



Standard Specification for Vinyl-Coated Steel Wire and Welded Wire Reinforcement¹

This standard is issued under the fixed designation A933/A933M; 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 specification covers plain and deformed steel wire and plain and deformed steel welded wire reinforcement with protective vinyl (polyvinyl chloride, or polyvinyl chloride powder compound) coating. A Class A minimum coating thickness is required for wire and welded wire reinforcement intended for use in concrete and masonry. A Class B minimum coating thickness is required for wire and welded wire reinforcement intended for use in mechanically stabilized earth applications.

1.2 Other thermoplastic organic coatings may be used provided they meet the requirements of this specification.

NOTE 1—The coating applicator is identified throughout this specification as the manufacturer.

1.3 Requirements for coatings are contained in [Annex A1](#).

1.4 Requirements for patching materials are contained in [Annex A2](#).

1.5 The text of this specification contains notes or footnotes, or both, that provide explanatory material. Such notes and footnotes, excluding those in tables or figures, do not contain any mandatory requirements.

1.6 This specification is applicable for orders in either inch-pound units (as Specification A933) or in SI units [as Specification A933M].

1.7 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is under the direct responsibility of Subcommittee A01.05 on Steel Reinforcement.

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2. Referenced Documents

2.1 ASTM Standards:²

A775/A775M Specification for Epoxy-Coated Steel Reinforcing Bars

A884/A884M Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

A1064/A1064M Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

B117 Practice for Operating Salt Spray (Fog) Apparatus

D374 Test Methods for Thickness of Solid Electrical Insulation (Withdrawn 2013)³

D2240 Test Method for Rubber Property—Durometer Hardness

D2967 Test Method for Corner Coverage of Powder Coatings

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

G8 Test Methods for Cathodic Disbonding of Pipeline Coatings

G12 Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel (Withdrawn 2013)³

G14 Test Method for Impact Resistance of Pipeline Coatings (Falling Weight Test)

G20 Test Method for Chemical Resistance of Pipeline Coatings

2.2 National Association of Corrosion Engineers Standards:⁴

RP-287-87 Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surface Using a Replica Tape

TM-01-70 Visual Standard for Surfaces of New Steel Air Blast Cleaned with Sand Abrasive (NACE No. 2)

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

⁴ Available from National Association of Corrosion Engineers (NACE), 1440 South Creek Dr., Houston, TX 77084-4906, <http://www.nace.org>.

*A Summary of Changes section appears at the end of this standard



TM-01-75 Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Shot or Steel Grit (NACE No. 2)

2.3 *Steel Structures Painting Council Specifications*:⁵

SSPC-PA2 Measurement of Dry Coating Thickness with Magnetic Gages

SSPC-SP 10 Near-White Blast Cleaning

SSPC-Vis 1 Pictorial Surface Preparation Standards for Painting Steel Surfaces

SSPC-Vis 2 Standard Methods of Evaluating Degree of Rusting on Painted Steel Surfaces

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *conversion coating, n*—a preparation of the blast-cleaned steel surface prior to coating application that is designed to pretreat the metal to promote coating adhesion, reduce metal/coating reactions, improve corrosion resistance, and increase blister resistance.

3.1.2 *disbonding, n*—loss of adhesion between the fusion-bonded vinyl coating and the steel reinforcement.

3.1.3 *fusion-bonded vinyl coating, n*—a product containing pigments, thermoplastic vinyl resin, and other additives. It is applied in the form of a powder on a clean, heated, metallic substrate and fuses to form a continuous barrier coating.

3.1.4 *holiday, n*—a discontinuity in a coating that is not discernible to a person with normal or corrected vision.

3.1.5 *patching material, n*—a liquid vinyl coating used to repair damaged or uncoated areas.

4. Ordering Information

4.1 It shall be the responsibility of the purchaser to specify all requirements that are necessary for material ordered to this specification. Such requirements shall include but are not limited to the following:

4.1.1 Name of material (vinyl-coated steel wire or welded wire reinforcement),

4.1.2 Wire or welded wire reinforcement specification (5.1),

4.1.3 Wire size, if wire reinforcement,

4.1.4 Wire spacing and sizes, if welded wire reinforcement,

4.1.5 Length and width of sheets or rolls,

4.1.6 Quantity,

4.1.7 Class of coating,

4.1.8 Requirements for material samples (5.3),

4.1.9 Requirements for patching material (5.4),

4.1.10 Requirements for visual standards for surface cleaning comparison (6.1),

4.1.11 Specific requirements for test frequency (9.1),

4.1.12 Requirements for inspection of manufacturing plant (12.1), and

4.1.13 ASTM designation and year of issue.

5. Materials

5.1 Plain or deformed steel wire or welded wire reinforcement to be coated shall meet the requirements of Specification

A1064/A1064M and shall be free of surface contaminants such as oil, grease, or paint when received at the manufacturer's plant and prior to cleaning and coating.

5.2 The coating material shall meet the requirements listed in Annex A1. In addition to the requirements of Annex A1, the coating material shall have demonstrated long-term stability when embedded in concrete.

5.2.1 A written certification shall be furnished to the purchaser that properly identifies the number of each batch of coating material used in the order, material quantity represented, date of manufacture, name and address of manufacturer, and a statement that the supplied coating material meets the requirements of Annex A1.

5.3 If specified in the order, a representative 8-oz [0.20-kg] sample of the coating material shall be supplied to the purchaser from each batch. The sample shall be packaged in an airtight container and identified by batch number.

5.4 Patching material for repairing damaged coating shall be compatible with the coating, inert in concrete, and feasible for repairs at the applicator plant or the fabricating shop. Patching material shall be approved in accordance with Annex A2 prior to use.

5.4.1 The patching material manufacturer shall specify the metals surface preparation and the procedures for application of the patching material.

5.4.2 If specified in the order, patching material conforming to Annex A2 and recommended by the powder coating manufacturer shall be supplied to the purchaser.

NOTE 2—When subjected to temperatures above 390°F [200°C] for a prolonged period of time, a vinyl coating is subject to decomposition. One of the products of decomposition is hydrochloric acid, HCl, which can damage concrete and reinforcing steel. Even in small amounts, HCl will accelerate corrosion of steel.

NOTE 3—Vinyl-coated wire has very low bond strength to concrete, and the use of deformed wire provides no advantage over plain wire. The bond strength of vinyl-coated welded wire reinforcement is similar to that of uncoated plain welded wire reinforcement since the cross wires provide the primary bond.

6. Surface Preparation

6.1 The surface of the steel wire or welded wire reinforcement to be coated shall be cleaned by abrasive blast cleaning to near-white metal in accordance with SSPC-SP 10. Additional surface treatment, as indicated in 6.3, is permitted. Any of the following visual standards of comparison shall be used to define the final surface condition: SSPC-Vis 1, SSPC-Vis 2, NACE TM-01-70, and NACE TM-01-75. Average blast profile maximum roughness depth readings of 1.5 to 4.0 mils [0.04 to 0.10 mm] as determined by replica tape measurements using NACE RP-287-87, shall be considered suitable as an anchor pattern.

NOTE 4—Abrasive blast cleaning of wire and welded wire reinforcement with a high degree (>90 %) of grit in the cleaning media provides the most suitable anchor profile for coating adhesion. After grit has been recycled, a small portion will take on the appearance of shot.

NOTE 5—The use of a profilometer type surface measurement instrument which measures the peak count as well as the maximum profile depth is recommended.

6.2 Multidirectional, high-pressure, dry air knives shall be used after blasting to remove dust, grit, and other foreign

⁵ Available from Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.