



TORQUE CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY
Inch Pounds	Foot Pounds	0.0835
Inch Pounds	Newton Meters	0.1130
Inch Pounds	Kg Meters	0.0115
Inch Pounds	Kg Centimeters	1.1519
Foot Pounds	Inch Pounds	12.000
Foot Pounds	Newton Meters	1.3560
Foot Pounds	Kg Meters	0.1382
Foot Pounds	Kg Centimeters	13.8240
Newton Meters	Inch Pounds	8.8440
Newton Meters	Foot Pounds	0.7370
Newton Meters	Kg Meters	0.1020
Newton Meters	Kg Centimeters	10.2000
Kg Meters	Inch Pounds	86.8100
Kg Meters	Foot Pounds	7.2340
Kg Meters	Newton Meters	9.8040
Kg Centimeters	Inch Pounds	0.8681
Kg Centimeters	Foot Pounds	0.0723
Kg Centimeters	Newton Meters	0.0980

MISCELLANEOUS CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY
Inches	Millimeters	25.4000
Millimeters	Inches	0.0394
Pounds	Kilograms	0.4536
Kilograms	Pounds	2.2050
psi	bar	0.069
bar	psi	14.5

AIR PRESSURE CONVERSION

PSI	kPa*	Bar**
85	586	25.4000
90	620	0.0394
95	655	0.4536
100	690	2.2050
125	860	0.069

TORQUE CONVERSION - In. Lbs (Nm)

In. Lbs.	Nm	In. Lbs.	Nm	In. Lbs.	Nm	In. Lbs.	Nm	In. Lbs.	Nm
5	0.6	30	3.4	60	6.8	110	12.4	160	18.1
10	1.1	35	4.0	70	7.9	120	13.6	170	19.2
15	1.7	40	4.5	80	9.0	130	14.7	180	20.3
20	2.3	45	5.1	90	10.2	140	15.8	190	21.5
25	2.8	50	5.7	100	11.3	150	17.0	200	22.6

TORQUE CONVERSION - Ft. Lbs (Nm)

Ft. Lbs.	Nm	Ft. Lbs.	Nm	Ft. Lbs.	Nm						
1	1.36	24	32.5	47	63.7	70	94.9	93	126.1	185	251.0
2	2.7	25	33.9	48	65.1	71	96.3	94	127.5	190	258.0
3	4.1	26	35.3	49	66.4	72	97.6	95	129.0	195	264.4
4	5.4	27	36.6	50	67.8	73	99.0	96	130.2	200	271.2
5	6.8	28	38.0	51	69.2	74	100.3	97	131.5	225	305.1
6	8.1	29	39.3	52	70.5	75	102.0	98	133.0	250	339.0
7	9.5	30	40.7	53	71.9	76	103.1	99	134.2	275	373.0
8	10.9	31	42.0	54	73.2	77	104.4	100	135.6	300	407.0
9	12.2	32	43.4	55	74.6	78	105.8	110	149.2	350	475.0
10	13.6	33	44.8	56	75.9	79	107.1	115	156.0	400	542.4
11	14.9	34	46.1	57	77.3	80	108.5	120	163.0	450	610.1
12	16.3	35	47.5	58	78.7	81	110.0	125	170.0	500	677.9
13	17.6	36	48.8	59	80.0	82	111.2	130	176.3	550	745.69
14	19.0	37	50/2	60	81.4	83	112.6	135	183.1	600	813.48
15	20.3	38	52.0	61	82.7	84	114.0	140	190.0	650	881.3
16	21.7	39	52.9	62	84.1	85	115.3	145	197.0	700	949.1
17	23.1	40	54.2	63	85.4	86	117.0	150	203.4	750	1016.9
18	24.4	41	55.6	64	86.8	87	118.0	155	210.2	800	1084.6
19	25.8	42	57.0	65	88.1	88	119.3	160	217.0	850	1152.4
20	27.1	43	58.3	66	90.0	89	121.0	165	224.0	900	1220.2
21	28.5	44	60.0	67	90.9	90	122.0	170	231.0	950	1288.0
22	29.8	45	61.0	68	92.2	91	123.4	175	237.3	1000	1355.8
23	31.2	46	62.4	69	93.6	92	125.0	180	244.1		



