

HYTORC

TORQUE GUIDE FOR ASTM A449 STUD					REQUIRED TORQUE (FtLbs)										THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN		
BOLT TENSION BASED ON			40	% 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 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	92,000	12,302	84	77	96	108	115	121	154	231	115	35	69	115	
7/8 x 9	1-7/16"	0.461	92,000	16,983	135	124	155	173	186	194	248	372	186	56	111	186	
1x 8	1-5/8"	0.605	92,000	22,280	202	186	232	260	279	291	371	557	279	84	167	279	
1-1/8 x 8	1-13/16"	0.790	81,000	25,598	262	240	300	336	360	377	480	720	360	108	216	360	
1-1/4 x 8	2"	0.999	81,000	32,374	368	337	422	472	506	529	674	1,012	506	152	304	506	
1-3/8 x 8	2-3/16"	1.233	81,000	39,945	499	458	572	641	687	719	915	1,373	687	206	412	687	
1-1/2 x 8	2-3/8"	1.491	81,000	48,311	658	604	755	845	906	948	1,208	1,812	906	272	544	906	
1-5/8 x 8	2-9/16"	1.774	58,000	41,153	607	557	697	780	836	875	1,115	1,672	836	251	502	836	
1-3/4 x 8	2-3/4"	2.081	58,000	48,281	767	704	880	986	1,056	1,105	1,408	2,112	1,056	317	634	1056	
1-7/8 x 8	2-15/16"	2.413	58,000	55,979	953	875	1,093	1,225	1,312	1,373	1,749	2,624	1,312	394	787	1312	
2 x 8	3-1/8"	2.769	58,000	64,246	1,167	1,071	1,338	1,499	1,606	1,681	2,142	3,212	1,606	482	964	1606	
2-1/8 x 8	3-5/16"	3.150	58,000	73,082	1,411	1,294	1,618	1,812	1,941	2,032	2,588	3,882	1,941	582	1165	1941	
2-1/4 x 8	3-1/2"	3.555	58,000	82,487	1,686	1,547	1,933	2,165	2,320	2,428	3,093	4,640	2,320	696	1392	2320	
2-3/8 x 8	3-11/16"	3.985	58,000	92,462	1,995	1,830	2,287	2,562	2,745	2,873	3,660	5,490	2,745	823	1647	2745	
2-1/2 x 8	3-7/8"	4.440	58,000	103,005	2,339	2,146	2,682	3,004	3,219	3,369	4,292	6,438	3,219	966	1931	3219	
2-3/4 x 8	4-1/4"	5.422	58,000	125,799	3,142	2,883	3,604	4,036	4,324	4,526	5,766	8,649	4,324	1297	2595	4324	
3 x 8	4-5/8"	6.503	58,000	150,870	4,111	3,772	4,715	5,280	5,658	5,922	7,544	11,315	5,658	1697	3395	5658	

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
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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 A449 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 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 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	92,000	15,377	105	96	120	135	144	151	192	288	144	43	86	144	
7/8 x 9	1-7/16"	0.461	92,000	21,229	169	155	193	217	232	243	310	464	232	70	139	232	
1x 8	1-5/8"	0.605	92,000	27,850	253	232	290	325	348	364	464	696	348	104	209	348	
1-1/8 x 8	1-13/16"	0.790	81,000	31,997	327	300	375	420	450	471	600	900	450	135	270	450	
1-1/4 x 8	2"	0.999	81,000	40,468	459	422	527	590	632	662	843	1,265	632	190	379	632	
1-3/8 x 8	2-3/16"	1.233	81,000	49,931	624	572	715	801	858	898	1,144	1,716	858	257	515	858	
1-1/2 x 8	2-3/8"	1.491	81,000	60,389	823	755	944	1,057	1,132	1,185	1,510	2,265	1,132	340	679	1132	
1-5/8 x 8	2-9/16"	1.774	58,000	51,441	759	697	871	975	1,045	1,094	1,393	2,090	1,045	313	627	1045	
1-3/4 x 8	2-3/4"	2.081	58,000	60,352	959	880	1,100	1,232	1,320	1,382	1,760	2,640	1,320	396	792	1320	
1-7/8 x 8	2-15/16"	2.413	58,000	69,974	1,192	1,093	1,367	1,531	1,640	1,717	2,187	3,280	1,640	492	984	1640	
2 x 8	3-1/8"	2.769	58,000	80,308	1,459	1,338	1,673	1,874	2,008	2,101	2,677	4,015	2,008	602	1205	2008	
2-1/8 x 8	3-5/16"	3.150	58,000	91,353	1,763	1,618	2,022	2,265	2,427	2,540	3,235	4,853	2,427	728	1456	2427	
2-1/4 x 8	3-1/2"	3.555	58,000	103,109	2,107	1,933	2,417	2,707	2,900	3,035	3,867	5,800	2,900	870	1740	2900	
2-3/8 x 8	3-11/16"	3.985	58,000	115,577	2,493	2,287	2,859	3,202	3,431	3,591	4,575	6,862	3,431	1029	2059	3431	
2-1/2 x 8	3-7/8"	4.440	58,000	128,756	2,924	2,682	3,353	3,755	4,024	4,211	5,365	8,047	4,024	1207	2414	4024	
2-3/4 x 8	4-1/4"	5.422	58,000	157,249	3,928	3,604	4,505	5,045	5,405	5,658	7,207	10,811	5,405	1622	3243	5405	
3 x 8	4-5/8"	6.503	58,000	188,588	5,139	4,715	5,893	6,601	7,072	7,402	9,429	14,144	7,072	2122	4243	7072	

