

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN				
BOLT TENSION BASED ON				40	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC	MOLYBDENUM	MOLY/LEAD	COPPER &	NICKEL &	API	MACHINE	DRY	CUSTOM	First Pass	Second Pass	All Subsequent		
					TS 801MOLY K=.109	DISULFIDE K=.100	OXIDE/GRAPHITE K=.125	& GRAPHITE K=.140	& GRAPHITE K=.150	SA2 K=.157	OIL K=.200	STEEL K=.440 K=.300	(INSERT K) K=.300			Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	9,492	65	59	74	83	89	93	119	178	89	27	53	89		
3/4 x 10	1-1/4"	0.334	105,000	14,040	96	88	110	123	132	138	176	263	132	39	79	132		
7/8 x 9	1-7/16"	0.461	105,000	19,383	154	141	177	198	212	222	283	424	212	64	127	212		
1x 8	1-5/8"	0.605	105,000	25,428	231	212	265	297	318	333	424	636	318	95	191	318		
1-1/8 x 8	1-13/16"	0.790	105,000	33,182	339	311	389	436	467	488	622	933	467	140	280	467		
1-1/4 x 8	2"	0.999	105,000	41,966	476	437	546	612	656	686	874	1,311	656	197	393	656		
1-3/8 x 8	2-3/16"	1.233	105,000	51,781	647	593	742	831	890	932	1,187	1,780	890	267	534	890		
1-1/2 x 8	2-3/8"	1.491	105,000	62,626	853	783	979	1,096	1,174	1,229	1,566	2,348	1,174	352	705	1,174		
1-5/8 x 8	2-9/16"	1.774	105,000	74,501	1,100	1,009	1,261	1,412	1,513	1,584	2,018	3,027	1,513	454	908	1,513		
1-3/4 x 8	2-3/4"	2.081	105,000	87,406	1,389	1,275	1,593	1,785	1,912	2,001	2,549	3,824	1,912	574	1,147	1,912		
1-7/8 x 8	2-15/16"	2.413	105,000	101,342	1,726	1,583	1,979	2,217	2,375	2,486	3,167	4,750	2,375	713	1,425	2,375		
2 x 8	3-1/8"	2.769	105,000	116,308	2,113	1,938	2,423	2,714	2,908	3,043	3,877	5,815	2,908	872	1,745	2,908		
2-1/8 x 8	3-5/16"	3.150	105,000	132,304	2,554	2,343	2,929	3,280	3,514	3,678	4,686	7,029	3,514	1,054	2,109	3,514		
2-1/4 x 8	3-1/2"	3.555	105,000	149,331	3,052	2,800	3,500	3,920	4,200	4,396	5,600	8,400	4,200	1,260	2,520	4,200		
2-3/8 x 8	3-11/16"	3.985	105,000	167,388	3,611	3,313	4,141	4,638	4,969	5,201	6,626	9,939	4,969	1,491	2,982	4,969		
2-1/2 x 8	3-7/8"	4.440	95,000	168,715	3,831	3,515	4,394	4,921	5,272	5,518	7,030	10,545	5,272	1,582	3,163	5,272		
2-3/4 x 8	4-1/4"	5.422	95,000	206,051	5,147	4,722	5,902	6,611	7,083	7,414	9,444	14,166	7,083	2,125	4,250	7,083		
3 x 8	4-5/8"	6.503	95,000	247,115	6,734	6,178	7,722	8,649	9,267	9,699	12,356	18,534	9,267	2,780	5,560	9,267		
3-1/4 x 8	5"	7.682	95,000	291,908	8,617	7,906	9,882	11,068	11,859	12,412	15,812	23,718	11,859	3,558	7,115	11,859		
3-1/2 x 8	5-3/8"	8.959	95,000	340,429	10,823	9,929	12,411	13,901	14,894	15,589	19,858	29,788	14,894	4,468	8,936	14,894		
3-3/4 x 8	5-3/4"	10.334	95,000	392,680	13,376	12,271	15,339	17,180	18,407	19,266	24,542	36,814	18,407	5,522	11,044	18,407		
4 x 8	6-1/8"	11.807	95,000	448,659	16,301	14,955	18,694	20,937	22,433	23,480	29,911	44,866	22,433	6,730	13,460	22,433		
4-1/4 x 8	6-1/2"	13.378	75,000	401,342	15,493	14,214	17,768	19,900	21,321	22,316	28,428	42,643	21,321	6,396	12,793	21,321		
4-1/2 x 8	6-7/8"	15.047	75,000	451,424	18,452	16,928	21,160	23,700	25,393	26,578	33,857	50,785	25,393	7,618	15,236	25,393		
4-3/4 x 8	7-1/4"	16.815	75,000	504,449	21,765	19,968	24,960	27,955	29,952	31,349	39,936	59,903	29,952	8,986	17,971	29,952		
5 x 8	7-5/8"	18.681	75,000	560,418	25,452	23,351	29,188	32,691	35,026	36,661	46,702	70,052	35,026	10,508	21,016	35,026		
5-1/4 x 8	8"	20.644	75,000	619,331	29,534	27,096	33,870	37,934	40,644	42,540	54,191	81,287	40,644	12,193	24,386	40,644		
