



Standard Test Method for Chemical Resistance of Protective Linings¹

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1. Scope

1.1 This test method covers a procedure for evaluating the chemical resistance of a polymer-based protective lining in immersion service. The method closely approximates the service conditions, including the temperature differential between the external and internal surfaces of the equipment, which may accelerate permeation of the lining by a corrosive media.

1.2 This test may be used to simulate actual field use conditions insofar as a qualitative evaluation of the lining system after a predetermined period of exposure.

1.3 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.

1.4 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- A36/A36M Specification for Carbon Structural Steel
- A285/A285M Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength
- C267 Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
- D471 Test Method for Rubber Property—Effect of Liquids
- D714 Test Method for Evaluating Degree of Blistering of Paints
- D785 Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials

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.

- D1474 Test Methods for Indentation Hardness of Organic Coatings
- D2583 Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
- D3363 Test Method for Film Hardness by Pencil Test
- D4417 Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- D5162 Practice for Discontinuity (Holiday) Testing of Non-conductive Protective Coating on Metallic Substrates

2.2 NACE Standard:

- NACE No. 1/SSPC-SP-5 White Metal Blast Cleaning³

3. Significance and Use

3.1 The results obtained by this test method should serve as a guide in, but not as the sole basis for, selection of a lining material for particular application. Simple chemical-resistance evaluations of the lining materials may be performed more conveniently by other pertinent methods as a prescreening test for this procedure in accordance with Test Methods C267 and D471.

4. Apparatus

4.1 *Four-Neck Cylindrical, Borosilicate-Type Glass Test Cell*⁴, similar to the unit shown in Fig. 1.

4.1.1 Where an additional inlet is needed for a thermocouple or thermistor to control temperature, a five-neck cell should be used.

NOTE 1—If test solutions that are known to attack glass such as HF or caustic, a fluorocarbon or other suitable cell should be used.

4.2 Heating Equipment:

4.2.1 The corrosive media may be heated by an electrical-resistant coil fitting inside the test cell. This is protected by a glass immersion tube. The heater shall be controlled through

³ Available from Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.

⁴ The sole source of supply of the four-neck cylindrical, borosilicate-type glass test cell known to the committee at this time is DelVal Glass Inc., 1135 E. 7th St., Wilmington, DE. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.