

**BOLT LOAD (METRIC) SOCKET HEAD CAP SCREWS (MATERIAL 1.4541 Mpa=600)
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 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600	PERCENT YIELD								
BOLT LOAD BASED ON			40									
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoadDISC 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	58.75	128	118	147	165	176	184	235	353	128
M22x2.5	32	303	72.82	175	160	200	224	240	252	320	481	175
M24x3	36	353	84.61	221	203	254	284	305	319	406	609	221
M27x3	41	459	110.26	325	298	372	417	447	467	595	893	325
M30x3.5	46	561	134.55	440	404	505	565	605	634	807	1,211	440
M33x3.5	50	694	166.46	599	549	687	769	824	862	1,099	1,648	599
M36x4	55	817	196.02	769	706	882	988	1,059	1,108	1,411	2,117	769
M39x4	60	976	234.19	996	913	1,142	1,279	1,370	1,434	1,827	2,740	996
M42x4.5	65	1121	269.03	1,232	1,130	1,412	1,582	1,695	1,774	2,260	3,390	1,232
M45x4.5	70	1306	313.46	1,537	1,411	1,763	1,975	2,116	2,215	2,821	4,232	1,537
M48x5	75	1473	353.57	1,850	1,697	2,121	2,376	2,546	2,665	3,394	5,091	1,850
M52x5	80	1758	421.90	2,391	2,194	2,742	3,071	3,291	3,444	4,388	6,582	2,391
M56x5.5	85	2030	487.23	2,974	2,728	3,411	3,820	4,093	4,284	5,457	8,185	2,974
M60x5.5	90	2362	566.91	3,708	3,401	4,252	4,762	5,102	5,340	6,803	10,204	3,708
M64x6	95	2676	642.26	4,480	4,110	5,138	5,755	6,166	6,453	8,221	12,331	4,480
M68x6	100	3055	733.30	5,435	4,986	6,233	6,981	7,480	7,829	9,973	14,959	5,435
M72x6	105	3460	830.37	6,517	5,979	7,473	8,370	8,968	9,387	11,957	17,936	6,517
M76x6	110	3889	933.47	7,733	7,094	8,868	9,932	10,642	11,138	14,189	21,283	7,733
M80x6	115	4344	1,042.61	9,092	8,341	10,426	11,677	12,511	13,095	16,682	25,023	9,092
M90x6	130	5591	1,341.83	13,163	12,077	15,096	16,907	18,115	18,960	24,153	36,230	13,163
M100x6	145	6995	1,678.76	18,298	16,788	20,984	23,503	25,181	26,357	33,575	50,363	18,298
M110x6	155	8556	2,053.38	24,620	22,587	28,234	31,622	33,881	35,462	45,174	67,762	24,620
M125x6	180	11192	2,686.01	36,597	33,575	41,969	47,005	50,363	52,713	67,150	100,725	36,597

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
BOLT LOAD BASED ON			50			PERCENT YIELD						
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoadDISC 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	73.44	160	147	184	206	220	231	294	441	160
M22x2.5	32	303	91.02	218	200	250	280	300	314	401	601	218
M24x3	36	353	105.76	277	254	317	355	381	398	508	761	277
M27x3	41	459	137.83	406	372	465	521	558	584	744	1,116	406
M30x3.5	46	561	168.19	550	505	631	706	757	792	1,009	1,514	550
M33x3.5	50	694	208.08	748	687	858	961	1,030	1,078	1,373	2,060	748
M36x4	55	817	245.03	961	882	1,103	1,235	1,323	1,385	1,764	2,646	961
M39x4	60	976	292.74	1,244	1,142	1,427	1,598	1,713	1,792	2,283	3,425	1,244
