



Designation: D4227 – 05 (Reapproved 2023)

Standard Practice for Qualification of Coating Applicators for Application of Coatings to Concrete Surfaces¹

This standard is issued under the fixed designation D4227; 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 practice provides a standard qualifying method for coating applicators to verify their proficiency and ability to attain the required quality for application of specified coatings to concrete surfaces including those in safety-related areas in a nuclear facility.

1.2 Variations or simplifications of the practice set forth herein may be appropriate for special coating work such as maintenance. It is not the intent of this practice to mandate a singular basis for all qualifications.

1.3 Evaluation of the coating applicator being qualified in accordance with this practice, shall be by qualified agents as specified in 4.1. Reports shall be prepared as specified in Section 5, and qualification as specified in Section 6.

1.4 It is the intent of this practice to judge only the ability of the coating applicator to apply specified coatings with the proper tools and equipment.

1.5 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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. Terminology

2.1 Definitions:

¹ This practice is under the jurisdiction of ASTM Committee D33 on Protective Coating and Lining Work for Power Generation Facilities and is the direct responsibility of Subcommittee D33.05 on Application and Surface Preparation.

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2.1.1 *coating applicator, n*—an individual who has worked in the painting trade sufficiently long enough to master the use of all applicable tools and the materials being applied.

2.1.2 *governing documents, n*—technical specifications, jobsite procedures, and reference documents.

2.1.3 *qualifying agents, n*—the designated representatives of the owner or of the coating organization, or both, who have sufficient experience in the practical application and evaluation of coating applied to concrete surfaces.

3. Application of Coatings

3.1 This practice requires the coating applicator to apply the specified coating in conformance to the governing documents to a test area similar to that detailed in Fig. 1 and Fig. 2. A physical test area may be selected by the owner/representative. The test area shall simulate job conditions and acceptance criteria shall be the specification requirement.

3.1.1 *Ceiling Section*—Beginning at the wall line, one 5 ft by 5 ft (1.5 m by 1.5 m) coating.

3.1.2 *Wall Section*—Beginning at the floor line, one 5 ft by 5 ft (1.5 m by 1.5 m) coating.

3.1.3 *Floor Section*—Beginning at the wall line and connecting with the wall section, one 5 ft by 5 ft (1.5 m by 1.5 m) coating.

3.2 This practice requires the coating applicator perform the application using the proper technique and application equipment consistent with the governing documents.

3.3 The surfaces of the concrete test area shall be prepared in accordance with the governing documents.

3.4 The coating applicator shall demonstrate the ability to apply the specified coating to a uniform dry film thickness in accordance with the governing documents, as evaluated by the qualifying agents.

3.5 When desired by the owner, one of the test surfaces may include embedded steel.

3.6 If a coating system specified requires multiple coats, treat each coat as a separate application, allowing a specified drying time before applying each succeeding coat.

3.7 The coating applicator shall be provided with the following:

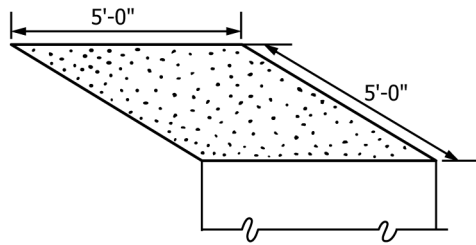


FIG. 1 Concrete Ceiling Test Area

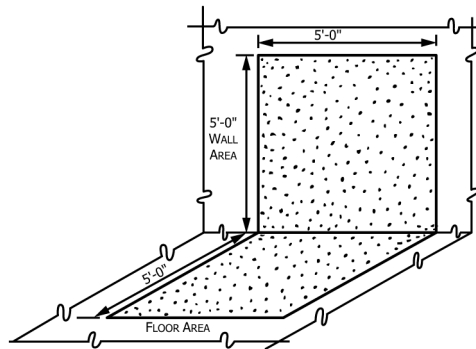


FIG. 2 Concrete Wall and Floor Test Area

3.7.1 Information regarding the specified coating material(s), including wet and dry film thickness required, and all other information contained in the governing documents for the coating system being applied.

3.7.2 Coating materials properly mixed in accordance with the governing documents and ready for application.

3.7.3 The necessary equipment for the proper application of the specified coating.

3.7.4 Miscellaneous equipment, brushes, and thinners required for cleaning the equipment after completion of the test.

3.7.5 A practice area to adjust and test the equipment prior to performing the test.

3.7.6 All necessary safety equipment.

3.7.7 Wet-film thickness gauge for verifying the coating thickness during application.

3.8 The coating applicator shall use the wet-film thickness gauge furnished to determine coating thickness buildup during application. Material thickness is one of the criteria for evaluation.

4. Evaluation of Coating Application

4.1 Evaluation of the coating applicator shall be made by two qualifying agents. Only one qualifying agent can be production-related.

4.2 The qualifying agents shall be capable of answering technical questions requested by the coating applicator relating to the application of the specified coating material(s). The qualifying agents shall be thoroughly familiar with the specified coating material(s) and acceptance criteria and shall be aware of any difficulties in applying the coating to any surface.

4.3 The qualifying agents shall have a wet-film gauge of the same type used by the coating applicator.

4.4 The qualifying agents shall take approximately 16 wet-film thickness readings on the test areas. These readings shall be recorded as specified in Section 5. The wet-film thickness readings shall be used to verify the specified dry-film thickness requirements and uniformity of application. The number and location of readings shall be as indicated in Fig. 3.

4.5 The coating applicator and the qualifying agents shall understand the required dry-film thickness range requirements of the governing documents before any coatings are applied.

4.6 Qualifying agents shall inspect the finished surface to verify that it conforms to the requirements of the governing documents. A description of the appearance of the completed applied coating shall be recorded on the form shown in Fig. 4.

5. Report

5.1 The qualifying agents shall use a report form similar to that in Fig. 4 to record wet-film thickness readings specified in 4.4 and the appearance of the completed coating surface as specified in 4.6.

5.2 The qualifying agents and coating applicator shall sign the report form.

5.3 The generation of documentation and maintenance of records shall be as delineated in the applicable project documents.

6. Initial Qualification

6.1 The qualifying agents shall prepare a qualification form similar to Fig. 5. The qualification form shall state the coating materials used and the application equipment used in the test.

6.2 The qualifying agents and the coating applicator shall sign the qualification form.

7. Requalification

7.1 The owner or his designated representative may determine the degree of requalification to be permitted, as well as the acceptance of previously qualified coating applicators based on time interval since the date of the qualification and provided the same coating materials and application procedures are used. Note the acceptance of previous qualification in the quality assurance file for the project.

8. Limited Qualifications—Touch Up and Repair

8.1 Limited qualifications can be accomplished using only areas representative of the actual plant surfaces, even though they do not include all areas represented by Fig. 1 and Fig. 2.

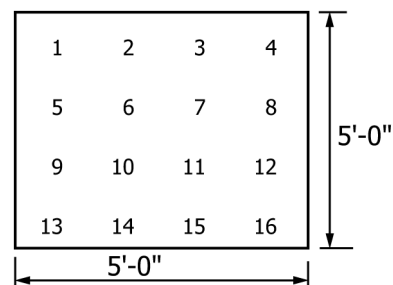


FIG. 3 Location of Wet-Film Thickness Readings