5-1/2 x 8	8-3/8"	22.706	75,000	681,188	34,031	31,221	39,026	43,710	46,832	49,017	62,442	93,663	46,832	14,049	28,099	46,832		
5-3/4 x 8	8-3/4"	24.866	75,000	745,988	38,962	35,745	44,682	50,043	53,618	56,120	71,491	107,236	53,618	16,085	32,171	53,618		
6 x 8	9-1/8"	27.124	75,000	813,732	44,348	40,687	50,858	56,961	61,030	63,878	81,373	122,060	61,030	18,309	36,618	61,030		

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361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
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TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)										THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				50	% YIELD											First Pass	Second Pass	All Subsequent
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM 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=.440 K=.300	CUSTOM (INSERT K) K=.300			Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	11,865	81	74	93	104	111	116	148	222	111	33	67	111		
3/4 x 10	1-1/4"	0.334	105,000	17,550	120	110	137	154	165	172	219	329	165	49	99	165		
7/8 x 9	1-7/16"	0.461	105,000	24,229	193	177	221	247	265	277	353	530	265	80	159	265		
1x 8	1-5/8"	0.605	105,000	31,785	289	265	331	371	397	416	530	795	397	119	238	397		
1-1/8 x 8	1-13/16"	0.790	105,000	41,478	424	389	486	544	583	611	778	1,167	583	175	350	583		
1-1/4 x 8	2"	0.999	105,000	52,458	596	546	683	765	820	858	1,093	1,639	820	246	492	820		
1-3/8 x 8	2-3/16"	1.233	105,000	64,726	808	742	927	1,038	1,112	1,164	1,483	2,225	1,112	334	667	1,112		
1-1/2 x 8	2-3/8"	1.491	105,000	78,282	1,067	979	1,223	1,370	1,468	1,536	1,957	2,936	1,468	440	881	1,468		
1-5/8 x 8	2-9/16"	1.774	105,000	93,126	1,375	1,261	1,576	1,766	1,892	1,980	2,522	3,783	1,892	567	1,135	1,892		
1-3/4 x 8	2-3/4"	2.081	105,000	109,257	1,737	1,593	1,992	2,231	2,390	2,502	3,187	4,780	2,390	717	1,434	2,390		
1-7/8 x 8	2-15/16"	2.413	105,000	126,677	2,157	1,979	2,474	2,771	2,969	3,108	3,959	5,938	2,969	891	1,781	2,969		
2 x 8	3-1/8"	2.769	105,000	145,385	2,641	2,423	3,029	3,392	3,635	3,804	4,846	7,269	3,635	1,090	2,181	3,635		
2-1/8 x 8	3-5/16"	3.150	105,000	165,380	3,192	2,929	3,661	4,100	4,393	4,598	5,857	8,786	4,393	1,318	2,636	4,393		
2-1/4 x 8	3-1/2"	3.555	105,000	186,663	3,815	3,500	4,375	4,900	5,250	5,495	7,000	10,500	5,250	1,575	3,150	5,250		
2-3/8 x 8	3-11/16"	3.985	105,000	209,234	4,514	4,141	5,176	5,798	6,212	6,502	8,282	12,423	6,212	1,863	3,727	6,212		
2-1/2 x 8	3-7/8"	4.440	95,000	210,894	4,789	4,394	5,492	6,151	6,590	6,898	8,787	13,181	6,590	1,977	3,954	6,590		
2-3/4 x 8	4-1/4"	5.422	95,000	257,563	6,434	5,902	7,378	8,263	8,854	9,267	11,805	17,707	8,854	2,656	5,312	8,854		
3 x 8	4-5/8"	6.503	95,000	308,894	8,417	7,722	9,653	10,811	11,584	12,124	15,445	23,167	11,584	3,475	6,950	11,584		
3-1/4 x 8	5"	7.682	95,000	364,885	10,772	9,882	12,353	13,835	14,823	15,515	19,765	29,647	14,823	4,447	8,894	14,823		
3-1/2 x 8	5-3/8"	8.959	95,000	425,537	13,529	12,411	15,514	17,376	18,617	19,486	24,823	37,234	18,617	5,585	11,170	18,617		
3-3/4 x 8	5-3/4"	10.334	95,000	490,850	16,720	15,339	19,174	21,475	23,009	24,082	30,678	46,017	23,009	6,903	13,805	23,009		
4 x 8	6-1/8"	11.807	95,000	560,824	20,377	18,694	23,368	26,172	28,041	29,350	37,388	56,082	28,041	8,412	16,825	28,041		