M42x4.5	65	1121	336.29	1,540	1,412	1,766	1,977	2,119	2,217	2,825	4,237	1,540
M45x4.5	70	1306	391.82	1,922	1,763	2,204	2,468	2,645	2,768	3,526	5,290	1,922
M48x5	75	1473	441.97	2,312	2,121	2,652	2,970	3,182	3,331	4,243	6,364	2,312
M52x5	80	1758	527.37	2,989	2,742	3,428	3,839	4,114	4,305	5,485	8,227	2,989
M56x5.5	85	2030	609.03	3,718	3,411	4,263	4,775	5,116	5,355	6,821	10,232	3,718
M60x5.5	90	2362	708.64	4,634	4,252	5,315	5,953	6,378	6,675	8,504	12,755	4,634
M64x6	95	2676	802.83	5,601	5,138	6,423	7,193	7,707	8,067	10,276	15,414	5,601
M68x6	100	3055	916.62	6,794	6,233	7,791	8,726	9,350	9,786	12,466	18,699	6,794
M72x6	105	3460	1,037.96	8,146	7,473	9,342	10,463	11,210	11,733	14,947	22,420	8,146
M76x6	110	3889	1,166.84	9,666	8,868	11,085	12,415	13,302	13,923	17,736	26,604	9,666
M80x6	115	4344	1,303.26	11,364	10,426	13,033	14,597	15,639	16,369	20,852	31,278	11,364
M90x6	130	5591	1,677.29	16,454	15,096	18,870	21,134	22,643	23,700	30,191	45,287	16,454
M100x6	145	6995	2,098.45	22,873	20,984	26,231	29,378	31,477	32,946	41,969	62,953	22,873
M110x6	155	8556	2,566.73	30,775	28,234	35,293	39,528	42,351	44,327	56,468	84,702	30,775
M125x6	180	11192	3,357.51	45,746	41,969	52,461	58,756	62,953	65,891	83,938	125,907	45,746

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
BOLT LOAD BASED ON			60			PERCENT YIELD						
BOLT SIZE DIA. x P	HEX NUT ACROSS FLAT (mm)	STRESS AREA (mm) ²	BOLT LOAD (kN)	LoadDISC 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	88.13	192	176	220	247	264	277	353	529	192
M22x2.5	32	303	109.23	262	240	300	336	360	377	481	721	262
M24x3	36	353	126.91	332	305	381	426	457	478	609	914	332
M27x3	41	459	165.39	487	447	558	625	670	701	893	1,340	487
M30x3.5	46	561	201.82	660	605	757	848	908	951	1,211	1,816	660
M33x3.5	50	694	249.69	898	824	1,030	1,154	1,236	1,294	1,648	2,472	898
M36x4	55	817	294.03	1,154	1,059	1,323	1,482	1,588	1,662	2,117	3,176	1,154
M39x4	60	976	351.29	1,493	1,370	1,713	1,918	2,055	2,151	2,740	4,110	1,493
M42x4.5	65	1121	403.55	1,847	1,695	2,119	2,373	2,542	2,661	3,390	5,085	1,847
M45x4.5	70	1306	470.18	2,306	2,116	2,645	2,962	3,174	3,322	4,232	6,347	2,306
M48x5	75	1473	530.36	2,775	2,546	3,182	3,564	3,819	3,997	5,091	7,637	2,775
M52x5	80	1758	632.85	3,587	3,291	4,114	4,607	4,936	5,167	6,582	9,872	3,587
M56x5.5	85	2030	730.84	4,461	4,093	5,116	5,730	6,139	6,426	8,185	12,278	4,461
M60x5.5	90	2362	850.36	5,561	5,102	6,378	7,143	7,653	8,010	10,204	15,307	5,561
M64x6	95	2676	963.39	6,721	6,166	7,707	8,632	9,249	9,680	12,331	18,497	6,721
M68x6	100	3055	1,099.95	8,153	7,480	9,350	10,472	11,219	11,743	14,959	22,439	8,153
M72x6	105	3460	1,245.56	9,775	8,968	11,210	12,555	13,452	14,080	17,936	26,904	9,775
M76x6	110	3889	1,400.21	11,599	10,642	13,302	14,898	15,962	16,707	21,283	31,925	11,599
