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Association**

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ANSI/AWWA D102-17
(Revision of ANSI/AWWA D102-14)

AWWA Standard

Coating Steel Water- Storage Tanks

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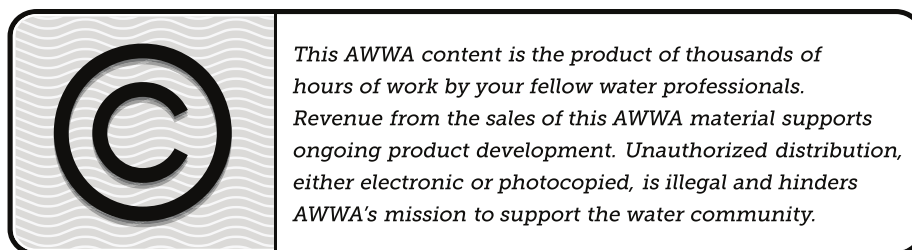
AWWA Standard

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA D102.

I. Introduction

I.A. *Background.* The purpose of this standard is to provide an outline of methods and coating systems that can be used for coating or recoating steel tanks for water storage. Immediately after the final approval of ANSI/AWWA D102-14, the AWWA Standards Committee on Steel Elevated Tanks, Standpipes, and Reservoirs directed the D102 Revision Task Force to start work on this edition. The final standards committee letter ballot on this edition closed on March 16, 2017.

I.B. *History.* The first edition of this standard was prepared by a joint committee of AWWA and the New England Water Works Association (NEWWA) and was approved as tentative on May 9, 1952. Revisions were made on June 2, 1953, May 24, 1954, and Aug. 5, 1955. The second edition of this standard was approved as tentative on Jan. 23, 1962, and was approved by the AWWA Board of Directors on Feb. 11, 1964. The third edition was approved on Jan. 28, 1978, and subsequently withdrawn on June 23, 1991. ANSI/AWWA D102 was reissued as the fourth edition and subsequently approved on Feb. 2, 1997. The fifth edition was approved on Jan. 19, 2003; the sixth edition on June 11, 2006; the seventh edition on June 12, 2011; the eighth edition on June 8, 2014; and this ninth edition on June 11, 2017.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for all direct and indirect drinking water additives. Other members of the original consortium included the Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.[†] Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

† Persons outside the United States should contact the appropriate authority having jurisdiction.

effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. Specific policies of the state or local agency.
2. Two standards developed under the direction of NSF International:* NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
3. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,† and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, “Toxicology Review and Evaluation Procedures,” to NSF/ANSI 61 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of “unregulated contaminants” are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA D102 does not address additives requirements. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues.

Volatile organic compound (VOC) emission and extractable regulations continue to become more restrictive and vary greatly from state to state and within states. The user of this AWWA standard should review current federal, state or provincial, and local regulations when selecting products in this standard.

III. Use of This Standard. It is the responsibility of the user of this AWWA standard to determine that the products described in this standard are suitable for use in the particular locale and application being considered.

* NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

† Both publications available from National Academy of Sciences, 500 Fifth Street, NW, Washington, DC 20001.

III.A. *Purchaser Options and Alternatives.* The following items should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA D102, Coating Steel Water-Storage Tanks, of latest revision.
2. Size, style, height, and location of structure.
3. Required coating systems (including finish color) to be used for interior and exterior surfaces (Section 4).
4. Details of other federal, state or provincial, and local requirements in addition to or superseding the requirements of this standard (Sec. 4.1).
5. Required documentation of paint test or field service data (Sec. 4.3.1, 4.4.1).
6. ANSI/AWWA D102 contains a default checklist of optional requirements that the purchaser may incorporate into the project documents (see appendix C).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. Major revisions made to the standard in this revision include the following:

