

Inch and Metric

Pouce et Métrique

Tension Loads / Tightening Torques

Charges de tension / Couples de serrage

GRADE 5				GRADE 8			
Coarse Thread				Coarse Thread			
Size	Clamp Load	Plain (ft. lbs.)	Plated	Size	Clamp Load	Plain (ft. lbs.)	Plated (ft. lbs.)
1/4-20 (.250)	2025	8	76 in lbs.	1/4-20 (.250)	2850	12	9
5/16-18 (.3125)	3338	17	13 ft lbs.	5/16-18 (.3125)	4725	25	18
3/8-16 (.375)	4950	31	23 ft lbs.	3/8-16 (.375)	6975	44	33
7/16-14 (.4375)	6788	50	37 ft lbs.	7/16-14 (.4375)	9600	70	52
1/2-13 (.500)	9075	76	57 ft lbs.	1/2-13 (.500)	12750	106	80
9/16-12 (.5625)	11625	109	82 ft lbs.	9/16-12 (.5625)	16350	153	115
5/8-11 (.625)	14400	150	112 ft lbs.	5/8-11 (.625)	20325	212	159
3/4-10 (.750)	21300	266	200 ft lbs.	3/4-10 (.750)	30075	376	282
7/8-9 (.875)	29475	430	322 ft lbs.	7/8-9 (.875)	41550	606	454
1-8 (1.000)	38625	644	483 ft lbs.	1-8 (1.000)	54525	909	682
1 1/8-7 (1.125)	42375	794	596 ft lbs.	1 1/8-7 (1.125)	68700	1288	966
1 1/4-7 (1.250)	53775	1120	840 ft lbs.	1 1/4-7 (1.250)	87225	1817	1363
1 3/8-6 (1.375)	64125	1470	1102 ft lbs.	1 3/8-6 (1.375)	103950	2382	1787
1 1/2-6 (1.500)	78000	1950	1462 ft lbs.	1 1/2-6 (1.500)	126450	3161	2371

GRADE 5				GRADE 8			
Fine Thread				Fine Thread			
Size	Clamp Load	Plain (ft. lbs.)	Plated	Size	Clamp Load	Plain (ft. lbs.)	Plated (ft. lbs.)
1/4-28 (.250)	2325	10	87 in lbs.	1/4-28 (.250)	3263	14	10
5/16-24 (.3125)	3675	19	14 ft lbs.	5/16-24 (.3125)	5113	27	20
3/8-24 (.375)	5588	35	26 ft lbs.	3/8-24 (.375)	7875	49	37
7/16-20 (.4375)	7575	55	41 ft lbs.	7/16-20 (.4375)	10650	78	58
1/2-20 (.500)	10200	85	64 ft lbs.	1/2-20 (.500)	14400	120	90
9/16-18 (.5625)	12975	122	91 ft lbs.	9/16-18 (.5625)	18300	172	129
5/8-18 (.625)	16350	170	128 ft lbs.	5/8-18 (.625)	23025	240	180
3/4-16 (.750)	23775	297	223 ft lbs.	3/4-16 (.750)	33600	420	315
7/8-14 (.875)	32475	474	355 ft lbs.	7/8-9 (.875)	45825	668	501
1-12 (1.000)	42300	705	529 ft lbs.	1-12 (1.000)	59700	995	746
1-14 (1.000)	32275	721	541 ft lbs.	1-14 (1.000)	61125	1019	764
1 1/8-12 (1.125)	47475	890	668 ft lbs.	1 1/8-12 (1.125)	77025	1444	1083
1 1/4-12 (1.250)	59550	1241	930 ft lbs.	1 1/4-12 (1.250)	96600	2012	1509
1 3/8-12 (1.375)	72975	1672	1254 ft lbs.	1 3/8-12 (1.375)	118350	2712	2034
1 1/2-12 (1.500)	87750	2194	1645 ft lbs.	1 1/2-12 (1.500)	142275	3557	2668

Metric Torque Table						
Property Class	8.8		10.9		12.9 Socket	
Minimum Tensile Strength Mpa	M6-M16:800 M20-M30:830		1040		1220	
Nominal Size and Thread Pitch	Bolt Torque Specs in Foot Pounds or (Inch Pounds)					
	Plain	Plated	Plain	Plated	Plain	Plated
M5 x 0.80	(54)	(41)	(78)	(59)	(91)	(68)
M6 x 1.00	(92)	(69)	(133)	(99)	(156)	(116)
M7 x 1.00	(156)	(116)	(222)	(167)	(260)	(195)
M8 x 1.25	(225)	(169)	(333)	(242)	(377)	(284)
M10 x 1.50	37	28	53	40	62	47
M12 x 1.75	65	49	93	69	108	81
M14 x 2.00	104	78	148	111	173	130
M16 x 2.00	161	121	230	172	269	202
M18 x 2.50	222	167	318	238	372	279
M20 x 2.50	314	235	449	337	525	394
M22 x 2.50	428	321	613	460	716	537
M24 x 3.00	543	407	776	582	908	681
M27 x 3.00	796	597	1139	854	1331	998
M30 x 3.50	1079	809	1543	1158	1804	1353
M33 x 3.50	1468	1101	2101	1576	2455	1842
M36 x 4.00	1886	1415	2699	2024	3154	2366

This table is based on a torque coefficient, K=0.20 for non-plated steel fasteners and K=0.15 for plated fasteners. These Figures represent an estimate of torque (torque being the measurement of friction, not tension) required to induce given preload (clamp load) in a bolt for non-critical applications only. For critical or special applications where greater control is desired this should be experimentally determined. This applies to washer faced or double chamfered hex nuts (or bolts, if bolt is torqued) having a width across flats of approximately 1.5 times the nominal diameter and having threads free of interference. Because of the many interrelated variables that directly or indirectly affect friction, such as surface texture, type of coating or finish, lubrication, speed of tightening, human error, etc., it is possible to experience as much as ±25% deviation in preload (clamp load) with the use of a torque wrench

