



Designation: D7091 – 22

# Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non- Ferrous Metals<sup>1</sup>

This standard is issued under the fixed designation D7091; 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.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 This practice describes the use of magnetic and eddy current gages for dry film thickness measurement. This practice is intended to supplement the manufacturers' instructions for the manual operation of the gages and is not intended to replace them. It includes definitions of key terms, reference documents, the significance and use of the practice, the advantages and limitations of coating thickness gages, and a description of test specimens. It describes the methods and recommended frequency for verifying the accuracy of gages and for adjusting the equipment and lists the reporting recommendations.

1.2 These procedures are not applicable to coatings that will be readily deformed under the load of the measuring gages/probes, as the gage probe must be placed directly on the coating surface to obtain a reading. Provisions for measuring on soft or tacky coatings are described in 5.7.

1.3 Coating thickness can be measured using a variety of gages. These gages are categorized as "magnetic pull-off" and "electronic." They use a sensing probe or magnet to measure the gap (distance) between the base metal and the probe. This measured distance is displayed as coating thickness by the gages.

1.4 Coating thickness can vary widely across a surface. As a result, obtaining single-point measurements may not accurately represent the actual coating system thickness. SSPC-PA 2 prescribes a frequency of coating thickness measurement based on the size of the area coated. A frequency of measurement for coated steel beams (girders) and coated test panels is also provided in the appendices to SSPC-PA 2. The governing specification is responsible for providing the user with the

minimum and the maximum coating thickness for each layer, and for the total coating system.

1.5 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

**D609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products**

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

**D1730 Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting**

### 2.2 SSPC Standard:<sup>3</sup>

**SSPC-PA 2 Procedure for Determining Conformance to Dry Coating Thickness Requirements**

<sup>1</sup> This practice 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.

Current edition approved June 1, 2022. Published June 2022. Originally approved in 2005. Last previous edition approved in 2021 as D7091 – 21. DOI: 10.1520/D7091-22.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from Society for Protective Coatings (SSPC), 800 Trumbull Dr., Pittsburgh, PA 15205, <http://www.sspc.org>.