4-1/4 x 8	6-1/2"	13.378	75,000	501,678	19,367	17,768	22,210	24,875	26,652	27,895	35,536	53,303	26,652	7,995	15,991	26,652		
4-1/2 x 8	6-7/8"	15.047	75,000	564,280	23,065	21,160	26,451	29,625	31,741	33,222	42,321	63,481	31,741	9,522	19,044	31,741		
4-3/4 x 8	7-1/4"	16.815	75,000	630,562	27,206	24,960	31,200	34,944	37,440	39,187	49,919	74,879	37,440	11,232	22,464	37,440		
5 x 8	7-5/8"	18.681	75,000	700,523	31,815	29,188	36,486	40,864	43,783	45,826	58,377	87,565	43,783	13,135	26,270	43,783		
5-1/4 x 8	8"	20.644	75,000	774,164	36,918	33,870	42,337	47,418	50,805	53,175	67,739	101,609	50,805	15,241	30,483	50,805		
5-1/2 x 8	8-3/8"	22.706	75,000	851,485	42,539	39,026	48,783	54,637	58,540	61,271	78,053	117,079	58,540	17,562	35,124	58,540		
5-3/4 x 8	8-3/4"	24.866	75,000	932,485	48,703	44,682	55,852	62,554	67,022	70,150	89,363	134,045	67,022	20,107	40,213	67,022		
6 x 8	9-1/8"	27.124	75,000	1,017,165	55,436	50,858	63,573	71,202	76,287	79,847	101,717	152,575	76,287	22,886	45,772	76,287		

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BOLT TENSION BASED ON				60	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC	MOLYBDENUM	MOLY/LEAD	COPPER &	NICKEL &	API	MACHINE	DRY	CUSTOM	First Pass	Second Pass	All Subsequent		
					TS 801MOLY K=.109	DISULFIDE K=.100	OXIDE/GRAPHITE K=.125	& GRAPHITE K=.140	& GRAPHITE K=.150	SA2 K=.157	OIL K=.200	STEEL K=.440 K=.300	(INSERT K) K=.300			Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	14,238	97	89	111	125	133	140	178	267	133	40	80	133		
3/4 x 10	1-1/4"	0.334	105,000	21,060	143	132	165	184	197	207	263	395	197	59	118	197		
7/8 x 9	1-7/16"	0.461	105,000	29,074	231	212	265	297	318	333	424	636	318	95	191	318		
1x 8	1-5/8"	0.605	105,000	38,143	346	318	397	445	477	499	636	954	477	143	286	477		
1-1/8 x 8	1-13/16"	0.790	105,000	49,773	509	467	583	653	700	733	933	1,400	700	210	420	700		
1-1/4 x 8	2"	0.999	105,000	62,949	715	656	820	918	984	1,029	1,311	1,967	984	295	590	984		
1-3/8 x 8	2-3/16"	1.233	105,000	77,671	970	890	1,112	1,246	1,335	1,397	1,780	2,670	1,335	400	801	1335		
1-1/2 x 8	2-3/8"	1.491	105,000	93,938	1,280	1,174	1,468	1,644	1,761	1,844	2,348	3,523	1,761	528	1057	1761		
1-5/8 x 8	2-9/16"	1.774	105,000	111,751	1,649	1,513	1,892	2,119	2,270	2,376	3,027	4,540	2,270	681	1362	2270		
1-3/4 x 8	2-3/4"	2.081	105,000	131,109	2,084	1,912	2,390	2,677	2,868	3,002	3,824	5,736	2,868	860	1721	2868		
1-7/8 x 8	2-15/16"	2.413	105,000	152,013	2,589	2,375	2,969	3,325	3,563	3,729	4,750	7,126	3,563	1069	2138	3563		
2 x 8	3-1/8"	2.769	105,000	174,462	3,169	2,908	3,635	4,071	4,362	4,565	5,815	8,723	4,362	1308	2617	4362		
2-1/8 x 8	3-5/16"	3.150	105,000	198,456	3,831	3,514	4,393	4,920	5,271	5,517	7,029	10,543	5,271	1581	3163	5271		
2-1/4 x 8	3-1/2"	3.555	105,000	223,996	4,578	4,200	5,250	5,880	6,300	6,594	8,400	12,600	6,300	1890	3780	6300		
2-3/8 x 8	3-11/16"	3.985	105,000	251,081	5,417	4,969	6,212	6,957	7,454	7,802	9,939	14,908	7,454	2236	4472	7454		
2-1/2 x 8	3-7/8"	4.440	95,000	253,073	5,747	5,272	6,590	7,381	7,909	8,278	10,545	15,817	7,909	2373	4745	7909		
2-3/4 x 8	4-1/4"	5.422	95,000	309,076	7,720	7,083	8,854	9,916	10,624	11,120	14,166	21,249	10,624	3187	6375	10624		
3 x 8	4-5/8"	6.503	95,000	370,672	10,101	9,267	11,584	12,974	13,900	14,549	18,534	27,800	13,900	4170	8340	13900		
3-1/4 x 8	5"	7.682	95,000	437,862	12,926	11,859	14,823	16,602	17,788	18,618	23,718	35,576	17,788	5336	10673	17788		