INCH BOLT TORQUE TABLE SAE J429 and ASME 574

Steel Grade	SAE 5		SAE 8		Socket Head Cap Screws	
Nom Dia-Pitch	Torque in Pound Foot or (Pound Inch)					
	Dry	Lubed	Dry	Lubed	Dry	Lubed
1/4-20	(101)	(76)	(143)	(107)	(168)	(120)
1/4-28	(116)	(87)	(147)	(123)	(192)	(144)
5/16-18	(209)	(157)	(295)	(221)	(348)	(264)
5/16-24	(231)	(174)	(327)	(245)	(384)	(288)
3/8-16	(372)	(276)	44	33	51	38
3/8-24	(420)	(312)	49	37	58	43
7/16-14	49	37	70	52	81	61
7/16-20	55	41	78	58	91	68
1/2-13	75	57	106	80	124	93
1/2-20	85	64	120	90	140	105
5/8-11	150	113	212	159	238	179
5/8-18	170	127	240	180	27	202
3/4-10	267	200	376	282	423	317
3/4-16	297	223	420	315	472	354
7/8-9	429	322	606	455	682	511
7/8-14	474	355	69	502	752	564
1-8	644	483	909	681	1022	767
1-12	722	542	1020	765	1147	860

Lubed means cleaned, dry bolts, lubricated with standard medium viscosity machine oil.
Lubricate all contact areas of the bolts and washers. Lubricating the bolts is the suggested method.

METRIC BOLT TORQUE TABLE ISO 898

Property Class	8.8		10.9		12.9 Socket Head Cap Screw	
Nom Size x Pitch	Torque in Newton Meter - Nm					
	Dry	Lubed	Dry	Lubed	Dry	Lubed
M5 x 0.80	6.1	4.6	8.8	6.7	10.3	7.7
M6 x 1.00	10.4	7.8	15	11.2	17.6	13.1
M7 x 1.00	17.6	13.1	25.1	18.9	29.4	22
M8 x 1.25	25.4	19.1	37.6	27.3	42.6	32.1
M10 x 1.50	50	38	72	54	84	64
M12 x 1.75	88	66	126	94	146	110
M14 x 2.00	141	106	201	150	235	176
M16 x 2.00	218	164	312	233	365	274
M18 x 2.50	301	226	431	323	504	378
M20 x 2.50	426	319	609	457	712	534
M22 x 2.50	580	435	831	624	971	728
M24 x 3.00	736	552	1052	789	1231	923
M27 x 3.00	1079	809	1544	1158	1805	1353
M30 x 3.50	1463	1097	2092	1570	2446	1834
M33 x 3.50	1990	1493	2849	2137	3328	2497
M36 x 4.00	2557	1918	3659	2744	4276	3208

Lubed means cleaned, dry bolts, lubricated with standard medium viscosity machine oil.
Lubricate all contact areas of the bolts and washers. Lubricating the bolts is the suggested method.