M80x6	115	4344	1,563.91	13,637	12,511	15,639	17,516	18,767	19,643	25,023	37,534	13,637
M90x6	130	5591	2,012.75	19,745	18,115	22,643	25,361	27,172	28,440	36,230	54,344	19,745
M100x6	145	6995	2,518.14	27,448	25,181	31,477	35,254	37,772	39,535	50,363	75,544	27,448
M110x6	155	8556	3,080.08	36,930	33,881	42,351	47,433	50,821	53,193	67,762	101,643	36,930
M125x6	180	11192	4,029.01	54,895	50,363	62,953	70,508	75,544	79,069	100,725	151,088	54,895

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
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	102.82	224	206	257	288	308	323	411	617	224
M22x2.5	32	303	127.43	306	280	350	392	421	440	561	841	306
M24x3	36	353	148.06	387	355	444	497	533	558	711	1,066	387
M27x3	41	459	192.96	568	521	651	729	781	818	1,042	1,563	568
M30x3.5	46	561	235.46	770	706	883	989	1,060	1,109	1,413	2,119	770
M33x3.5	50	694	291.31	1,048	961	1,202	1,346	1,442	1,509	1,923	2,884	1,048
M36x4	55	817	343.04	1,346	1,235	1,544	1,729	1,852	1,939	2,470	3,705	1,346
M39x4	60	976	409.84	1,742	1,598	1,998	2,238	2,398	2,509	3,197	4,795	1,742
M42x4.5	65	1121	470.81	2,155	1,977	2,472	2,768	2,966	3,104	3,955	5,932	2,155
M45x4.5	70	1306	548.55	2,691	2,468	3,086	3,456	3,703	3,875	4,937	7,405	2,691
M48x5	75	1473	618.75	3,237	2,970	3,713	4,158	4,455	4,663	5,940	8,910	3,237
M52x5	80	1758	738.32	4,185	3,839	4,799	5,375	5,759	6,028	7,679	11,518	4,185
M56x5.5	85	2030	852.65	5,205	4,775	5,969	6,685	7,162	7,496	9,550	14,324	5,205
M60x5.5	90	2362	992.09	6,488	5,953	7,441	8,334	8,929	9,345	11,905	17,858	6,488
M64x6	95	2676	1,123.96	7,841	7,193	8,992	10,071	10,790	11,294	14,387	21,580	7,841
M68x6	100	3055	1,283.27	9,512	8,726	10,908	12,217	13,089	13,700	17,453	26,179	9,512
M72x6	105	3460	1,453.15	11,404	10,463	13,078	14,648	15,694	16,426	20,925	31,388	11,404
M76x6	110	3889	1,633.58	13,533	12,415	15,519	17,381	18,623	19,492	24,830	37,246	13,533
M80x6	115	4344	1,824.56	15,910	14,597	18,246	20,435	21,895	22,917	29,193	43,790	15,910
M90x6	130	5591	2,348.21	23,036	21,134	26,417	29,587	31,701	33,180	42,268	63,402	23,036
M100x6	145	6995	2,937.83	32,022	29,378	36,723	41,130	44,067	46,124	58,757	88,135	32,022
M110x6	155	8556	3,593.42	43,085	39,528	49,410	55,339	59,291	62,058	79,055	118,583	43,085
M125x6	180	11192	4,700.51	64,044	58,756	73,445	82,259	88,135	92,248	117,513	176,269	64,044

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
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	117.51	256	235	294	329	353	369	470	705	256
M22x2.5	32	303	145.64	349	320	401	449	481	503	641	961	349
M24x3	36	353	169.21	443	406	508	569	609	638	812	1,218	443
M27x3	41	459	220.53	649	595	744	834	893	935	1,191	1,786	649
M30x3.5	46	561	269.10	880	807	1,009	1,130	1,211	1,267	1,615	2,422	880
