

# STUDBOLT & BOLT, NUT A193-A193M, A194-A194M

Specification for Alloy Steel and Stainless Steel bolting material for high temperature service according to ASTM A193/A193 M, specification for carbon and alloy steel nuts for bolts for high – pressure and high temperature service according to ASTM A194/A194 M

## Ordering information

The inquiry and order for material under this specification shall include the following as required to describe the material adequately (Specification designation and grade , Heat treated condition this is normalized and tempered , ASTM A29/A29 M for general requirement for steel bars, carbon and alloy steel, hot-wrought and cold finished.

## Supplementary requirement

- 1- These requirements shall not apply unless specified in the order and in the ordering information, in which event the specified tests shall be made before shipment of the product from S1 through S7.  
S1: high temperature test shall be recommended practice E21, E139, E292, E150 AND E151  
S2: charpy impact test.  
S3: hardness testing of grade B7M  
S4: hardness testing of grade B16  
S5: marking: grade and manufactures identification symbols shall be applied to one end of studs and  
To the heads of bolt of all size.  
S6: stress relieving.  
S6.1: stress relieving operation shall follow straightening after heat treatment.  
S6.2: the minimum stress relieving temperature shall be 100 °f (55°c) Bellow the tempering  
temperature test for mechanical Properties shall be performed after stress relieving.  
S7: magnetic particle inspection bars shall be magnetic particle examined in according to with  
Practice E709.
- 2- Bars from which the nuts are made shall be hot-wrought and confirm from (S1 through S6) of an optional nature are provided.

**Note 1:** for grades of alloy steel material suitable for use at the lower range of high temperature Application, reference should be made to specification A354.

**Note 2:** for grades of alloy – steel bolting material suitable for use in low temperature application Reference should be made to Specification A320 /A320M.

**Threads:** All bolt, studs, stud bolts, and accompanying nuts, shall be threaded in accordance with ANSI B1.1.class 2A fit size 1 inch (25 mm) and smaller in diameter with the coarse-thread series, and 1 1/8 Inch (28 mm) and longer in diameter with the 8 pitch thread series.

**Heat analysis:** An analysis of each heat of steel shall be supplementary requirement for S3 of specification A788, Chemical composition and mechanical properties.

**Marking:** marking is done according to material standard and stamped for stud bolt, bolt, and nuts.

**Certificate:** should be third party /grade and manufacturing identification symbol shall be applied to one End of studs and to the head of bolts of all size.

**Mill test:** all materials supplied with mill test certificate (3 copies) for Individual items including all test Performed (heat analysis), Chemical composition, mechanical properties dimension and weight.

**Delivery:** for bolting material and nuts, including threaded bars, that are Furnished bundle and tagged or Boxed, the tags and boxes shall carry the grade symbol for the material identification and the Manufactures identification mark or name.

**Vendor:** material for supplied from (Europe).

LIST (A) STUD BOLT UNC FULL THREADED A193 Gr.B7

<b>DIMENSION</b>	<b>QTY/NOS.</b>
1/2" * 24"	500
5/8" * 24"	500
3/4" * 24"	750
7/8" * 24"	500
1" * 24"	500
1 1/8" * 24"	500
1 1/4" * 24"	500

LIST (B) BOLT & NUT HEAD HEXA GONAL CAP SCREW A490 FORCE (10.9)  
EQUIVALENT TO DIN 933, DIN 934.

<b>DIMENSION (FULLTHREADED)</b>	<b>QTY/NOS.</b>	<b>DIMENSION (FULL HREADED)</b>	<b>QTY/NOS.</b>
M10 * 30	2000	M16 * 80	4000
M10 * 40	2000	M16 * 90	4000
M10 * 50	2000	M16 * 100	4000
M10 * 60	2000	M16 * 110	2000
M10 * 70	2000	M16 * 120	4000
M10 * 80	2000	M18 * 50	4000
M12 * 30	2000	M18 * 60	4000
M12 * 40	2000	M18 * 70	4000
M12 * 50	2000	M18 * 80	4000
M12 * 60	2000	M18 * 90	4000
M12 * 70	2000	M18 * 100	4000
M12 * 80	2000	M18 * 110	4000
M12 * 90	2000	M18 * 120	4000
M14 * 40	3000	M20 * 50	3000
M14 * 50	3000	M20 * 60	3000
M14 * 60	3000	M20 * 70	3000
M14 * 70	3000	M20 * 80	3000
M14 * 80	3000	M20 * 90	3000
M14 * 90	3000	M20 * 100	3000
M14 * 100	3000	M20 * 110	3000
M14 * 110	3000	M20 * 120	3000
M16 * 50	4000	M24 * 60	2500
M16 * 60	4000	M24 * 70	2500
M16 * 70	4000	M24 * 80	2500
M24 * 90	2500	M28 * 120	2000
M24 * 100	2500	M28 * 140	2000
M24 * 110	2000	M28 * 160	2000
M24 * 120	2000	M28 * 180	2000
M24 * 130	2500	M28 * 200	2000
M28 * 100	2000		

**LIST C STUD BOLT UNC FULL THREADED TYPE A193 Gr.B7 WITH TWO NUT**  
**A194 GR.2H**

<b>SIZE</b>	<b>QTY/NOS.</b>	<b>SIZE</b>	<b>QTY/NOS.</b>
1/2" * 4"	500	1" * 5"	1000
1/2" * 5"	2000	1" * 6"	2000
1/2" * 6"	2500	1" * 8"	2000
5/8" * 4"	2000	1" * 10"	2000
5/8" * 5"	2000	1 1/8" * 6"	2000
5/8" * 6"	2000	1 1/8" * 8"	4000
5/8" * 8"	2000	1 1/8" * 10"	4000
3/4" * 4"	2000	1 1/4" * 6"	2000
3/4" * 5"	3000	1 1/4" * 8"	4000
3/4" * 6"	3000	1 1/4" * 10"	4000
3/4" * 8"	3000	7/8" * 6"	2000
7/8" * 5"	2000	7/8" * 8"	1500

