













Grades of Bolts - Bolt Grade Marking Chart






| Grade Bolt Markings - Inch Steel Bolts | | | | | | | |
|--|---|---|-------------------------------|------------------|--------------------------|------------------------|---------------------------|
| Head Marking | Grade/Specification | Material | Nominal Size (Inch) | Proof Load psi | Tensile Strength Min psi | Yield Strength Min psi | Rockwell Hardness Min/Max |
|  | Grade 1 - SAE J429 Bolts, Screws and Studs | Low or medium carbon steel | 1/4" - 1-1/2" | 33,000 | 60,000 | 36,000 | B70 / B100 |
|  | Grade 2 - SAE J429 Bolts, Screws and Studs | Low or medium carbon steel | 1/4" - 3/4" >3/4" - 1-1/2" | 55,000 33,000 | 74,000 60,000 | 57,000 36,000 | B80 / B100 B70 / B100 |
|  | Grade 5 - SAE J429 Bolts, Screws and Studs | Medium carbon steel or carbon steel with additives, quenched and tempered | 1/4" - 1" >1" - 1-1/2" | 85,000 74,000 | 120,000 105,000 | 92,000 81,000 | C25 / C34 C19 / C30 |
|  | Grade 5.1 - SAE J429 Sems | Low or medium carbon steel, quenched and tempered | No. 4 - 5/8" | 85,000 | 120,000 | 92,000 | C25 / C40 |
|  | Grade 5.2 - SAE J429 Bolts, Screws and Studs | Low carbon Boron steel, quenched and tempered | 1/4" - 1" | 85,000 | 120,000 | 92,000 | C26 / C36 |
|  | Grade 8 - SAE J429 Bolts and Screws | Medium carbon / alloy steel with additives, quenched and tempered | 1/4" - 1-1/2" | 120,000 | 150,000 | 130,000 | C33 / C39 |
|  | Grade 8.2 - SAE J429 Bolts and Screws | Low carbon Boron steel, quenched and tempered | 1/4" - 1" | 120,000 | 150,000 | 130,000 | C33 / C39 |
|  | L9 - Grade 9 Bolts, Nuts and Washers | Hight strength alloy steel | 1/4" - 1-1/2" | 145,000 | 180,000 | 155,000 | C38 / C42 |
|  | ASTM A307 Grade A Bolts, Screws and Studs (General Engineering) | Low or medium carbon steel | 1/4" - 4" | 33,000 | 60,000 | 36,000 | B69 / B100 |

Grades of Bolts - Bolt Grade Marking Chart, p2

| | | | | | | | |
|--|---|--|--------------------------------|--------------------|--------------------|--------------------|------------------------|
|  | ASTM A307 Grade B Bolts, Screws and Studs (Flanged Joints) | Low or medium carbon steel | 1/4" - 4" | 33,000 | 60,000 | 36,000 | B69 / B95 |
|  | ASTM A325 Type 1 High strength structural bolts | Medium carbon steel, quenched and tempered | 1/2" - 1" 1-1/8" - 1-1/2" | 85,000 74,000 | 120,000 105,000 | 92,000 81,000 | C24 / C35 C19 / C31 |
|  | ASTM A325 Type 2 High strength structural bolts | Low carbon Martensitic steel, quenched and tempered | 1/2" - 1" 1-1/8" - 1-1/2" | 85,000 74,000 | 120,000 105,000 | 92,000 81,000 | C24 / C35 C19 / C31 |
|  | ASTM A325 Type 3 High strength structural bolts | Atmospheric corrosion-resistant steel, quenched and tempered | 1/2" - 1" 1-1/8" - 1-1/2" | 85,000 74,000 | 120,000 105,000 | 92,000 81,000 | C24 / C35 C19 / C31 |
|  | ASTM A354 Grade BB Bolts and studs | Alloy steel, quenched and tempered | 1/4" - 2-1/2" > 2-1/2" - 4" | 80,000 75,000 | 105,000 100,000 | 83,000 78,000 | C26 / C36 C22 / C33 |
|  | ASTM A354 Grade BC Bolts and studs | Alloy steel, quenched and tempered | 1/4" - 2-1/2" > 2-1/2" - 4" | 105,000 95,000 | 125,000 115,000 | 109,000 99,000 | C26 / C36 C22 / C33 |
|  | ASTM A354 Grade BD Bolts, screws and studs | Alloy steel, quenched and tempered | 1/4" - 2-1/2" > 2-1/2" - 4" | 120,000 105,000 | 150,000 140,000 | 130,000 120,000 | C33 / C39 C31 / C39 |
|  | ASTM A449 Type 1 Bolts, screws and studs | Medium carbon steel, quenched and tempered | 1/4" - 1" > 1" - 1-1/2" | 85,000 74,000 | 120,000 105,000 | 81,000 58,000 | C25 / C34 |
|  | ASTM A449 Type 2 Bolts, Screws and studs | Low carbon Martensitic steel, quenched and tempered | 1/4" - 1" | 85,000 | 120,000 | 58,000 | C25 / C34 |

Grades of Bolts - Bolt Grade Marking Chart, p3

| | | | | | | | |
|---|---|--|---------------|---------|----------------------------|---------|-----------|
|  | ASTM A490 Type 1 High strength structural bolts | Medium carbon alloy steel, quenched and tempered | 1/2" - 1-1/2" | 120,000 | 150,000 min 170,000 max | 130,000 | C33 / C38 |
|  | ASTM A490 Type 2 High strength structural bolts | Low carbon Martensitic steel, quenched and tempered | 1/2" - 1" | 120,000 | 150,000 min 170,000 max | 130,000 | C33 / C38 |
|  | ASTM A490 Type 3 High strength structural bolts | Atmospheric corrosion-resistant steel, quenched and tempered | 1/2" - 1-1/2" | 120,000 | 150,000 min 170,000 max | 130,000 | C33 / C38 |
| <i>Note: Manufacturer's identification mark are also stamped when applicable.</i> | | | | | | | |

| Grade Bolt Markings - Metric Steel Bolts | | | | | | |
|---|------------------------------|---|------------------|----------------------------|--------------------------|------------------|
| Head Marking | Grade/Specification | Material | Proof Load (MPa) | Tensile Strength min (MPa) | Yield Strength Min (MPa) | Hardness Min/Max |
|  | Class 4.6 | Low or medium carbon steel | 220 | 400 (58,000 psi) | 240 | HRB-67 / HRB-95 |
|  | Class 5.8 | Low or medium carbon steel, quenched and tempered | 380 | 520 (75,000 psi) | 420 | HRB-82 / HRB-95 |
|  | Class 8.8 | Medium carbon steel, quenched and tempered | 600 | 830 (120,000 psi) | 640 | HRC-22 / HRC-34 |
|  | Class 10.9 | Alloy steel, quenched and tempered | 830 | 1040 (150,000 psi) | 940 | HRC-32 / HRC-39 |
|  | Class 12.9 | Alloy steel, quenched and tempered | 970 | 1220 (176,000 psi) | 1220 | HRC-39 / HRC-44 |
| Usually stamped A-2 or A-4 | A2 & A4 Stainless | Steel alloy with chromium and nickel | N/A | 500 Min 700 Typical | 210 Min 450 Typical | |
| <i>Note: Manufacturer's identification mark are also stamped when applicable.</i> | | | | | | |

Tensile Strength: The resistance of a material to breaking under tension

Yield Strength: The stress at which a specific amount of deformation is produced

Proof Load: An axial tensile load which the product must stand without evidence of any permanent set.