3-1/2 x 8	5-3/8"	8.959	95,000	510,644	16,234	14,894	18,617	20,851	22,341	23,383	29,788	44,681	22,341	6702	13404	22341		
3-3/4 x 8	5-3/4"	10.334	95,000	589,020	20,063	18,407	23,009	25,770	27,610	28,899	36,814	55,221	27,610	8283	16566	27610		
4 x 8	6-1/8"	11.807	95,000	672,989	24,452	22,433	28,041	31,406	33,649	35,220	44,866	67,299	33,649	10095	20190	33649		
4-1/4 x 8	6-1/2"	13.378	75,000	602,014	23,240	21,321	26,652	29,850	31,982	33,474	42,643	63,964	31,982	9595	19189	31982		
4-1/2 x 8	6-7/8"	15.047	75,000	677,136	27,678	25,393	31,741	35,550	38,089	39,866	50,785	76,178	38,089	11427	22853	38089		
4-3/4 x 8	7-1/4"	16.815	75,000	756,674	32,647	29,952	37,440	41,932	44,928	47,024	59,903	89,855	44,928	13478	26957	44928		
5 x 8	7-5/8"	18.681	75,000	840,628	38,178	35,026	43,783	49,037	52,539	54,991	70,052	105,078	52,539	15762	31524	52539		
5-1/4 x 8	8"	20.644	75,000	928,997	44,302	40,644	50,805	56,901	60,965	63,810	81,287	121,931	60,965	18290	36579	60965		
5-1/2 x 8	8-3/8"	22.706	75,000	1,021,782	51,047	46,832	58,540	65,564	70,247	73,526	93,663	140,495	70,247	21074	42148	70247		
5-3/4 x 8	8-3/4"	24.866	75,000	1,118,982	58,444	53,618	67,022	75,065	80,427	84,180	107,236	160,854	80,427	24128	48256	80427		
6 x 8	9-1/8"	27.124	75,000	1,220,598	66,523	61,030	76,287	85,442	91,545	95,817	122,060	183,090	91,545	27463	54927	91545		

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TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN				
BOLT TENSION BASED ON				70	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM 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=.440 K=.300	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	16,611	113	104	130	145	156	163	208	311	156	47	93	156		
3/4 x 10	1-1/4"	0.334	105,000	24,570	167	154	192	215	230	241	307	461	230	69	138	230		
7/8 x 9	1-7/16"	0.461	105,000	33,920	270	247	309	346	371	388	495	742	371	111	223	371		
1x 8	1-5/8"	0.605	105,000	44,500	404	371	464	519	556	582	742	1,112	556	167	334	556		
1-1/8 x 8	1-13/16"	0.790	105,000	58,069	593	544	680	762	817	855	1,089	1,633	817	245	490	817		
1-1/4 x 8	2"	0.999	105,000	73,441	834	765	956	1,071	1,148	1,201	1,530	2,295	1,148	344	689	1,148		
1-3/8 x 8	2-3/16"	1.233	105,000	90,616	1,132	1,038	1,298	1,454	1,557	1,630	2,077	3,115	1,557	467	934	1,557		
1-1/2 x 8	2-3/8"	1.491	105,000	109,595	1,493	1,370	1,712	1,918	2,055	2,151	2,740	4,110	2,055	616	1,233	2,055		
1-5/8 x 8	2-9/16"	1.774	105,000	130,376	1,924	1,766	2,207	2,472	2,648	2,772	3,531	5,297	2,648	794	1,589	2,648		
1-3/4 x 8	2-3/4"	2.081	105,000	152,960	2,431	2,231	2,788	3,123	3,346	3,502	4,461	6,692	3,346	1,004	2,008	3,346		
1-7/8 x 8	2-15/16"	2.413	105,000	177,348	3,020	2,771	3,464	3,879	4,157	4,351	5,542	8,313	4,157	1,247	2,494	4,157		
2 x 8	3-1/8"	2.769	105,000	203,538	3,698	3,392	4,240	4,749	5,088	5,326	6,785	10,177	5,088	1,527	3,053	5,088		
2-1/8 x 8	3-5/16"	3.150	105,000	231,532	4,469	4,100	5,125	5,740	6,150	6,437	8,200	12,300	6,150	1,845	3,690	6,150		
2-1/4 x 8	3-1/2"	3.555	105,000	261,329	5,341	4,900	6,125	6,860	7,350	7,693	9,800	14,700	7,350	2,205	4,410	7,350		
2-3/8 x 8	3-11/16"	3.985	105,000	292,928	6,319	5,798	7,247	8,117	8,696	9,102	11,595	17,393	8,696	2,609	5,218	8,696		
2-1/2 x 8	3-7/8"	4.440	95,000	295,252	6,705	6,151	7,689	8,612	9,227	9,657	12,302	18,453	9,227	2,768	5,536	9,227		
