



Designation: D 3003 – 01

## Standard Test Method for Pressure Mottling and Blocking Resistance of Organic Coatings on Metal Substrates<sup>1</sup>

This standard is issued under the fixed designation D 3003; 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.

### 1. Scope

1.1 This test method covers determination of the pressure mottling and sticking, or blocking resistance of organic coatings applied to coil-coated or factory-coated metal prior to fabrication.

1.2 The values stated in SI 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. Terminology

2.1 *Description of Terms Specific to This Standard:*

2.1.1 *blocking or sticking*—the condition wherein coated surfaces adhere to each other.

2.1.2 *pressure mottling*—film distortion or uneven pattern giving a change of gloss and nonuniform appearance. It is usually caused by pressures within a painted coil or stacked painted sheets or other painted products.

### 3. Summary of Test Method

3.1 The coated metal is cut into suitably sized panels. A stack of these panels is then subjected to a specified pressure and temperature for a specified time to permit any pressure mottling and sticking or blocking to develop. The applied heat of the test apparatus is turned off and, after cooling, the specimens are examined for any signs of sticking (or blocking), and mottling. The results are rated on the 0 to 10 scale and may be used in accepting or rejecting the coating in accordance with standards established between the purchaser and the seller.

### 4. Apparatus<sup>2</sup>

4.1 *Suitable Hydraulic or Mechanical Press or Vise* may be used. The equipment shall be capable of producing the required test pressure in kilopascals (or pounds-force per square inch) and be equipped with a suitable device for measuring the force applied.

### 5. Test Specimens and Conditions

5.1 At least four, and preferably six, flat panels shall be cut from the coated stock, the age of which shall be within the limits agreed upon between the purchaser and the seller.

5.2 Panels should be at least 100 by 70 mm (4 by 2.5 in.) to provide an adequate area for assessing the results. Where the equipment does not provide adequate pressure, smaller panels may be used. The minimum recommended size is 50 by 50 mm (2 by 2 in.).

5.3 Use only flat panels. If necessary, file the edges smooth to ensure maximum contact between the surfaces. When the equipment permits, panels larger than the pressure plates may be used, thus eliminating any effect from uneven edges. With this method, the kilopascals (or pounds of force per square inch) is calculated using only the panel area within the pressure plates.

5.4 The film thickness of the coating under test shall be as specified or agreed upon between the purchaser and the seller.

5.5 The coated stock shall be tested under the conditions of pressure, temperature, and time mutually agreed upon between the purchaser and the seller. Pressures ranging from 750 to 2400 kPa (110 to 350 psi), temperatures from 43 to 60°C (110 to 140°F), and times of 2 to 16 h have been used.

5.6 In the absence of agreed or specified test conditions, a pressure of 750  $\pm$  35 kPa (110  $\pm$  5 psi), a temperature of 43  $\pm$  1.5°C (110  $\pm$  3°F), and a time of 16 h shall be used.

5.7 The total force applied is measured by a suitable gage and the pounds of force per kilopascals (or square inch) is calculated by dividing the force by the area in square inches of one side of one panel.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.53 on Coil Coated Metal.

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<sup>2</sup> Suitable equipment includes presses and drill press vises modified for use with a torque wrench if agreed upon between purchaser and seller (Hensley, W. L., "Pressure Mottling Test," *Journal of Paint Technology*, Vol 40, No. 517, February 1968, p. 54A).