ASTM A615 / A615M - 09b Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

Abstract

This specification covers deformed and plain carbon-steel bars for concrete reinforcements in cut lengths and coils. Materials considered under this specification are available in Grades 40 [280], 60 [420], and 75 [520]. Steel samples shall be rolled from properly identified heats of mold cast or strand cast steel using electric-furnace, basic-oxygen, or open-hearth. Heat analysis shall be performed wherein steel materials shall conform to required compositions of carbon, manganese, phosphorus, and sulfur. Steel specimens shall also undergo tensile tests and shall conform to required values of tensile strength, yield strength, and elongation. Steel samples shall also undergo deformation test, tension test and bend tests. Final products shall be marked by a tag.

1. Scope

1.1 This specification covers deformed and plain carbon-steel bars for concrete reinforcement in cut lengths and coils. Steel bars containing alloy additions, such as with the American Iron and Steel Institute 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. 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.

1.2 Bars are of four minimum yield strength levels: namely, 40 000 [280 MPa], 60 000 [420 MPa], 75 000 psi [520 MPa], and 80 000 [550 MPa], designated as Grade 40 [280], Grade 60 [420], Grade 75 [520], and Grade 80 [550], respectively.

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 75 [520], and Grade 80 [550]. 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 1—Welding of the material in this specification should be approached with caution since no specific provisions have been included to enhance its weldability. When 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 D 1.4/D 1.4M is recommended. This document describes the proper selection

of the filler metals and preheat/interpass temperatures, as well as performance and procedure qualification requirements.

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

1.5 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 are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

1.6 This standard 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 standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

ASTM Standards
A6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A370 Test Methods and Definitions for Mechanical Testing of Steel Products
A510 Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
A510M Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel (Metric)
A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment
A706/A706M Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
AWS Standard
AWSD1.4/D1.4M Structural Welding Code--Reinforcing Steel
U.S. Military Standard
MIL-STD-129 Marking for Shipment and Storage
U.S. Federal Standard
Fed.Std.No.123 Marking for Shipment (Civil Agencies)

Index Terms

concrete reinforcement; deformations (protrusions); steel bars; Concrete reinforcement--specifications; Deformed steel bars--specifications; Steel bars and billets--specifications; Steel bars (concrete reinforcement--specifications; ICS Number Code 77.140.15 (Steels for reinforcement of concrete)