

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 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 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	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
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		
1 x 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	85,000	454,855	17,559	16,109	20,137	22,553	24,164	25,292	32,219	48,328	24,164	7,249	14,498	24,164		
4-1/2 x 8	6-7/8"	15.047	85,000	511,614	20,912	19,186	23,982	26,860	28,778	30,121	38,371	57,557	28,778	8,633	17,267	28,778		
4-3/4 x 8	7-1/4"	16.815	85,000	571,709	24,667	22,630	28,288	31,682	33,945	35,529	45,260	67,890	33,945	10,184	20,367	33,945		
5 x 8	7-5/8"	18.681	85,000	635,141	28,846	26,464	33,080	37,050	39,696	41,549	52,928	79,393	39,696	11,909	23,818	39,696		
5-1/4 x 8	8"	20.644	85,000	701,909	33,472	30,709	38,386	42,992	46,063	48,212	61,417	92,126	46,063	13,819	27,638	46,063		
5-1/2 x 8	8-3/8"	22.706	85,000	772,013	38,568	35,384	44,230	49,537	53,076	55,553	70,768	106,152	53,076	15,923	31,846	53,076		
5-3/4 x 8	8-3/4"	24.866	85,000	845,453	44,157	40,511	50,639	56,716	60,767	63,603	81,023	121,534	60,767	18,230	36,460	60,767		
6 x 8	9-1/8"	27.124	85,000	922,230	50,262	46,111	57,639	64,556	69,167	72,395	92,223	138,334	69,167	20,750	41,500	69,167		

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON			50	% 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	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
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	
1 x 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	85,000	568,568	21,949	20,137	25,171	28,192	30,205	31,615	40,274	60,410	30,205	9,062	18,123	30,205	
4-1/2 x 8	6-7/8"	15.047	85,000	639,517	26,140	23,982	29,977	33,575	35,973	37,652	47,964	71,946	35,973	10,792	21,584	35,973	
4-3/4 x 8	7-1/4"	16.815	85,000	714,636	30,834	28,288	35,360	39,603	42,432	44,412	56,575	84,863	42,432	12,729	25,459	42,432	
5 x 8	7-5/8"	18.681	85,000	793,926	36,057	33,080	41,350	46,312	49,620	51,936	66,160	99,241	49,620	14,886	29,772	49,620	
5-1/4 x 8	8"	20.644	85,000	877,386	41,840	38,386	47,982	53,740	57,578	60,265	76,771	115,157	57,578	17,274	34,547	57,578	
5-1/2 x 8	8-3/8"	22.706	85,000	965,016	48,211	44,230	55,287	61,922	66,345	69,441	88,460	132,690	66,345	19,903	39,807	66,345	
5-3/4 x 8	8-3/4"	24.866	85,000	1,056,816	55,197	50,639	63,299	70,895	75,959	79,503	101,278	151,917	75,959	22,788	45,575	75,959	
6 x 8	9-1/8"	27.124	85,000	1,152,787	62,827	57,639	72,049	80,695	86,459	90,494	115,279	172,918	86,459	25,938	51,875	86,459	

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
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 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	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
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	
1 x 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	85,000	682,282	26,339	24,164	30,205	33,830	36,246	37,938	48,328	72,492	36,246	10874	21748	36246	
4-1/2 x 8	6-7/8"	15.047	85,000	767,421	31,368	28,778	35,973	40,290	43,167	45,182	57,557	86,335	43,167	12950	25900	43167	
4-3/4 x 8	7-1/4"	16.815	85,000	857,564	37,000	33,945	42,432	47,523	50,918	53,294	67,890	101,836	50,918	15275	30551	50918	
5 x 8	7-5/8"	18.681	85,000	952,711	43,269	39,696	49,620	55,575	59,544	62,323	79,393	119,089	59,544	17863	35727	59544	
5-1/4 x 8	8"	20.644	85,000	1,052,863	50,208	46,063	57,578	64,488	69,094	72,319	92,126	138,188	69,094	20728	41456	69094	
5-1/2 x 8	8-3/8"	22.706	85,000	1,158,019	57,853	53,076	66,345	74,306	79,614	83,329	106,152	159,228	79,614	23884	47768	79614	
5-3/4 x 8	8-3/4"	24.866	85,000	1,268,180	66,236	60,767	75,959	85,074	91,150	95,404	121,534	182,301	91,150	27345	54690	91150	
6 x 8	9-1/8"	27.124	85,000	1,383,345	75,392	69,167	86,459	96,834	103,751	108,593	138,334	207,502	103,751	31125	62251	103751	

