

BOLT LOAD (METRIC) (MATERIAL STANDARD 1.4913)

40% - 99% YIELD



Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

BOLT LOADS

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780		REQUIRED TORQUE (N-m)							
BOLT LOAD BASED ON			40									
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
												0.109
M20x2.5	30	245	76.38	167	153	191	214	229	240	306	458	167
M22x2.5	32	303	94.67	227	208	260	292	312	327	417	625	227
M24x3	36	353	109.99	288	264	330	370	396	414	528	792	288
M27x3	41	459	143.34	422	387	484	542	581	608	774	1,161	422
M30x3.5	46	561	174.91	572	525	656	735	787	824	1,049	1,574	572
M33x3.5	50	694	216.40	778	714	893	1,000	1,071	1,121	1,428	2,142	778
M36x4	55	817	254.83	1,000	917	1,147	1,284	1,376	1,440	1,835	2,752	1,000
M39x4	60	976	304.45	1,294	1,187	1,484	1,662	1,781	1,864	2,375	3,562	1,294
M42x4.5	65	1121	349.74	1,601	1,469	1,836	2,056	2,203	2,306	2,938	4,407	1,601
M45x4.5	70	1306	407.49	1,999	1,834	2,292	2,567	2,751	2,879	3,667	5,501	1,999
M48x5	75	1473	459.64	2,405	2,206	2,758	3,089	3,309	3,464	4,413	6,619	2,405
M52x5	80	1758	548.47	3,109	2,852	3,565	3,993	4,278	4,478	5,704	8,556	3,109
M56x5.5	85	2030	633.39	3,866	3,547	4,434	4,966	5,321	5,569	7,094	10,641	3,866
M60x5.5	90	2362	736.98	4,820	4,422	5,527	6,191	6,633	6,942	8,844	13,266	4,820
M64x6	95	2676	834.94	5,825	5,344	6,680	7,481	8,015	8,389	10,687	16,031	5,825
M68x6	100	3055	953.29	7,066	6,482	8,103	9,075	9,724	10,177	12,965	19,447	7,066
M72x6	105	3460	1,079.48	8,472	7,772	9,715	10,881	11,658	12,202	15,545	23,317	8,472
M76x6	110	3889	1,213.52	10,053	9,223	11,528	12,912	13,834	14,480	18,445	27,668	10,053
M80x6	115	4344	1,355.39	11,819	10,843	13,554	15,180	16,265	17,024	21,686	32,529	11,819
M90x6	130	5591	1,744.38	17,112	15,699	19,624	21,979	23,549	24,648	31,399	47,098	17,112
M100x6	145	6995	2,182.39	23,788	21,824	27,280	30,553	32,736	34,263	43,648	65,472	23,788
M110x6	155	8556	2,669.40	32,006	29,363	36,704	41,109	44,045	46,101	58,727	88,090	32,006
M125x6	180	11192	3,491.81	47,576	43,648	54,560	61,107	65,471	68,527	87,295	130,943	47,576