1. The definition of *inaccessible areas* has been revised (Section 3).
2. Minimum dry thickness criteria have changed for outside coating systems OCS-2, OCS-3, OCS-5, and OCS-6 (Sec. 4.3), and inside coating systems ICS-3, ICS-4, and ICS-5 (Sec. 4.4).
3. A new inside coating system, ICS-6, has been added (Sec. 4.4.7 and Sec. A.3.6).
4. The section on surface preparation (Sec. 4.6) has numerous major changes.
5. References to standards ISO 12944-2 and ISO 12944-5 have been added to appendix A as guidance documents on establishing exposure conditions and selecting coating systems based on exposure conditions (Sec. A.1).
6. Guidance on dissimilar metals has been added to appendix A (Sec. A.4).
7. Guidance on inaccessible areas has been expanded in appendix A (Sec. A.5).
8. Guidance on undersides of tank bottoms has been modified (Sec. A.5.4).
9. Roof construction options have changed (Sec. A.5.6 and Table A.1).

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX 303.795.7603; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

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ANSI/AWWA D102-17
(Revision of ANSI/AWWA D102-14)

AWWA Standard

Coating Steel Water-Storage Tanks

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes coating systems for coating and recoating the inside and outside surfaces of steel tanks used for potable water storage in water supply service. Coating systems for new bolted steel tanks are not described in this standard (see ANSI/AWWA D103).

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for coating steel water-storage tanks, including materials, coating systems, surface preparation, application, and inspection and testing.

Sec. 1.3 Application

This standard can be referenced in purchase documents for coating steel water-storage tanks. The requirements of this standard apply when this document has been referenced and then only to coating steel water-storage tanks.

SECTION 2: REFERENCES

This standard references the following documents. These documents in the edition specified, or the latest edition if not specified, form a part of this standard

to the extent specified within the standard. In any case of conflict, the requirements of this standard shall prevail.

AAMA* 2604—Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (With Coil Coating Appendix).

ANSI†/AWWA C210—Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.

ANSI/AWWA C222—Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe and Fittings.

ANSI/AWWA D103—Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

ASTM D4141—Standard Practice for Conducting Black Box and Solar Concentrating Exposures of Coatings.

ASTM G90—Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight.

NACE‡ SP0188—Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

NSF§/ANSI 61—Drinking Water System Components—Health Effects.

SSPC¶ PA 2—Procedure for Determining Conformance to Dry Coating Thickness Requirements.

SSPC-Paint 20—Zinc-Rich Coating (Type I—Inorganic, and Type II—Organic).

SSPC-Paint 28 (2013)—Water-Borne Epoxy Primer for Steel Surfaces.

SSPC-Paint 36—Two-Component Weatherable Aliphatic Polyurethane Topcoat, Performance-Based.

SSPC-Paint 101 (2013)—Aluminum Alkyd Paint Leafing (Type I) and Non-Leafing (Type II).

SSPC-PS 24.00 (2013)—Latex Painting System for Industrial and Marine Atmospheres, Performance-Based.

SSPC-PS 27.00 (2013)—Alkyd Coating System Materials Specification, Performance-Based.

* American Architectural Manufacturers Association, 1827 Walden Office Square, Suite 550, Schaumburg, IL 60173.

† American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

‡ NACE International, 1440 South Creek Drive, Houston, TX 77084.

§ NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

¶ SSPC: The Society for Protective Coatings, 40 24th Street, Sixth Floor, Pittsburgh, PA 15222.

SSPC-SP 6/NACE No. 3—Commercial Blast Cleaning.

SSPC-SP 7/NACE No. 4—Brush-Off Blast Cleaning.

SSPC-SP 10/NACE No. 2—Near-White Blast Cleaning.

SSPC-SP 11—Power Tool Cleaning to Bare Metal.

SSPC-SP 15—Commercial Grade Power Tool Cleaning.

SSPC-SP WJ-1/ NACE WJ-1—Waterjet Cleaning of Metals—Clean to Bare Substrate.

SSPC-SP WJ-2/ NACE WJ-2—Waterjet Cleaning of Metals—Very Thorough Cleaning.

