

Tightening Torques

iso metric thread



**Dutch Industrial
FASTENERS**

Standardized bolts		Maximum tightening torques corresponding to 85% of the bolt yield strength, for a friction coefficient $\mu = 0,15$ (coeff. K = efficiency coefficient: 0,20). Computations based on FDE 25030 standard.																	
Nominal \varnothing	Pitch	4.6		4.8		5.6		5.8		6.8		8.8		A193 B7 - A320 L7 A193 B16 9.8		10.9		12.9	
		Rm: 400N/ mm ² Re: 240N/ mm ²		Rm: 400N/ mm ² Re: 340N/ mm ²		Rm: 500N/ mm ² Re: 300N/ mm ²		Rm: 500N/ mm ² Re: 420N/ mm ²		Rm: 600N/ mm ² Re: 480N/ mm ²		Rm: 800N/ mm ² Re: 640N/ mm ²		Rm: 900N/ mm ² Re: 720N/ mm ²		Rm:1000N/mm ² Re: 940N/ mm ²		Rm:1200N/mm ² Re: 1140N/mm ²	
		Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N
M6	1	3.7	3113	5.2	4410	4.6	3891	6.4	5448	7.3	6226	9.7	8302	11	9028	14.3	12194	16.7	14269
M8	1.25	9.2	5716	13	8097	11.5	7145	16.1	10003	18.3	11432	24.5	15242	27.5	17142	35.9	22388	42	26198
M10	1.5	18.2	9103	25.7	12896	22.7	11379	31.8	15930	36.3	18206	48.4	24275	55	27307	71	35655	83	41724
M12	1.75	31.4	13725	44.4	18806	39.2	16594	54.9	23231	63	26550	84	35401	94	39827	123	51995	144	60845
M14	2	50	18231	71	25828	63	22789	88	31905	100	36463	133	48618	150	54559	196	71408	229	83563
M16	2	78	25108	110.9	35569	98	31385	137	43939	156	50216	209	66955	235	75408	307	98340	359	115079
M18	2.5	107	30499	152	43207	134	38123	188	53373	214	60998	286	81330	322	91342	420	119454	492	130787
M20	2.5	152	39231	216	55578	190	49039	266	68655	304	78463	406	104617	457	117732	596	153657	698	179811
M22	2.5	209	49061	297	69503	262	61326	366	85857	419	98123	588	130830	628	147034	820	192157	960	224865
M24	3	262	56493	371	80032	328	70616	459	98863	524	112986	699	150649	787	169593	1027	221266	1202	258928
M27	3	389	74434	551	105488	486	93042	681	130259	778	148868	1038	198491	1168	223135	1524	291534	1784	341157
M30	3.5	528	90436	748	128118	660	113045	924	158263	1056	180872	1408	241163	1585	271380	2069	354209	2421	414500
M33	3.5	717	112807	1017	159810	897	141009	1256	197412	1436	225614	1914	300819	2153	338496	2811	441828	3290	517033
M36	4	921	132327	1304	187464	1151	165409	1612	231573	1842	264655	2456	352873	2763	396991	3607	518282	4221	606501
M39	4	1196	159128	1695	225432	1496	198910	2094	278474	2393	318257	3191	424342	3590	477373	4686	623253	5484	729339
M42	4.5	1474	182038	2088	257887	1843	227548	2580	318567	2948	364076	3931	485435	4422	546114	5773	712983	6756	834342
M45	4.5	1847	213357	2617	302256	2309	266697	3232	373375	3694	426715	4925	568953	5541	640072	7234	835650	8465	977888
M48	5	2230	230893	3159	339849	2788	299867	3903	419813	4461	479787	5948	639716	6691	719680	8736	939582	10222	1099511
M52	5	2872	287909	4069	407871	3590	359886	5027	503841	5745	575818	7661	767757	8618	863727	11251	1127644	13166	1319583
M56	5.5	3578	332395	5069	470892	4473	415493	6262	581690	7157	664789	9543	886385	10735	997184	14016	1301879	16401	1523475
M60	5.5	4442	388266	6294	550044	5553	485333	7775	679466	8885	776532	11847	1035376	13328	1164798	17400	1520709	23062	1779553
M64	6	5347	439205	7575	622207	6684	549006	9358	768609	10694	878410	14259	1171213	16041	1317615	20943	1720220	24508/	2013023
M68	6	6470	503456	9166	713230	8088	629321	11323	881049	12940	1006913	17253	1342550	17792	1384505	25341	1971871	29655	2307509
M72	6	7742	572187	10969	810599	9678	715234	13550	1001328	15486	1144375	20647	1525833	21293	1573516	30326	2241968	35488	2622526
M76	6	9167	645181	12987	914007	11459	806477	16042	1129067	18334	1290363	24446	1720483	25210	1774249	35905	2526960	42016	2957081
M80	6	10759	722656	15243	1023762	13450	903319	18830	1264647	21520	1445311	28693	1927082	29589	1987303	42143	2830401	49316	3312171
M85	6	10401	825321	14745	1169205	13001	1031651	18202	1444311	29802	1650462	27736	2200856	28603	2269632	40737	3232507	47672	3782721
M90	6	15586	935141	22080	1324782	19483	1168926	27276	1636496	31172	1870281	41563	2403708	42862	2571637	61046	3662634	71437	4286061