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			50	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
												0.109
M20x2.5	30	245	95.48	208	191	239	267	286	300	382	573	208
M22x2.5	32	303	118.33	284	260	325	364	390	409	521	781	284
M24x3	36	353	137.48	360	330	412	462	495	518	660	990	360
M27x3	41	459	179.18	527	484	605	677	726	760	968	1,451	527
M30x3.5	46	561	218.64	715	656	820	918	984	1,030	1,312	1,968	715
M33x3.5	50	694	270.50	973	893	1,116	1,250	1,339	1,401	1,785	2,678	973
M36x4	55	817	318.54	1,250	1,147	1,433	1,605	1,720	1,800	2,293	3,440	1,250
M39x4	60	976	380.56	1,618	1,484	1,855	2,078	2,226	2,330	2,968	4,453	1,618
M42x4.5	65	1121	437.18	2,001	1,836	2,295	2,571	2,754	2,883	3,672	5,508	2,001
M45x4.5	70	1306	509.36	2,498	2,292	2,865	3,209	3,438	3,599	4,584	6,876	2,498
M48x5	75	1473	574.56	3,006	2,758	3,447	3,861	4,137	4,330	5,516	8,274	3,006
M52x5	80	1758	685.59	3,886	3,565	4,456	4,991	5,348	5,597	7,130	10,695	3,886
M56x5.5	85	2030	791.74	4,833	4,434	5,542	6,207	6,651	6,961	8,868	13,301	4,833
M60x5.5	90	2362	921.23	6,025	5,527	6,909	7,738	8,291	8,678	11,055	16,582	6,025
M64x6	95	2676	1,043.67	7,281	6,680	8,349	9,351	10,019	10,487	13,359	20,039	7,281
M68x6	100	3055	1,191.61	8,832	8,103	10,129	11,344	12,154	12,722	16,206	24,309	8,832
M72x6	105	3460	1,349.35	10,590	9,715	12,144	13,601	14,573	15,253	19,431	29,146	10,590
M76x6	110	3889	1,516.89	12,566	11,528	14,410	16,140	17,293	18,100	23,057	34,585	12,566
M80x6	115	4344	1,694.24	14,774	13,554	16,942	18,975	20,331	21,280	27,108	40,662	14,774
M90x6	130	5591	2,180.48	21,391	19,624	24,530	27,474	29,436	30,810	39,249	58,873	21,391
M100x6	145	6995	2,727.98	29,735	27,280	34,100	38,192	40,920	42,829	54,560	81,840	29,735
M110x6	155	8556	3,336.75	40,008	36,704	45,880	51,386	55,056	57,626	73,408	110,113	40,008
M125x6	180	11192	4,364.76	59,470	54,560	68,199	76,383	81,839	85,658	109,119	163,679	59,470

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			60	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
												0.109
M20x2.5	30	245	114.57	250	229	286	321	344	360	458	687	250
M22x2.5	32	303	142.00	341	312	390	437	469	490	625	937	341
M24x3	36	353	164.98	432	396	495	554	594	622	792	1,188	432
M27x3	41	459	215.01	633	581	726	813	871	911	1,161	1,742	633
M30x3.5	46	561	262.37	858	787	984	1,102	1,181	1,236	1,574	2,361	858
M33x3.5	50	694	324.60	1,168	1,071	1,339	1,500	1,607	1,682	2,142	3,214	1,168
M36x4	55	817	382.25	1,500	1,376	1,720	1,927	2,064	2,160	2,752	4,128	1,500
M39x4	60	976	456.67	1,941	1,781	2,226	2,493	2,672	2,796	3,562	5,343	1,941
M42x4.5	65	1121	524.61	2,402	2,203	2,754	3,085	3,305	3,459	4,407	6,610	2,402
M45x4.5	70	1306	611.24	2,998	2,751	3,438	3,851	4,126	4,318	5,501	8,252	2,998
M48x5	75	1473	689.47	3,607	3,309	4,137	4,633	4,964	5,196	6,619	9,928	3,607
M52x5	80	1758	822.70	4,663	4,278	5,348	5,989	6,417	6,717	8,556	12,834	4,663
M56x5.5	85	2030	950.09	5,799	5,321	6,651	7,449	7,981	8,353	10,641	15,962	5,799
M60x5.5	90	2362	1,105.47	7,230	6,633	8,291	9,286	9,949	10,414	13,266	19,898	7,230
M64x6	95	2676	1,252.41	8,737	8,015	10,019	11,222	12,023	12,584	16,031	24,046	8,737
M68x6	100	3055	1,429.93	10,599	9,724	12,154	13,613	14,585	15,266	19,447	29,171	10,599
M72x6	105	3460	1,619.22	12,708	11,658	14,573	16,322	17,488	18,304	23,317	34,975	12,708
M76x6	110	3889	1,820.27	15,079	13,834	17,293	19,368	20,751	21,719	27,668	41,502	15,079
M80x6	115	4344	2,033.09	17,729	16,265	20,331	22,771	24,397	25,536	32,529	48,794	17,729
M90x6	130	5591	2,616.58	25,669	23,549	29,436	32,969	35,324	36,972	47,098	70,648	25,669
M100x6	145	6995	3,273.58	35,682	32,736	40,920	45,830	49,104	51,395	65,472	98,207	35,682
M110x6	155	8556	4,004.10	48,009	44,045	55,056	61,663	66,068	69,151	88,090	132,135	48,009
M125x6	180	11192	5,237.71	71,364	65,471	81,839	91,660	98,207	102,790	130,943	196,414	71,364