SSPC-SP WJ-3/ NACE WJ-3—Waterjet Cleaning of Metals—Thorough Cleaning.

SSPC-SP WJ-4/NACE WJ-4—Waterjet Cleaning of Metals—Light Cleaning.

SSPC-TU 3—Overcoating.

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Coating*: Liquid, powder, or mastic composition that has been converted to a solid, durable, and functional adherent film after application.
2. *Constructor*: The party that provides the work and materials for placement or installation.
3. *Exterior surfaces*: Exterior surfaces, excluding inaccessible areas, of the tank roof, shell, pedestal, legs, accessories, and appurtenances that are exposed to the elemental atmosphere.
4. *Inaccessible areas*: Areas of the finished structure that, by virtue of the configuration of the completed structure, cannot be accessed to perform surface preparation or coating application (with or without the use of scaffolding, rigging, or staging). Inaccessible areas include such areas as the contact surfaces of roof plate lap joints, underside of roof plates where they cross supporting members, top surface of rafters directly supporting roof plates, contact surfaces of bolted connections, underside of column base plates, contact surfaces of mating parts not intended to be removed or disassembled during routine operation or maintenance of the tank, underside of the tank bottom for ground-supported flat-bottom tanks, and inside surfaces of risers and other inflow/outflow appurtenances of less than a nominal 36-in. inside diameter and more than one pipe diameter from an open end of the pipe.

5. *Interior dry surfaces:* Interior surfaces of the finished structure, excluding inaccessible areas, that are not exposed to the elemental atmosphere, the stored water, or its vapor. Examples are the interior of the access tube, interior of the pedestal, and underside of a suspended bottom within the pedestal.

6. *Interior wet surfaces:* Interior surfaces, excluding inaccessible areas, of the tank roof, shell, bottom, accessories, and appurtenances that are exposed to the stored water or its vapor. Examples are the interior of the roof, shell, bottom, and exterior of the access tube within the tank.

7. *Manufacturer:* The party that manufactures, fabricates, or produces materials or products.

8. *Potable water:* Water that is safe and satisfactory for drinking and cooking.

9. *Pot life:* The period of time, after mixing the components together, that the coating remains usable with no decrease in the desired properties or performance.

10. *Preconstruction primer:* Primers shop applied at relatively thin (0.75–2.0 mils) dry film thickness designed to protect the blast-cleaned steel during the fabrication, transportation, and erection processes.

11. *Purchaser:* The person, company, or organization that purchases any materials or work to be performed.

12. *Stripe coat:* A coat of paint applied to specified areas such as edges or welds before or after a full coat is applied to the entire surface.

13. *Tank:* As defined in this standard, the term *tank* includes steel standpipes, reservoirs, and elevated tanks.

14. *Top capacity level (TCL):* Elevation of the lip of the overflow.

SECTION 4: REQUIREMENTS

Sec. 4.1 Materials.

Materials shall comply with federal, state or provincial, and local requirements.

Sec. 4.2 Data to Be Provided

The following data are to be provided:

4.2.1 *Coatings manufacturer.* The name of the company that manufactures the coatings to be applied.

4.2.2 *Application method.* The application method for inside and outside coatings—that is, brushing, rolling, or spraying, and whether the use of

dehumidification equipment is required during blast-cleaning and coating operations for interior coating systems.

4.2.3 *Materials.* The identification of each coating material intended for use on the project.

4.2.4 *Material safety data sheets.* Current material safety data sheets (SDSs) for each product to be used.

Sec. 4.3 Outside Coating Systems

4.3.1 *General.* This section describes coating systems for the exterior, weather-exposed surfaces of steel tanks. When coating materials are referenced to technical standards, the reference shall define the general type and quality required but shall not limit acceptable materials to an exact formulation. Proprietary formulations will be acceptable provided the coating is of the same generic type and that the performance of the formulation offered meets or exceeds the performance of the formulation defined in the referenced coating standard.

