



for your total fastening requirements in all materials

RECOMMENDED MAXIMUM BOLT LOADS AND TORQUE VALUES (METRIC COARSE THREADS)

	4.6		5.6		6.8		8.8		10.9		12.9	
mm	Newtons	N.m	Newtons	N.m	Newtons	N.m	Newtons	N.m	Newtons	N.m	Newtons	N.m
5	2,059	2	2,736	3	5,286	5	6,257	6	8,806	9	10,591	10
6	2,903	3	3,864	5	7,453	9	8,836	10	12,405	15	14,906	18
8	5,315	8	7,090	11	13,680	22	16,230	26	22,751	35	27,360	42
10	8,473	17	11,278	22	21,771	42	25,791	50	36,284	71	43,541	85
12	12,356	28	16,475	38	31,773	74	37,657	87	52,956	123	63,547	147
16	23,340	70	31,087	93	60,016	179	71,196	211	100,027	299	120,131	358
20	36,481	135	48,641	180	93,749	384	111,305	412	156,415	579	187,796	696
24	52,563	320	70,019	309	135,331	598	160,338	711	225,552	1,000	270,662	1,196
30	84,043	466	112,286	623	215,745	1,206	255,952	1,422	359,902	2,010	432,471	2,403
36	123,073	814	164,261	1,089	316,753	2,099	374,612	2,481	527,595	3,491	632,526	4,197
42	169,164	1,304	225,552	1,746	435,413	3,364	515,827	3,991	725,688	5,609	870,826	6,727

Strength Grades For Steel Bolts, Screws, Studs and Nuts

The strength of standard ISO metric steel bolts, screws, studs and nuts is readily identified by means of a numerical code.

Strength designation for steel bolts, screws and studs

The code is comprised of two numbers separated by a dot. This dot is not a decimal marker, but is merely a means of separating the two parts of the code.

The number to the left of the dot when multiplied by 100 provides an indication of the ULTIMATE STRENGTH in Mega Pascals while the number to the right when multiplied by 10 times the preceding number gives the YIELD STRENGTH (Mega Pascals - MPa) or STRESS at 0.2% PERMANENT SET (MPa) depending on the strength grade; eg.8.8

Ultimate Strength

8 x 100 = 800 MPa

Yield Strength or Stress at 0,2%

Permanent Set

8 x 8 x 10 = 640 MPa

Strength designation for nuts

The corresponding code for nuts is a single number and is derived from the left hand number of the Strength Grade of the bolt, screw and stud. This number when multiplied by 100 indicates the PROOF LOAD STRESS of the nut in MPa. Thus, for the bolt of strength grade 8.8 in the above example a nut of strength grade 8 is required. This nut will have a PROOF LOAD STRESS of

8 x 100 = 800 MPa

In practice only standard threaded fasteners in the high tensile strength grades, i.e. strength grade 8.8 and above are required to be marked with the appropriate code.

STRENGTH GRADE DESIGNATION MARKINGS OF BOLTS, SCREWS AND STUDS

Strength Grade	3.5	4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9
Marking	3.6	4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9

STRENGTH GRADE DESIGNATION OF STEEL NUTS

Strength Grade	4	5	6	8	10	12
Proof load stress, MPa	400	500	600	800	1000	1200

STEEL BOLT/SCREW/STUDS AND NUT COMBINATIONS

Grade* of bolt	3.6	4.6	4.8	5.6	(5.8)	(6.6)	6.8	8.8	10.9	12.9	(14.9)
Recommended grade of nut*	4	4	4	5	5	6	6	8	10	12	14

NOTE: * Higher grade nuts may be used on lower grade bolts.