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			70	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
												0.109
M20x2.5	30	245	133.67	291	267	334	374	401	420	535	802	291
M22x2.5	32	303	165.66	397	364	456	510	547	572	729	1,093	397
M24x3	36	353	192.48	504	462	577	647	693	725	924	1,386	504
M27x3	41	459	250.85	738	677	847	948	1,016	1,063	1,355	2,032	738
M30x3.5	46	561	306.10	1,001	918	1,148	1,286	1,377	1,442	1,837	2,755	1,001
M33x3.5	50	694	378.70	1,362	1,250	1,562	1,750	1,875	1,962	2,499	3,749	1,362
M36x4	55	817	445.95	1,750	1,605	2,007	2,248	2,408	2,521	3,211	4,816	1,750
M39x4	60	976	532.79	2,265	2,078	2,597	2,909	3,117	3,262	4,156	6,234	2,265
M42x4.5	65	1121	612.05	2,802	2,571	3,213	3,599	3,856	4,036	5,141	7,712	2,802
M45x4.5	70	1306	713.11	3,498	3,209	4,011	4,493	4,813	5,038	6,418	9,627	3,498
M48x5	75	1473	804.38	4,209	3,861	4,826	5,405	5,792	6,062	7,722	11,583	4,209
M52x5	80	1758	959.82	5,440	4,991	6,239	6,987	7,487	7,836	9,982	14,973	5,440
M56x5.5	85	2030	1,108.44	6,766	6,207	7,759	8,690	9,311	9,745	12,415	18,622	6,766
M60x5.5	90	2362	1,289.72	8,435	7,738	9,673	10,834	11,607	12,149	15,477	23,215	8,435
M64x6	95	2676	1,461.14	10,193	9,351	11,689	13,092	14,027	14,682	18,703	28,054	10,193
M68x6	100	3055	1,668.26	12,365	11,344	14,180	15,882	17,016	17,810	22,688	34,032	12,365
M72x6	105	3460	1,889.09	14,826	13,601	17,002	19,042	20,402	21,354	27,203	40,804	14,826
M76x6	110	3889	2,123.65	17,592	16,140	20,175	22,596	24,210	25,339	32,280	48,419	17,592
M80x6	115	4344	2,371.93	20,683	18,975	23,719	26,566	28,463	29,791	37,951	56,926	20,683
M90x6	130	5591	3,052.67	29,947	27,474	34,343	38,464	41,211	43,134	54,948	82,422	29,947
M100x6	145	6995	3,819.18	41,629	38,192	47,740	53,468	57,288	59,961	76,384	114,575	41,629
M110x6	155	8556	4,671.45	56,011	51,386	64,232	71,940	77,079	80,676	102,772	154,158	56,011
M125x6	180	11192	6,110.67	83,258	76,383	95,479	106,937	114,575	119,922	152,767	229,150	83,258