4.3.1.1 *Shop priming.* Primers or prime coats for the exterior systems outlined in this section may be shop applied. On surfaces where weld quality might be affected, the shop-applied primer may be eliminated or applied at reduced thickness within 4 in. of the area to be welded. When the shop priming option is used, fieldwork after the tank is erected consists of spot cleaning and spot priming exposed weld margins and primer abrasions. Refer to Sec. 4.6.2.4 regarding cleaning of shop-applied prime coats prior to application of finish coats.

4.3.1.2 *Preconstruction priming.* If specified, a fully compatible preconstruction primer shall be shop applied. Preconstruction primers specially formulated for welding may be applied without weld margins (see Sec. 4.3.1.1). Full removal of preconstruction primers is not required if (1) allowed by the specification and (2) compatible with the paint system primer. However, a full field coat of the primer specified for the selected outside system shall be applied over the spot-cleaned bare steel and remaining preconstruction primer. Field surface preparation for compatible preconstruction primers not requiring full removal is the same as for standard shop primers. Refer to Sec. 4.6.2.4 regarding cleaning of shop-applied prime coats prior to application of finish coats. Surfaces with incompatible preconstruction primers shall be prepared in accordance with Sec. 4.6.2.1.

4.3.1.3 *Weld-related shop primer requirements.* When the coating system primer or preconstruction primer is shop applied, refer to the applicable product-specific AWWA standard(s) for further information regarding weld-related shop primer requirements.

4.3.2 *Outside coating system No. 1 (OCS-1).* This is a three-coat or optional four-coat system consisting of one or two prime coats of rust-inhibitive pigmented alkyd primer, followed by an intermediate coat of alkyd coating and a finish coat of alkyd or silicone alkyd enamel. The following systems are included:

System Designation	Intermediate Coat	Finish Coat
OCS-1-A	Aluminum	Aluminum
OCS-1-B	Aluminum (colored)	Aluminum (colored)
OCS-1-C	Alkyd	Alkyd
OCS-1-D	Alkyd	Silicone Alkyd

4.3.2.1 *Materials.* The prime coat shall be red iron oxide, zinc oxide, oil, and alkyd primer without lead or chromate pigments in accordance with the performance requirements of SSPC-PS 27.00 (2013).

For system OCS-1-A, the aluminum intermediate and finish coats shall be aluminum alkyd in accordance with the performance requirements of SSPC-Paint 101 (2013).

For system OCS-1-B, the aluminum intermediate and finish coats shall be a nonleaving aluminum alkyd in accordance with the performance requirements of SSPC-Paint 101 (2013) tinted with phthalocyanine blue or green.

For system OCS-1-C, the intermediate and finish coats shall be gloss alkyd enamel in accordance with the performance requirements of SSPC-PS 27.00 (2013).

For system OCS-1-D, the intermediate coat shall be alkyd coating in accordance with the performance requirements of SSPC-PS 27.00 (2013). The finish coat shall be high-gloss silicone-alkyd coating.

4.3.2.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-1 coating system shall be as follows:

System	Primer 1	Primer 2* (Optional)	Intermediate Coat	Finish Coat	Total System	
OCS-1-A	2.0	(1.5)	1.0	1.0	4.0	(5.5)
OCS-1-B	2.0	(1.5)	1.0	1.0	4.0	(5.5)
OCS-1-C	2.0	(1.5)	1.5	1.5	5.0	(6.5)
OCS-1-D	2.0	(1.5)	1.5	1.0	4.5	(6.0)

NOTE: Consult the coating manufacturer for coating thickness limitations.

* Numbers in parentheses indicate thickness when optional second prime coat is used.

4.3.3 *Outside coating system No. 2 (OCS-2).* This is a three-coat system consisting of a single-component moisture-cure polyurethane zinc-rich primer, an intermediate coat of single-component moisture-cure polyurethane (normally pigmented with micaceous iron oxide), and a finish coat of single-component moisture-cure polyurethane coating.

