


































Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 No Grade Mark	SAE J429Grade 1	Bolts, Screws, Studs	Low or Medium Carbon Steel	1/4 thru 1-1/2	33,000		60,000
	ASTM A307Grades A&B		Low Carbon Steel	1/4 thru 4	–	–	
	SAE J429Grade 2		Low or Medium Carbon Steel	1/4 thru 3/4 Over 3/4 to 1-1/2	55,000 33,000	57,000 36,000	74,000 60,000
 No Grade Mark	SAE J429Grade 4	Studs	Medium Carbon Cold Drawn Steel	1/4 thru 1-1/2	–	100,000	115,000
 B5	ASTM A193Grade B5	–	AISI 501	1/4 thru 4	–	80,000	100,000
 B6	ASTM A193Grade B6		AISI 410		–	85,000	110,000
 B7	ASTM A193Grade B7		AISI 4140, 4142, OR 4105	1/4 thru 2-1/2 Over 2-1/2 thru 4	–	105,000 95,000 75,000	125,000 115,000 100,000
 B16	ASTM A193Grade B16		CrMoVa Alloy Steel	Over 4 thru 7	–	105,000 95,000 85,000	125,000 115,000 100,000
 B8	ASTM A193Grade B8		AISI 304	1/4 and larger	–	30,000	75,000
 B8C	ASTM A193Grade B8C		AISI 347		–		
 B8M	ASTM A193Grade B8M		AISI 316		–		
 B8T	ASTM A193Grade B8T	Bolts, Screws, Studs for High- Temperature Service	AISI 321	1/4 and larger	–	30,000	75,000




**ASTM, SAE & ISO FASTENER  
MARKINGS AND SPECIFICATIONS**






Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 B8	ASTM A193Grade B8	Bolts, Screws, Studs for High- Temperature Service	AISI 304Strain Hardened	1/4 thru 3/4 Over 3/4 thru 1  Over 1 thru 1-1/4  Over 1-1/4 thru 1-1/2	—	100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000
 B8C	ASTM A193Grade B8C		AISI 347Strain Hardened		—		
 B8M	ASTM A193Grade B8M		AISI 316Strain Hardened		—	95,000 80,000 65,000 50,000	110,000 100,000 95,000 90,000
 B8T	ASTM A193Grade B8T		AISI 321Strain Hardened		—	100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000
 L7	ASTM A320Grade L7	Bolts,Screws, Studs for Low- Temperature Service	AISI 4140,4142 or 4145	1/4 thru 2-1/2	—	105,000	125,000
 L7A	ASTM A320Grade L7A		AISI 4037		—		
 L7B	ASTM A320Grade L7B		AISI 4137		—		
 L7C	ASTM A320Grade LC7		AISI 8740		—		
 L43	ASTM A320Grade L43		AISI 4340	1/4 thru 4	—	30,000	75,000
 B8	ASTM A320Grade B8		AISI 304	1/4 and larger	—		
 B8C	ASTM A320Grade B8C		AISI 347		—		
 B8T	ASTM A320Grade B8T		AISI 321		—		

**ASTM, SAE & ISO FASTENER  
MARKINGS AND SPECIFICATIONS**

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 B8T	ASTM A320 Grade B8T	Bolts, Screws, Studs for Low- Temperature Service	1/4 thru 3/4 Over 3/4 thru 1 Over 1 thru 1-1/4 Over 1-1/4 thru 1-1/2	1/4 and larger	—	30,000	75,000
 B8F	ASTM A320 Grade B8F				—		
 B8M	ASTM A320 Grade B8M				—		
 B8	ASTM A320 Grade B8		AISI 304	1/4 thru 3/4 Over 3/4 thru 1 Over 1 thru 1-1/4 Over 1-1/4 thru 1-1/2	—	100,000 80,000 65,00 50,00	100,000 80,000 65,00 50,00
 B8C	ASTM A320 Grade B8C		AISI 347		—		
 B8F	ASTM A320 Grade B8F		AISI 303or 303Se		—		
 B8M	ASTM A320 Grade B8M		AISI 316		—		
 B8T	ASTM A320 Grade B8T		AISI 321		—		
	SAE J429 Grade 5	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	1/4 thru 1Over 1 to 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
	ASTM A449			1/4 thru 1Over 1 to 1-1/2 Over 1-1/2 thru 3	85,000 74,000 55,000	92,000 81,000 58,000	120,000 105,000 90,000
	SAE J429 Grade 5.1	Sems	Low or Medium Carbon Steel, Quenched and Tempered	No. 6 thru 3/8	85,000	—	120,000
	SAE J429 Grade 5.2	Bolts, Screws, Studs	Low Carbon Martensitic Steel, Quenched and Tempered	1/4 thru 1	85,000	92,000	120,000

