



STUDS & NUTS

Studs & Nuts (As per 6A & ANSI B16.5)

1.1 Brief Description

PARVEEN manufactures and supplies studs, nuts to meet requirements of all API flanges as per API-6A, as well as flanges as per ANSI B-16.5 and MSS-SP-44 & BS 3293.

Studs & Nuts for API Flanges (Table - 1)

Studs Nuts shall meet the requirements of the applicable ASTM specs unless otherwise noted. Dimension and thread pitch shall be as per ASTM A -193 for studs and ASTM A 194 for nuts. The mechanical properties as specified in the table. API flanges takes precedence from those required by ASTM.

Yield strength shall meet or exceed the minimum shown in the table. Material size limitations specified in ASTM A-320 for Gr L7M may be exceeded if the material requirement are met.

NACE Class - I Studs

- a. UNS No. 05500 in the hot rolled and age hardened condition will have a hardness of HRC 35 or lower and a minimum yield strength of 105000 PSI (725 MPA) for dia's upto 2.5" and of 95000 PSI for Larger sizes.
- b. ASTM a 453 Gr 660 solution treated and age hardened will have a hardness of HRC 35 and lower and a Minimum yield strength of 105,000 PSI for dia's upto 2.5" and of 95000 PSI for larger sizes.

NACE Class. II Studs

- a. ASTM a 193 Gr B7M is provided at a minimum yield strength of 80,000 PSI for the API flanges for NACE MR 01-75 Class II only.
- b. ASTM a 320 Grade L7M is provided at a minimum yield strength of 80000 PSI for the API flanges for NACE MR 01-75 Class II only.

NACE Class. III Studs

- a. ASTM a 193 Gr B7 is provided for non exposed service for the API flanges for NACE MR 01-75 Class III only.
- b. ASTM a 320 Gr L7 is provided for non exposed service for the API flanges for NACE MR 01-75 Class III Only.

NACE Nuts

- a. ASTM a 194 Gr. 2 HM is provided for all API flange sizes and rated working pressure.
- b. For NACE Class I, UNS no. 05500 or ASTM A 453 Gr. 660 nuts can be used with NACE Class I bolting after making provisions to prevent galling.

Studs & Nuts for ANSI B - 16.5 Flanges (Table - 2)

Bolting materials for high strength bolting having allowable stress not less than those for ASTM a 193 Gr. B7 are also listed. These and other materials of comparable strength can be used. Bolting materials for intermediate strength at low strength are also listed in the Table 2. Minimum yield strength for low strength bolting is 30 KSI (207 MPA). Flanged joints using low strength carbon steel bolts will not be used above 400° F (200°C) or below -20° F (-29°C)



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General Note:

- a. Bolting material will not be used beyond temperature limits specified in the governing Code.

Notes:

1. Repair welding of bolting material is prohibited.
2. These bolting materials may be used with all listed materials and gaskets.
3. These bolting materials may be used with all listed materials and gaskets, provided it has been verified that as Sealed Joint can be maintained under rated working pressure and temperature.
4. These bolting materials may be used with all listed materials but are limited to class 150 and class 300 Joints.
5. These materials may be used as bolting with comparable nickel and special alloy parts.
6. This austenitic stainless material has been carbide solution treated but not strain hardened. Use A 194 Nuts of corresponding material.
7. Nut may be machined from the same material or may be of a compatible grade of ASTM A194.
8. Maximum operating temperature is arbitrarily set at 500° F (260° C) because hard temper adversely affects design stress in the creep rupture range.
9. Forging quality not permitted unless the producer last heating or working these parts tests them as required for other permitted conditions in the same specification and certifies their final tensile, yield, and elongation properties to equal or exceed the requirements for one of the other permitted conditions.
10. This ferritic material is intended for low temperature service. Use A 194 Gr 4 or Gr 7 nuts.
11. This austenitic stainless material has been carbide solution treated and strain hardened. Use A 194 nuts of corresponding material.
12. This carbon steel fastener shall not be used above 400° F (200° C) or below -20° F (-29° C). See also note 4. Bolts with drilled or undersized heads shall not be used.
13. Acceptable nuts for use with quenched and tempered Bolts are A 194 Gr 2 and Gr 2H. Mechanical property requirements for studs shall be the same as those for bolts.
14. This special alloy is intended for high temperature service with austenitic stainless steel.