2-3/4 x 8	4-1/4"	5.422	95,000	360,589	9,007	8,263	10,329	11,569	12,395	12,974	16,527	24,790	12,395	3,719	7,437	12,395		
3 x 8	4-5/8"	6.503	95,000	432,451	11,784	10,811	13,514	15,136	16,217	16,974	21,623	32,434	16,217	4,865	9,730	16,217		
3-1/4 x 8	5"	7.682	95,000	510,839	15,080	13,835	17,294	19,369	20,753	21,721	27,670	41,506	20,753	6,226	12,452	20,753		
3-1/2 x 8	5-3/8"	8.959	95,000	595,752	18,940	17,376	21,720	24,327	26,064	27,280	34,752	52,128	26,064	7,819	15,638	26,064		
3-3/4 x 8	5-3/4"	10.334	95,000	687,190	23,407	21,475	26,843	30,065	32,212	33,715	42,949	64,424	32,212	9,664	19,327	32,212		
4 x 8	6-1/8"	11.807	95,000	785,153	28,527	26,172	32,715	36,640	39,258	41,090	52,344	78,515	39,258	11,777	23,555	39,258		
4-1/4 x 8	6-1/2"	13.378	75,000	702,349	27,114	24,875	31,094	34,825	37,312	39,054	49,750	74,625	37,312	11,194	22,387	37,312		
4-1/2 x 8	6-7/8"	15.047	75,000	789,992	32,291	29,625	37,031	41,475	44,437	46,511	59,249	88,874	44,437	13,331	26,662	44,437		
4-3/4 x 8	7-1/4"	16.815	75,000	882,786	38,089	34,944	43,680	48,921	52,415	54,861	69,887	104,831	52,415	15,725	31,449	52,415		
5 x 8	7-5/8"	18.681	75,000	980,732	44,542	40,864	51,080	57,209	61,296	64,156	81,728	122,592	61,296	18,389	36,777	61,296		
5-1/4 x 8	8"	20.644	75,000	1,083,830	51,685	47,418	59,272	66,385	71,126	74,446	94,835	142,253	71,126	21,338	42,676	71,126		
5-1/2 x 8	8-3/8"	22.706	75,000	1,192,079	59,554	54,637	68,296	76,492	81,955	85,780	109,274	163,911	81,955	24,587	49,173	81,955		
5-3/4 x 8	8-3/4"	24.866	75,000	1,305,479	68,184	62,554	78,193	87,576	93,831	98,210	125,108	187,663	93,831	28,149	56,299	93,831		
6 x 8	9-1/8"	27.124	75,000	1,424,031	77,610	71,202	89,002	99,682	106,802	111,786	142,403	213,605	106,802	32,041	64,081	106,802		

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361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
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TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN				
BOLT TENSION BASED ON				80	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM 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=.440 K=.300	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	18,984	129	119	148	166	178	186	237	356	178	53	107	178		
3/4 x 10	1-1/4"	0.334	105,000	28,080	191	176	219	246	263	276	351	527	263	79	158	263		
7/8 x 9	1-7/16"	0.461	105,000	38,766	308	283	353	396	424	444	565	848	424	127	254	424		
1x 8	1-5/8"	0.605	105,000	50,857	462	424	530	593	636	665	848	1,271	636	191	381	636		
1-1/8 x 8	1-13/16"	0.790	105,000	66,364	678	622	778	871	933	977	1,244	1,866	933	280	560	933		
1-1/4 x 8	2"	0.999	105,000	83,933	953	874	1,093	1,224	1,311	1,373	1,749	2,623	1,311	393	787	1311		
1-3/8 x 8	2-3/16"	1.233	105,000	103,562	1,293	1,187	1,483	1,661	1,780	1,863	2,373	3,560	1,780	534	1068	1780		
1-1/2 x 8	2-3/8"	1.491	105,000	125,251	1,707	1,566	1,957	2,192	2,348	2,458	3,131	4,697	2,348	705	1409	2348		
1-5/8 x 8	2-9/16"	1.774	105,000	149,001	2,199	2,018	2,522	2,825	3,027	3,168	4,035	6,053	3,027	908	1816	3027		
1-3/4 x 8	2-3/4"	2.081	105,000	174,812	2,779	2,549	3,187	3,569	3,824	4,002	5,099	7,648	3,824	1147	2294	3824		
1-7/8 x 8	2-15/16"	2.413	105,000	202,683	3,452	3,167	3,959	4,434	4,750	4,972	6,334	9,501	4,750	1425	2850	4750		
2 x 8	3-1/8"	2.769	105,000	232,615	4,226	3,877	4,846	5,428	5,815	6,087	7,754	11,631	5,815	1745	3489	5815		
