



Nickel Systems Torque Tables

A286

Min Yield Strength (σ_y)	105.0	KSI	105,000	PSI	UNS S66286 Fastener Torque	
Bolt Nominal Diameter (D)	Threads	Stress Area (A)	Proof Load	Clamping Load	K value	
					Dry	0.20
					Lubricated	0.13
					Dry	Lubricated
in	#/in	in ²	lbf	lbf	ft-lbf	ft-lbf
1/4	20	0.0318	3,005.1	2,253.8	9.4	6.1
1/4	28	0.0364	3,439.8	2,579.9	10.7	7.0
5/16	18	0.0524	5,061.8	3,796.4	19.8	12.9
5/16	24	0.0580	5,602.8	4,202.1	21.9	14.2
3/8	16	0.0775	7,486.5	5,614.9	35.1	22.8
3/8	24	0.0878	8,481.5	6,361.1	39.8	25.8
7/16	14	0.1063	10,268.6	7,701.4	56.2	36.5
7/16	20	0.1187	11,466.4	8,599.8	62.7	40.8
1/2	13	0.1419	13,707.5	10,280.7	85.7	55.7
1/2	20	0.1599	15,446.3	11,584.8	96.5	62.8
9/16	12	0.1820	17,581.2	13,185.9	123.6	80.4
9/16	18	0.2030	19,609.8	14,707.4	137.9	89.6
5/8	11	0.2260	21,831.6	16,373.7	170.6	110.9
5/8	18	0.2560	24,729.6	18,547.2	193.2	125.6
3/4	10	0.3340	32,264.4	24,198.3	302.5	196.6
3/4	16	0.3730	36,031.8	27,023.9	337.8	219.6
7/8	9	0.4620	44,629.2	33,471.9	488.1	317.3
7/8	14	0.5090	49,169.4	36,877.1	537.8	349.6
1	8	0.6060	58,539.6	43,904.7	731.7	475.6
1	12	0.6630	64,045.8	48,034.4	800.6	520.4
1 1/4	7	0.9690	93,605.4	70,204.1	1,462.6	950.7
1 1/4	12	1.0730	103,651.8	77,738.9	1,619.6	1,052.7
1 1/2	6	1.4050	135,723.0	101,792.3	2,544.8	1,654.1
1 1/2	12	1.5800	152,628.0	114,471.0	2,861.8	1,860.2

Equations

$$= \pi / 4 * (D - 0.9743 / n)^2$$

$$= \sigma_y * A * 90\%$$

$$= \text{Proof Load} * 75\%$$

$$= k * D * \text{Clamp Load} * (1\text{ft}/12\text{in})$$

Assumptions: (1) Yield Strength is chosen based on ASTM A453 660 minimum standard for S66286 0.2% offset at room temperature. (2) This is for standard bolt, washer and nut connection. (3) This is for uniform materials for the bolt, washer & the nut. (4) This is for full thread engagement. (5) This is for new bolts and nuts without corrosion. (6) Our k values are typical. Nickel anti-seize or moly lubricant was considered for lubrication. These values can fluctuate depending upon the source, type of oil and a variety of other factors. (7) This is considered under static load. Other factors such as vibration or dynamic applications were not considered. (8) These values are only appropriate for bolts under 6 inches. *This table was reviewed by an engineer & is believed by Nickel Systems to be accurate. However, it is not to be used as a substitute for professional engineering bolt design. Please consult a professional engineer. Nickel Systems assumes no liability for any use of this table beyond its intended purpose.*