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.

Designation: A615/A615M – 18ε1

American Association State Highway and Transportation Officials Standard
AASHTO No.: M 31

Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement[1]

This standard is issued under the fixed designation A615/A615M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

ε[1] NOTE—Editorial corrections were made throughout in July 2018.

1. Scope*

1.1 This specification covers deformed and plain carbon-steel bars in cut lengths and coils for concrete reinforcement. Annex A2 of this specification covers deformed bars for use for other applications. Steel bars containing alloy additions, such as with the Association for Iron and Steel Technology and the Society of Automotive Engineers series of alloy steels, are permitted if the resulting product meets all the other requirements of this specification. The standard sizes and dimensions of deformed bars and their number designations are given in Table 1.

1.2 Unless specified for use for other applications in Annex A2, bars are of four minimum yield strength levels: namely, 40 000 psi [280 MPa], 60 000 psi [420 MPa], 80 000 psi [550 MPa], and 100 000 psi [690 MPa], designated as Grade 40 [280], Grade 60 [420], Grade 80 [550], and Grade 100 [690], respectively.

NOTE 1—Grade 100 [690] reinforcing bars were introduced in this specification in 2015. In contrast to the lower grades, which have ratios of specified tensile strength to specified yield strength that range from 1.31 to 1.5, Grade 100 [690] reinforcing bars have a ratio of specified tensile strength to specified yield strength of 1.15. Designers should be aware that there will, therefore, be a lower margin of safety and reduced warning of failure following yielding when Grade 100 [690] bars are used in structural members where strength is governed by the tensile strength of the reinforcement, primarily in beams and slabs. If this is of concern, the purchaser has the option of specifying a minimum ratio of tensile strength to actual yield strength. Consensus design codes and specifications such as "Building Code Requirements for Structural Concrete (ACI 318)" may not recognize Grade 100 [690] reinforcing bars: therefore the 125 % of specified yield strength requirements in tension and compression are not applicable. Mechanical and welded splices should meet a minimum specified tensile strength of 115 000 psi [790 MPa].

NOTE 2—Designers need to be aware that design standards do not recognize the use of the No. 20 [64] bar, the largest bar included in this specification. Structural members reinforced with No. 20 [64] bars may require approval of the building official or other appropriate authority and require special detailing to ensure adequate performance at service and factored loads.

1.3 Plain bars, in sizes up to and including 2½ in. [63.5 mm] in diameter in coils or cut lengths, when ordered shall be furnished under this specification in Grade 40 [280], Grade 60 [420], Grade 80 [550], and Grade 100 [690]. For ductility properties (elongation and bending), test provisions of the nearest smaller nominal diameter deformed bar size shall apply. Requirements providing for deformations and marking shall not be applicable.

NOTE 3—Welding of the material in this specification should be approached with caution since no specific provisions have been included to enhance its weldability. When this steel is to be welded, a welding procedure suitable for the chemical composition and intended use or service should be used. The use of the latest edition of AWS D1.4/D1.4M is recommended. The AWS D1.4/D1.4M Welding Code describes the proper selection of the filler metals and preheat/interpass temperatures, as well as performance and procedure qualification requirements.

1.4 Requirements for alternate bar sizes are presented in Annex A1. The requirements in Annex A1 only apply when specified by the purchaser (see 4.2.5).

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

1.6 This specification is applicable for orders in either inch-pound units (as Specification A615) or in SI units (as Specification A615M).

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 specification.

[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.

Current edition approved July 1, 2018. Published July 2018. Originally approved in 1968. Last previous edition approved in 2016 as A615/A615M – 16. DOI: 10.1520/A0615_A0615M-18E01.

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

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