Standard Specification for

Uncoated, Corrosion-Resistant, Deformed and Plain Chromium Alloyed, Billet-Steel Bars for Concrete Reinforcement and Dowels

AASHTO Designation: M 334M/M 334-17 (2021)[1]

Adopted with Revisions: 2017 **Reviewed but Not Updated: 2021**

Technical Subcommittee: 4f, Metals

AASHTO

American Association of State Highway and Transportation Officials
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1. SCOPE

1.1. This specification covers uncoated, corrosion-resistant, deformed and plain chromium alloyed, billet-steel concrete reinforcement and dowel bars in cut lengths or coils (Notes 1 and 2). The standard sizes and dimensions of deformed bars and their number designations shall be those listed in Table 2 for millimeter-kilogram bars [Table 3 for inch-pound bars].

Note 1—For coils of deformed bars, the capacity of industrial equipment limits the maximum bar size that can be straightened.

Note 2—The degree of corrosion resistance specified for both concrete reinforcement and dowel bars is typically dependent on the type of structure, the expected in-service environmental conditions, and the material properties of the concrete in which they are embedded.

1.2. Bars are of three minimum yield levels: 420 MPa [60,000 psi], 550 MPa [80,000 psi], and 690 MPa [100,000 psi], designated as Grade 420 [60], Grade 550 [80], and Grade 690 [100], respectively.

1.3. Hot-rolled plain rounds, in sizes up to and including 57 mm [2.25 in.] in diameter in coils or cut lengths, when specified for dowels, spirals, and structural ties or supports, shall be furnished under this specification in Grade 420 [60], Grade 550 [80], and Grade 690 [100] (Note 3).

For ductility properties, test provisions of the nearest nominal diameter deformed bar size shall apply. Those requirements providing for deformations and marking shall not be applicable (Note 3).

Note 3—The weight for plain rounds smaller than 10 mm [$^3/_8$ in.] in diameter shall be computed on the basis of the size in ASTM A510/A510M.

Note 4—When welding of the material listed in this specification is required, it should be in conformance with AWS D1.4 *Structural Welding Code—Reinforcing Steel* and the applicable sections of AWS D1.6 *Structural Welding Code—Stainless Steels*. If the material is not addressed in these specifications, the manufacturer of the steel should be contacted to obtain a welding procedure for the particular application.

1.4. This specification is applicable for orders in either SI units (as M 334M) or in inch-pound units (as M 334). SI units and inch-pound units are not necessarily equivalent. Inch-pound units are shown in brackets in the text for clarity, but they are the applicable values when the material is ordered to M 334.

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- T 244, Mechanical Testing of Steel Products
- T 285, Bend Test for Bars for Concrete Reinforcement
- T 372M/T 372, Sensitivity of Stainless Steel to Intergranular Attack
- T 373M/T 373, Comparative Qualitative Corrosion Characterization of Steel Bars Used for Concrete Reinforcement (Linear Polarization Resistance and Potentiodynamic Polarization Tests)
- T 374M/T 374, Comparative Qualitative Corrosion Characterization of Uncoated Chromium-Alloyed Steel Bars Used in Concrete Reinforcement (Tombstone Test)
- T 375M/T 375, Identification of Iron-Based Alloy Steel Bars for Concrete Reinforcement or Dowels by Handheld X-Ray Fluorescence (XRF) Spectrometer
- T 376M/T 376, Macrocell Slab Chloride Threshold

2.2. *ASTM Standards*:

- A276/A276M, Standard Specification for Stainless Steel Bars and Shapes
- A484/A484M, Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings
- A510/A510M, Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel
- A700, Standard Guide for Packaging, Marking, and Loading Methods for Steel Products for Shipment
- A751, Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
- A955/A955M, Standard Specification for Deformed and Plain Stainless Steel Bars for Concrete Reinforcement
- A1035/A1035M, Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
- E29, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

2.3. *Military Standards*:

- MIL-STD-129, Marking for Shipment and Storage
- MIL-STD-163, Steel Mill Products Preparation for Shipment and Storage

2.4. *Federal Standard*:

- Fed. Std. No. 123, Marking for Shipment (Civil Agencies)

2.5. *AWS Standards*:

- AWS D1.4, *Structural Welding Code—Reinforcing Steel*
- AWS D1.6, *Structural Welding Code—Stainless Steels*