



Nickel Systems Torque Tables

310 Stainless

Min Yield Strength (σ_y)	30.0	KSI	30,000	PSI	UNS S31000 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	858.6	644.0	2.7	1.7
1/4	28	0.0364	982.8	737.1	3.1	2.0
5/16	18	0.0524	1,446.2	1,084.7	5.6	3.7
5/16	24	0.0580	1,600.8	1,200.6	6.3	4.1
3/8	16	0.0775	2,139.0	1,604.3	10.0	6.5
3/8	24	0.0878	2,423.3	1,817.5	11.4	7.4
7/16	14	0.1063	2,933.9	2,200.4	16.0	10.4
7/16	20	0.1187	3,276.1	2,457.1	17.9	11.6
1/2	13	0.1419	3,916.4	2,937.3	24.5	15.9
1/2	20	0.1599	4,413.2	3,309.9	27.6	17.9
9/16	12	0.1820	5,023.2	3,767.4	35.3	23.0
9/16	18	0.2030	5,602.8	4,202.1	39.4	25.6
5/8	11	0.2260	6,237.6	4,678.2	48.7	31.7
5/8	18	0.2560	7,065.6	5,299.2	55.2	35.9
3/4	10	0.3340	9,218.4	6,913.8	86.4	56.2
3/4	16	0.3730	10,294.8	7,721.1	96.5	62.7
7/8	9	0.4620	12,751.2	9,563.4	139.5	90.7
7/8	14	0.5090	14,048.4	10,536.3	153.7	99.9
1	8	0.6060	16,725.6	12,544.2	209.1	135.9
1	12	0.6630	18,298.8	13,724.1	228.7	148.7
1 1/4	7	0.9690	26,744.4	20,058.3	417.9	271.6
1 1/4	12	1.0730	29,614.8	22,211.1	462.7	300.8
1 1/2	6	1.4050	38,778.0	29,083.5	727.1	472.6
1 1/2	12	1.5800	43,608.0	32,706.0	817.7	531.5

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 A276 minimum standard for S31000 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. Typical molybdenum disulfide-based anti-seize 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.*