Designation: F3125/F3125M – 26

Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength[1]

This standard is issued under the fixed designation F3125/F3125M; 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 chemical, physical and mechanical requirements for quenched and tempered bolts manufactured from steel and alloy steel, in inch and metric dimensions, in two strength grades, two types and two styles.

1.1.1 This specification was originally issued as a consolidation and replacement of six structural bolting ASTM standards, including; A325, A325M, A490, A490M, F1852 and F2280. One additional fastener grade, 144 ksi, is added with two types and two styles for inch series only.

1.2 *Intended Use:*

1.2.1 Bolts manufactured under this specification are intended for use in structural connections covered in the Specification for Structural Joints Using High-Strength Bolts, as approved by the Research Council on Structural Connections.

1.2.2 Grade A325 and Grade A490 Heavy Hex style in this specification are furnished in sizes ½ to 1 ½ in. inclusive.

1.2.3 Grade A325M and Grade A490M Heavy Hex styles are furnished in sizes from M12 to M36 inclusive.

1.2.4 Grade F1852 and Grade F2280 Twist-Off style assemblies are furnished in sizes ½ to 1 ¼ in. inclusive.

1.2.5 Grade 144 Twist-Off style assemblies and Heavy Hex style are furnished in sizes ½ to 1 ¼ in. inclusive.

1.3 *Classification,* Table 1*:*

1.3.1 Bolts are designated by grade, or group (at the manufacturer's option), which indicates inch or metric strength and style.

1.3.2 Bolts are designated by type denoting raw material chemical composition.

1.3.3 Bolts are designated by style denoting Heavy Hex bolts or "Twist-Off" style assemblies.

1.4 Terms used in this specification are defined in F1789.

1.5 *Units*—The values stated in either SI units or inch pound units are to be regarded separately as standard. 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 nonconformance with the standard.

1.6 Table footnotes are requirements. Notes are advisory.

1.7 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *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]

A194/A194M Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both

A354 Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

A449 Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use

A563/A563M Specification for Carbon and Alloy Steel Nuts (Inch and Metric)

[1] This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.02 on Steel Bolts, Studs and Nuts.

Current edition approved July 1, 2026. Published July 2026. Originally published in 2015. Last previous edition published in 2025 as F3125 – 25a. DOI: 10.1520/F3125_F3125M-26.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. 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 Classification[A]

Grade	Group	Min. Tensile Strength	Type[B]		Style
A325	120	120 ksi	1	3	Heavy Hex
144	144	144 ksi	1	3	Heavy Hex
A490	150	150 ksi	1	3	Heavy Hex
F1852	120	120 ksi	1	3	Twist-Off
144	144	144 ksi	1	3	Twist-Off
F2280	150	150 ksi	1	3	Twist-Off
A325M		830 MPa	1	3	Heavy Hex
A490M		1040 MPa	1	3	Heavy Hex

[A] Bolts may be designated by grade or group at the manufacturer's option.
[B] See Section 6 for chemical composition for Type 1 & Type 3.

A751 Test Methods and Practices for Chemical Analysis of Steel Products
B695 Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
E709 Guide for Magnetic Particle Testing
E1444/E1444M Practice for Magnetic Particle Testing for Aerospace
F436/F436M Specification for Hardened Steel Washers Inch and Metric Dimensions
F606/F606M Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets
F788/F788M Specification for Surface Discontinuities of Bolts, Screws, Studs, and Rivets, Inch and Metric Series
F1136/F1136M Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners (Withdrawn 2025)[3]
F1470 Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection
F1789 Terminology for F16 Mechanical Fasteners
F1940 Test Method for Process Control Verification to Prevent Hydrogen Embrittlement in Plated or Coated Fasteners
F2328 Test Method for Determining Decarburization and Carburization in Hardened and Tempered Threaded Steel Bolts, Screws, Studs, and Nuts
F2328M Test Method for Determining Decarburization and Carburization in Hardened and Tempered Threaded Steel Bolts, Screws, Studs, and Nuts (Metric)
F2329/F2329M Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
F2660 Test Method for Qualifying Coatings for Use on F3125 Grade A490 Structural Bolts Relative to Environmental Hydrogen Embrittlement
F2833 Specification for Corrosion Protective Fastener Coatings with Zinc Rich Base Coat and Aluminum Organic/Inorganic Type (Withdrawn 2025)[3]
F3019/F3019M Specification for Chromium Free Zinc-Flake Composite, with or without Integral Lubricant, Corrosion Protective Coatings for Fasteners (Withdrawn 2025)[3]
F3393 Specification for Zinc-Flake Coating Systems for Fasteners
G101 Guide for Estimating the Atmospheric Corrosion Resistance of Low-Alloy Steels

2.2 *ASME Standards:*[4]
B1.1 Unified Inch Screw Thread (UN, UNR, and UNJ Thread Forms)
B1.13M Metric Screw Threads: M Profile
B18.18 Quality Assurance for Fasteners
B18.2.6 Fasteners for Use in Structural Applications
B18.2.6M Metric Fasteners for Use in Structural Applications

2.3 *IFI Standard:*[5]
IFI 144 Test Evaluation Procedures for Coating Qualification Intended for Use of High Strength Bolts

2.4 *RCSC Specification:*[6]
Specification for Structural Joints Using High-Strength Bolts

3. Ordering Information

3.1 Orders for bolts under this specification shall include:

3.1.1 *ASTM designation.*

3.1.2 *Quantity:* Number of bolts or assemblies, including washers, if required.

3.1.3 *Size:* Including nominal bolt diameter and bolt length, and thread pitch if other than standard.

3.1.4 *Grade or Group:*
Grades A325, 144, A490, F1852, F2280, A325M, or A490M. Groups 120,144,150.

3.1.5 *Type:* Type 1 or Type 3. When Type is not specified either Type 1 or Type 3 may be furnished at the supplier's option.

3.1.6 *Style:* Heavy Hex or Twist-Off Style.

3.1.7 *Coatings or finishes:* If other than plain finish, specify the coating process or finish required, see Annex A1.

3.2 *Test reports,* see Section 14.

3.3 Additional details of other assembly components such as nuts and washers, if required.

3.4 Rotational capacity testing of Heavy Hex bolts sold as matched sets or assemblies in accordance with Annex A2, as required in 8.1.5 and when requested by the purchaser.

3.5 Heavy Hex bolts may be ordered individually, packaged with nuts, packaged with nuts and washers, or as assemblies.

3.6 Any special observation or inspection requirements shall be specified at the time of inquiry and at the time of order. See Section 13.2.

3.7 Any supplementary requirements.

3.8 Country of origin requirements, if any.

NOTE 1—A typical description follows: 1000 pieces ¾ in.× 3 in. ASTM F3125 – 25, Grade A325 Heavy Hex Bolt, Type 1, each with one ASTM F436/F436M Type 1 Hardened Washer, and one A563/A563M

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, http://www.asme.org.

[5] Industrial Fasteners Institute (IFI), 6363 Oak Tree Blvd. Independence, OH 44131. http://www.indfast.org

[6] Research Council on Structural Connections (RCSC), http://boltcouncil.org