



Stud Bolt Technical Information

Grades of Alloy Steel for Stud Bolts

Marking Symbol Grade of Bolt	B7	L7	B16	B8 CLASS 1	B8M CLASS 2
Service Conditions	Min: -30°C Max: 400°C	Min: -100°C Max: -30°C	Min: 0°C Max: 520°C	Min: -250°C Max: 575°C	Min: -250°C Max: 600°C
Material Specifications	ASTM- A193/A193M AISI 4140	ASTM- A320/A320M AISI 4140	ASTM- 193/A193M Chrome-Moly- Vanadium	ASTM- 193/A193M AISI Type 304	ASTM- 193/A193M AISI Type 316
Chemical Composition					
Carbon	0.37-0.49	0.38-0.48	0.36-0.47	0.08 max	0.08 max
Silicon	0.15-0.35	0.15-0.35	0.15-0.35	1.00 max	1.00 max
Manganese	0.65-1.10	0.75-1.00	0.45-.70	2.00 max	2.00 max
Nickel	-	-	-	8.00-10.50	10.00-14.00
Chromium	0.75-1.20	.80-1.10	0.80-1.15	18.00-20.00	16.00-18.00
Molybdenum	0.15-0.25	0.15-0.25	0.50-0.65	-	2.00-3.00
Vanadium	-	-	0.25-0.35	-	-
Sulphur	0.040 max	0.040 max	0.040 max	0.030 max	0.030 max
Phosphorus	0.035 max	0.035 max	0.035 max	0.045 max	0.045 max
Mechanical Properties					
Limiting Ruling Section	2.1/2" and under	2.1/2" and under	2.1/2" and under	-	-
Minimum Tensile Strength	860Mpa	860Mpa	860Mpa	515Mpa	515Mpa
Yield Strength Min. 0.2% Offset	720Mpa	725Mpa	725Mpa	205Mpa	205Mpa
Minimum Elongation in 4D%	16	16	18	30	30
Minimum Reduction of Area%	50	50	50	50	50
Brinell Hardness	-	-	-	223HB OR 96HRB	223HB OR 96HRB

Note:

Please refer to relevant standards for more information.

Service Temperatures refer to actual metal temperatures.



Grade of Alloy Steel for Nuts

Marking Symbol Grade of Bolt	2H	7	8	8M	
Service Conditions	Min: -30°C Max: 400°C	Min: -100°C Max: 565°C	Min: -250°C Max: 575°C	Min: -250°C Max: 600°C	
Material Specifications	ASTM- A194/A194 M Carbon Steel	ASTM- A194/A194M 4140	ASTM- A194/A194M AISI Type 304	ASTM- A194/A194M AISI Type 316	
Chemical Composition					
Carbon	0.40 min	0.37-0.49	0.08 max	0.08 max	
Silicon	0.40 max	0.15-0.35	1.00 max	1.00 max	
Manganese	1.00 max	0.65-1.10	2.00 max	2.00 max	
Nickel	-	-	8.00-11.00	10.00-14.00	
Chromium	-	0.75-1.20	18.00-20.00	16.00-18.00	
Molybdenum	-	0.15-0.25	-	2.00-3.00	
Vanadium	-	-	-	-	
Sulphur	0.050 max	0.040 max	0.030 max	0.030 max	
Phosphorus	0.040 max	0.035 max	0.045 max	0.045 max	
Mechanical Properties					
Limiting Ruling Section	1.1/2" and under	1.1/2" and under	1.1/2" and under	1.1/2" and under	
Brinell Hardness (completed Nut)	248-327HB	248-327HB	126-300HB	126-300HB	
Brinell Hardness (after Treatment)	179HB min	201HB min			

Note:

Please refer to relevant standards for more information.

Service Temperatures refer to actual metal temperatures.