Millimeter - Decimal - Fraction

mm	decimal	inch												
0.100	.0039		5.159	.2031	13/64	10.300	.4055		15.400	.6063		20.400	.8031	
0.200	.0079		5.200	.2047		10.319	.4063	13/32	15.478	.6094	39/64	20.500	.8071	
0.300	.0118		5.300	.2087		10.400	.4094		15.500	.6102		20.600	.8110	
0.0397	.0156	1/64	5.400	.2126		10.500	.4134		15.600	.6142		20.638	.8125	13/16
0.400	.0157		5.500	.2165		10.600	.4173		15.700	.6181		20.700	.8150	
0.500	.0197		5.556	.2188	7/32	10.700	.4219		15.800	.6220		20.800	.8189	
0.600	.0236		5.600	.2205		10.716	.4219	27/64	15.875	.6250	5/8	20.900	.8228	
0.700	.0276		5.700	.2244		10.800	.4252		15.900	.6250		21.000	.8268	
0.794	.0313	1/32	5.800	.2283		10.900	.4291		16.000	.6299		21.034	.8182	53/64
0.800	.0315		5.900	.2323		11.000	.4331		16.100	.6339		21.100	.8307	
0.900	.0354		5.953	.2344	15/64	11.100	.4370		16.200	.6378		21.200	.8307	
1.000	.0394		6.000	.2362		11.113	.4375	7/16	16.272	.6406	41/64	21.200	.8346	
1.100	.0433		6.100	.2402		11.200	.4409		16.300	.6417		21.300	.8386	
1.191	.0469	3/64	6.200	.2441		11.300	.4449		16.400	.6457		21.400	.8425	
1.200	.0472		6.300	.2480		11.400	.4488		16.500	.6496		21.431	.8438	27/32
1.300	.0512		6.350	.2500	1/4	11.500	.4528		16.600	.6535		21.500	.8465	
1.400	.0551		6.400	.2520		11.509	.4531	29/64	16.669	.6563	21/32	21.600	.8504	
1.500	.0591		6.500	.2559		11.600	.4567		16.700	.6575		21.700	.8543	
1.588	.0625	1/16	6.600	.2598		11.700	.4606		16.800	.6614		21.800	.8583	
1.600	.0630		6.700	.2638		11.800	.4646		16.900	.6654		21.828	.8594	55/64
1.700	.0669		6.747	.2656	17/64	11.900	.4685		17.000	.6693		21.900	.8622	
1.800	.0709		6.800	.2677		11.906	.4688	15/32	17.066	.6719	43/64	22.000	.8661	
1.900	.0748		6.900	.2717		12.000	.4724		17.100	.6732		22.100	.8701	
1.984	.0781	5/64	7.000	.2756		12.100	.4764		17.200	.6772		22.200	.8740	
2.000	.0878		7.100	.2795		12.200	.4803		17.300	.6811		22.225	.8750	7/8
2.100	.0827		7.144	.2813	9/32	12.300	.4843		17.400	.6850		22.300	.8780	
2.200	.0866		7.200	.2835		12.303	.4844	31/64	17.463	.6875	11/16	22.400	.8819	
2.300	.0906		7.300	.2874		12.400	.4882		17.500	.6890		22.500	.8858	
2.381	.0938	3/32	7.400	.2913		12.500	.4921		17.600	.6929		22.600	.8898	
2.400	.0945		7.500	.2953		12.600	.4961		17.700	.6968		22.622	.8906	57/64
2.500	.0984		7.541	.2969	19/64	12.700	.5000	1/2	17.800	.7008		22.700	.8937	
2.600	.1024		7.600	.2992		12.800	.5039		17.859	.7031	45/64	22.800	.8976	
2.700	.1063		7.700	.3031		12.900	.5079		17.900	.7047		22.900	.9016	
2.778	.1094	7/64	7.800	.3071		13.000	.5118		18.000	.7087		23.000	.9055	
2.800	.1102		7.900	.3110		13.097	.5156	33/64	18.100	.7126		23.019	.9063	29/32
2.900	.1142		7.938	.3125	5/16	13.100	.5157		18.200	.7165		23.100	.9094	
3.000	.1181		8.000	.3150		13.200	.5197		18.256	.7188	23/32	23.200	.9134	
3.100	.1220		8.100	.3189		13.300	.5236		18.300	.7205		23.300	.9173	
3.175	.1250	1/8	8.200	.3228		13.400	.5276		18.400	.7244		23.400	.9213	
3.200	.1260		8.300	.3268		13.494	.5313	17/32	18.500	.7283		23.416	.9219	59/64
3.300	.1299		8.334	.3281	21/64	13.500	.5315		18.600	.7323		23.500	.9252	
3.400	.1339		8.400	.3307		13.600	.5354		18.653	.7344	47/64	23.600	.9291	
3.500	.1378		8.500	.3346		13.700	.5394		18.700	.7362		23.700	.9331	
3.572	.1406	9/64	8.600	.3386		13.800	.5433		18.800	.7402		23.800	.9370	
3.600	.1417		8.700	.3425		13.891	.5469	35/64	18.900	.7441		23.900	.9409	
3.700	.1457		8.731	.3438	11/32	13.900	.5472		19.000	.7480		24.000	.9449	
3.800	.1496		8.800	.3465		14.000	.5512		19.050	.7500	3/4	24.100	.9488	
3.900	.1535		8.900	.3504		14.100	.5551		19.100	.7520		24.200	.9528	
3.969	.1563	5/32	9.000	.3543		14.200	.5591		19.200	.7559		24.209	.9531	61/64
4.000	.1575		9.100	.3583		14.288	.5625	9/16	19.300	.7598		24.300	.9567	
4.100	.1624		9.128	.3594	23/64	14.300	.5630		19.400	.7638		24.400	.9606	
4.200	.1654		9.200	.3622		14.400	.5669		19.447	.7656	49/64	24.500	.9646	
4.300	.1693		9.300	.3661		14.500	.5709		19.500	.7677		24.600	.9685	
4.366	.1719	11/64	9.400	.3701		14.600	.5748		19.600	.7717		24.606	.9688	31/32
4.400	.17320		9.500	.3740		14.684	.5781	37/64	19.700	.7756		24.700	.9724	
4.500	.1772		9.525	.3750	3/8	14.700	.5787		19.800	.7795		24.800	.9764	
4.600	.1811		9.700	.3819		14.800	.5827		19.844	.7813	25/32	24.900	.9803	
4.700	.1850		9.800	.3858		14.900	.5866		19.900	.7835		25.000	.9843	
4.763	.1875	3/16	9.900	.3898		15.000	.5906		20.000	.7874		25.003	.9844	63/64
4.800	.1890		9.922	.3902	25/64	15.081	.5938	19/32	20.100	.7913		25.100	.9882	
4.900	.1929		10.000	.3937		15.100	.5945		20.200	.7953		25.200	.9921	
5.000	.1969		10.100	.3976		15.200	.5984		20.241	.7969	51/64	25.300	.9961	
5.100	.2008		10.200	.4016		15.300	.6024		20.300	.7992		25.400	1.000	1



