













































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## ASTM, SAE AND ISO GRADE HEAD MARKINGS AND MECHANICAL PROPERTIES FOR STEEL HEX BOLTS

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 No Grade Mark	SAE J429 Grade 1	Bolts, Screws, Studs	Low or Medium Carbon Steel	1/4 thru 1-1/2	33,000	36,000	60,000
	ASTM A307 Grades A&B		Low Carbon Steel	1/4 thru 4	--	--	
	SAE J429 Grade 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 J429 Grade 4	Studs	Medium Carbon Cold Drawn Steel	1/4 thru 1-1/2	--	100,000	115,000
 B5	ASTM A193 Grade B5	Bolts, Screws Studs for High-Temperature Service	AISI 501	1/4 Thru 4	--	80,000	100,000
 B6	ASTM A193 Grade B6		AISI 410			85,000	110,000
 B7	ASTM A193 Grade B7		AISI 4140, 4142, OR 4105	1/4 thru 2-1/2 Over 2-1/2 thru 4 Over 4 thru 7	--	105,000 95,000 75,000	125,000 115,000 100,000
 B16	ASTM A193 Grade B16		CrMoVa Alloy Steel			105,000 95,000 85,000	125,000 115,000 100,000
 B8	ASTM A193 Grade B8		AISI 304	1/4 and larger	--	30,000	75,000

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)	
 B8C	ASTM A193 Grade B8C	Bolts, Screws Studs for High- Temperature Service	AISI 347					
 B8M	ASTM A193 Grade B8M		AISI 316					
 B8T	ASTM A193 Grade B8T		AISI 321	1/4 and larger	--	30,000	75,000	
 B8	ASTM A193 Grade B8		AISI 304 Strain Hardened				100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000
 B8C	ASTM A193 Grade B8C	Bolts, Screws, Studs for High- Temperature Service	AISI 347 Strain Hardened	1/4 thr 3/4 Over 3/4 thru 1	-- --			
 B8M	ASTM A193 Grade B8M		AISI 316 Strain Hardened	Over 1 thru 1-1/4 Over 1-1/4 thru 1-1/2	-- --	95,000 80,000 65,000 50,000	110,000 100,000 95,000 90,000	
 B8T	ASTM A193 Grade B8T		AISI 321 Strain Hardened			100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000	
 L7	ASTM A320 Grade L7		Bolts, Screws, Studs for Low- Temperature Service	AISI 4140, 4142 or 4145				
 L7A	ASTM A320 Grade L7A	AISI 4037						
 L7B	ASTM A320 Grade L7B	AISI 4137			1/4 thru 2- 1/2	--	105,000	125,000
 L7C	ASTM A320 Grade LC7	AISI 8740						
 L43	ASTM A320 Grade L43	AISI 4340			1/4 thru 4			

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 B8	ASTM A320 Grade B8	Bolts, Screws, Studs for Low- Temperature Service	AISI 304	1/4 and larger	--	30,000	75,000
 B8C	ASTM A320 Grade B8C		AISI 347	1/4 and larger	--	30,000	75,000
 B8T	ASTM A320 Grade B8T		AISI 321	1/4 and larger	--	30,000	75,000
 B8F	ASTM A320 Grade B8F		AISI 303 or 303Se				
 B8M	ASTM A320 Grade B8M		AISI 316				
 B8	ASTM A320 Grade B8		AISI 304				
 B8C	ASTM A320 Grade B8C		AISI 347				
 B8F	ASTM A320 Grade B8F		AISI 303 or 303Se	1/4 thru 3/4	--	100,000	100,000
 B8M	ASTM A320 Grade B8M		AISI 316	Over 3/4 thru 1	--	80,000	80,000
 B8T	ASTM A320 Grade B8T		AISI 321	Over 1 thru 1-1/4	--	65,000	65,000
 B8M	ASTM A320 Grade B8M	AISI 316	Over 1-1/4 thru 1-1/2	--	50,000	50,000	
 B8T	ASTM A320 Grade B8T	AISI 321					
	SAE J429 Grade 5	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	1/4 thru 1	85,000	92,000	120,000
	ASTM A449			Over 1 to 1-1/2	74,000	81,000	105,000
				1/4 thru 1	85,000	92,000	120,000
				Over 1 to 1-1/2	74,000	81,000	105,000
				Over 1-1/2 thru 3	55,000	58,000	90,000

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
	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
 A325	ASTM A325 Type 1	High Strength Structural Bolts	Medium Carbon Steel, Quenched and Tempered	1/2 thru 1 1-1/8 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 1 1-1/8 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 2-1/2 2-3/4 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
	SAE J429 Grade 7	Bolts, Screws	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 1-1/2	105,000	115,000	133,000
	SAE J429 Grade 8	Bolts, Screws, Studs		1/4 thru 1-1/2	120,000	130,000	150,000
	ASTM A354 Grade BD			Alloy Steel, Quenched and Tempered			
 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

Identification Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Proof Load (psi)	Yield Strength Min (psi)	Tensile Strength Min (psi)
 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
 No Grade Mark	ISO R898 Class 5.8				55,000	57,000	74,000
 8.8 or  88	ISO R898 Class 8.8				85,000	92,000	120,000
 10.9 or  109	ISO R898 Class 10.9		Alloy Steel, Quenched and Tempered		120,000	130,000	150,000