Phones: (800)638-1830 (410)358-3130 FAXes: (800) USA-9-FAX =[800-872-9329] (410)358-3142

MARYLAND METRICS

TORQUE VALUES

The following Tables of Maximum Tightening Torques for both Metric, USA & Imperial threads are provided for general guidance in the absence of specific values, but it cannot be over-emphasized that where the recommended torque loads are available, they should be strictly adhered to.

Maximum recommended tightening torque

Imperial threads

Torque figures in (lbf)in

Nominal thread dia	Quality (lbf in) 'A'	'P'	'R'	'S'	'T'	'X'
No. 2	1·8	2·7	4·1	4·6	5·3	7·6
No. 3	2·8	4·1	6·3	7·0	8·1	11·6
No. 4	3·9	5·7	8·9	9·9	11·5	16·4
No. 5	5·5	8·1	12·5	14·0	16·2	23·1
No. 6	7·5	11·0	17·0	19·0	22·0	31·5
No. 8	12·9	18·9	29·2	32·6	37·8	54·0
No. 10	20·3	29·8	46·1	51·5	59·6	85·4
No. 12	29·9	43·8	67·7	75·6	87·5	125·0

British BA series

Nominal thread dia	Quality (lbf in) 'A'	'P'	'R'	'S'	'T'	'X'
8 BA	1·9	2·8	4·4	4·9	5·6	8·1
7 BA	2·7	4·0	6·2	6·9	8·0	11·5
6 BA	3·9	5·6	8·7	10·0	11·3	16·1
5 BA	5·9	8·6	13·4	14·9	17·3	24·8
4 BA	8·4	12·3	19·0	21·3	24·6	35·3
3 BA	12·5	18·3	28·2	31·6	36·6	52·4
2 BA	19·1	28·0	43·3	48·4	56·0	80·2
1 BA	27·4	40·2	62·1	69·4	80·0	115·0
0 BA	40·2	59·0	91·1	101·9	118·0	169·0

Useful Conversions

lbf ft × 1·356 = Nm (Newton metres)
lbf ft × 0·138 = Kgf m (Kilogram Force Metres) or Kpm (Kilopond Metres)

lbf ft × 12	=	lbf in			
lbf in × 0·113	=	Nm	Nm × 0·102	=	Kgf m
lbf in × 0·0115	=	Kgf m	Kgf m × 7·233	=	lbf ft
Nm × 0·7376	=	lbf ft	Kgf m × 86·8	=	lbf in
Nm × 8·851	=	lbf in	Kgf m × 9·807	=	Nm

Steel Qualities

ISO Material Grades

In the ISO recommendation, the first figure in the grade* number is the ultimate tensile strength in kgf/mm² divided by 10, and the second figure is the proportion of yield to ultimate tensile strength, so that multiplying the two figures together and then multiplying by 10, gives the minimum yield stress.

Example
Material Grade 8·8
Ultimate Tensile Strength of Material=80 kgf/mm²
Minimum Yield Stress of Material=8×0·8×10=64 kgf/mm²

Strength class comparison(approximate).

Metric (property class)	British(quality)	U.S.A.(grade)
6/6.6/6.8/6.9	P	3
8/8.8	R & S	5&A-449
9/9.8	T	6
10/10.9	V	8&A-354-BD
12/12.9	X	-

Maximum recommended tightening torque – Metric threads

Standard series – Coarse & Fine
All torque figures in Nm (Newton metres)

Nominal Thread Dia mm	4·6 property class Coarse	Fine	4·8 property class Coarse	Fine	5·6 property class Coarse	Fine	5·8 property class Coarse	Fine	6·6 property class Coarse	Fine
	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm
1·5	·08		10		·10		·13		11	
2	·16		·21		·19		·26		·23	
2·5	·32		·43		·40		·53		·48	
3	·57		·76		·71		·95		·85	
4	1·3		1·8		1·7		2·2		2·0	
5	2·7		3·6		3·3		4·5		4·0	
6	4·5		6·1		5·7		7·6		6·8	
7	7·6		10·2		9·5		12·7		11·4	
8	11	11·8	14·7	15·7	13·8	14·8	18·4	19·7	16·5	17·7
10	21·8	23	29·1	30·7	27·3	28·8	36·4	38·4	32·8	34·6
12	38·1	41·6	50·8	55·5	47·6	52	64	69	57	62
14	60·6	66	81	88	76	82	101	110	91	99
16	95	101	126	134	118	126	158	168	142	151
18	130	146	174	195	163	183	217	244	195	220
20	185	205	246	273	231	256	308	342	277	307
22	251	276	335	368	314	345	419	460	377	414
24	319	347	425	463	399	434	532	579	479	521
27	467	504	622	672	583	630	778	841	700	757