GAUGE TO THICKNESS

Gauge		Stainless	Galvanized	Sheet Steel	Aluminum	Wire
	Fraction	Inches (mm)				
30		0.0125 (0.33)	0.0157 (0.40)	0.0120 (0.30)	0.0100 (0.25)	0.1285 (3.26)
29		0.0141 (0.36)	0.0172 (0.44)	0.0135 (0.34)	0.0113 (0.29)	0.1360 (3.45)
28	1/64	0.0156 (0.41)	0.0187 (0.47)	0.0149 (0.38)	0.0126 (0.32)	0.1405 (3.57)
27		0.0172 (0.43)	0.0202 (0.51)	0.0164 (0.42)	0.0142 (0.36)	0.1440 (3.66)
26		0.0187 (0.48)	0.0217 (0.55)	0.0179 (0.45)	0.0159 (.40)	0.1470 (3.73)
25		0.0219 (0.56)	0.0247 (0.63)	0.0209 (0.53)	0.0179 (0.46)	0.1495 (3.80)
24		0.250 (0.64)	0.0276 (0.70)	0.0239 (0.61)	0.0201 (0.51)	0.1520 (3.86)
23		0.0281 (0.71)	0.0306 (0.78)	0.0269 (0.68)	0.0226 (0.58)	0.1530 (3.91)
22	1/32	0.0312 (0.79)	0.0336 (0.85)	0.0299 (0.76)	0.0253 (0.64)	0.1570 (3.99)
21		0.0344 (0.86)	0.0366 (0.93)	0.0329 (0.84)	0.0285 (0.71)	0.1590 (4.04)
20		0.0375 (0.95)	0.0396 (1.01)	0.0359 (0.91)	0.0320 (0.81)	0.1610 (4.09)
19		0.0427 (1.1)	0.0456 (1.16)	0.0418 (1.06)	0.0359 (0.91)	0.1660 (4.22)
18		0.0500 (1.27)	0.0516 (1.31)	0.0478 (1.21)	0.0403 (1.02)	0.1695 (4.31)
17		0.0562 (1.4)	0.0575 (1.46)	0.0538 (1.37)	0.0453 (1.1)	0.1730 (4.40)
16	1/16	0.0625 (1.59)	0.0635 (1.61)	0.0598 (1.52)	0.0508 (1.29)	0.1770 (4.50)
15		0.0703 (1.8)	0.0710 (1.80)	0.0673 (1.71)	0.0571 (1.4)	0.1800 (4.57)
14	5/64	0.0781 (1.98)	0.0785 (1.99)	0.0747 (1.90)	0.0641 (1.63)	0.1820 (4.62)
13	3/32	0.094 (2.4)	0.0934 (2.37)	0.0897 (2.28)	0.072 (1.8)	0.1850 (4.70)
12	7/64	0.1094 (2.78)	0.1084 (2.75)	0.1046 (2.66)	0.0808 (2.05)	0.1890 (4.80)
11	1/8	0.1250 (3.18)	0.1233 (3.13)	0.1196 (3.04)	0.0907 (2.30)	0.1910 (4.85)
10	9/64	0.1406 (3.57)	0.1382 (3.51)	0.1345 (3.42)	0.1019 (2.59)	0.1935 (4.92)
9	5/32	0.1563 (3.97)	0.1532 (3.89)	0.1495 (3.80)	0.1144 (2.91)	0.1960 (4.98)
8	11/64	0.1719 (4.37)	0.1681 (4.27)	0.1644 (4.18)	0.1285 (3.26)	0.1990 (5.60)
7	3/16	0.1875 (4.76)	N/A	0.1793 (4.55)	0.1443 (3.67)	0.2010 (5.10)
6	13/64	0.2031	N/A	0.1943 (4.94)	0.162 (4.1)	0.2040 (5.18)
5	7/32	0.2187	N/A	0.2092 (5.31)	0.1819	0.2055 (5.22)
4	15/64	0.2344	N/A	0.2242 (5.69)	0.2043	0.2090 (5.34)
3	1/4	0.25	N/A	0.2391 (6.07)	0.2294	0.2130 (5.41)