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			80	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
												0.109
M20x2.5	30	245	152.76	333	306	382	428	458	480	611	917	333
M22x2.5	32	303	189.33	454	417	521	583	625	654	833	1,250	454
M24x3	36	353	219.98	575	528	660	739	792	829	1,056	1,584	575
M27x3	41	459	286.68	844	774	968	1,084	1,161	1,215	1,548	2,322	844
M30x3.5	46	561	349.83	1,144	1,049	1,312	1,469	1,574	1,648	2,099	3,148	1,144
M33x3.5	50	694	432.80	1,557	1,428	1,785	2,000	2,142	2,242	2,856	4,285	1,557
M36x4	55	817	509.66	2,000	1,835	2,293	2,569	2,752	2,881	3,670	5,504	2,000
M39x4	60	976	608.90	2,588	2,375	2,968	3,325	3,562	3,728	4,749	7,124	2,588
M42x4.5	65	1121	699.48	3,202	2,938	3,672	4,113	4,407	4,612	5,876	8,813	3,202
M45x4.5	70	1306	814.98	3,997	3,667	4,584	5,134	5,501	5,758	7,335	11,002	3,997
M48x5	75	1473	919.29	4,810	4,413	5,516	6,178	6,619	6,928	8,825	13,238	4,810
M52x5	80	1758	1,096.94	6,217	5,704	7,130	7,986	8,556	8,955	11,408	17,112	6,217
M56x5.5	85	2030	1,266.79	7,732	7,094	8,868	9,932	10,641	11,138	14,188	21,282	7,732
M60x5.5	90	2362	1,473.96	9,640	8,844	11,055	12,381	13,266	13,885	17,688	26,531	9,640
M64x6	95	2676	1,669.88	11,649	10,687	13,359	14,962	16,031	16,779	21,374	32,062	11,649
M68x6	100	3055	1,906.58	14,132	12,965	16,206	18,151	19,447	20,355	25,929	38,894	14,132
M72x6	105	3460	2,158.96	16,944	15,545	19,431	21,762	23,317	24,405	31,089	46,634	16,944
M76x6	110	3889	2,427.03	20,106	18,445	23,057	25,824	27,668	28,959	36,891	55,336	20,106
M80x6	115	4344	2,710.78	23,638	21,686	27,108	30,361	32,529	34,047	43,372	65,059	23,638
M90x6	130	5591	3,488.77	34,225	31,399	39,249	43,958	47,098	49,296	62,798	94,197	34,225
M100x6	145	6995	4,364.77	47,576	43,648	54,560	61,107	65,472	68,527	87,295	130,943	47,576
M110x6	155	8556	5,338.80	64,012	58,727	73,408	82,217	88,090	92,201	117,454	176,180	64,012
M125x6	180	11192	6,983.62	95,152	87,295	109,119	122,213	130,943	137,053	174,590	261,886	95,152

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			90	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
M20x2.5	30	245	171.86	375	344	430	481	516	540	687	1,031	0.109
M22x2.5	32	303	213.00	511	469	586	656	703	736	937	1,406	511
M24x3	36	353	247.47	647	594	742	832	891	932	1,188	1,782	647
M27x3	41	459	322.52	949	871	1,089	1,219	1,306	1,367	1,742	2,612	949
M30x3.5	46	561	393.55	1,287	1,181	1,476	1,653	1,771	1,854	2,361	3,542	1,287
M33x3.5	50	694	486.90	1,751	1,607	2,008	2,249	2,410	2,523	3,214	4,820	1,751
M36x4	55	817	573.37	2,250	2,064	2,580	2,890	3,096	3,241	4,128	6,192	2,250
M39x4	60	976	685.01	2,912	2,672	3,339	3,740	4,007	4,194	5,343	8,015	2,912
M42x4.5	65	1121	786.92	3,603	3,305	4,131	4,627	4,958	5,189	6,610	9,915	3,603
M45x4.5	70	1306	916.86	4,497	4,126	5,157	5,776	6,189	6,478	8,252	12,378	4,497
M48x5	75	1473	1,034.20	5,411	4,964	6,205	6,950	7,446	7,794	9,928	14,892	5,411
M52x5	80	1758	1,234.05	6,995	6,417	8,021	8,984	9,626	10,075	12,834	19,251	6,995
M56x5.5	85	2030	1,425.14	8,699	7,981	9,976	11,173	11,971	12,530	15,962	23,942	8,699
M60x5.5	90	2362	1,658.21	10,845	9,949	12,437	13,929	14,924	15,620	19,898	29,848	10,845
M64x6	95	2676	1,878.61	13,105	12,023	15,029	16,832	18,035	18,876	24,046	36,069	13,105
M68x6	100	3055	2,144.90	15,898	14,585	18,232	20,419	21,878	22,899	29,171	43,756	15,898
M72x6	105	3460	2,428.83	19,061	17,488	21,860	24,483	26,231	27,456	34,975	52,463	19,061
M76x6	110	3889	2,730.41	22,619	20,751	25,939	29,052	31,127	32,579	41,502	62,253	22,619
M80x6	115	4344	3,049.63	26,593	24,397	30,496	34,156	36,596	38,303	48,794	73,191	26,593
M90x6	130	5591	3,924.86	38,503	35,324	44,155	49,453	52,986	55,458	70,648	105,971	38,503
M100x6	145	6995	4,910.37	53,523	49,104	61,380	68,745	73,656	77,093	98,207	147,311	53,523
M110x6	155	8556	6,006.15	72,014	66,068	82,585	92,495	99,101	103,726	132,135	198,203	72,014
M125x6	180	11192	7,856.57	107,046	98,207	122,759	137,490	147,311	154,185	196,414	294,621	107,046