4.3.3.1 *Materials.* The primer shall be a zinc-rich primer in accordance with SSPC-Paint 20, type II, chemically cured. The organic zinc-rich primer may be single-package or multipackage with the zinc dust packaged separately. The finish coat shall be in conformance with SSPC-Paint 36, level 1.

4.3.3.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-2 coating system shall be as follows:

System	Primer	Intermediate Coat	Finish Coat	Total System
OCS-2	2.5	3.0	1.5	7.0

NOTE: Consult the coating manufacturer for coating thickness limitations.

4.3.4 *Outside coating system No. 3 (OCS-3).* This is a three-coat system consisting of an inorganic or an organic zinc-rich primer and an intermediate coat and finish coat of a single-component water-based industrial acrylic or modified acrylic emulsion.

4.3.4.1 *Materials.* If an inorganic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type I-B or type I-C. If an organic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type II, chemically cured. The zinc-rich primer may be single-package or multipackage with the zinc dust packaged separately. The intermediate and finish coats shall be in accordance with SSPC-PS 24.00 (2013). If a shop-applied inorganic zinc-rich primer is specified for new tanks, field touch-up shall be performed using the organic zinc-rich primer followed by a complete finish coat of water-based industrial acrylic or modified acrylic emulsion.

4.3.4.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-3 coating system shall be as follows:

System	Primer	Intermediate Coat	Finish Coat	Total System
OCS-3	2.5	2.0	2.0	6.5

NOTE: Consult the coating manufacturer for coating thickness limitations.

4.3.5 *Outside coating system No. 4 (OCS-4).* This is a three-coat system consisting of an inorganic or organic zinc-rich primer, an intermediate coat of an aliphatic polyurethane, and a finish coat of two-component aliphatic fluorourethane. If a shop-applied inorganic zinc-rich primer is specified for new tanks, field touch-up shall be performed using the organic zinc-rich primer followed by a complete intermediate coat of aliphatic polyurethane and a complete finish coat of aliphatic fluorourethane.

4.3.5.1 *Materials.* If an inorganic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type I-B or type I-C. If an organic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type II, chemically cured. The organic zinc-rich primer may be single-package or multi-package with the zinc dust packaged separately. The intermediate coat shall be a two-component aliphatic polyurethane coating in accordance with SSPC-Paint 36, level 1. The finish coat shall be a two-component aliphatic fluoroethylene/vinyl ether fluorourethane coating conforming to the weathering requirements of AAMA 2604 and a 95 percent gloss retention after a minimum of 1,252 MJ/m² of UV spectrum exposure in accordance with ASTM D4141 (Procedure C) and ASTM G90 (Cycle 1).

4.3.5.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-4 coating system shall be as follows:

System	Primer	Intermediate Coat	Finish Coat	Total System
OCS-4	2.5	2.0	2.0	6.5

NOTE: Consult the coating manufacturer for coating thickness limitations.

4.3.6 *Outside coating system No. 5 (OCS-5).* This is a three-coat system consisting of a first coat and an intermediate coat of two-component epoxy and a finish coat of a two-component aliphatic polyurethane coating. The epoxy first coat may be formulated with or without rust-inhibitive pigments.

4.3.6.1 *Materials.* The first and intermediate coats shall be a two-component epoxy coating in accordance with ANSI/AWWA C210 or a proprietary epoxy formulation in accordance with the requirements of Sec. 4.3.1. The first coat shall be considered as the prime coat. The finish coat shall be a two-component aliphatic polyurethane coating in accordance with SSPC-Paint 36, level 1.

4.3.6.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-5 coating system shall be as follows:

System	First Coat	Intermediate Coat	Finish Coat	Total System
OCS-5	2.5	2.0	2.0	6.5

NOTE: Consult the coating manufacturer for coating thickness limitations.