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 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	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
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		
1 x 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	85,000	795,996	30,729	28,192	35,239	39,468	42,287	44,261	56,383	84,575	42,287	12,686	25,372	42,287		
4-1/2 x 8	6-7/8"	15.047	85,000	895,324	36,596	33,575	41,968	47,005	50,362	52,712	67,149	100,724	50,362	15,109	30,217	50,362		
4-3/4 x 8	7-1/4"	16.815	85,000	1,000,491	43,167	39,603	49,503	55,444	59,404	62,176	79,206	118,808	59,404	17,821	35,642	59,404		
5 x 8	7-5/8"	18.681	85,000	1,111,496	50,480	46,312	57,890	64,837	69,469	72,710	92,625	138,937	69,469	20,841	41,681	69,469		
5-1/4 x 8	8"	20.644	85,000	1,228,340	58,576	53,740	67,175	75,236	80,610	84,372	107,480	161,220	80,610	24,183	48,366	80,610		
5-1/2 x 8	8-3/8"	22.706	85,000	1,351,022	67,495	61,922	77,402	86,691	92,883	97,217	123,844	185,766	92,883	27,865	55,730	92,883		
5-3/4 x 8	8-3/4"	24.866	85,000	1,479,543	77,275	70,895	88,618	99,253	106,342	111,305	141,790	212,684	106,342	31,903	63,805	106,342		
6 x 8	9-1/8"	27.124	85,000	1,613,902	87,958	80,695	100,869	112,973	121,043	126,691	161,390	242,085	121,043	36,313	72,626	121,043		

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				80	% YIELD										First Pass	Second Pass	All Subsequent Passes
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	CUSTOM (INSERT K) K=.300	30%	60%	100%	
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	
1 x 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	1,311	
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	1,068	1,780	
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	1,409	2,348	
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	1,816	3,027	
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	1,147	2,294	3,824	
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	1,425	2,850	4,750	
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	1,745	3,489	5,815	
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	2,109	4,217	7,029	
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	2,520	5,040	8,400	
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	2,982	5,963	9,939	
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	3,163	6,327	10,545	
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	4,250	8,500	14,166	
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	5,560	11,120	18,534	
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	7,115	14,231	23,718	
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	8,936	17,873	29,788	
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	11,044	22,088	36,814	
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	13,460	26,920	44,866	
4-1/4 x 8	6-1/2"	13.378	85,000	909,709	35,119	32,219	40,274	45,106	48,328	50,584	64,438	96,657	48,328	14,498	28,997	48,328	
4-1/2 x 8	6-7/8"	15.047	85,000	1,023,228	41,824	38,371	47,964	53,719	57,557	60,243	76,742	115,113	57,557	17,267	34,534	57,557	
4-3/4 x 8	7-1/4"	16.815	85,000	1,143,418	49,334	45,260	56,575	63,364	67,890	71,059	90,521	135,781	67,890	20,367	40,734	67,890	
5 x 8	7-5/8"	18.681	85,000	1,270,282	57,692	52,928	66,160	74,100	79,393	83,098	105,857	158,785	79,393	23,818	47,636	79,393	
5-1/4 x 8	8"	20.644	85,000	1,403,817	66,945	61,417	76,771	85,984	92,126	96,425	122,834	184,251	92,126	27,638	55,275	92,126	
5-1/2 x 8	8-3/8"	22.706	85,000	1,544,026	77,137	70,768	88,460	99,075	106,152	111,106	141,536	212,304	106,152	31,846	63,691	106,152	
5-3/4 x 8	8-3/4"	24.866	85,000	1,690,906	88,315	81,023	101,278	113,432	121,534	127,205	162,045	243,068	121,534	36,460	72,920	121,534	
6 x 8	9-1/8"	27.124	85,000	1,844,460	100,523	92,223	115,279	129,112	138,334	144,790	184,446	276,669	138,334	41,500	83,001	138,334	

