

# Marking and mechanical requirements for fasteners of stainless steel in inch

**Table 205 Mechanical property requirements for bolts, hex cap screws and studs in stainless steel**

Stainless alloy Group	Condition <sup>B</sup>	Alloy mech. property marking	Nominal diameter inch	Full-Size tests		
				Tensile strength ksi	Yield strength ksi	Rockwell hardness
Austenitic alloys						
1 (303, 304, 304L, 305, 384, XM1, 18-9LW, 302HQ, 303Se)	AF	F593A	1/4 - 1 1/2	65 - 85	20	B85 max.
	A	F593B	1/4 - 1 1/2	75 - 100	30	B65 - 95
	CW1	F593C	1/4 - 5/8	100 - 150	65	B95 - C32
	CW2	F593D	3/4 - 1 1/2	85 - 140	45	B80 - C32
	SH1	<u>F593A</u>	1/4 - 5/8	120 - 160	95	C24 - C36
	SH2	<u>F593B</u>	3/4 - 1	110 - 150	75	C20 - C32
	SH3	<u>F593C</u>	1 1/8 - 1 1/4	100 - 140	60	B95 - C30
	SH4	<u>F593D</u>	1 3/8 - 1 1/2	95 - 130	45	B90 - C28
2 (316, 316L)	AF	F593E	1/4 - 1 1/2	65 - 85	20	B85 max.
	A	F593F	1/4 - 1 1/2	75 - 100	30	B65 - 95
	CW1	F593G	1/4 - 5/8	100 - 150	65	B95 - C32
	CW2	F593H	3/4 - 1 1/2	85 - 140	45	B80 - C32
	SH1	<u>F593E</u>	1/4 - 5/8	120 - 160	95	C24 - C36
	SH2	<u>F593F</u>	3/4 - 1	110 - 150	75	C20 - C32
	SH3	<u>F593G</u>	1 1/8 - 1 1/4	100 - 140	60	B95 - C30
	SH4	<u>F593H</u>	1 3/8 - 1 1/2	95 - 130	45	B90 - C28
3 (321, 347)	AF	F593J	1/4 - 1 1/2	65 - 85	20	B85 max.
	A	F593K	1/4 - 1 1/2	75 - 100	30	B65 - 95
	CW1	F593L	1/4 - 5/8	100 - 150	65	B95 - C32
	CW2	F593M	3/4 - 1 1/2	85 - 140	45	B80 - C32
	SH1	<u>F593J</u>	1/4 - 5/8	120 - 160	95	C24 - C36
	SH2	<u>F593K</u>	3/4 - 1	110 - 150	75	C20 - C32
	SH3	<u>F593L</u>	1 1/8 - 1 1/4	100 - 140	60	B95 - C30
	SH4	<u>F593M</u>	1 3/8 - 1 1/2	95 - 130	45	B90 - C28
Ferritic alloys						
4 (430, 430F)	AF	F593X	1/4 - 1 1/2	55 - 75	30	B85 max.
	A	F593N	1/4 - 1 1/2	55 - 75	30	B85 max.
	CW1	F593V	1/4 - 5/8	60 - 105	40	B75 - 98
	CW2	F593W	3/4 - 1 1/2	55 - 100	30	B65 - 95
Martensitic alloys						
5 (410, 416, 416Se)	H	F593P	1/4 - 1 1/2	110 - 140	90	C20 - 30
	HT	F593R	1/4 - 1 1/2	160 - 190	120	C34 - 45
6 (431)	H	F593S	1/4 - 1 1/2	125 - 150	100	C25 - 32
	HT	F593T	1/4 - 1 1/2	180 - 220	140	C40 - 48
Precipitation hardening alloys						
7 (630)	AH	F593U	1/4 - 1 1/2	135 - 170	105	C28 - 38

<sup>A</sup> Minimum values, except where shown as maximum or as a range.

<sup>B</sup> Legend of conditions.

Source: Abstract of ASTM F593 2002.

