



Designation: ~~D4082-02~~ Designation: D4082 - 10

Standard Test Method for Effects of Gamma Radiation on Coatings for Use in Light- Water Nuclear Power Plants¹

This standard is issued under the fixed designation D4082; 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 a standard procedure for evaluating the lifetime radiation tolerance of coatings to be used in nuclear power plants. This test method is applicable to Coating Service Levels I and II.~~

1.1 This test method covers a standard procedure for evaluating the lifetime radiation tolerance of coatings to be used in nuclear power plants. This test method is applicable to Coating Service Levels I, II, and III.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Referenced Documents

2.1 ASTM Standards:²

D659 [Test Method of Evaluating Degree of Chalking of Exterior Paints](#)³

D660 [Test Method for Evaluating Degree of Checking of Exterior Paints](#)

D661 [Test Method for Evaluating Degree of Cracking of Exterior Paints](#)

D714 [Test Method for Evaluating Degree of Blistering of Paints](#)

D772 [Test Method for Evaluating Degree of Flaking \(Scaling\) of Exterior Paints](#)

[D4538 Terminology Relating to Protective Coating and Lining Work for Power Generation Facilities](#)

[D5139 Specification for Sample Preparation for Qualification Testing of Coatings to be Used in Nuclear Power Plants](#)

3. Significance and Use

~~3.1 Variations can occur in surface preparation, application, and curing of coating materials. They may affect the performance of a coating system exposed to radiation when considered in conjunction with applicable engineered safety requirements. This test method is designed to provide a uniform test to assess the suitability of coatings, used in nuclear power facilities, under continuous radiation exposure for the projected 40-year lifetime of the facilities, including radiation during a DBA. Specific plant radiation exposure may exceed or be less than the amount specified in 6.2 of this standard. The gamma dose used may exceed the actual anticipated plant gamma dose in order to account for expected beta exposure as well. Coatings in Level II areas (outside primary containment) are expected to be exposed to lower accumulated radiation doses. Terminology~~

3.1 Definitions—Definitions for use with this Test Method are shown in Terminology D4538 or other referenced standards.

4. Significance and Use

4.1 This test method is designed to provide a uniform test to assess the suitability of coatings, used in nuclear power facilities, under radiation exposure for the life of the facilities, including radiation during a DBA (Coating Service Level I areas only). Specific plant radiation exposure may exceed or be less than the amount specified in 7.2 of this standard. If required by the licensee design basis, the gamma dose used may exceed the actual anticipated plant gamma dose to account for beta dose. Coatings in Level II and III areas (outside primary containment) are expected to be exposed to lower accumulated radiation doses.

¹ This test method 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 D33.02 on Service and Material Parameters.

~~Current edition approved Jan. 10, 2002. Published March 2002. Originally approved in 1983. Last previous edition approved in 1995 as D4082-95. DOI: 10.1520/D4082-02.~~

Current edition approved May 15, 2010. Published June 2010. Originally approved in 1983. Last previous edition approved in 2002 as D4082-02. DOI: 10.1520/D4082-10.

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