

## TORQUE TENSIONING

Table 1 - Torque-Tension Relationships for SAE Grades 2, 5 and 8

Nom. Size and Threads / in.	Stress Area (1) in. <sup>2</sup>	Grade 2 Clamp Load Lb.	Grade 2 Torque Dry k=0.2 in - lb.	Grade 2 Torque Lub k=0.15 in-lb.	Grade 5 Clamp Load lb.	Grade 5 Torque Dry k=0.2 in-lb.	Grade 5 Torque Lub k=0.15 in-lb.	Grade 8 Clamp Load Lb.	Grade 8 Torque Dry k=0.2 in-lb.	Grade 8 Torque Lub k=0.15 in-lb.
0.138-40	0.01014	418.0	10.2	7.7	647.5	15.6	11.7	913.5	23.4	17.6
0.138-32	0.00909	401.0	9.6	7.2	579.5	14.4	10.8	818.0	21.0	15.8
0.164.36	0.01473	608.0	17.4	13.1	938.5	27.6	20.7	1306.0	40.2	30.2
0.164-31	0.01401	578.0	16.8	12.6	893.0	25.8	19.4	1261.0	40.2	30.2
0.190-32	0.01999	825.0	28.2	21.2	1275.0	43.2	32.4	1798.5	63.6	47.7
0.190-24	0.01753	723.0	24.6	18.5	1117.5	37.2	27.9	1577.5	55.8	41.9
0.250-28	0.03637	1500.0	75.0	56.0	2319.0	116.0	87.0	3273.0	164.0	123.0
0.250-20	0.03182	1313.0	66.0	49.0	2029.0	101.0	76.0	2864.0	143.0	107.0
0.3125-24	0.05807	2395.0	150.0	112.0	3700.0	230.0	173.0	5225.0	327.0	245.0
0.3125-18	0.05243	2163.0	135.0	101.0	3342.0	209.0	157.0	4719.0	295.0	221.0
.0375-24	0.08783	3623.0	272.0	204.0	5600.0	420.0	315.0	7905.0	893.0	445.0
.0375-16	0.07749	3196.0	240.0	180.0	4940.0	370.0	278.0	6974.0	523.0	392.0
0.4375-20	0.11872	4896.0	428.0	321.0	7567.0	662.0	496.0	10638.0	935.0	700.0
0.4375-14	0.10631	4385.0	384.0	288.0	6777.0	593.0	445.0	9567.0	837.0	628.0
0.500-20	0.15995	6598.0	660.0	495.0	10197.0	1020.0	764.0	14396.0	1440.0	1080.0
0.500-13	0.14190	5853.0	585.0	439.0	9046.0	904.0	678.0	12771.0	1277.0	958.0

Table 2 - Torque-Tension Relationships for Metric Property Classes

Major Diameter and Thread Pitch	Stress Area mm <sup>2</sup>	Class 4.6 Clamp Load kN	Class 4.6 Torque Dry k=0.2 N-m	Class 4.6 Torque Lub k=0.15 N-m	Class 4.8 Clamp Load kN	Class 4.8 Torque Dry k=0.2 N-m	Class 4.8 Torque Lub k=0.15 N-m	Class 5.8 Clamp Load kN	Class 5.8 Torque Dry k=0.2 N-m	Class 5.8 Torque Lub k=0.15 N-m
3.0x0.5	5.03	.085	0.50	0.40	1.17	0.70	0.50	.	.	.
3.5x0.6	6.78	1.14	0.80	0.60	1.58	1.10	0.80	.	.	.
4.0x0.7	8.78	1.14	1.20	0.90	2.04	1.60	1.20	.	.	.
5.0x0.8	14.2	2.40	2.40	1.80	3.30	3.30	2.50	4.05	4.00	3.00
6.0x1.0	20.10	3.40	4.00	3.00	4.67	5.66	4.20	5.73	6.90	5.20
8.0x1.25	36.60	6.18	9.90	7.40	8.51	13.60	10.20	10.40	16.70	12.50
10.0x1.50	58.00	9.79	19.60	14.70	13.48	27.00	20.00	16.50	33.10	24.80
12.0x1.75	84.30	14.22	34.10	25.60	19.60	47.00	35.00	24.00	58.00	43.00
Tensile Strength		400 MPa			420 MPa			520 MPa		
Proof Load Stress		224 MPa			310 MPa			380 MPa		
Major Diameter and Thread	Stress Area mm <sup>2</sup>	Class 8.8 Clamp	Class 8.8 Torque Dry	Class 8.8 Torque Lub	Class 9.8 Clamp	Class 9.8 Torque Dry	Class 9.8 Torque Lub	Class 10.9 Clamp	Class 10.9 Torque Dry	Class 10.9 Torque Lub k=0.15

Pitch		Load kN	k=0.2 N-m	k=0.15 N-m	Load kN	k=0.2 N-m	k=0.15 N-m	Load kN	k=0.2 N-m	N-m
3.0x0.5	5.03	.	.	.	.	.	.	.	.	.
3.5x0.6	6.78	.	.	.	.	.	.	.	.	.
4.0x0.7	8.78	.	.	.	.	.	.	.	.	.
5.0x0.8	14.20	.	.	.	.	.	.	.	.	.
6.0x1.0	20.10	.	.	.	.	.	.	.	.	.
8.0x1.25	36.60	16.50	26.40	19.80	17.80	28.50	21.40	22.80	36.50	27.30
10.0x1.50	58.00	26.10	52.20	39.20	28.30	56.60	42.40	36.10	72.20	54.20
12.0x1.75	84.30	37.90	91.00	68.00	41.10	99.00	74.00	52.50	126.00	94.00
Tensile Strength	830 MPa			900 Pa			1040 Pa			
Proof Load Stress	600 MPa			650 Pa			830 Pa			

**NOTE:** The stress area of threaded series not included in Table 2 may be computed from the equation:  
 $A_s = 0.7854 (D - 0.9382P)^2$  WHERE:  $A_s$ =Stress area in mm<sup>2</sup> D=Diameter in mm P=Pitch in mm

**CAUTION:** The previously listed torque and resulting tension are provided as an advisory guide. Individual application discretion is recommended. The content, has been presented as accurately as possible, but responsibility for its application lies with the user.