



# Nickel Systems Torque Tables

## Inconel 718

Min Yield Strength ( $\sigma_y$ )	150.0	KSI	150,000	PSI	UNS N07718 Fastener Torque	
Bolt Nominal Diameter (D)	Threads	Stress Area (A)	Proof Load	Clamping Load	K value	
					Dry	0.22
					Lubricated	0.13
					Dry	Lubricated
in	#/in	in <sup>2</sup>	lbf	lbf	ft-lbf	ft-lbf
1/4	20	0.0318	4,293.0	3,219.8	14.8	8.7
1/4	28	0.0364	4,914.0	3,685.5	16.9	10.0
5/16	18	0.0524	7,231.2	5,423.4	31.1	18.4
5/16	24	0.0580	8,004.0	6,003.0	34.4	20.3
3/8	16	0.0775	10,695.0	8,021.3	55.1	32.6
3/8	24	0.0878	12,116.4	9,087.3	62.5	36.9
7/16	14	0.1063	14,669.4	11,002.1	88.2	52.1
7/16	20	0.1187	16,380.6	12,285.5	98.5	58.2
1/2	13	0.1419	19,582.2	14,686.7	134.6	79.6
1/2	20	0.1599	22,066.2	16,549.7	151.7	89.6
9/16	12	0.1820	25,116.0	18,837.0	194.3	114.8
9/16	18	0.2030	28,014.0	21,010.5	216.7	128.0
5/8	11	0.2260	31,188.0	23,391.0	268.0	158.4
5/8	18	0.2560	35,328.0	26,496.0	303.6	179.4
3/4	10	0.3340	46,092.0	34,569.0	475.3	280.9
3/4	16	0.3730	51,474.0	38,605.5	530.8	313.7
7/8	9	0.4620	63,756.0	47,817.0	767.1	453.3
7/8	14	0.5090	70,242.0	52,681.5	845.1	499.4
1	8	0.6060	83,628.0	62,721.0	1,149.9	679.5
1	12	0.6630	91,494.0	68,620.5	1,258.0	743.4
1 1/4	7	0.9690	133,722.0	100,291.5	2,298.3	1,358.1
1 1/4	12	1.0730	148,074.0	111,055.5	2,545.0	1,503.9
1 1/2	6	1.4050	193,890.0	145,417.5	3,999.0	2,363.0
1 1/2	12	1.5800	218,040.0	163,530.0	4,497.1	2,657.4

### 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 B 637 minimum standard for N07718 0.2% offset at room temperature for hot worked or cold worked annealed rods and bars. (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. Molybdenum disulfide-based and nickel-based anti-seize lubricants 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.*