4.3.7 *Outside coating system No. 6 (OCS-6).* This is a three-coat system consisting of an inorganic or organic zinc-rich primer, an intermediate coat of two-component epoxy, and a finish coat of two-component aliphatic polyurethane coating. If a shop-applied inorganic zinc-rich primer is specified for new tanks, field touch-up shall be performed using the organic zinc-rich primer followed by a complete intermediate coat of epoxy and a complete finish coat of aliphatic polyurethane.

4.3.7.1 *Materials.* If an inorganic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type I-B or type I-C. If an organic zinc-rich primer is specified, it shall be in accordance with SSPC-Paint 20, type II, chemically cured. The organic zinc-rich primer may be single-package or multipackage with the zinc dust packaged separately. The intermediate coat shall be a two-component epoxy coating in accordance with ANSI/AWWA C210 or a proprietary epoxy formulation in accordance with the requirements of Sec. 4.3.1. The finish coat shall be a two-component aliphatic polyurethane coating in accordance with SSPC-Paint 36, level 1.

4.3.7.2 *Thickness.* Minimum dry film thickness, in mils, of the OCS-6 coating system shall be as follows:

System	Primer	Intermediate Coat	Finish Coat	Total System
OCS-6	2.5	2.0	2.0	6.5

NOTE: Consult the coating manufacturer for coating thickness limitations.

4.3.8 *Outside coating system No. 7 (OCS-7).* This is a three-coat system consisting of a first coat and an intermediate coat of two-component water-based epoxy and a finish coat of a two-component water-based aliphatic polyurethane coating.

4.3.8.1 *Materials.* The first and intermediate coats shall be two-component water-based epoxy coatings in accordance with the performance requirements of SSPC-Paint 28. The first coat shall be considered as the prime coat. The finish coat shall be a two-component water-based aliphatic polyurethane coating in accordance with level 1 weathering requirements of SSPC-Paint 36.

4.3.8.2 **Thickness.** Minimum dry film thickness, in mils, of the OCS-7 coating system shall be as follows:

System	First Coat	Intermediate Coat	Finish Coat	Total System
OCS-7	2.0	2.0	2.0	6.0

NOTE: Consult the coating manufacturer for coating thickness limitations.

Sec. 4.4 Inside Coating Systems

4.4.1 *General.* This section describes coating systems for the interior of steel tanks. The selected coating systems for interior wet surfaces and interior dry surfaces are not required to be the same. Unless otherwise specified, the interior dry surfaces shall be coated with inside coating system No. 1 (ICS-1).

When coating materials are referenced to technical standards, the reference shall define the general type and quality required but shall not limit acceptable materials to an exact formulation. Proprietary formulations will be acceptable provided the coating is of the same generic type and that the performance of the formulation offered meets or exceeds the performance of the formulation defined in the referenced coating standard. Each coat color shall be specified to be contrasting to the underlying coat color.

Coatings used on interior wet surfaces of the tank shall have been tested and certified for potable water contact in accordance with NSF/ANSI 61. They shall have been evaluated for long-term freshwater resistance, and the system shall have demonstrated satisfactory service in freshwater for at least 18 months. Any coating that cannot meet these requirements, whether or not included in this standard, shall not be used.

4.4.1.1 **Shop priming.** Primers or prime coats for the interior systems outlined in this section may be shop applied. On surfaces where weld quality might be affected, the shop-applied primer may be eliminated or applied at reduced thickness within 4 in. of the area to be welded. When the shop-priming option is used, fieldwork after the tank is erected consists of spot cleaning and spot priming exposed weld margins and primer abrasions, as required for the particular coating system. Refer to Sec. 4.6.2.4 regarding cleaning of shop-applied prime coats prior to application of finish coats.

4.4.1.2 **Preconstruction priming.** If specified, a fully compatible preconstruction primer shall be shop applied. Preconstruction primers specially formulated for welding may be applied without weld margins (see Sec. 4.4.1.1). Full