**LIST D NUT A194 GRADE 2H UNC THREADED**

<b>SIZE</b>	<b>QTY/NOS.</b>
1/2"	5000
5/8"	10000
3/4"	7000
7/8"	10000
1"	14000
1 1/8"	20000
1 1/4"	20000

**LIST E BOLT AND NUT STAINLESS – STEEL TYPE 304 ACCORDING TO ASTM 193**  
**GRADE B8A IT SHOULD BE FULL THREADED EQUIVALENT TO A2, DIN 933**

<b>SIZE</b>	<b>QTY/NOS.</b>	<b>SIZE</b>	<b>QTY/NOS.</b>
M10 * 30	1500	M18 * 60	1500
M10 * 60	1500	M18 * 70	1500
M10 * 70	2000	M18 * 80	1500
M12 * 40	2000	M18 * 90	1500
M12 * 50	2000	M18 * 100	1500
M12 * 60	2000	M20 * 50	1500
M12 * 70	2000	M20 * 60	1500
M12 * 80	2000	M20 * 70	1500
M14 * 40	2000	M20 * 80	1500
M14 * 50	2000	M20 * 90	1500
M14 * 60	2000	M20 * 100	1000
M14 * 70	2000	M20 * 110	1000
M14 * 80	1500	M20 * 120	1000
M14 * 90	1500	M20 * 130	1000
M16 * 80	2000	M16 * 100	1500
M16 * 90	1500	M16 * 120	1500
M16 * 100	1500	M16 * 120	1500
M16 * 120	1500	M18 * 60	1500

**LIST F BOLT AND NUT STAINLESS – STEEL TYPE 316 ACCORDING TO ASTM 193**  
**GRADE B8M IT SHOULD BE FULL THREADED EQUIVALENT TO A4, DIN 933**

<b>SIZE</b>	<b>QTY/NOS.</b>	<b>SIZE</b>	<b>QTY/NOS.</b>
M10 * 30	1500	M16 * 80	2000
M10 * 40	1500	M16 * 90	2000
M10 * 50	1500	M16 * 100	2500
M10 * 60	1500	M16 * 120	2000
M10 * 70	2000	M18 * 60	1500
M12 * 40	3000	M18 * 70	1500
M12 * 50	2000	M18 * 80	1500
M12 * 60	2000	M18 * 90	1500
M12 * 70	3000	M18 * 100	1500
M12 * 80	3000	M20 * 50	1500
M14 * 40	2000	M20 * 60	1500
M14 * 50	2000	M20 * 70	1500
M14 * 60	2000	M20 * 80	1500
M14 * 70	2000	M20 * 90	1500
M14 * 80	1500	M20 * 100	1000
M14 * 90	1500	M20 * 110	1000
M16 * 50	1500	M20 * 120	1000
M16 * 60	2000	M20 * 130	1000
M16 * 70	2000		

**LIST F BOLT AND NUT STAINLESS – STEEL TYP E 410 ACCORDING TO ASTM 193  
GRADE B6 M IT SHOULD BE FULL THREADED EQUIVALENT TO A4, DIN 933 & NUT  
A 194 GR B6**

<b>SIZE</b>	<b>QTY/NOS.</b>	<b>SIZE</b>	<b>QTY/NOS.</b>
<b>M10 * 30</b>	<b>1500</b>	<b>M16 * 90</b>	<b>2000</b>
<b>M10 * 60</b>	<b>2000</b>	<b>M16 * 100</b>	<b>1500</b>
<b>M10 * 70</b>	<b>2000</b>	<b>M16 * 120</b>	<b>1500</b>
<b>M12 * 40</b>	<b>2000</b>	<b>M18 * 60</b>	<b>1500</b>
<b>M12 * 50</b>	<b>3000</b>	<b>M18 * 70</b>	<b>1500</b>
<b>M12 * 60</b>	<b>3000</b>	<b>M18 * 80</b>	<b>1500</b>
<b>M12 * 70</b>	<b>4000</b>	<b>M18 * 90</b>	<b>1500</b>
<b>M12 * 80</b>	<b>4000</b>	<b>M18 * 100</b>	<b>1500</b>
<b>M14 * 40</b>	<b>3000</b>	<b>M20 * 50</b>	<b>1500</b>
<b>M14 * 50</b>	<b>2000</b>	<b>M20 * 60</b>	<b>1500</b>
<b>M14 * 60</b>	<b>2000</b>	<b>M20 * 70</b>	<b>1500</b>
<b>M14 * 70</b>	<b>2000</b>	<b>M20 * 80</b>	<b>1500</b>
<b>M14 * 80</b>	<b>1500</b>	<b>M20 * 90</b>	<b>1500</b>
<b>M14 * 90</b>	<b>1500</b>	<b>M20 * 100</b>	<b>1000</b>
<b>M16 * 50</b>	<b>1500</b>	<b>M20 * 110</b>	<b>1000</b>
<b>M16 * 60</b>	<b>2000</b>	<b>M20 * 120</b>	<b>1000</b>
<b>M16 * 70</b>	<b>2000</b>	<b>M16 * 90</b>	<b>2000</b>
<b>M16 * 80</b>	<b>2000</b>	<b>M16 * 100</b>	<b>1500</b>