Designation: F593 – 13a$^{\varepsilon 1}$

Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs[1]

This standard is issued under the fixed designation F593; 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—The equation in Table 4 was editorially corrected in August 2016.

1. Scope*

1.1 This specification covers the requirements for stainless steel bolts, hex cap screws, and studs 0.25 to 1.50 in., inclusive, in nominal diameter in a number of alloys in common use and intended for service applications requiring general corrosion resistance.

1.2 Seven groups of stainless steel alloys are covered, including thirteen austenitic, two ferritic, four martensitic, and one precipitation hardening.

Group	Alloys[A]	Condition[B]
1	304, 305, 384, 304 L, 18-9LW, 302HQ[D]	(CW) cold worked[C]
2	316, 316 L	(CW) cold worked[C]
3	321, 347	(CW) cold worked[C]
4	430[E]	(CW) cold worked[C]
5	410[F]	(H) hardened and tempered
6	431	(H) hardened and tempered
7	630	(AH) age hardened

[A] Unless otherwise specified on the inquiry and order, the choice of an alloy from within a group shall be at the discretion of the fastener manufacturer (see 6.1).
[B] See 4.2 for options.
[C] Sizes 0.75 in. and larger may be hot worked and solution annealed, provided the bolts comply with the cold worked (CW) mechanical property requirements.
[D] When approved by the purchaser, Alloys 303, 303Se, or XM1 may be furnished.
[E] When approved by the purchaser, Alloy 430F may be furnished.
[F] When approved by the purchaser, Alloys 416 or 416Se may be furnished.

1.3 Supplementary requirements of an optional nature are provided, applicable only when agreed upon between the manufacturer and the purchaser at the time of the inquiry and order.

1.4 Suitable nuts for use with bolts, hex cap screws, and studs included in this specification are covered by Specification F594. Unless otherwise specified, all nuts used on these fasteners shall conform to the requirements of Specification F594, shall be of the same alloy group, and shall have a specified minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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

2.1 *ASTM Standards:*[2]

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
A276 Specification for Stainless Steel Bars and Shapes
A342/A342M Test Methods for Permeability of Weakly Magnetic Materials
A380 Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
A484/A484M Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings
A493 Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging
A555/A555M Specification for General Requirements for Stainless Steel Wire and Wire Rods
A564/A564M Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes
A582/A582M Specification for Free-Machining Stainless Steel Bars
A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
A967 Specification for Chemical Passivation Treatments for

[1] This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.04 on Nonferrous Fasteners.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. 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**

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