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Standard Test Method for FLOW RATINGS OF ORGANIC COATINGS USING THE SHELL FLOW COMPARATOR¹

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1. Scope

1.1 This method covers the determination of the flow rating, in terms of flow-out characteristics or degree of film smoothness, of an organic film applied to a flat substrate.

1.2 The method is applicable to all organic coatings capable of providing a recognizable reflected image when applied to a plane substrate.

2. Applicable Documents

2.1 *ASTM Standards:*

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

D 1005 Method for Measurement of Dry Film Thickness of Organic Coatings²

D 1186 Method for Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base, Nondestructive²

3. Summary of Method

3.1 This test method is based on a comparative visual observation between a sample panel and a series of standard flow panels which vary in film smoothness.

3.2 The coating to be evaluated is sprayed on a 6 by 12-in. (150 by 300-mm) glass panel and dried. In the case of clear coatings, such as unpigmented varnishes, shellacs, and lacquers, the coating is applied to a blackbacked glass test panel to provide a reflective surface. The coated test panel is then compared with a set of ten flow standards numbered from 1 to 10 and is given the numerical rating that corresponds most closely to one of the flow standards.

4. Significance and Use

4.1 Flow, or film smoothness, can be described as the degree of levelness of an organic

film applied to a substrate. If the surface is very smooth and plane it behaves as a mirror and reflects undistorted images. Conversely, if the film is wavy because of "orange peel" or other irregularities it will reflect distorted images. The degree of distortion of a selected image from a paint panel is the basis for the flow determination described. It is an important factor used in determining whether the coating is suitable for the application determined by both the producer and the user.

5. Interference

5.1 Gloss describes the property of a surface to reflect light specularly and may be responsible for influencing an observer's judgment of flow. High gloss coatings give bright reflected images. The observer should disregard glossiness and look only for distortion of the reflected image.

6. Apparatus

6.1 *Shell Flow Comparator* (Figs. 1, 2, and 3) (Notes 1 and 2), equipped with a set of ten fixed flow standards and a light source over a series of letter "E"'s of various sizes arranged to project onto the standard flow panels. The flow standards consist of nine lacquered panels and one clear glass panel representing gradations in flow from 1, which represents very poor flow, to 10, which represents perfect flow (plate glass, black lacquered on back). The flow standards are

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings and Materials and is the direct responsibility of Subcommittee D01.55 on Factory-Applied Coatings on Preformed Products.

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