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1.2 BOLTING REQUIREMENT FOR API END FLANGES (Applicable ASTM Specification)

TABLE - 1

REQUIREMENT	MATERIAL CLASS						
	AA, BB OR CC		DD,EE,FF&HH				
	TEMPERATURE CLASSIFICATION		TEMPERATURE CLASSIFICATION				
	P,S,T OR U	K,L,P,S. T OR U	P,S,T OR U	K,L,P,S. T OR U	P,S,T OR U	K,L,P,S. T OR U	S,K,L,P, T OR U
NACE MR 0175 CLASS.	NONE	NONE	III	III	II	II	I
SIZE AND RATED WORKING PRESSURE	ALL	ALL	ALL	ALL	ALL 2000 AND 3000 PSI. 5000 PSI FLGS<13 5/8 10000 PSI FLGS<4 1/16 15000 PSI FLG <2 1/16 ALL 20,000PSI.		ALL
BOLTING							
ASTM SPEC. GRADES AND MATERIALS.	A 193 GR.B7	A 320 GR. L7 OR L43	A 193 GR.B7	A 320 GR. L7 OR L43	A 193 GR B7M	A 320 GR. L7M	A 453 GR 600 K- 500 MONEL
YIELD STRENGTH, KSI, MINIMUM	105(≤2.5IN.) 95(>2.5IN.)	105(≤2.5IN.) 95(>2.5IN.)	105(≤2.5IN.) 95(>2.5IN.)	105(≤2.5IN.) 95(>2.5IN.)	80	80	105(≤2.5IN.) 95(>2.5IN.)
HARDNESS PER NACE MR0175	NO	NO	NO	NO	YES	YES	YES
CHARPY TESTING REQUIRED	NO	YES	NO	YES	NO	YES	NO
NUTS.							
ASTM SPEC AND GRADES HEAVY	A 194 2H,2HM, 4 OR 7	A 194 2H,2HM, 4 OR 7	A 194 2H,2HM, 4 OR 7	A 194 2H,2HM, 4 OR 7	A 194 GR 2HM	A 194 GR 2HM	A 194 GR 2HM
HARDNESS PER NACE Mr0175	NO	NO	NO	NO	YES	YES	YES
CHARPY TESTING REQUIRED.	NO	NO	NO	NO	NO	NO	NO



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1.3 BOLTING SPECIFICATIONS FOR ANSI B 16.5 FLANGE (Applicable ASTM Specifications) TABLE 2

BOLTING MATERIALS							
HIGH STRENGTH (NOTE NO. 2)		INTERMEDIATE STRENGTH (NOTE NO. 3)		LOW STRENGTH (NOTE NO. 4)		NICKEL & SPECIAL ALLOY (NOTE NO. 5)	
SPEC - GR	NOTES	SPEC - GR	NOTES	SPEC - GR	NOTES	SPEC - GR	NOTES
A 193 - B 7		A 193 - B 5		A 193 - B 8 CL. 1	(6)	B 164	(7) (8) (9)
A 193 - B 16		A 193 - B 6		A 193 - BBC CL. 1	(6)	B 166	(7) (8) (9)
A 320 - L 7	(10)	A 193 - B 6X		A 193 - BBM CL. 1	(6)	B 335 - N 10665	(7)
A 320 - L 7A	(10)	A 193 - B 7M		A 193 - BBT CL. 1	(6)	B 408	(7) (8) (9)
A 320 - L 7B	(10)	A 193 - B 8 CL 2	(11)	A 193 - B 8A	(6)	B 473	(7)
A 320 - L 7C	(10)	A 193 - B 8C CL 2	(11)	A 193 - B 8CA	(6)	B 574 - N 10276	(7)
A 320 - L 73	(10)	A 193 - B 8M CL 2	(11)	A 193 - B 8MA	(6)	-	
A 354 - BC		A 193 - B 8T CL 2	(11)	A 193 - B 8TA	(6)	-	
A 354 - BD		A 320 - B 8 CL 2	(11)	A 307 - B	(12)		
		A 320 - B 8C CL 2	(11)	A 320 - B 8 CL. 1	(6)	-	
A 540 - B 21		A 320 - B 8F CL 2	(11)	A 320 - B 8C CL. 1	(6)	-	
A 540 - B 22		A 320 - B 8M CL 2	(11)	A 320 - B 8M CL. 1	(6)	-	
A 540 - B 23		A 320 - B 8T CL 2	(11)	A 320 - B 8T CL. 1	(6)	-	
A 540 - B 24		A 449	(13)			-	
		A 453 - 651	(14)			-	
		A 453 - 660	(14)			-	