MACHINE SCREW, FRACTIONAL, AND METRIC SIZES

Inch	Metric Tap Size & Pitch	Cutting Taps		Forming Taps	
		Drill Size	Decimal Equivalent	Drill Size	Decimal Equivalent
0-80		3/64	.0469	54	.0050
0-80	M1.6 x 0.35	1.25	.0492	1.45	.0571
0-80	M1.8 x 0.35	1.45	.0571	1.65	.0650
1-64		53	.0595	51	.0670
1-72		53	.0595	51	.0670
	M2 x 0.40	1.60	.0630	1.80	.0709
2-56		50	.0700	5/64	.0781
2-64		50	.0700	47	.0785
	M2.2 x 0.45	2.75	.0689	2.00	.0787
	M2.5 x 0.45	2.05	.0807	2.30	.0906
3-48		47	.0785	43	.0890
3-56		46	.0810	2.30	.0905
4-40		43	.0890	38	.1015
4-48		42	.0935	2.60	.1024
	M3 x 0.50	2.50	.0984	7/64	.1094
5-40		38	.1015	33	.1130
5-44		37	.1040	2.90	.1142
	M3.5 x 0.60	2.60	.1142	3.20	.1260
6-32		36	.1065	1/8	.1250
6-40		33	.1130	3.25	.1280
	M4 x 0.70	3.30	.1299	3.70	.1476
8-32		29	.1360	25	.1495
8-36		29	.1360	24	.1520
	M4.5 x 0.75	3.70	.1476	4.10	.1614
10-24		26	.1470	11/64	.1719
10-32		21	.1590	16	.1770
	M5 x 0.80	4.20	.1654	14	.1820
12-24		16	.1770	8	.1990
12-28		15	.1800	7	.2010
	M6 x 1.00	5.00	.1969	7/32	.2188
1/4-20		7	.2010	1	.2280
1/4-28		3	.2130	15/64	.2340
	M7 x 1.00	6.00	.2362	F	.2570
5/16-18		F	.2570	L	.2900
5/16-24		I	.2720	M	.2950
	M8 x 1.25	6.70	.2638	7.40	.2913
	M8 x 1.00	7.00	.2756	19/64	.2969
3/8-16		5/16	.3125	S	.3480
3/8-24		Q	.3320	T	.3580
	M10 x 1.50	8.50	.3346	U	.3680
	M10 x 1.25	8.70	.3425	9.40	.3701
7/16-14		U	.3680	Y	.4040
7/16-20		25/64	.3906	Z	.4130
	M12 x 1.75	10.20	.4016	11.20	.4409
	M12 x 1.25	10.80	.4252	11.50	.4528
1/2-13		27/64	.4219	15/32	.4682
1/2-20		29/64	.4531	12.25	.4823
	M14 x 2.00	12.00	.4224	33/64	.5156
9/16-12		31/64	.4844	17/32	.5312
9/16-18		33/64	.5156	13.50	.5315
5/8-11		17/32	.5312	14.75	.5807
5/8-18		37/64	.5781	15.25	.6004
	M16 x 2.00	14.00	.5512	19/32	.5938
	M16 x 1.50	14.50	.5209	15.25	.6004
	M18 x 2.50	15.50	.6102	39/64	.6094
	M18 x 1.50	16.50	.6496	17.25	.6791
3/4-10		21/32	.6562	45/64	.7031
3/4-16		11/16	.6875	23/32	.7188
	M20 x 2.50	17.50	.6890		
	M20 x 1.50	18.50	.7283		
	M22 x 2.50	19.50	.7677		

