

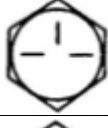







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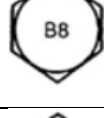

**MARKING AND MECHANICAL PROPERTIES OF STEEL FASTENERS**

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)	Hardness
 No Mark	SAE J429 Grade 1	Bolts, Screws, Studs	Low or Medium Carbon Steel	¼ - 1 ½	33,000	36,000	60,000	HRB 70~100
	SAE J429 Grade 2			¼ - ¾	55,000	57,000	74,000	HRC 80~100
	SAE J429 Grade 4	Studs	Medium Carbon Cold Drawn Steel	¼ ~ 1 ½	33,000	33,000	60,000	HRC 80~100
	SAE J429 Grade 5	Bolts, Screws, Studs	Medium carbon Steel Quenched and Tempered	¼ ~ 1	85,000	92,000	120,000	HRC 25 ~34
				Over 1 ~ 1 ½	74,000	81,000	105,000	HRC 19 ~30
	SAE J429 Grade 5.1	Sems	Low or Medium Carbon Steel Quenched and Tempered	No 6 ~ 5/8	85,000	-	120,000	HRC 25 ~40
		Bolts, Screws		No 6 ~ 1/2				
	SAE J429 Grade 5.2	Bolts, Screws	Low Carbon Martensite Steel Quenched and Tempered	1/4 ~ 1	85,000	92,000	120,000	HRC 26 ~36
	SAE J429 Grade 7	Bolts, Screws	Low or Medium Carbon Alloy Steel Quenched and Tempered	¼ ~ 1 ½	85,000	115,000	133,000	HRC 28 ~34
	SAE J429 Grade 8	Bolts, Screws	Medium Carbon Alloy Steel Quenched and Tempered	¼ ~ 1 ½	105,000	130,000	150,000	HRC 33~39
	SAE J429 Grade 8.1	Studs	Medium Carbon or SAE 1541	¼ ~ 1 ½	120,000	130,000	150,000	HRC 32 ~38
	SAE J429 Grade 8.2	Bolts, Screws	Low Carbon Martensite Steel Quenching and Tempering	¼ ~ 1	120,000	130,000	150,000	HRC 33 ~39

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	ASTM A193/193M Grade B6	Bolts, Screws, Studs for High Temperature	AISI 410 (sus 410)	~4 Inch (100mm)	-	85,000	110,000	-
	ASTM A193/193M Class 1 Grade B7		AISI 4140 4142 4145	~2 ½(65)	-	105,000	125,000	-
				Over 2 ½ ~ 4 (100)	-	95,000	115,000	-
				Over 4 ~7 (180)	-	75,000	100,000	-
	ASTM A193/193M Class 1 Grade B16		Cr-Mo-Va Alloy Steel	~2 ½ (65)	-	105,000	125,000	-
				Over 2 ½ ~ 4 (100)	-	95,000	110,000	-
				Over 4 ~7 (180)	-	85,000	100,000	-
	ASTM A193/193M Class 1 Grade B8		AISI 304	All Size	-	30,000	75,000	Max HRB 96
	ASTM A193/193M Class 1 Grade B8M		AISI 316	All Size	-	30,000	75,000	Max HRB 96
	ASTM A194/194M Grade 1		Nuts	Carbon Steel	¼ (6.4) ~ 4 (101.6)	HEAVY 130,000 HEX 120,000	-	-
	ASTM A194/194M Grade 2	Carbon Steel		HEAVY 150,000 HEX 135,000		-	-	Min HRB 84
	ASTM A194/194M Grade 2H	Carbon Steel		HEAVY 175,000 HEX 150,000		-	-	HRC 24 ~38
	ASTM A194 / 194M Grade 4	Carbon Molybdenum		HEAVY 175,000 HEX 150,000		-	-	HRC 24 ~38

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Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)	Hardness		
	ASTM A194/194M Grade 6	Nuts	AISI 410	¾ (6.4) ~ 4 (101.6)	Heavy 150,000 HEX 135,000	-	-	HRC 20 ~ 28		
	ASTM A194/194M Grade 7		AISI4140 4142 4145		Heavy 175,000 HEX 150,000	-	-	HRC 24 ~ 38		
	ASTM A194/194M Grade 8		AISI 304		Heavy 80,000 HEX 75,000	-	-	HRB 60 ~ 105		
	ASTM A194/194M Grade 8M		AISI 316	HEAVY	~3/4 (19)	110,000	-	-	HRB 60~105	
					7/8 (22.2) ~ 1 (25.4)	100,000				
					11/8 (28.6) ~ 11/4 (31.8)	95,000				
					13/8 (34.9) ~ 11/2 (38.1)	90,000				
					HEX	~3/4 (19)				100,000
					7/8 (22.2) ~ 1 (25.4)	90,000				
					11/8 (28.6) ~ 11/4 (31.8)	85,000				
					13/8 (34.9) ~ 11/2 (38.1)	80,000				
	ASTM A307 Grade A	Bolts Studs	Carbon Steel	-	-	-	Min 60,000	HRB 69 ~ 100		
	ASTM A307 Grade B			-	-	-	60,000~100,000	HRB 69 ~ 95		
	ASTM A320 / 320 M Grade L7	Bolts, Screws, Studs, Stud bolts	AISI4140 4142 4145	~2 ½ (65)	-	Min 105,000	Min 125,000	-		
	ASTM A320 / 320 M Class 1 Grade B8		AISI 304	All Diameter	-	Min 30,000	Min 75,000	Max HRB 96		
	ASTM A320 / 320 M Class 1 Grade B8M		AISI 316	All Diameter	-	Min 30,000	Min 75,000	Max HRB 96		