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 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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BOLT TENSION BASED ON			60	% 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 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	92,000	18,453	126	115	144	161	173	181	231	346	173	52	104	173	
7/8 x 9	1-7/16"	0.461	92,000	25,475	202	186	232	260	279	292	372	557	279	84	167	279	
1x 8	1-5/8"	0.605	92,000	33,420	304	279	348	390	418	437	557	836	418	125	251	418	
1-1/8 x 8	1-13/16"	0.790	81,000	38,397	392	360	450	504	540	565	720	1,080	540	162	324	540	
1-1/4 x 8	2"	0.999	81,000	48,561	551	506	632	708	759	794	1,012	1,518	759	228	455	759	
1-3/8 x 8	2-3/16"	1.233	81,000	59,918	748	687	858	961	1,030	1,078	1,373	2,060	1,030	309	618	1030	
1-1/2 x 8	2-3/8"	1.491	81,000	72,467	987	906	1,132	1,268	1,359	1,422	1,812	2,718	1,359	408	815	1359	
1-5/8 x 8	2-9/16"	1.774	58,000	61,729	911	836	1,045	1,170	1,254	1,312	1,672	2,508	1,254	376	752	1254	
1-3/4 x 8	2-3/4"	2.081	58,000	72,422	1,151	1,056	1,320	1,479	1,584	1,658	2,112	3,168	1,584	475	951	1584	
1-7/8 x 8	2-15/16"	2.413	58,000	83,969	1,430	1,312	1,640	1,837	1,968	2,060	2,624	3,936	1,968	590	1181	1968	
2 x 8	3-1/8"	2.769	58,000	96,369	1,751	1,606	2,008	2,249	2,409	2,522	3,212	4,818	2,409	723	1446	2409	
2-1/8 x 8	3-5/16"	3.150	58,000	109,623	2,116	1,941	2,427	2,718	2,912	3,048	3,882	5,824	2,912	874	1747	2912	
2-1/4 x 8	3-1/2"	3.555	58,000	123,731	2,529	2,320	2,900	3,248	3,480	3,642	4,640	6,960	3,480	1044	2088	3480	
2-3/8 x 8	3-11/16"	3.985	58,000	138,693	2,992	2,745	3,431	3,843	4,117	4,310	5,490	8,235	4,117	1235	2470	4117	
2-1/2 x 8	3-7/8"	4.440	58,000	154,508	3,509	3,219	4,024	4,506	4,828	5,054	6,438	9,657	4,828	1449	2897	4828	
2-3/4 x 8	4-1/4"	5.422	58,000	188,699	4,714	4,324	5,405	6,054	6,487	6,789	8,649	12,973	6,487	1946	3892	6487	
3 x 8	4-5/8"	6.503	58,000	226,305	6,167	5,658	7,072	7,921	8,486	8,882	11,315	16,973	8,486	2546	5092	8486	

