



# Nickel Systems Torque Tables

## Nitronic 50

Min Yield Strength ( $\sigma_y$ )	55.0	KSI	55,000	PSI	UNS S20910, XM19	
					Fastener Torque	
					K value	
					Dry	0.20
					Lubricated	0.13
Bolt Nominal Diameter (D)	Threads	Stress Area (A)	Proof Load	Clamping Load	Dry	Lubricated
in	#/in	in <sup>2</sup>	lbf	lbf	ft-lbf	ft-lbf
1/4	20	0.0318	1,574.1	1,180.6	4.9	3.2
1/4	28	0.0364	1,801.8	1,351.4	5.6	3.7
5/16	18	0.0524	2,651.4	1,988.6	10.4	6.7
5/16	24	0.0580	2,934.8	2,201.1	11.5	7.5
3/8	16	0.0775	3,921.5	2,941.1	18.4	11.9
3/8	24	0.0878	4,442.7	3,332.0	20.8	13.5
7/16	14	0.1063	5,378.8	4,034.1	29.4	19.1
7/16	20	0.1187	6,006.2	4,504.7	32.8	21.4
1/2	13	0.1419	7,180.1	5,385.1	44.9	29.2
1/2	20	0.1599	8,090.9	6,068.2	50.6	32.9
9/16	12	0.1820	9,209.2	6,906.9	64.8	42.1
9/16	18	0.2030	10,271.8	7,703.9	72.2	46.9
5/8	11	0.2260	11,435.6	8,576.7	89.3	58.1
5/8	18	0.2560	12,953.6	9,715.2	101.2	65.8
3/4	10	0.3340	16,900.4	12,675.3	158.4	103.0
3/4	16	0.3730	18,873.8	14,155.4	176.9	115.0
7/8	9	0.4620	23,377.2	17,532.9	255.7	166.2
7/8	14	0.5090	25,755.4	19,316.6	281.7	183.1
1	8	0.6060	30,663.6	22,997.7	383.3	249.1
1	12	0.6630	33,547.8	25,160.9	419.3	272.6
1 1/4	7	0.9690	49,031.4	36,773.6	766.1	498.0
1 1/4	12	1.0730	54,293.8	40,720.4	848.3	551.4
1 1/2	6	1.4050	71,093.0	53,319.8	1,333.0	866.4
1 1/2	12	1.5800	79,948.0	59,961.0	1,499.0	974.4

### 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 XM19 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 light machine oil, moly anti-seize, or nickel-based anti-seize lubricant were 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.*