2-1/8 x 8	3-5/16"	3.150	105,000	264,608	5,107	4,686	5,857	6,560	7,029	7,357	9,372	14,057	7,029	2109	4217	7029		
2-1/4 x 8	3-1/2"	3.555	105,000	298,661	6,104	5,600	7,000	7,840	8,400	8,792	11,200	16,800	8,400	2520	5040	8400		
2-3/8 x 8	3-11/16"	3.985	105,000	334,775	7,222	6,626	8,282	9,276	9,939	10,402	13,252	19,877	9,939	2982	5963	9939		
2-1/2 x 8	3-7/8"	4.440	95,000	337,431	7,662	7,030	8,787	9,842	10,545	11,037	14,060	21,089	10,545	3163	6327	10545		
2-3/4 x 8	4-1/4"	5.422	95,000	412,102	10,294	9,444	11,805	13,222	14,166	14,827	18,888	28,332	14,166	4250	8500	14166		
3 x 8	4-5/8"	6.503	95,000	494,230	13,468	12,356	15,445	17,298	18,534	19,399	24,711	37,067	18,534	5560	11120	18534		
3-1/4 x 8	5"	7.682	95,000	583,816	17,235	15,812	19,765	22,136	23,718	24,824	31,623	47,435	23,718	7115	14231	23718		
3-1/2 x 8	5-3/8"	8.959	95,000	680,859	21,646	19,858	24,823	27,802	29,788	31,178	39,717	59,575	29,788	8936	17873	29788		
3-3/4 x 8	5-3/4"	10.334	95,000	785,360	26,751	24,542	30,678	34,359	36,814	38,532	49,085	73,627	36,814	11044	22088	36814		
4 x 8	6-1/8"	11.807	95,000	897,318	32,603	29,911	37,388	41,875	44,866	46,960	59,821	89,732	44,866	13460	26920	44866		
4-1/4 x 8	6-1/2"	13.378	75,000	802,685	30,987	28,428	35,536	39,800	42,643	44,633	56,857	85,285	42,643	12793	25586	42643		
4-1/2 x 8	6-7/8"	15.047	75,000	902,848	36,904	33,857	42,321	47,400	50,785	53,155	67,714	101,570	50,785	15236	30471	50785		
4-3/4 x 8	7-1/4"	16.815	75,000	1,008,899	43,530	39,936	49,919	55,910	59,903	62,699	79,871	119,807	59,903	17971	35942	59903		
5 x 8	7-5/8"	18.681	75,000	1,120,837	50,905	46,702	58,377	65,382	70,052	73,321	93,403	140,105	70,052	21016	42031	70052		
5-1/4 x 8	8"	20.644	75,000	1,238,662	59,069	54,191	67,739	75,868	81,287	85,081	108,383	162,574	81,287	24386	48772	81287		
5-1/2 x 8	8-3/8"	22.706	75,000	1,362,375	68,062	62,442	78,053	87,419	93,663	98,034	124,884	187,327	93,663	28099	56198	93663		
5-3/4 x 8	8-3/4"	24.866	75,000	1,491,976	77,925	71,491	89,363	100,087	107,236	112,240	142,981	214,472	107,236	32171	64341	107236		
6 x 8	9-1/8"	27.124	75,000	1,627,464	88,697	81,373	101,717	113,923	122,060	127,756	162,746	244,120	122,060	36618	73236	122060		

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361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

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HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)										THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				90	% YIELD											First Pass	Second Pass	All Subsequent
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM 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=.440 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	21,357	145	133	167	187	200	210	267	400	200	60	120	200		
3/4 x 10	1-1/4"	0.334	105,000	31,590	215	197	247	276	296	310	395	592	296	89	178	296		
7/8 x 9	1-7/16"	0.461	105,000	43,612	347	318	398	445	477	499	636	954	477	143	286	477		
1x 8	1-5/8"	0.605	105,000	57,214	520	477	596	667	715	749	954	1,430	715	215	429	715		
1-1/8 x 8	1-13/16"	0.790	105,000	74,660	763	700	875	980	1,050	1,099	1,400	2,100	1,050	315	630	1050		
1-1/4 x 8	2"	0.999	105,000	94,424	1,072	984	1,229	1,377	1,475	1,544	1,967	2,951	1,475	443	885	1475		
1-3/8 x 8	2-3/16"	1.233	105,000	116,507	1,455	1,335	1,669	1,869	2,002	2,096	2,670	4,005	2,002	601	1201	2002		