* Gegevens afkomstig van Beck & Crespel

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Tightening Torques Stainless & ASTM Steels

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Standardized bolts		Maximum tightening torques corresponding to 85% of the bolt yield strength, for a friction coefficient $\mu = 0,15$ (coeff. $K =$ efficiency coefficient: 0,20). Computations based on FDE 25030 standard.											
Nominal \varnothing	Pitch	A 193 B8 CL1 A 193 B8M CL1		A 193 B8 CL2		A 193 B8M CL2		A.2 – A.4 CL 70		A.2 – A.4 CL 80		A 453 GR 660	
		Rm: 515N/ mm ² Re: 205N/ mm ²		Rm: selon A193 Re: selon A193		Rm: selon A193 Re: selon A193		Rm: 700N/ mm ² Re: 450N/ mm ²		Rm: 800N/ mm ² Re: 600N/ mm ²		Rm: 895N/ mm ² Re: 585N/ mm ²	
		Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N
M6	1	2.6	2117	8.6	7125	8.3	6847	5.6	4647	7.5	6195	7.3	6041
M8	1.25	6.5	4019	21.7	13529	20.9	13039	14.2	8823	18.9	11764	18.4	11470
M10	1.5	12.8	6403	43	21551	41.5	20770	28	14055	37.4	18740	36.5	18272
M12	1.75	22.1	9339	74	31342	72	30293	48	20499	65	27332	63	26649
M14	2	35.2	12793	118	43059	114	41499	77	28082	103	37443	100	36507
M16	2	55	17681	185	59513	179	57357	121	38813	161	51750	157	50457
M18	2.5	75	21418	254	72089	245	69477	166	47014	221	62686	215	61119
M20	2.5	107	27605	360	92916	347	89549	235	60597	313	80796	306	78777
M22	2.5	147	34476	395	92497	395	92497	323	75679			420	98383
M24	3	184	39766	495	106689	495	106689	405	87291			526	113478
M27	3	274	52320	601	114849	601	114849					781	149303
M30	3.5	371	63632	816	139681	816	139681					1060	181585
M33	3.5	505	79369	850	133573	850	133573					1441	226493
M36	4	648	93085	1090	156656	1090	156656					1849	265633
M39	4	842	111933	1416	188375	1416	188375					2402	319418
M42	4.5	1037	128051									2959	365415
M45	4.5	1299	150082									3708	428284
M48	5	1569	168749									4477	481551
M52	5	2021	202524									5766	577935
M56	5.5	2517	233817									7183	667233
M60	5.5	3125	273119									9818	779387
M64	6	3761	308951									10734	881640
M68	6	4551	354147									12988	1010615
M72	6	5446	402495									15543	1148582
M76	6	6448	453841									18402	1295107
M80	6	7569	508339									21599	1450625
M85	6	7316	580557									20879	1656710
M90	6	10964	657807									31287	1877157

