

## ASTM F593E

# AUSTENITIC STAINLESS STEEL

BOLTING MATERIAL FOR GENERAL PURPOSE USE

ASTM F593E covers the chemical and mechanical requirements for stainless steel bolts, hex cap screws and studs in diameters ranging from 1/4" to 1-1/2" inclusive. These fasteners are for general purpose usage, and are available in seven alloy groups. Below is a basic summary of the common grades within the ASTM F593E specification. A number of other less common grades of ASTM F593E exist, but are not detailed in the description below. The Mechanical table here is limited to Alloy groups 1 and 2, as those are the most common and the Chemical table is only showing the most common alloy grades used for their respective alloy groups

### Chemical Properties

Stainless Alloy Group	UNS No.	Composition, % maximum except as shown								
		Carbon	Magnese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Copper	Molybdenum
2										
316	S31600	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	-	2.00-3.00
316L	S31603	0.03	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	-	2.00-3.00

### Mechanical Properties

Alloy	Marking	Size	Proof Stress	Hardness
2	F593E	1/4 to 1-1/2	20	B85 max

### Heat Treatment

Headed and rolled from annealed stock and then reannealed.

### Tensile Stress Areas and Threads Per Inch

Size	Coarse Thread (UNC)		Fine Thread (UNF)		8 Thread series (8 UN)	
	Threads	Stress Area	Threads	Stress Area	Threads	Stress Area
1/4"	20	0.0318	28	0.0364	--	--
5/16"	18	0.0524	24	0.0364	--	--
3/16"	16	0.0775	24	0.0878	--	--
7/16"	14	0.1063	20	0.1187	--	--
1/2"	13	0.1419	20	0.1599	--	--
9/16"	12	0.1820	18	0.2030	--	--
5/8"	11	0.2260	18	0.2560	--	--
3/4"	10	0.3340	16	0.3730	--	--
7/8"	9	0.4620	14	0.5090	--	--
1"	8	0.6060	12	0.6630	--	--
1 1/8"	7	0.7630	12	0.8560	8	0.790
1 1/4"	7	0.9690	12	1.0730	8	1.000
1 3/8"	6	1.1550	12	1.3150	8	1.233
1 1/2"	6	1.4050	12	1.5810	8	1.492

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