





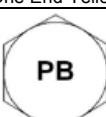
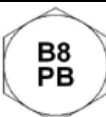



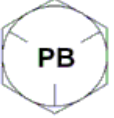












Bolt Strength Requirements by Grade

Grade Marking	Specification	Material and Treatment	Nominal Size (In.)	Mechanical Properties			Hardness Rockwell		
				Proof Load Min (ksi)	Yield Strength Min (ksi)	Tensile Strength Min (ksi)	Min	Max	
	SAE J429 Grade 1	Low or Medium Carbon Steel	1/4" - 1/2"	33	36	60	B70	B100	
	A307 Grade A		-	-	60	B69	B100		
	A307 Grade B		-	-	60 min 100 max	B69	B95		
 One End Green	A307 Grade C *Replaced, See Notes		-	36	58 min 80 max	-	-		
 One End Blue	F1554 Grade 36		-	36	58 min 80 max	-	-		
 One End Yellow	F1554 Grade 55		-	55	75 min 95 max	-	-		
	SAE J429 Grade 2		1/4" - 3/4"	55	57	74	B80	B100	
			7/8" - 1 1/2"	33	36	60	B70	B100	
	A193/A320 Grade B8		AISI SS304 Stainless	No Restrictions	-	30	75	-	B96
	A193/A320 Grade B8M		AISI SS316 Stainless Steel						

Grade Marking	Specification	Material and Treatment	Nominal Size (In.)	Mechanical Properties			Hardness Rockwell	
				Proof Load Min (ksi)	Yield Strength Min (ksi)	Tensile Strength Min (ksi)	Min	Max
	A325 Type 1	Medium Carbon Steel, Q & T	1/2" - 1"	85	92	120	C24	C35
	A325 Type 3	Atmospheric Corrosion Resistant Steel, Q & T	1 1/8" - 1 1/2"	74	81	105	C19	C31
	SAE J429 Grade 5	Medium Carbon Steel, Q & T	1/4" - 1"	85	92	120	C25	C34
			1 1/8" - 1 1/2"	74	81	105	C19	C30
	A449 Type 1		1/4" - 1"	85	92	120	C25	C34
			1 1/8" - 1 1/2"	74	81	105	C19	C30
			1 5/8" - 3"	55	58	90	B91	B100
	A193 Grade B7	Medium Carbon Alloy Steel, Q & T	1/4" - 2 1/2"	-	105	125	-	C35
			2 5/8" - 4"	-	95	115	-	C35
			4 1/8" - 7"	-	75	100	-	C35
	A354 Grade BC	Medium Carbon Alloy Steel, Q & T	1/4" - 2 1/2"	105	109	125	C26	C36
			2 5/8" - 4"	95	94	115	C22	C33
 One End Red	F1554 Grade 105		1/4" - 3"	-	105	125 min 150max	-	-
	A320 Grade L7	AISI 4140, 4142, or 4145	1/4" - 2 1/2"	-	105	125	-	-
	A320 Grade L43	AISI 4340	1/4" - 4"	-	105	125	-	-

Grade Marking	Specification	Material and Treatment	Nominal Size (In.)	Mechanical Properties			Hardness Rockwell	
				Proof Load Min (ksi)	Yield Strength Min (ksi)	Tensile Strength Min (ksi)	Min	Max
	A490 Type 1	Medium Carbon Alloy Steel, Q & T	1/2" - 1 1/2"	120	130	150 min 173 max	C33	C38
	A490 Type 3	Atmospheric Corrosion Resistant Steel, Q & T						
	SAE J429 Grade 8	Medium Carbon Alloy Steel, Q & T	1/4" - 1 1/2"	120	130	150	C33	C39
	A354 Grade BD		1/4" - 2 1/2" 2 5/8" - 4"	120 105	130 115	150 140	C33 C31	C39 C39

- All specifications are ASTM unless otherwise noted.
- All specifications shall be marked by the manufacturer with a unique identifier to identify the manufacturer or private label distributor, as appropriate.
- Q & T - Quenched and Tempered.
- Stamping of F1554 and A307 grade C bolts is a supplemental requirement while color coding is required.
- Although markings are shown on hex heads, grade markings apply equally to products with other head configurations.
- All Grade BD products shall be marked "BD". In addition to the "BD" marking, the product may be marked with 6 radial lines 60° apart.
- Hex cap screws and bolts and one end of studs shall be marked "A449". In addition, fasteners shall be permitted to be marked with three radial lines 120° apart.
- ASTM A307 grade C has been replaced by ASTM F1554 grade 36.