



Designation: A1055/A1055M – 22

Standard Specification for Zinc and Epoxy Dual-Coated Steel Reinforcing Bars¹

This standard is issued under the fixed designation A1055/A1055M; 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 deformed and plain steel reinforcing bars with a dual coating of zinc-alloy followed by an epoxy coating applied by the electrostatic spray method.

1.2 The zinc-alloy coating is produced as one of two types: zinc-alloy applied by the thermal spray method (Type I) or zinc-alloy applied in accordance with Specification **A1094/A1094M** (Type II).

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

1.3 Requirements for the zinc coating are contained in **Table 1**.

1.4 Requirements for epoxy powder coatings are contained in **Annex A1**.

1.5 Guidelines for construction practices at the job-site are presented in **Appendix X1**.

1.6 The text of this specification references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.

1.7 This specification is applicable for orders in either inch-pound units [as Specification A1055] or SI units [as Specification A1055M].

1.8 The values stated in either inch-pound units or SI units are to be regarded 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 must be used independently of the other, except as specifically noted in **Table 2**. Combining values from the two systems may result in non-conformance with this specification.

1.9 *This specification 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 specification to establish*

appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- A615/A615M Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- A706/A706M Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- A775/A775M Specification for Epoxy-Coated Steel Reinforcing Bars
- A944 Test Method for Comparing Bond Strength of Steel Reinforcing Bars to Concrete Using Beam-End Specimens
- A996/A996M Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
- A1035/A1035M Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
- A1094/A1094M Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement
- B117 Practice for Operating Salt Spray (Fog) Apparatus
- B833 Specification for Zinc and Zinc Alloy Wire for Thermal Spraying (Metallizing) for the Corrosion Protection of Steel
- D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- D4417 Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E527 Practice for Numbering Metals and Alloys in the

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

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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.

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



TABLE 1 Chemical Composition Requirements for Zinc and Zinc-Alloy Wires

Common Name (UNS) ^A	Al, max unless noted	Cd, max	Cu, max	Fe, max	Pb, max	Sn, max	Sb, max	Ag, max	Bi, max	As, max	Ni, max	Mg, max	Mo, max	Ti, max	Zn, min	Other, Total max
99.99 Zinc ^B (Z13005)	0.002 ^C	0.003	0.005	0.003	0.003	0.001	... ^D	...	...	...	...	...	...	...	99.99	...
99.99 Zinc ^B (Z15005)	0.01	0.02	0.02	0.02	0.03	...	...	...	...	...	...	...	...	...	99.9	0.10 total non-Zn
99.995 Zinc (...) ^E	0.001	0.003	0.001	0.002	0.003	0.003	...	...	...	...	...	...	...	...	99.995	0.005
99.95 Zinc (...) ^E	0.01	0.02	0.001	0.02	0.03	0.001	...	...	...	...	...	...	...	...	99.95	0.050
99.95 Zinc (...) ^E	0.01	0.005	0.7	0.01	0.005	0.001	...	...	...	...	...	0.01	0.01	0.18	99	1.0
98Zn/2Al (Z30402)	1.5-2.5	0.005	0.005	0.02	0.005	0.003	0.10	0.015	0.02	0.002	0.005	0.02	...	...	remainder	...

^A UNS designations were established in accordance with Practice E527.

^B In accordance with ANSI/AWS A5.33.

^C The following applies to all specified limits in this table. For the purposes of determining conformance with this specification, an observed value obtained from analysis shall be rounded off to the nearest unit in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding method of Practice E29.

^D ... indicates that the element is not applicable.

^E (...) indicates no Unified Numbering System (UNS) designation for this option.

TABLE 2 Bend Test Requirements

A615, A706, or A996		A615M, A706M, or A996M		Bend Angle (After Rebound, degrees)	Time to Completion max, s
Bar No.	Pin Diameter in. ^A	Bar No.	Pin Diameter mm ^A		
3	3	10	75	180	15
4	4	13	100	180	15
5	5	16	125	180	15
6	6	19	150	180	15
7	7	22	175	180	45
8	8	25	200	180	45
9 ^B	9	29 ^B	230	180	45
10 ^B	10	32 ^B	250	180	45
11 ^B	11	36 ^B	280	180	45
14 ^B	17	43 ^B	430	90	45
18 ^B	23	57 ^B	580	90	45

^A Pin diameters specified for similar size (shown on the same line) inch-pound bars and metric may be interchanged.

^B Bar designation Nos. 9, 10, 11, 14, and 18 [29, 32, 36, 43, and 57] are not covered by Specification A996/A996M.

Unified Numbering System (UNS)

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

G20 Test Method for Chemical Resistance of Pipeline Coatings

G62 Test Methods for Holiday Detection in Pipeline Coatings

2.2 American Welding Society:³

ANSI/AWS A5.33 Specification for Solid and Ceramic Wires and Ceramic Rods for Thermal Spraying

AWS C2.23M/C2.23 Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection for Steel

AWS C2.25/C2.25M Specification for Thermal Spray Feedstock—Solid and Composite Wire and Ceramic Rods

³ Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.

2.3 Society for Protective Coatings Specifications:⁴

SSPC-PA 2 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

2.4 Concrete Reinforcing Steel Institute:⁵

Voluntary Certification Program for Fusion Bonded Epoxy Coating Applicator Plants

2.5 American Concrete Institute Standard:⁶

ACI 301 Specifications for Structural Concrete

3. Terminology

3.1 Definitions of Terms Specific to This Specification:

3.1.1 *batch, n*—epoxy powder or patching material contained in an individual shipping release or shipping order.

3.1.2 *damaged coating, n*—area surrounded by coating where steel surface is visible to a person with normal or corrected vision.

3.1.3 *disbonding, n*—loss of adhesion between the fusion-bonded epoxy coating and the zinc-coated steel reinforcing bar.

3.1.4 *fusion-bonded epoxy coating, n*—a product containing pigments, thermosetting resins, cross-linking agents, and other additives, which is applied in the form of a powder onto a clean, heated metallic substrate and fused to form a continuous barrier coating.

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

3.1.6 *lot, n*—bars of one size and pattern of deformations contained in an individual shipping release or shipping order.

⁴ Available from Society for Protective Coatings (SSPC), 800 Trumbull Dr., Pittsburgh, PA 15205, <http://www.sspc.org>.

⁵ Available from Concrete Reinforcing Steel Institute (CRSI), 933 N. Plum Grove Rd., Schaumburg, IL 60173-4758, <http://www.crsi.org>.

⁶ Available from American Concrete Institute (ACI), 38800 Country Club Dr., Farmington Hills, MI 48331-3439, <http://www.concrete.org>.