M33x3.5	50	694	332.92	1,198	1,099	1,373	1,538	1,648	1,725	2,197	3,296	1,198
M36x4	55	817	392.05	1,538	1,411	1,764	1,976	2,117	2,216	2,823	4,234	1,538
M39x4	60	976	468.38	1,991	1,827	2,283	2,557	2,740	2,868	3,653	5,480	1,991
M42x4.5	65	1121	538.06	2,463	2,260	2,825	3,164	3,390	3,548	4,520	6,780	2,463
M45x4.5	70	1306	626.91	3,075	2,821	3,526	3,950	4,232	4,429	5,642	8,463	3,075
M48x5	75	1473	707.15	3,700	3,394	4,243	4,752	5,091	5,329	6,789	10,183	3,700
M52x5	80	1758	843.80	4,783	4,388	5,485	6,143	6,582	6,889	8,775	13,163	4,783
M56x5.5	85	2030	974.45	5,948	5,457	6,821	7,640	8,185	8,567	10,914	16,371	5,948
M60x5.5	90	2362	1,133.82	7,415	6,803	8,504	9,524	10,204	10,681	13,606	20,409	7,415
M64x6	95	2676	1,284.52	8,961	8,221	10,276	11,509	12,331	12,907	16,442	24,663	8,961
M68x6	100	3055	1,466.60	10,870	9,973	12,466	13,962	14,959	15,657	19,946	29,919	10,870
M72x6	105	3460	1,660.74	13,033	11,957	14,947	16,740	17,936	18,773	23,915	35,872	13,033
M76x6	110	3889	1,866.95	15,466	14,189	17,736	19,864	21,283	22,276	28,378	42,566	15,466
M80x6	115	4344	2,085.22	18,183	16,682	20,852	23,354	25,023	26,190	33,363	50,045	18,183
M90x6	130	5591	2,683.67	26,327	24,153	30,191	33,814	36,230	37,920	48,306	72,459	26,327
M100x6	145	6995	3,357.52	36,597	33,575	41,969	47,005	50,363	52,713	67,150	100,726	36,597
M110x6	155	8556	4,106.77	49,240	45,174	56,468	63,244	67,762	70,924	90,349	135,523	49,240
M125x6	180	11192	5,372.01	73,194	67,150	83,938	94,010	100,725	105,426	134,300	201,450	73,194

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
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)
												0.109
M20x2.5	30	245	132.20	288	264	330	370	397	415	529	793	288
M22x2.5	32	303	163.84	393	360	451	505	541	566	721	1,081	393
M24x3	36	353	190.36	498	457	571	640	685	717	914	1,371	498
M27x3	41	459	248.09	730	670	837	938	1,005	1,052	1,340	2,010	730
M30x3.5	46	561	302.73	990	908	1,135	1,271	1,362	1,426	1,816	2,725	990
M33x3.5	50	694	374.54	1,347	1,236	1,545	1,730	1,854	1,940	2,472	3,708	1,347
M36x4	55	817	441.05	1,731	1,588	1,985	2,223	2,382	2,493	3,176	4,763	1,731
M39x4	60	976	526.93	2,240	2,055	2,569	2,877	3,083	3,226	4,110	6,165	2,240
M42x4.5	65	1121	605.32	2,771	2,542	3,178	3,559	3,814	3,991	5,085	7,627	2,771
M45x4.5	70	1306	705.27	3,459	3,174	3,967	4,443	4,761	4,983	6,347	9,521	3,459
M48x5	75	1473	795.54	4,162	3,819	4,773	5,346	5,728	5,995	7,637	11,456	4,162
M52x5	80	1758	949.27	5,380	4,936	6,170	6,911	7,404	7,750	9,872	14,809	5,380
M56x5.5	85	2030	1,096.26	6,692	6,139	7,674	8,595	9,209	9,638	12,278	18,417	6,692
M60x5.5	90	2362	1,275.54	8,342	7,653	9,567	10,715	11,480	12,016	15,307	22,960	8,342
M64x6	95	2676	1,445.09	10,081	9,249	11,561	12,948	13,873	14,520	18,497	27,746	10,081