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BOLT TENSION BASED ON			70	% 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 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	92,000	21,528	147	135	168	188	202	211	269	404	202	61	121	202	
7/8 x 9	1-7/16"	0.461	92,000	29,721	236	217	271	303	325	340	433	650	325	98	195	325	
1x 8	1-5/8"	0.605	92,000	38,990	354	325	406	455	487	510	650	975	487	146	292	487	
1-1/8 x 8	1-13/16"	0.790	81,000	44,796	458	420	525	588	630	659	840	1,260	630	189	378	630	
1-1/4 x 8	2"	0.999	81,000	56,655	643	590	738	826	885	927	1,180	1,770	885	266	531	885	
1-3/8 x 8	2-3/16"	1.233	81,000	69,904	873	801	1,001	1,121	1,201	1,258	1,602	2,403	1,201	360	721	1201	
1-1/2 x 8	2-3/8"	1.491	81,000	84,544	1,152	1,057	1,321	1,480	1,585	1,659	2,114	3,170	1,585	476	951	1585	
1-5/8 x 8	2-9/16"	1.774	58,000	72,017	1,063	975	1,219	1,365	1,463	1,531	1,950	2,926	1,463	439	878	1463	
1-3/4 x 8	2-3/4"	2.081	58,000	84,492	1,343	1,232	1,540	1,725	1,848	1,935	2,464	3,697	1,848	554	1109	1848	
1-7/8 x 8	2-15/16"	2.413	58,000	97,964	1,668	1,531	1,913	2,143	2,296	2,403	3,061	4,592	2,296	689	1378	2296	
2 x 8	3-1/8"	2.769	58,000	112,431	2,042	1,874	2,342	2,623	2,811	2,942	3,748	5,622	2,811	843	1686	2811	
2-1/8 x 8	3-5/16"	3.150	58,000	127,894	2,469	2,265	2,831	3,171	3,397	3,556	4,530	6,794	3,397	1019	2038	3397	
2-1/4 x 8	3-1/2"	3.555	58,000	144,353	2,950	2,707	3,383	3,789	4,060	4,249	5,413	8,120	4,060	1218	2436	4060	
2-3/8 x 8	3-11/16"	3.985	58,000	161,808	3,491	3,202	4,003	4,483	4,804	5,028	6,405	9,607	4,804	1441	2882	4804	
2-1/2 x 8	3-7/8"	4.440	58,000	180,259	4,093	3,755	4,694	5,258	5,633	5,896	7,511	11,266	5,633	1690	3380	5633	
2-3/4 x 8	4-1/4"	5.422	58,000	220,149	5,499	5,045	6,306	7,063	7,568	7,921	10,090	15,135	7,568	2270	4541	7568	
3 x 8	4-5/8"	6.503	58,000	264,023	7,195	6,601	8,251	9,241	9,901	10,363	13,201	19,802	9,901	2970	5941	9901	

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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 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	92,000	24,604	168	154	192	215	231	241	308	461	231	69	138	231	
7/8 x 9	1-7/16"	0.461	92,000	33,966	270	248	310	347	372	389	495	743	372	111	223	372	
1x 8	1-5/8"	0.605	92,000	44,560	405	371	464	520	557	583	743	1,114	557	167	334	557	
1-1/8 x 8	1-13/16"	0.790	81,000	51,195	523	480	600	672	720	754	960	1,440	720	216	432	720	
1-1/4 x 8	2"	0.999	81,000	64,748	735	674	843	944	1,012	1,059	1,349	2,023	1,012	304	607	1012	
1-3/8 x 8	2-3/16"	1.233	81,000	79,890	998	915	1,144	1,282	1,373	1,437	1,831	2,746	1,373	412	824	1373	
1-1/2 x 8	2-3/8"	1.491	81,000	96,622	1,316	1,208	1,510	1,691	1,812	1,896	2,416	3,623	1,812	544	1087	1812	
1-5/8 x 8	2-9/16"	1.774	58,000	82,305	1,215	1,115	1,393	1,560	1,672	1,750	2,229	3,344	1,672	502	1003	1672	
1-3/4 x 8	2-3/4"	2.081	58,000	96,563	1,535	1,408	1,760	1,971	2,112	2,211	2,816	4,225	2,112	634	1267	2112	
1-7/8 x 8	2-15/16"	2.413	58,000	111,958	1,907	1,749	2,187	2,449	2,624	2,746	3,499	5,248	2,624	787	1574	2624	
2 x 8	3-1/8"	2.769	58,000	128,492	2,334	2,142	2,677	2,998	3,212	3,362	4,283	6,425	3,212	964	1927	3212	
2-1/8 x 8	3-5/16"	3.150	58,000	146,164	2,821	2,588	3,235	3,624	3,882	4,064	5,177	7,765	3,882	1165	2329	3882	
2-1/4 x 8	3-1/2"	3.555	58,000	164,975	3,372	3,093	3,867	4,331	4,640	4,856	6,187	9,280	4,640	1392	2784	4640	
2-3/8 x 8	3-11/16"	3.985	58,000	184,923	3,989	3,660	4,575	5,124	5,490	5,746	7,320	10,980	5,490	1647	3294	5490	
2-1/2 x 8	3-7/8"	4.440	58,000	206,010	4,678	4,292	5,365	6,009	6,438	6,738	8,584	12,876	6,438	1931	3863	6438	
2-3/4 x 8	4-1/4"	5.422	58,000	251,599	6,285	5,766	7,207	8,072	8,649	9,052	11,532	17,297	8,649	2595	5189	8649	
3 x 8	4-5/8"	6.503	58,000	301,740	8,222	7,544	9,429	10,561	11,315	11,843	15,087	22,631	11,315	3395	6789	11315	