TORQUE GUIDE FOR MATERIAL STANDARD 1.4913												
MINIMUM YIELD (Mpa)			780	REQUIRED TORQUE (N-m)								
BOLT LOAD BASED ON			99	PERCENT YIELD								
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoaDISC TS 801 MOLY K=.109	MOLY DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.300	CUSTOM (INSERT K)
M20x2.5	30	245	189.04	412	378	473	529	567	594	756	1,134	412
M22x2.5	32	303	234.30	562	515	644	722	773	809	1,031	1,546	562
M24x3	36	353	272.22	712	653	817	915	980	1,026	1,307	1,960	712
M27x3	41	459	354.77	1,044	958	1,197	1,341	1,437	1,504	1,916	2,874	1,044
M30x3.5	46	561	432.91	1,416	1,299	1,623	1,818	1,948	2,039	2,597	3,896	1,416
M33x3.5	50	694	535.59	1,927	1,767	2,209	2,474	2,651	2,775	3,535	5,302	1,927
M36x4	55	817	630.70	2,475	2,271	2,838	3,179	3,406	3,565	4,541	6,812	2,475
M39x4	60	976	753.51	3,203	2,939	3,673	4,114	4,408	4,614	5,877	8,816	3,203
M42x4.5	65	1121	865.61	3,963	3,636	4,544	5,090	5,453	5,708	7,271	10,907	3,963
M45x4.5	70	1306	1,008.54	4,947	4,538	5,673	6,354	6,808	7,125	9,077	13,615	4,947
M48x5	75	1473	1,137.62	5,952	5,461	6,826	7,645	8,191	8,573	10,921	16,382	5,952
M52x5	80	1758	1,357.46	7,694	7,059	8,823	9,882	10,588	11,082	14,118	21,176	7,694
M56x5.5	85	2030	1,567.65	9,569	8,779	10,974	12,290	13,168	13,783	17,558	26,337	9,569
M60x5.5	90	2362	1,824.03	11,929	10,944	13,680	15,322	16,416	17,182	21,888	32,832	11,929
M64x6	95	2676	2,066.47	14,416	13,225	16,532	18,516	19,838	20,764	26,451	39,676	14,416
M68x6	100	3055	2,359.39	17,488	16,044	20,055	22,461	24,066	25,189	32,088	48,132	17,488
M72x6	105	3460	2,671.72	20,968	19,236	24,045	26,931	28,855	30,201	38,473	57,709	20,968
M76x6	110	3889	3,003.45	24,881	22,826	28,533	31,957	34,239	35,837	45,652	68,479	24,881
M80x6	115	4344	3,354.59	29,252	26,837	33,546	37,571	40,255	42,134	53,673	80,510	29,252
M90x6	130	5591	4,317.35	42,353	38,856	48,570	54,399	58,284	61,004	77,712	116,568	42,353
M100x6	145	6995	5,401.41	58,875	54,014	67,518	75,620	81,021	84,802	108,028	162,042	58,875
M110x6	155	8556	6,606.76	79,215	72,674	90,843	101,744	109,012	114,099	145,349	218,023	79,215
M125x6	180	11192	8,642.23	117,750	108,028	135,035	151,239	162,042	169,604	216,056	324,083	117,750