

ASTM F593D

AUSTENITIC STAINLESS STEEL

BOLTING MATERIAL FOR GENERAL PURPOSE USE

ASTM F593D 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 F593D specification. A number of other less common grades of ASTM F593D 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
1										
303	S30300	0.15	2.00	0.20	0.15 min	1.00	17.0-19.0	8.0-10.0		0.60 max
304	S30400	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-10.5	1.00	-
304L	S30403	0.03	2.00	0.045	0.030	1.00	18.0-20.0	8.0-12.0	1.00	-
305	S30500	0.12	2.00	0.045	0.030	1.00	17.0-19.0	10.5-13.0	1.00	-
384	S38400	0.08	2.00	0.045	0.030	1.00	15.0-17.0	17.0-19.0	-	-
XM1	S20300	0.08	5.0-6.5	0.04	0.18-0.35	1.00	16.0-18.0	5.0-6.5	1.75-2.25	0.50 max
18-9LW	S30430	0.10	2.00	0.045	0.030	1.00	17.0-19.0	8.0-10.0	3.0-4.0	-
302HQ	S30433	0.03	2.00	0.045	0.030	1.00	17.0-19.0	8.0-10.0	3.0-4.0	-
303Se	S30323	0.15	2.00	0.20	0.060	1.00	17.0-19.0	8.0-10.0	-	-

Mechanical Properties

Alloy	Marking	Size	Proof Stress	Hardness
1	F593D	3/4 to 1-1/2	45	B80 to C32

Heat Treatment

Headed and rolled from annealed stock thus acquiring a degree of cold work; sizes 0.75 in. and larger may not be hot worked and solution annealed.

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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