1-1/2 x 8	2-3/8"	1.491	105,000	140,907	1,920	1,761	2,202	2,466	2,642	2,765	3,523	5,284	2,642	793	1585	2642		
1-5/8 x 8	2-9/16"	1.774	105,000	167,626	2,474	2,270	2,837	3,178	3,405	3,564	4,540	6,810	3,405	1021	2043	3405		
1-3/4 x 8	2-3/4"	2.081	105,000	196,663	3,126	2,868	3,585	4,015	4,302	4,503	5,736	8,604	4,302	1291	2581	4302		
1-7/8 x 8	2-15/16"	2.413	105,000	228,019	3,883	3,563	4,453	4,988	5,344	5,594	7,126	10,688	5,344	1603	3207	5344		
2 x 8	3-1/8"	2.769	105,000	261,692	4,754	4,362	5,452	6,106	6,542	6,848	8,723	13,085	6,542	1963	3925	6542		
2-1/8 x 8	3-5/16"	3.150	105,000	297,684	5,746	5,271	6,589	7,380	7,907	8,276	10,543	15,814	7,907	2372	4744	7907		
2-1/4 x 8	3-1/2"	3.555	105,000	335,994	6,867	6,300	7,875	8,820	9,450	9,891	12,600	18,900	9,450	2835	5670	9450		
2-3/8 x 8	3-11/16"	3.985	105,000	376,622	8,125	7,454	9,317	10,436	11,181	11,703	14,908	22,362	11,181	3354	6709	11181		
2-1/2 x 8	3-7/8"	4.440	95,000	379,610	8,620	7,909	9,886	11,072	11,863	12,416	15,817	23,726	11,863	3559	7118	11863		
2-3/4 x 8	4-1/4"	5.422	95,000	463,614	11,581	10,624	13,281	14,874	15,937	16,680	21,249	31,873	15,937	4781	9562	15937		
3 x 8	4-5/8"	6.503	95,000	556,009	15,151	13,900	17,375	19,460	20,850	21,823	27,800	41,701	20,850	6255	12510	20850		
3-1/4 x 8	5"	7.682	95,000	656,793	19,389	17,788	22,235	24,903	26,682	27,927	35,576	53,364	26,682	8005	16009	26682		
3-1/2 x 8	5-3/8"	8.959	95,000	765,966	24,351	22,341	27,926	31,277	33,511	35,075	44,681	67,022	33,511	10053	20107	33511		
3-3/4 x 8	5-3/4"	10.334	95,000	883,530	30,095	27,610	34,513	38,654	41,415	43,348	55,221	82,831	41,415	12425	24849	41415		
4 x 8	6-1/8"	11.807	95,000	1,009,483	36,678	33,649	42,062	47,109	50,474	52,830	67,299	100,948	50,474	15142	30284	50474		
4-1/4 x 8	6-1/2"	13.378	75,000	903,020	34,860	31,982	39,977	44,775	47,973	50,212	63,964	95,946	47,973	14392	28784	47973		
4-1/2 x 8	6-7/8"	15.047	75,000	1,015,704	41,517	38,089	47,611	53,324	57,133	59,800	76,178	114,267	57,133	17140	34280	57133		
4-3/4 x 8	7-1/4"	16.815	75,000	1,135,011	48,971	44,928	56,159	62,899	67,391	70,536	89,855	134,783	67,391	20217	40435	67391		
5 x 8	7-5/8"	18.681	75,000	1,260,941	57,268	52,539	65,674	73,555	78,809	82,487	105,078	157,618	78,809	23643	47285	78809		
5-1/4 x 8	8"	20.644	75,000	1,393,495	66,452	60,965	76,207	85,352	91,448	95,716	121,931	182,896	91,448	27434	54869	91448		
5-1/2 x 8	8-3/8"	22.706	75,000	1,532,672	76,570	70,247	87,809	98,346	105,371	110,289	140,495	210,742	105,371	31611	63223	105371		
5-3/4 x 8	8-3/4"	24.866	75,000	1,678,473	87,665	80,427	100,534	112,598	120,640	126,270	160,854	241,281	120,640	36192	72384	120640		
6 x 8	9-1/8"	27.124	75,000	1,830,897	99,784	91,545	114,431	128,163	137,317	143,725	183,090	274,635	137,317	41195	82390	137317		

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TORQUE GUIDE FOR ASTM A193 GRADE B7 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN				
BOLT TENSION BASED ON				99	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM 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=.440 K=.300	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
5/8 x 11	1-1/16"	0.226	105,000	23,493	160	147	184	206	220	231	294	440	220	66	132	220		
3/4 x 10	1-1/4"	0.334	105,000	34,749	237	217	271	304	326	341	434	652	326	98	195	326		