Maximum recommended tightening torque – Metric threads

Standard series – Coarse & Fine
All torque figures in Nm (Newton metres)

Nominal Thread Dia mm	8·8 property class Coarse	Fine	9·8 property class Coarse	Fine	10·9 property class Coarse	Fine	12·9 property class Coarse	Fine	14·9 property class Coarse	Fine
	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm
1·6	·20		·23		·29		34		·40	
2	·42		·47		·58		70		82	
2·5	·85		·96		1·2		1·44		1·7	
3	1·5		1·7		2·1		2·6		3·0	
4	3·5		4·0		5		6		7·0	
5	7·1		8·0		10		12		14	
6	12·1		13·6		17		20·4		23·8	
7	20·3		22·8		28·6		34·3		40·0	
8	29·4	31·5	33·1	35·4	41·3	44·3	49·6	53·2	57·9	62
10	58·3	61	66	69	82	86	98	104	115	121
12	102	111	114	125	143	156	171	187	200	219
14	162	176	182	198	227	247	273	297	318	346
16	252	268	284	302	355	377	426	453	497	528
18	347	391	391	439	488	549	586	659	683	769
20	492	546	554	615	693	768	830	922	969	1076
22	670	736	753	828	941	1035	1130	1241	1318	1448
24	851	926	957	1041	1196	1301	1436	1562	1675	1822
27	1245	1344	1401	1513	1750	1891	2100	2269	2450	2648

Maximum recommended tightening torques – Imperial threads

UNC, UNF, BSF & BSW
All torque figures in lbf ft

Nominal Thread Dia	'A' Quality BSW	BSF	UNC	UNF	'P' Quality BSW	BSF	UNC	UNF	'R' Quality BSW	BSF	UNC	UNF
	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft
1/4	3·6	4	3·6	4	5·3	5·9	5·3	6	8·2	9·1	8·2	9·3
5/16	7·4	7·9	7·4	8·2	11	12	11	12	17	18	17	19
3/8	13	14	13	15	19	21	19	22	30	32	30	34
7/16	21	23	21	23	31	33	31	34	48	51	48	53
1/2	31	34	32	36	46	50	47	53	70	77	73	82
9/16	46	50	46	52	68	73	68	76	104	113	105	117
5/8	64	68	64	72	93	100	94	106	144	154	145	164
3/4	113	118	114	126	166	173	167	185	256	268	256	286
7/8	181	191	183	201	266	280	269	295	411	433	415	456
1	272	288	274	299	400	422	402	438	617	652	621	678
1 1/8	387	411	389	434	567	602	570	637	876	931	881	984

Maximum recommended tightening torque – Imperial threads

UNC, UNF, BSF & BSW
All torque figures in lbf ft

Nominal Thread Dia	'S' Quality BSW	BSF	UNC	UNF	'T' Quality BSW	BSF	UNC	UNF	'X' Quality BSW	BSF	UNC	UNF
	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft	lbf ft
1/4	9·1	9·1	10	10	11	12	11	12	15	17	15	17
5/16	19	19	20	21	22	23	22	24	31	33	31	34
3/8	33	33	36	38	38	41	39	44	55	59	55	63
7/16	53	53	58	60	62	67	62	69	88	95	89	99
1/2	79	82	86	91	91	100	94	106	130	143	135	152
9/16	117	117	126	131	135	146	137	152	194	210	195	217
5/8	161	162	172	183	187	200	188	212	267	286	269	304
3/4	286	288	300	319	331	347	333	370	474	497	477	529
7/8	460	464	484	510	532	560	537	590	762	802	769	845
1	690	695	729	757	799	844	804	877	1144	1208	1152	1255
1 1/8	979	985	1041	1100	1134	1205	1140	1273	1624	1725	1632	1823

*grade may be also referred to as 'quality' or 'property class' in the charts on this page.

Mail to: P.O. BOX 261, OWINGS MILLS, MARYLAND 21117
Warehouse: 6119 OAKLEAF AVENUE, BALTIMORE, MARYLAND 21215