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Standardized bolts		Maximum tightening torques corresponding to 85% of the bolt yield strength, for a friction coefficient $\mu = 0,15$ (coeff. K = efficiency coefficient: 0,20). Computations based on FDE 25030 standard.											
Nominal \varnothing	Thread nr per inch	A 307 GR B		A 325 type 1		A 193 B7		A 320 L7		A 193 B16		A 354 GR BD	
		Rm: 550N/ mm ² Re: 300N/ mm ²		Rm: 800N/ mm ² Re: 640N/ mm ²		Rm: 900N/ mm ² Re: 720N/ mm ²		Rm: 900N/ mm ² Re: 720N/ mm ²		Rm: 900N/ mm ² Re: 720N/ mm ²		Rm: zie A354 Re: zie A354	
		Cs Nm	Fo maxi N	Cs Nm	Fo maxi N	Cs Nm	Fo maxi N	Cs Nm	Fo maxi N	Cs Nm	Fo maxi N	Cs Nm	Fo maxi N
¼	20UNC	5.6	3878	11.9	8274	13.3	9308	13.3	9308	13.3	9308	16.6	11583
5/16	18UNC	11.1	6516	23.8	13900	26.7	15638	26.7	15638	26.7	15638	33.3	19460
3/8	16UNC	20.1	9726	42.8	20748	48.1	23341	48.1	23341	48.1	23341	60	29047
7/16	14UNC	32.6	13378	69	28540	78	32107	78	32107	78	32107	97	39956
½	13UNC	49.1	17997	105	34737	118	43192	118	43192	118	43192	146	53751
9/16	12UNC	69	23185	148	49461	167	55644	167	55644	167	55644	208	69246
5/8	11UNC	96	28857	205	61561	231	69256	231	69256	231	69256	287	86186
3/4	10UNC	169	43076	361	91895	406	103382	406	103382	406	103382	506	128653
7/8	9UNC	271	59829	579	127635	651	143590	651	143590	651	143590	810	178690
1	8UNC	404	78600	862	167680	970	188640	970	188640	970	188640	1207	234752
1 1/8	8UN	592	103566	1263	220942	1421	248559	1421	248559	1421	248559	1769	309318
1 1/4	8UN	831	132109	1773	281833	1994	317062	1994	317062	1994	317062	2482	394566
1 3/8	8UN	1125	163975	2401	349814	2701	393541	2701	393541	2701	393541	3361	489740
1 1/2	8UN	1481	199422	3161	425433	3556	478613	3556	478613	3556	478613	4425	595607
1 5/8	8UN	1912	238722			4589	572932	4589	572932	4589	572932	5710	712982
1 3/4	8UN	2409	280353			5781	672847	5781	672847	5781	672847	7194	837321
1 7/8	8UN	2983	325921			7160	782211	7160	782211	7160	782211	8910	973418
2	8UN	3649	375443			8758	901063	8758	901063	8758	901063	10898	1121323
2 1/4	8UN	5262	484521			12629	1162850	12629	1162850	12629	1162850	15716	1447103
2 1/2	8UN	7286	606649			17486	1455957	17486	1455957	17486	1455957	21761	1811858
2 3/4	8UN	9792	672876			21452	1636150	21452	1636150	21452	1636150	25883	1965859
3	8UN	12782	893800			28120	1966361	28120	1966361	28120	1966361	33787	2362613
3 1/4	8UN	16356	1057882			35984	2327341	35984	2327341	35984	2327341	43235	2796336
3 1/2	8UN	22017	1327002			48437	2919405	48437	2919405	48437	2919405	58197	3507709
3 3/4	8UN	25298	1427045			55657	3139498	55657	3139498	55657	3139498	66872	3772155
4	8UN	30680	1632121			64496	3590667	64496	3590667	64496	3590667	81097	4314240

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		Rm: 515N/ mm ² Re: 205N/ mm ²		Rm: selon A193 Re: selon A193		Rm: selon A193 Re: selon A193		Rm: 700N/ mm ² Re: 450N/ mm ²		Rm: 800N/ mm ² Re: 600N/ mm ²		Rm: 895N/ mm ² Re: 585N/ mm ²	
		Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N	Cs N m	Fo maxi N
¼	20UNC	3.1	2182	10.5	7346	10.1	7080	6.9	4791	9.2	638	9	6281
5/16	18UNC	6.3	3667	21.1	12342	20.3	11894	13.8	8049	18.4	10732	18	10553
3/8	16UNC	11.3	5473	38	18421	36.6	17754	24.8	12014	33	16019	32	15752
7/16	14UNC	18.3	7528	62	25340	59	24421	40.3	16526	54	22034	53	21667
½	13UNC	27.6	10128	93	34088	89	32853	60	22231	81	29642	79	29148
9/16	12UNC	39.1	13047	132	43915	127	42324	86	28640	114	38187	113	37551
5/8	11UNC	54	16239	182	54658	176	52678	119	35647	158	47529	156	46737
3/4	10UNC	95	24241	321	81591	309	78634	209	53211	279	70948	274	69766
7/8	9UNC	153	33669	410	90330	410	90330	335	73907			439	96900
1	8UNC	227	44232	610	118670	610	118670	499	97094			655	127301
1 1/8	8UN	333	58282	732	127935	732	127935					959	167737
1 1/4	8UN	468	74344	1026	163194	1026	163194					1346	213965
1 3/8	8UN	633	92276	1066	155294	1066	155294					1822	265576
1 1/2	8UN	834	112224	1403	188864	1403	188864					2399	322985
1 5/8	8UN	1076	134339									3096	386636
1 3/4	8UN	1355	157767									3901	454062
1 7/8	8UN	1679	183411									4832	527865
2	8UN	2054	211279									5910	608070
2 1/4	8UN	2961	272662									8523	784734
2 1/2	8UN	4100	341389									11800	982533
2 3/4	8UN	5510	418516									15859	1204510
3	8UN	7193	502982									20702	1447606
3 1/4	8UN	9204	595318									26491	1713355
3 1/2	8UN	12390	746764									3568	2149223
3 3/4	8UN	14237	803062									40974	2311253
4	8UN	17265	918468									49689	2643396

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