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 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 Passes
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	CUSTOM (INSERT K) K=.300	30%	60%	100%	
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	
1 x 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	85,000	1,023,423	39,508	36,246	45,308	50,745	54,369	56,907	72,492	108,739	54,369	16311	32622	54369	
4-1/2 x 8	6-7/8"	15.047	85,000	1,151,131	47,052	43,167	53,959	60,434	64,751	67,773	86,335	129,502	64,751	19425	38851	64751	
4-3/4 x 8	7-1/4"	16.815	85,000	1,286,346	55,500	50,918	63,647	71,285	76,377	79,941	101,836	152,754	76,377	22913	45826	76377	
5 x 8	7-5/8"	18.681	85,000	1,429,067	64,903	59,544	74,431	83,362	89,317	93,485	119,089	178,633	89,317	26795	53590	89317	
5-1/4 x 8	8"	20.644	85,000	1,579,294	75,313	69,094	86,368	96,732	103,641	108,478	138,188	207,282	103,641	31092	62185	103641	
5-1/2 x 8	8-3/8"	22.706	85,000	1,737,029	86,779	79,614	99,517	111,459	119,421	124,994	159,228	238,841	119,421	35826	71652	119421	
5-3/4 x 8	8-3/4"	24.866	85,000	1,902,270	99,354	91,150	113,938	127,611	136,726	143,106	182,301	273,451	136,726	41018	82035	136726	
6 x 8	9-1/8"	27.124	85,000	2,075,017	113,088	103,751	129,689	145,251	155,626	162,889	207,502	311,253	155,626	46688	93376	155626	

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.

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B16 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	CUSTOM (INSERT K) K=.300	First Pass	Second Pass	All Subsequent Passes		
													0.15	30%	60%	100%		
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		
1 x 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	1,155		
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	1,623		
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	2,203		
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	2,906		
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	3,745		
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	4,732		
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	5,879		
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	7,197		
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	8,698		
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	10,395		
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	12,299		
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	13,049		
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	17,530		
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	22,935		
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	29,350		
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	36,862		
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	45,557		
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	55,522		
4-1/4 x 8	6-1/2"	13.378	85,000	1,125,765	43,459	39,871	49,839	55,819	59,806	62,597	79,742	119,613	59,806	17942	35884	59,806		
4-1/2 x 8	6-7/8"	15.047	85,000	1,266,244	51,758	47,484	59,355	66,478	71,226	74,550	94,968	142,452	71,226	21368	42736	71,226		
4-3/4 x 8	7-1/4"	16.815	85,000	1,414,980	61,050	56,010	70,012	78,413	84,014	87,935	112,019	168,029	84,014	25204	50409	84,014		
5 x 8	7-5/8"	18.681	85,000	1,571,973	71,394	65,499	81,874	91,698	98,248	102,833	130,998	196,497	98,248	29475	58949	98,248		
5-1/4 x 8	8"	20.644	85,000	1,737,224	82,844	76,004	95,004	106,405	114,005	119,326	152,007	228,011	114,005	34202	68403	114,005		
5-1/2 x 8	8-3/8"	22.706	85,000	1,910,732	95,457	87,575	109,469	122,605	131,363	137,493	175,150	262,726	131,363	39409	78818	131,363		
5-3/4 x 8	8-3/4"	24.866	85,000	2,092,497	109,289	100,265	125,332	140,372	150,398	157,417	200,531	300,796	150,398	45119	90239	150,398		
6 x 8	9-1/8"	27.124	85,000	2,282,519	124,397	114,126	142,657	159,776	171,189	179,178	228,252	342,378	171,189	51357	102713	171,189		

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.