7/8 x 9	1-7/16"	0.461	105,000	47,973	381	350	437	490	525	549	700	1,049	525	157	315	525		
1x 8	1-5/8"	0.605	105,000	62,935	572	524	656	734	787	823	1,049	1,573	787	236	472	787		
1-1/8 x 8	1-13/16"	0.790	105,000	82,126	839	770	962	1,078	1,155	1,209	1,540	2,310	1,155	346	693	1155		
1-1/4 x 8	2"	0.999	105,000	103,867	1,179	1,082	1,352	1,515	1,623	1,699	2,164	3,246	1,623	487	974	1623		
1-3/8 x 8	2-3/16"	1.233	105,000	128,157	1,601	1,468	1,836	2,056	2,203	2,305	2,937	4,405	2,203	661	1322	2203		
1-1/2 x 8	2-3/8"	1.491	105,000	154,998	2,112	1,937	2,422	2,712	2,906	3,042	3,875	5,812	2,906	872	1744	2906		
1-5/8 x 8	2-9/16"	1.774	105,000	184,389	2,722	2,497	3,121	3,496	3,745	3,920	4,994	7,491	3,745	1124	2247	3745		
1-3/4 x 8	2-3/4"	2.081	105,000	216,330	3,439	3,155	3,944	4,417	4,732	4,953	6,310	9,464	4,732	1420	2839	4732		
1-7/8 x 8	2-15/16"	2.413	105,000	250,821	4,272	3,919	4,899	5,487	5,879	6,153	7,838	11,757	5,879	1764	3527	5879		
2 x 8	3-1/8"	2.769	105,000	287,862	5,229	4,798	5,997	6,717	7,197	7,532	9,595	14,393	7,197	2159	4318	7197		
2-1/8 x 8	3-5/16"	3.150	105,000	327,452	6,321	5,799	7,248	8,118	8,698	9,104	11,597	17,396	8,698	2609	5219	8698		
2-1/4 x 8	3-1/2"	3.555	105,000	369,593	7,554	6,930	8,662	9,702	10,395	10,880	13,860	20,790	10,395	3118	6237	10395		
2-3/8 x 8	3-11/16"	3.985	105,000	414,284	8,937	8,199	10,249	11,479	12,299	12,873	16,399	24,598	12,299	3690	7379	12299		
2-1/2 x 8	3-7/8"	4.440	95,000	417,570	9,482	8,699	10,874	12,179	13,049	13,658	17,399	26,098	13,049	3915	7829	13049		
2-3/4 x 8	4-1/4"	5.422	95,000	509,976	12,739	11,687	14,609	16,362	17,530	18,348	23,374	35,061	17,530	5259	10518	17530		
3 x 8	4-5/8"	6.503	95,000	611,609	16,666	15,290	19,113	21,406	22,935	24,006	30,580	45,871	22,935	6881	13761	22935		
3-1/4 x 8	5"	7.682	95,000	722,472	21,328	19,567	24,459	27,394	29,350	30,720	39,134	58,701	29,350	8805	17610	29350		
3-1/2 x 8	5-3/8"	8.959	95,000	842,563	26,786	24,575	30,718	34,405	36,862	38,582	49,150	73,724	36,862	11059	22117	36862		
3-3/4 x 8	5-3/4"	10.334	95,000	971,883	33,105	30,371	37,964	42,520	45,557	47,683	60,743	91,114	45,557	13667	27334	45557		
4 x 8	6-1/8"	11.807	95,000	1,110,431	40,346	37,014	46,268	51,820	55,522	58,113	74,029	111,043	55,522	16656	33313	55522		
4-1/4 x 8	6-1/2"	13.378	75,000	993,322	38,346	35,180	43,975	49,252	52,770	55,233	70,360	105,540	52,770	15831	31662	52770		
4-1/2 x 8	6-7/8"	15.047	75,000	1,117,274	45,669	41,898	52,372	58,657	62,847	65,780	83,796	125,693	62,847	18854	37708	62847		
4-3/4 x 8	7-1/4"	16.815	75,000	1,248,512	53,868	49,420	61,775	69,188	74,130	77,590	98,841	148,261	74,130	22239	44478	74130		
5 x 8	7-5/8"	18.681	75,000	1,387,035	62,995	57,793	72,241	80,910	86,690	90,735	115,586	173,379	86,690	26007	52014	86690		
5-1/4 x 8	8"	20.644	75,000	1,532,845	73,098	67,062	83,827	93,887	100,593	105,287	134,124	201,186	100,593	30178	60356	100593		
5-1/2 x 8	8-3/8"	22.706	75,000	1,685,940	84,227	77,272	96,590	108,181	115,908	121,317	154,544	231,817	115,908	34773	69545	115908		
5-3/4 x 8	8-3/4"	24.866	75,000	1,846,320	96,432	88,470	110,587	123,857	132,704	138,897	176,939	265,409	132,704	39811	79623	132704		
6 x 8	9-1/8"	27.124	75,000	2,013,987	109,762	100,699	125,874	140,979	151,049	158,098	201,399	302,098	151,049	45315	90629	151049		

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

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.