



Designation: D8271 – 19

Standard Test Method for the Direct Measurement of Surface Profile of Prepared Concrete¹

This standard is issued under the fixed designation D8271; 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 is suitable for both field and laboratory use to quantify the depth of surface profile of prepared concrete. It may also be used on unprepared concrete surfaces.

1.2 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.

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

1.4 *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:*²

D4417 Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel

E178 Practice for Dealing With Outlying Observations

3. Summary of Test Method

3.1 The depth of profile is measured using a fine pointed probe at a predetermined number of locations, and the range and arithmetic mean of the maximum peak-to-valley distances is determined.

4. Significance and Use

4.1 Proper bonding of coatings and linings to concrete surfaces requires proper cleaning and frequently requires the

concrete to be roughened to increase the surface area. The roughness, also known as surface profile, can be imparted into concrete by abrasive blast cleaning, acid etching or various impact/scarifying power tools. The resulting surface profile depth can influence coating/lining adhesion and performance. Coating/lining manufacturers and/or facility owners frequently specify cleaning and roughening of the concrete surface prior to product installation. The procedure described herein enables the user to quantitatively determine the profile directly from the prepared concrete surface in multiple locations. The procedure is similar to that described in Method B of ASTM D4417, which addresses measurement of surface profile on abrasive blast cleaned steel surfaces.

5. Apparatus

5.1 A depth micrometer fitted with a remote pointed probe. The probe point is machined at a 60° included angle with a nominal radius of 500 μm at the tip and exerting a minimum force of 75 g. The base of the probe has a surface area diameter between 20 and 25 mm. This base rests on the tops of the peaks of the surface profile while the spring-loaded tip, protruding from the probe face projects into the valleys. The distance that the tip projects into the valley relative to the tops of the peaks is displayed.

5.2 The depth micrometer must have a minimum upper range of 6 mm (250 mils) and a manufacturer stated accuracy of $\pm 1\%$ or greater.

6. Test Surface

6.1 Any concrete/masonry surface that is free of loose surface interference material, dirt, dust, and abrasive residue. The instrument probe must sit flush on the concrete surface; care should be taken when measuring on curved surfaces.

7. Procedure

7.1 Verify instrument accuracy prior to each period of use by measuring a metal shim of known thickness placed onto plate float glass (see 7.2). Both are usually supplied by the instrument manufacturer. Certified standards are also available. If the average of at least three measurements is not within the combined tolerance of the instrument and the shim or certified

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 D01.46 on Industrial Protective Coatings.

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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.