

SSPC: The Society for Protective Coatings

Coating Specification No. 44

Liquid-Applied Organic Polymeric Coatings and Linings for Concrete Structures in Municipal Wastewater Facilities, Performance-Based

1. Scope

The standard provides performance requirements for coatings and linings used on sound concrete substrates in principal service environments of areas of a municipal wastewater treatment facility, including:

- **Collection Systems** (manholes, lift stations, pump stations, tunnels and interceptors)
- **Preliminary Treatment Systems** (grit chambers, headworks and screening structures)
- **Primary Treatment Systems** (sedimentation tanks and primary clarifiers)
- **Secondary Treatment Systems** (aeration basins, secondary clarifiers, chlorine contact chambers and oxygenation chambers)
- **Advanced Treatment Systems** (filtration units)
- **Solids Handling Areas** (digesters and dewatering structures)
- **Chemical Storage:** Secondary Containment Structures

Nonmandatory Note 6.1 provides an example of project specification language used to invoke requirements of this standard.

2. Referenced Standards

2.1 The latest issue, revision, or amendment of the referenced documents in effect on the date of invitation to bid shall govern unless otherwise specified. Standards marked with an asterisk (*) are referenced only in the Notes, which are not requirements of this standard.

2.2 If there is a conflict between the requirements of any of the cited reference documents and this standard, the requirements of this standard shall prevail. If an owner or specifier modifies requirements of a referenced standard in any manner, the modification shall be identified and explained.

2.3 American Society for Testing and Materials (ASTM) Standards¹:

C267 Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes

C307 Standard Test Method for Tensile Strength of Chemical Resistant Mortar, Grouts and Monolithic Surfacing

C413 Standard Test Method for Absorption of Chemical Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

C531 Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes

* **D562** Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

* **D1475** Standard Test Method For Density of Liquid Coatings, Inks, and Related Products

* **D1640** Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature

D1653 Standard Test Methods for Water Vapor Transmission of Organic Coating Film

* **D2369** Standard Test Method for Volatile Content of Coatings

D2370 Standard Test Method for Tensile Properties of Organic Coatings

* **D2621** Standard Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints

D4060 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

D 6943 Standard Practices for Immersion Testing of Industrial Protective Coatings

D7234 Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

E96 Standard Test Methods for Water Vapor Transmission of Materials

¹ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. For referenced ASTM standards, visit the ASTM website, <<http://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.

4. Definitions

Coating: A liquid, liquefiable, or mastic composition that is converted to a solid protective, decorative, or functional adherent film after application as a thin layer.

Collection Systems: The series of laterals, manholes, interceptors and pump stations through which municipal wastewater is transported to the treatment facility.

Light Service (concrete): Environments in which surfaces and applied coatings have minimal exposure to traffic, chemicals, and changes in temperature.

Lining: A material used to protect the interior of a container against corrosion and/or to protect the contents of the container from contamination by the container shell material. Sprayable linings, sheet liners, and drop-in liners can be used to accomplish these purposes,

Preliminary Treatment Systems: The first steps in processing municipal wastewater, which consists of monitoring flow, screening debris, and removing grit (heavy inorganic solids).

Primary Treatment: The process by which contaminants that either float or settle are removed from the wastewater (e.g., oils, greases, solids etc.).

Secondary Containment: Structures (often concrete dikes) that provide chemical spill containment should the primary means of chemical storage fail or leak.

Secondary Treatment: The process by which microorganisms are used to absorb and oxidize organic substances from the wastewater.

Severe Service (concrete): Environments in which surfaces and applied coatings have significant exposure to traffic, chemicals, or changes in temperature.

Solids Handling: The process by which wastewater sludge (settled solids) is removed from the wastewater treatment process and treated to remove excess water.

Advanced Treatment: Specialized processes that remove specific organic and inorganic contaminants from wastewater.

Wastewater Sludge: Solid, semisolid or liquid material generated from a wastewater treatment process. A biologically active mix of water, organic matter (derived from human wastes, food wastes, etc.), inorganic solids (including trace elements), dead and alive microorganisms (including pathogens), and trace contaminants (e.g., chemicals). Wastewater sludge is generated in primary settling tanks ("clarifiers") and

secondary settling tanks and, in most cases, is a slightly viscous, gray-brown liquid.

5. Minimum Coating Performance Requirements in Specific Wastewater Treatment Facility Areas

4.1 Table 1 (pages 4-5) displays the minimum coating performance requirements for coatings and linings used in various areas of a wastewater treatment facility.

- Column 1, "System or Area" lists the area of the facility where the coating will be used.
- Columns 2 through 8 list ASTM test procedures and minimum performance requirements for the coatings used in the various facility areas.
- Column 9 "Description of Test Environment..." describes the test environment and minimum exposure duration for chemical resistance testing following procedures in ASTM D6943 or ASTM C267.
- Unless otherwise specified, the number of replicate specimens required for testing shall be as recommended by the ASTM test method specified. If the ASTM test method does not include a recommended number of replicates, 3 replicate specimens shall be prepared and tested to determine compliance with requirements of this standard, unless otherwise specified.

4.2 Disregard the results of any adhesion test pull that causes 100 percent substrate failure prior to reaching the minimum psi for the specified service condition. Repeat the test pull. Test substrates (panels) that fail consistently below the minimum required psi shall be discarded.

4.3 ANALYTICAL TEST DATA: If mutually agreed upon by purchaser and supplier, the coating manufacturer shall provide records of chemical and physical analysis of coating batches qualified by independent testing to meet this standard (see Notes 6.2 and 6.3).

5. Disclaimer

5.1 This is a consensus standard developed by SSPC: The Society for Protective Coatings. While every precaution is taken to ensure that all information furnished in SSPC standards and specifications is as accurate, complete and useful as possible, SSPC cannot assume responsibility nor incur any obligation resulting from the use of any materials, coatings, or methods specified herein, or of the specification or standard itself.

5.2 This standard does not attempt to address problems concerning safety associated with its use. The user of this standard, as well as the user of all products or practices described herein, is responsible for instituting appropriate health and safety practices and for ensuring compliance with all governmental regulations.