to Fed. Spec. CCC-C-419(f) or cheesecloth, Type I, conforming to Federal Specification CCC-C-440(e).

NOTE 1—With the cheesecloth only, use a pad of nonwoven felt cloth at least 0.05 in. (1.3 mm) thick, weighing 7 oz/yd² (0.24 kg/m²) and larger than the plane end of the weight.

5.3 *Weights*, consisting of metal cylinders cut from standard stock 2 in. (51 mm) in diameter, with plane ends perpendicular to the axis, and of a length to give a pressure of 1/2 or 1 lb/in.² (3.5 or 7.0 kPa).

5.4 *Automatic Application Equipment, (Optional)*, as described in Practices D 823.

5.5 *Film Thickness Measuring Apparatus*, as described in Test Methods D 1005, D 1186, D 1400, and D 5235.

6. Preparation of Test Specimen

6.1 *Single Coats*—Prepare a specimen for test by applying the test lacquer to a panel with a film applicator or other specified method, as described in Test Methods D 823, to give a specified film thickness to be stated in the result. In the absence of a specified dry film thickness, 1 \pm 0.1 mil (25 \pm 3 μ m) is recommended.

6.2 *Multiple Coats*—Use the finish system as agreed upon between the purchaser and the seller. In the absence of a specified dry film thickness, 3 \pm 0.3 mils (75 \pm 8 μ m) are recommended.

6.3 *Conditioning*—Allow to dry as agreed upon between the purchaser and the seller, but run the test within 48 h after coating. In the absence of a specified drying schedule, a period

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 06.02.

⁴ Available from Standardization Documents Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094.