



# Tightening Torque for UNF Grade 5 Bolts

Bolt Diameter	Tebstile Stress Area inch	Tensile Strength lb	Proof Load lbs	Clamp Load lbs	Zinc Plated	Unplated (lightly oiled)	Unplated (wax coated)
					Plain (Dry) lbf.ft	Lightly Lubricated lbf.ft	Well Lubricated lbf.ft
<b>1/4-28</b>	0.0364	4350	3100	2325	10	7	5
<b>5/16-24</b>	0.0580	6950	4900	3675	19	14	10
<b>3/8-24</b>	0.0878	10500	7450	5588	35	26	17
<b>7/16-20</b>	0.1187	14200	10100	7575	55	41	28
<b>1/2-20</b>	0.1599	19200	13600	10200	85	64	43
<b>9/16-18</b>	0.2030	24400	17300	12975	122	91	61
<b>5/8-18</b>	0.2560	30700	21800	16350	170	128	85
<b>3/4-16</b>	0.3730	44800	31700	23775	297	223	149
<b>7/8-14</b>	0.5090	61100	43300	32475	474	355	237
<b>1-12</b>	0.6630	79600	56400	42300	705	529	353
<b>1-14UNS</b>	0.6790	81500	57700	43275	721	541	361
<b>1 1/8-12</b>	0.8560	89900	63300	47475	890	668	445
<b>1 1/4-12</b>	1.0730	112700	79400	59550	1241	930	620
<b>1 3/8-12</b>	1.3150	138100	97300	72975	1672	1254	836
<b>1 1/2-12</b>	1.5810	166000	117000	87750	2194	1645	1097



# Tightening Torque For UNF Grade 8 Bolts

Bolt Diameter	Tebstile Stress Area inch	Tensile Strength lb	Proof Load lbs	Clamp Load lbs	Zinc Plated	Unplated (lightly oiled)	Unplated (wax coated)
					Plain (Dry) lbf.ft	Lightly Lubricated lbf.ft	Well Lubricated lbf.ft
<b>1/4-28</b>	0.0364	5450	4350	3263	14	10	7
<b>5/16-24</b>	0.0580	8700	6950	5213	27	20	14
<b>3/8-24</b>	0.0878	13200	10500	7875	49	36	25
<b>7/16-20</b>	0.1187	17800	14200	10650	78	58	39
<b>1/2-20</b>	0.1599	24000	19200	14400	120	90	60
<b>9/16-18</b>	0.2030	30400	24400	18300	172	129	86
<b>5/8-18</b>	0.2560	38400	30700	23025	240	180	120
<b>3/4-16</b>	0.3730	56000	44800	33600	420	315	210
<b>7/8-14</b>	0.5090	76400	61100	45825	668	501	334
<b>1-12</b>	0.6630	99400	79600	59700	995	746	498
<b>1-14UNS</b>	0.6790	101900	81500	61125	1019	764	509
<b>1 1/8-12</b>	0.8560	128400	102700	77025	1444	1083	722
<b>1 1/4-12</b>	1.0730	161000	128800	96600	2013	1509	1006
<b>1 3/8-12</b>	1.3150	197200	157800	118350	2712	2034	1356
<b>1 1/2-12</b>	1.5810	237200	189700	142275	3557	2668	1778