

A Roadmap to ASTM Standards

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Many ASTM standards for structural steel design and construction have been updated during the past year.

Here's a summary of the latest versions of each.

Common ASTM (American Society for Testing and Materials) standards used in steel design and construction are tabulated below. The table includes current version information as well as a brief description of what's covered in each standard. For more specific information about each document, such as mechanical properties or size ranges, refer to the AISC *Manual of Steel Construction*, third edition. The January 2004 issue of *Modern Steel Construction* (www.modernsteel.com) contains

guidance in properly specifying the materials covered by ASTM standards.

The scope statement for each standard is available free from www.astm.org. The complete standard can be purchased in electronic or paper form from the ASTM web site. AISC's publication *Selected ASTM Standards for Structural Steel Fabrication* (2003 ed.) collects these commonly used standards into one document, although many have been revised by ASTM over the past few years. ★

Most Commonly Referenced ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A36/A36M Standard Specification for Carbon Structural Steel	04	M, S, HP, C, MC, L, plates, bars (also covers, but is no longer common for, W-shapes; see A992)
A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	04a*	Pipe (not HSS; see A500)
A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	02	Hot-dip galvanizing for members
A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware	04	Hot-dip galvanizing for hardware
A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength	04b*	High-strength bolts (not anchor rods; see F1554)
A325M Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength [Metric]	04b*	Metric high-strength bolts
A490 A490-04a Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength	04a*	High-strength bolts (not anchor rods; see F1554)
A490M Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric)	04a*	Metric high-strength bolts

* Note: When multiple revisions of an ASTM standard occur within the same calendar year, ASTM denotes those revisions with a, b, c, etc. modifiers after the two-digit year.

Most Commonly Referenced ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes	03a*	Square, rectangular and round HSS (not pipe; see A53)
A563 Standard Specification for Carbon and Alloy Steel Nuts	04a*	Nuts
A572/A572M Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel	04	M, S, HP, C, MC, L, plates, bars (also covers, but is no longer common for, W-shapes; see A992)
A588/A588M Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi [345MPa] Minimum Yield Point to 4 in. [100mm] Thick	04	Weathering steel for W, M, S, HP, C, MC, L, plates, bars
A709/A709M Standard Specification for Carbon and High-Strength Low-Alloy Structural Steel Shapes, Plates, and Bars and Quenched-and-Tempered Alloy Structural Steel Plates for Bridges	04a*	Shapes, plates, bars for bridges
A913/A913M Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST)	04	W, M, S, HP, C, MC, L (not all shapes possible; contact manufacturer)

Most Commonly Referenced ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A992/A992M Standard Specification for Steel for Structural Steel Shapes	04a*	W (also covers, but is not yet common in, M, S, HP, C, MC, L)
B695 Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel	04	Mechanical galvanizing
F436 Standard Specification for Hardened Steel Washers	04	Washers
F959 Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners	04	DTI washers
F1554 Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength	04	Anchor rods
F1852 Standard Specification for Twist-Off Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength	04a*	Twist-off type tension control bolts in A325 strength level

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Other ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A6/A6M Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling	04b*	General requirements only, for W, M, S, HP, C, MC, L, plates, bars
A27/A27M Standard Specification for Steel Castings, Carbon, for General Application	03	Steel castings
A148/A148M Standard Specification for Steel Castings, High Strength, for Structural Purposes	03	Steel castings
A193/A193M Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service	04c*	Bolts for high-temperature applications
A194/A194M Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High-Temperature Service, or Both	04a*	Nuts for high-temperature applications
A242/A242M Standard Specification for High-Strength Low-Alloy Structural Steel	04	Weathering steel for shapes, plates and bars
A283/A283M Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates	03	Plates
A307 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength	04	Bolts and anchor rods

Other ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A354 Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners	04	Bolts and anchor rods
A370 Standard Test Methods and Definitions for Mechanical Testing of Steel Products	03a*	Mechanical testing of steel
A435/A435M Standard Specification for Straight-Beam Ultrasonic Examination of Steel Plates	90 (2001)	Ultrasonic testing
A449 Standard Specification for Quenched and Tempered Steel Bolts and Studs	04a*	Bolts and anchor rods
A501 Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing	01	Square, rectangular and round HSS (not pipe; see A53)
A514/A514M Standard Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding	00a*	Plates
A529/A529M Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality	04	Shapes, plates and bars
A578/A578M Standard Specification for Straight-Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications	96 (2001)	Ultrasonic testing

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Other ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A618 Standard Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing	04	Square, rectangular and round HSS (not pipe; see A53)
A673/A673M Standard Specification for Sampling Procedure for Impact Testing of Structural Steel	04	CVN testing
A759 Standard Specification for Carbon Steel Crane Rails	00	Crane rails
A770/A770M Standard Specification for Through-Thickness Tension Testing of Steel Plates for Special Applications	03	Through-thickness tension testing
A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings	01	Repair of damaged hot-dip galvanized coatings
A786/A786M Standard Specification for Hot Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates	00b*	Checkered floor plate
A847 Standard Specification for Cold-Formed Welded and Seamless High-Strength, Low-Alloy Structural Tubing with Improved Atmospheric Corrosion Resistance	99a* (2003)	Weathering steel for square, rectangular and round HSS (not pipe)

Other ASTM Standards

ASTM STANDARD AND TITLE	CURRENT VERSION (PER WWW.ASTM.ORG)	WHAT IT COVERS
A852/A852M Standard Specification for Quenched and Tempered Low-Alloy Structural Steel Plate with 70 ksi [485 MPa] Minimum Yield Strength to 4 in. [100 mm] Thick	03	Plates
E94 Standard Guide for Radiographic Examination	04	Radiographic testing
E165 Standard Test Method for Liquid Penetrant Examination	02	Dye-penetrant testing
E709 Standard Guide for Magnetic Particle Examination	01	Magnetic particle testing
E1032 Standard Test Method for Radiographic Examination of Weldments	01	Magnetic particle testing

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