M68x6	100	3055	1,649.92	12,229	11,219	14,024	15,707	16,829	17,615	22,439	33,658	12,229
M72x6	105	3460	1,868.33	14,663	13,452	16,815	18,833	20,178	21,120	26,904	40,356	14,663
M76x6	110	3889	2,100.32	17,399	15,962	19,953	22,347	23,944	25,061	31,925	47,887	17,399
M80x6	115	4344	2,345.87	20,456	18,767	23,459	26,274	28,150	29,464	37,534	56,301	20,456
M90x6	130	5591	3,019.13	29,618	27,172	33,965	38,041	40,758	42,660	54,344	81,516	29,618
M100x6	145	6995	3,777.21	41,172	37,772	47,215	52,881	56,658	59,302	75,544	113,316	41,172
M110x6	155	8556	4,620.11	55,395	50,821	63,527	71,150	76,232	79,789	101,643	152,464	55,395
M125x6	180	11192	6,043.51	82,343	75,544	94,430	105,762	113,316	118,604	151,088	226,632	82,343

TORQUE GUIDE FOR MATERIAL STANDARD 1.4541						REQUIRED TORQUE (N-m)						
MINIMUM YIELD (Mpa)			600									
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)
												0.109
M20x2.5	30	245	145.42	317	291	364	407	436	457	582	872	317
M22x2.5	32	303	180.23	432	397	496	555	595	623	793	1,190	432
M24x3	36	353	209.40	548	503	628	704	754	789	1,005	1,508	548
M27x3	41	459	272.90	803	737	921	1,032	1,105	1,157	1,474	2,210	803
M30x3.5	46	561	333.01	1,089	999	1,249	1,399	1,499	1,568	1,998	2,997	1,089
M33x3.5	50	694	411.99	1,482	1,360	1,699	1,903	2,039	2,135	2,719	4,079	1,482
M36x4	55	817	485.16	1,904	1,747	2,183	2,445	2,620	2,742	3,493	5,240	1,904
M39x4	60	976	579.62	2,464	2,261	2,826	3,165	3,391	3,549	4,521	6,782	2,464
M42x4.5	65	1121	665.85	3,048	2,797	3,496	3,915	4,195	4,391	5,593	8,390	3,048
M45x4.5	70	1306	775.80	3,805	3,491	4,364	4,888	5,237	5,481	6,982	10,473	3,805
M48x5	75	1473	875.09	4,578	4,200	5,251	5,881	6,301	6,595	8,401	12,601	4,578
M52x5	80	1758	1,044.20	5,919	5,430	6,787	7,602	8,145	8,525	10,860	16,290	5,919
M56x5.5	85	2030	1,205.88	7,361	6,753	8,441	9,454	10,129	10,602	13,506	20,259	7,361
M60x5.5	90	2362	1,403.10	9,176	8,419	10,523	11,786	12,628	13,217	16,837	25,256	9,176
M64x6	95	2676	1,589.60	11,089	10,173	12,717	14,243	15,260	15,972	20,347	30,520	11,089
M68x6	100	3055	1,814.92	13,452	12,341	15,427	17,278	18,512	19,376	24,683	37,024	13,452
M72x6	105	3460	2,055.17	16,129	14,797	18,497	20,716	22,196	23,232	29,594	44,392	16,129
M76x6	110	3889	2,310.35	19,139	17,559	21,948	24,582	26,338	27,567	35,117	52,676	19,139
M80x6	115	4344	2,580.45	22,502	20,644	25,805	28,901	30,965	32,411	41,287	61,931	22,502
M90x6	130	5591	3,321.04	32,579	29,889	37,362	41,845	44,834	46,926	59,779	89,668	32,579
M100x6	145	6995	4,154.93	45,289	41,549	51,937	58,169	62,324	65,232	83,099	124,648	45,289
M110x6	155	8556	5,082.13	60,935	55,903	69,879	78,265	83,855	87,768	111,807	167,710	60,935
M125x6	180	11192	6,647.87	90,577	83,098	103,873	116,338	124,647	130,464	166,197	249,295	90,577