



Tension forces and tension moments.

Thread coefficient of friction, μ	Tension forces and moments F_{Sp} (N)			Friction	Thread coefficient of friction, μ_K	Moments M_{Sp} (Nm)		
	8.8	10.9	12.9			8.8	10.9	12.9
0.10	4250	5900	7100	M 4	0.10	2.6	3.7	4.4
0.14	3900	5500	6600		0.14	3.1	4.4	5.2
0.16	3750	5300	6300		0.16	3.3	4.6	5.6
0.10	6900	9700	11700	M 5	0.10	5.3	7.5	8.9
0.14	6400	9000	10800		0.14	6.2	8.7	10.5
0.16	6100	8600	10300		0.16	6.7	9.4	11.3
0.10	9700	13700	16400	M 6	0.10	8.9	12.5	15
0.14	9000	12700	15200		0.14	10.5	15	17.5
0.16	8600	12100	14600		0.16	11.2	16	19
0.10	14400	20200	24200	M 7	0.10	13	19	23
0.14	13200	18500	22200		0.14	16	23	28
0.16	12600	17800	21300		0.16	18	25	30
0.10	17900	25000	30000	M 8	0.10	21.5	30	36
0.14	16500	23800	28000		0.14	25	36	43
0.16	15900	22300	27000		0.16	27	38	46
0.10	28500	40000	48000	M 10	0.10	42	60	72
0.14	26500	37000	44500		0.14	50	70	84
0.16	25500	35500	42500		0.16	53	75	90
0.10	41500	58000	70000	M 12	0.10	74	104	124
0.14	38500	54000	65000		0.14	86	121	145
0.16	37000	52000	62000		0.16	93	130	155
0.10	57000	80000	96000	M 14	0.10	117	165	195
0.14	53000	74000	89000		0.14	135	195	230
0.16	50000	71000	85000		0.16	145	205	250
0.10	78000	110000	132000	M 16	0.10	180	260	310
0.14	73000	102000	123000		0.14	215	300	360
0.16	70000	98000	118000		0.16	230	320	390
0.10	95000	134000	160000	M 18	0.10	250	350	420
0.14	88000	124000	148000		0.14	290	410	490
0.16	84000	119000	142000		0.16	310	440	530
0.10	122000	172000	207000	M 20	0.10	350	500	600
0.14	113000	160000	192000		0.14	410	580	700
0.16	109000	153000	184000		0.16	440	630	750
0.10	153000	215000	260000	M 22	0.10	480	680	810
0.14	142000	199000	239000		0.14	560	790	950
0.16	136000	191000	230000		0.16	600	850	1020
0.10	176000	248000	300000	M 24	0.10	610	860	1030
0.14	164000	230000	275000		0.14	710	1000	1200
0.16	157000	221000	265000		0.16	770	1080	1300
0.10	232000	325000	390000	M 27	0.10	890	1250	1500
0.14	215000	300000	365000		0.14	1050	1450	1750
0.16	206000	290000	350000		0.16	1130	1600	1900
0.10	280000	395000	475000	M 30	0.10	1210	1700	2050
0.14	260000	370000	440000		0.14	1400	2000	2400
0.16	250000	355000	425000		0.16	1550	2150	2600

The values given in the table for tension force " F_{sp} " and tension moment " M_{sp} " apply to standard metric thread as per DIN 13 and head seats as per DIN 912, 931-934, 6912, 7984, 7990.

The indicated tension forces F_{sp} give a 90% utilisation of the yield point $\sigma 0,2$ (DIN 267, Sh. 3) depending on the relative head coefficient of friction.

The tension force table shows which screw and what quality should be used together

with what type of thread to provide the necessary fitting force F_M ($F_{sp} \geq F_M$).

The tension moments M_{sp} are calculated from the tension forces F_{sp} , assuming $\mu = \mu_m = \mu_{tot}$.

The tension moment M_{sp} for a 90% yield point utilisation for a screw, the dimensions and quality of which are given, is determined according to the table on the right in dependence of the occurring head friction (μ_m) without taking into consideration

the differing thread friction.

To gain the nominal torque to be applied, subtract half of the tolerance of the used torque wrench from the obtained tension moment M_{sp} .

The table value calculations and instructions for their application comply with Guideline 2230 of VDI (Society of German Engineers).