

Material Specifications

for Grades 2, 5, 8 & A449, A354BD Externally Threaded Fasteners

1. **Applicable To:** Cap Screws and Studs.

3. **Surface Discontinuities:** SAE Standard J1061 current issue shall apply.

2. **Mechanical & Chemical Requirements:** Mechanical and chemical requirements shall be in accordance with SAE J429, or ASTM A449 and A354 as noted in Table III.

When the engineering requirements of the application necessitate that surface discontinuities be more closely controlled, SAE Standard J123 should be used and is available upon request.

TABLE III




MECHANICAL REQUIREMENTS								CHEMICAL COMPOSITION REQUIREMENTS				
Grade	Diameter	a.	a.	b.	b.	b.	Hardness (Rockwell)	C		P Max.	S Max.	Mn Min.
		Proof Load	Tensile Strength	Yield Strength	Elongation (Min. %)	Reduction of area (Min. %)		Min.	Max.			
2	1/4" thru 3/4" > 3/4" thru 1 1/2"	55,000	74,000	57,000	18	35	B80-B100 B70-B100	—	0.55	0.048	0.058	—
		33,000	60,000	36,000	18	35						
5	1/4" thru 1" > 1" thru 1 1/2"	85,000	120,000	92,000	14	35	C25-C34 C19-C30	0.28	0.55	0.048	0.058	—
		74,000	105,000	81,000	14	35						
8	1/4" thru 1 1/2"	120,000	150,000	130,000	12	35	C33-C39	0.28	0.55	0.040	0.045	—
A449 Type I	1/4" thru 1" > 1" thru 1 1/2" > 1 1/2 thru 3"	85,000	120,000	92,000	14	35	C25-C34 C19-C30	0.25	0.58	0.048	0.058	0.57
		74,000	105,000	81,000	14	35		0.25	0.58			
		55,000	90,000	58,000	14	35	B90-C22	0.25	0.58	0.048	0.058	0.57
A354 BD	1/4" thru 2 1/2" > 2 1/2"	120,000	150,000	130,000	14	40	C33-C39	1/4 - 1 1/2		0.040	0.045	—
								0.28	0.55			
								>1 1/2				
		105,000	140,000	115,000	14	40	C31-C39	0.33	0.55	0.040	0.045	—

a. Applicable to full size product testing.

b. Applicable to machined specimen testing.

TABLE OF GRADE COMPARISON

ASTM VS. SAE

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 Markings	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 to 1 1/2	55,000 33,000	57,000 36,000	
	SAE J429 Grade 5	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	1/4 thru 1 > 1 to 1 1/2	85,000 74,000	92,000 81,000	120,000 105,000
	ASTM A449			1/4 thru 1 >1 thru 1 1/2	85,000 74,000	92,000 81,000	120,000 105,000
				> 1 1/2 thru 3	55,000	58,000	90,000
	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				

NOTE: All of the above grades require manufacturer s identification symbol in addition to the applicable grade marking.