- Continued

Inch	Metric Tap	Cutting Taps		Forming Taps	
		Drill Size	Decimal	Drill Size	Decimal
7/8-9	M22 x 1.50	20.50	.8071	18.50	.7283
		49/64	.7656	47/64	.7334
7/8-14	M24 x 3.00	13/16	.8125	19.00	.7480
		21.00	.8268	3/4	.7500
	M24 x 2.00	22.00	.8661	49/64	.7656
1-8		7/8	.8750	19.50	.7656
1-12	M27 x 3.00	59/64	.9219	25/32	.7812
		24.00	.9449	20.00	.7874
	M27 x 2.00	25.00	.9843	51/64	.7969
1-1/8-7		63/64	.9844	20.50	.8071
1-1/8-12	M30 x 3.50	1-3/64	1.0469	13/16	0.8125
		26.50	1.0433	21.00	0.8268
	M30 x 2.00	28.00	1.1024	53/64	0.8281
1-1/4-7		1-7/64	1.1094	27/32	0.8438
1-1/4-12	M30 x 3.50	1-11/64	1.1719	21.50	0.8465
		29.50	1.1614	55/64	0.8594
	M33 x 2.00	31.00	1.2205	22.00	0.8661
1-3/8-6		1-7/32	1.2188	7/8	0.8750
1-3/8-12	M36 x 4.00	1-19/64	1.2969	22.50	0.8858
		32.00	1.2598	57/64	0.8906
	M36 x 3.00	33.00	1.2992	23.00	0.9055
1-1/2-6		1-11/32	1.3438	29/32	0.9062
1-1/2-12	M39 x 4.00	1-27/64	1.4219	59/64	0.9219
		35.00	1.3780	23.50	0.9252
	M39 x 3.00	36.00	1.4173	15/16	0.9375

STANDARD TAP & DRILL Approx 75% Thread

ROLLFORM TAP & DRILL For 65% Thread

0-80	54
1-64	1.65 mm
1-72	1.7 mm
2-56	5/64
2-64	2 mm
3-48	43
3-56	2.3 mm
4-40	39
4-48	2.6 mm
5-40	33
5-44	2.9 mm
6-32	1/8
6-40	3.2 mm
8-32	25
8-36	24
10-24	11/64
10-32	16
12-24	5 mm
12-28	8
1/4-20	1
1/4-28	A
5/16-18	7.3 mm
5/16-24	M
3/8-16	S
3/8-24	T
7/16-14	13/32
7/16-20	10.5 mm
1/2-13	15/32
1/2-20	31/64
9/16-12	17/32
9/16-18	13.5 mm
5/8-11	15 mm
5/8-18	19/32
3/4-10	45/64
3/4-16	23/32
7/8-9	.823
7/8-14	27/32
1/8	15/16
1-12	.963

0-80	3/64
1-64	53
1-72	53
2-56	50
2-64	50
3-48	47
3-56	46
4-40	43
4-48	42
5-40	39
5-44	38
6-32	36
6-40	33
8-32	29
8-36	29
10-24	25
10-32	21
12-24	17
12-28	15
1/4-20	7
1/4-28	3
5/16-18	F
5/16-24	I
3/8-16	5/16
3/8-24	Q
7/16-14	U
7/16-20	W
1/2-12	27/64
1/2-13	27/64
1/2-20	29/64
9/16-12	31/64
9/16-18	33/64
5/8-11	17/32
5/8-18	37/64
3/4-10	21/32
3/4-16	11/16
7/8-9	49/64
7/8-14	13/16
1/8	7/8
1-12	59/64
1-14	15/16