



Designation: D2134 – 93 (Reapproved2007)

Standard Test Method for Determining the Hardness of Organic Coatings with a Sward-Type Hardness Rocker¹

This standard is issued under the fixed designation D2134; 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.

1. Scope

1.1 This test method covers the determination of the relative degree of surface hardness of organic coatings using a specific apparatus widely used in the coatings industry.

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 test method does not purport to address all of the safety problems, 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:*²

D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

D1005 Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

D1186 Test Methods for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base (Withdrawn 2006)³

D1400 Test Method for Nondestructive Measurement of Dry Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base (Withdrawn 2006)³

D3924 Specification for Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials

D4138 Practices for Measurement of Dry Film Thickness of

Protective Coating Systems by Destructive, Cross-Sectioning Means

3. Significance and Use

3.1 Sward-type hardness rocker instruments have been used by the coatings industry for more than a half a century as a nondestructive test instrument to measure cure and ultimate surface hardness of organic coatings (see Refs. **(1)** through **(11)**).⁴ An accepted standard test method for the use of such an instrument is long overdue.

3.2 In previous task group work designed to establish an ASTM method for measuring hardness of organic coatings with Sward-type hardness rocker instruments, round-robin test results continually showed poor interlaboratory reproducibility. This lack of interlaboratory agreement could have resulted from dimensional variations among instruments, with the contact rocker rings as the most likely offender in that regard. There are several producers of Sward-type hardness rockers making instruments that differ among themselves in net weight and ring radius. Some of them exceed the measurements and net weight called for in this test method.

3.3 This test method, however, is useful within laboratories to quickly screen and measure the surface hardness of candidate coatings.

4. Apparatus

4.1 *Hardness Tester*—The hardness tester shall consist of two flat, chromium-plated bronze rings with uniformly round outside edges. These rings are separated and held in position with a weighted lower member and three horizontal light-weight spacer bars with the topmost one supporting a weight adjustable in height. A rack across the center section supports two bubble tube-type levels that are used to measure the amplitude of the oscillations of the hardness tester. The rate of change in amplitude is used as a measure of hardness or softness of the test surface. The hardness tester shall meet the following characteristics:

⁴ Boldface numbers in parentheses refer to the list of references at the end of this test method.

¹ 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 D01.23 on Physical Properties of Applied Paint Films.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.