**ASTM, SAE & ISO FASTENER  
MARKINGS AND SPECIFICATIONS**

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 A325	ASTM A325 Type 1	High Strength Structural Bolts	Medium Carbon Steel, Quenched and Tempered	1/2 thru 11-1/8 thru 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
 A325	ASTM A325 Type 2		Low Carbon Martensitic Steel, Quenched and Tempered	1/2 thru 1	85,000	92,000	120,000
 A325	ASTM A325 Type 3		Atmospheric Corrosion Resisting Steel, Quenched and Tempered	1/2 thru 11-1/8 thru 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
 BB	ASTM A354 Grade BB	Bolts, Studs	Alloy Steel, Quenched and Tempered	1/4 thru 2-1/22-3/4 thru 4	80,000 75,000	83,000 78,000	105,000 100,000
 BC	ASTM A354 Grade BC				105,000 95,000	109,000 99,000	125,000 115,000
 No Grade Mark	SAE J429 Grade 7	Bolts, Screws	Medium Carbon Alloy Steel, Quenched and Tempered <sup>4</sup>	1/4 thru 1-1/2	105,000	115,000	133,000
 No Grade Mark	SAE J429 Grade 8	Bolts, Screws, Studs	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 1-1/2	120,000	130,000	150,000
	ASTM A354 Grade BD		Alloy Steel, Quenched and Tempered <sup>4</sup>				
 No Grade Mark	SAE J429 Grade 8.1	Studs	Medium Carbon Alloy or SAE 1041 Modified Elevated Temperature Drawn Steel	1/4 thru 1-1/2	120,000	130,000	150,000
 A490	ASTM A490	High Strength Structural Bolts	Alloy Steel, Quenched and Tempered	1/2 thru 1-1/2	120,000	130,000	150,000 min 170,000 max
 No Grade Mark	ISO R898 Class 4.6	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	All Sizes thru 1-1/2	33,000	36,000	60,000

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 No Grade Mark	ISO R898 Class 5.8	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	All Sizes thru 1-1/2	55,000	57,000	74,000
 8.8 or  88	ISO R898 Class 8.8		Alloy Steel, Quenched and Tempered		85,000	92,000	120,000
 10.9 or  109	ISO R898 Class 10.9				120,000	130,000	150,000

**NOTES:**

1. ASTM Specifications:

A193 – Alloy-Steel Bolding Materials for High-Temperature Service  
A307 – Low-Carbon Steel Externally and Internally Threaded Standard Fasteners  
A320 – Alloy-Steel Bolding Materials for Low-Temperature Service  
A325 – High-Strength Bolts for Structural Steel Joints, Including Suitable Nuts and Plain Hardened Washers  
A354 – Quenched and Tempered Alloy Steel Bolts and Studs with Suitable Nuts  
A449 – Quenched and Tempered Steel Bolts and Studs  
A490 – Quenched and Tempered Alloy Bolts for Structural Steel Joints

2. SAE Specification:





J429 – Mechanical and Quality Requirements for Externally Threaded Fasteners

3. ISO Recommendations:

No. R898 – Mechanical Properties of Fasteners  
Part 1 – Bolts, Screws and Studs

4. Grade 7 bolts and screws are roll threaded after heat treatment.

Grade Identification Marking	Specification	Material	Nominal Size Range (in.)	Proof Load Stress (ksi)	Hardness Rockwell		See Note
					Min	Max	
 No Mark	ASTM A563 Grade 0	Carbon Steel	1/4 thru 1-1/2	69	B55	C32	3, 4
	ASTM A563 Grade A			90	B68		
	ASTM A563 - Grade B		1/4 thru 1	120	B69		
			Over 1 thru 1-1/2	105			
	ASTM A563 Grade C	Carbon Steel May Be Quenched and Tempered	1/4 thru 4	144	B78	C38	5
	ASTM A563 Grade C3	Atmospheric Corrosion Resistant Steel May be Quenched and Tempered	1/4 thru 4	144	B78	C38	5, 9
	ASTM A563 Grade D	Carbon Steel Maybe Quenched and Tempered	1/4 thru 4	150	B84	C38	6
	ASTM A563 Grade DH	Carbon Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	6
	ASTM A563 Grade DH3	Atmospheric Corrosion Resistant Steel May be Quenched and Tempered	1/4 thru 4	175	C24	C38	5, 9
	ASTM A194 Grade 1	Carbon Steel	1/4 thru 4	130	B70	--	7
	ASTM A194 Grade 2	Medium Carbon Steel	1/4 thru 4	150	159	352	7, 8
	ASTM A194 Grade 2H	Medium Carbon Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	7

Grade Identification Marking	Specification	Material	Nominal Size Range (in.)	Proof Load Stress (ksi)	Hardness Rockwell		See Note
					Min	Max	
	ASTM A194 Grade 2HM	Medium Carbon Steel Quenched and Tempered	1/4 thru 4	150	159	237	7, 8
	ASTM A194 Grade 4	Medium Carbon Alloy Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	7
	ASTM A194 Grade 7	Medium Carbon Alloy Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	7
	ASTM A194 Grade 7M	Medium Carbon Alloy Steel Quenched and Tempered	1/4 thru 4	150	159	237	7

**NOTES:**

1. In addition to the indicated grade marking, all grades, except A563 grades O, A and B, must be marked for manufacturer identification.
2. The markings shown for all grades of A194 nuts are for cold formed and hot forged nuts. When nuts are machined from bar stock the nut must be additionally marked with the letter "B."
3. Nuts are not required to be marked unless specified by the purchaser. When marked, the identification marking shall be the grade letter O, A or B.
4. Properties shown are those of nonplated or noncoated coarse thread hex nuts.
5. Properties shown are those of coarse thread heavy hex nuts.
6. Properties shown are those of coarse thread heavy hex nuts.
7. Properties shown are those of coarse 8-pitch thread heavy hex nuts.
8. Hardnesses are Brinell Hardness Numbers.
9. The nut manufacturer, at his option, may add other markings to indicate the use of atmospheric corrosion resistant steel.
10. Specifications:  
ASTM A563 – Carbon and Alloy Steel Nuts.  
ASTM A194/A194M – Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service.