- A = Machined from annealed or solution annealed stock thus retaining the properties of the original material, or hot-formed and solution annealed.
- AF = Headed and rolled from annealed stock and then reannealed.
- AH = Solution annealed and age-hardened after forming.
- CW = Headed and rolled from annealed stock thus acquiring a degree of cold work; sizes 0.75 in. and larger may be hot worked and solution annealed.
- H = Hardened and tempered at 1050°F min.
- HT = Hardened and tempered at 525°F min.
- SH = Machined from strain-hardened stock or cold worked to develop the specified properties.

**Table 206 Marking and mechanical requirements for nuts of stainless steel**

Stainless alloy Group	Condition <sup>B</sup>	Alloy mechanical property marking	Nominal diameter inch	Proof stress ksi, min	Rockwell hardness
Austenitic alloys					
1 (303, 304, 304L, 305, 384, XM1, 18-9LW, 302HQ, 303Se)	AF	F594A	1/4 - 1 1/2	70	B85 max.
	A	F594B	1/4 - 1 1/2	75	B65 - 95
	CW1	F594C	1/4 - 5/8	100	B95 - C32
	CW2	F594D	3/4 - 1 1/2	85	B80 - C32
	SH1	F594A	1/4 - 5/8	120	C24 - C36
	SH2	F594B	3/4 - 1	110	C20 - C32
	SH3	F594C	1 1/8 - 1 1/4	100	B95 - C30
	SH4	F594D	1 3/8 - 1 1/2	85	B90 - C28
2 (316, 316L)	AF	F594E	1/4 - 1 1/2	70	B85 max.
	A	F594F	1/4 - 1 1/2	75	B65 - 95
	CW1	F594G	1/4 - 5/8	100	B95 - C32
	CW2	F594H	3/4 - 1 1/2	85	B80 - C32
	SH1	F594E	1/4 - 5/8	120	C24 - C36
	SH2	F594F	3/4 - 1	110	C20 - C32
	SH3	F594G	1 1/8 - 1 1/4	100	B95 - C30
	SH4	F594H	1 3/8 - 1 1/2	85	B90 - C28
3 (321, 347)	AF	F594J	1/4 - 1 1/2	70	B85 max.
	A	F594K	1/4 - 1 1/2	75	B65 - 95
	CW1	F594L	1/4 - 5/8	100	B95 - C32
	CW2	F594M	3/4 - 1 1/2	85	B80 - C32
	SH1	F594J	1/4 - 5/8	120	C24 - C36
	SH2	F594K	3/4 - 1	110	C20 - C32
	SH3	F594L	1 1/8 - 1 1/4	100	B95 - C30
	SH4	F594M	1 3/8 - 1 1/2	85	B90 - C28
Ferritic alloys					
4 (430, 430F)	A	F594N	1/4 - 1 1/2	55	B85 max.
	CW1	F594V	1/4 - 5/8	60	B75 - 98
	CW2	F594W	3/4 - 1 1/2	55	B65 - 95
Martensitic alloys					
5 (410, 416, 416Se)	H	F594P	1/4 - 1 1/2	100	C20 - 30
	HT	F594R	1/4 - 1 1/2	160	C34 - 45
6 (431)	H	F594S	1/4 - 1 1/2	125	C25 - 32
	HT	F594T	1/4 - 1 1/2	180	C40 - 48
Precipitation hardening alloys					
7 (630)	AH	F594U	1/4 - 1 1/2	135	C28 - 38

<sup>A</sup> Minimum values except where shown as maximum or as a range.

<sup>B</sup> Legend of conditions.

Source: Abstract of ASTM F594 2002.

A = Machined from annealed or solution annealed stock, thus retaining the properties of the original stock; or hot formed and solution annealed.

AF = Annealed after all threading is completed.

AH = Solution annealed and age hardened after forming.

CW = Annealed and cold worked. Sizes 0.75 in. and larger may be hot worked and solution annealed.

H = Hardened and tempered at 1050°F min.

HT = Hardened and tempered at 525°F min.

SH = Machined from strain hardened stock.