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HYTORC

TORQUE GUIDE FOR ASTM A449 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 K=.300	CUSTOM (INSERT K) K=.300	0.15	30%	60%	100%
3/4 x 10	1-1/4"	0.334	92,000	27,679	189	173	216	242	259	272	346	519	259	78	156	259	
7/8 x 9	1-7/16"	0.461	92,000	38,212	304	279	348	390	418	437	557	836	418	125	251	418	
1x 8	1-5/8"	0.605	92,000	50,130	455	418	522	585	627	656	836	1,253	627	188	376	627	
1-1/8 x 8	1-13/16"	0.790	81,000	57,595	589	540	675	756	810	848	1,080	1,620	810	243	486	810	
1-1/4 x 8	2"	0.999	81,000	72,842	827	759	948	1,062	1,138	1,191	1,518	2,276	1,138	341	683	1138	
1-3/8 x 8	2-3/16"	1.233	81,000	89,877	1,123	1,030	1,287	1,442	1,545	1,617	2,060	3,090	1,545	463	927	1545	
1-1/2 x 8	2-3/8"	1.491	81,000	108,700	1,481	1,359	1,698	1,902	2,038	2,133	2,718	4,076	2,038	611	1223	2038	
1-5/8 x 8	2-9/16"	1.774	58,000	92,594	1,367	1,254	1,567	1,755	1,881	1,969	2,508	3,762	1,881	564	1128	1881	
1-3/4 x 8	2-3/4"	2.081	58,000	108,633	1,727	1,584	1,980	2,218	2,376	2,487	3,168	4,753	2,376	713	1426	2376	
1-7/8 x 8	2-15/16"	2.413	58,000	125,953	2,145	1,968	2,460	2,755	2,952	3,090	3,936	5,904	2,952	886	1771	2952	
2 x 8	3-1/8"	2.769	58,000	144,554	2,626	2,409	3,012	3,373	3,614	3,782	4,818	7,228	3,614	1084	2168	3614	
2-1/8 x 8	3-5/16"	3.150	58,000	164,435	3,174	2,912	3,640	4,077	4,368	4,572	5,824	8,736	4,368	1310	2621	4368	
2-1/4 x 8	3-1/2"	3.555	58,000	185,597	3,793	3,480	4,350	4,872	5,220	5,464	6,960	10,440	5,220	1566	3132	5220	
2-3/8 x 8	3-11/16"	3.985	58,000	208,039	4,488	4,117	5,147	5,764	6,176	6,464	8,235	12,352	6,176	1853	3706	6176	
2-1/2 x 8	3-7/8"	4.440	58,000	231,762	5,263	4,828	6,035	6,760	7,243	7,581	9,657	14,485	7,243	2173	4346	7243	
2-3/4 x 8	4-1/4"	5.422	58,000	283,049	7,070	6,487	8,108	9,081	9,730	10,184	12,973	19,460	9,730	2919	5838	9730	
3 x 8	4-5/8"	6.503	58,000	339,458	9,250	8,486	10,608	11,881	12,730	13,324	16,973	25,459	12,730	3819	7638	12730	

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TORQUE GUIDE FOR ASTM A449 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%	
3/4 x 10	1-1/4"	0.334	92,000	30,447	207	190	238	266	285	299	381	571	285	86	171	285	
7/8 x 9	1-7/16"	0.461	92,000	42,033	334	306	383	429	460	481	613	919	460	138	276	460	
1x 8	1-5/8"	0.605	92,000	55,143	501	460	574	643	689	721	919	1,379	689	207	414	689	
1-1/8 x 8	1-13/16"	0.790	81,000	63,354	647	594	742	832	891	932	1,188	1,782	891	267	535	891	
1-1/4 x 8	2"	0.999	81,000	80,126	910	835	1,043	1,168	1,252	1,310	1,669	2,504	1,252	376	751	1252	
1-3/8 x 8	2-3/16"	1.233	81,000	98,864	1,235	1,133	1,416	1,586	1,699	1,779	2,266	3,398	1,699	510	1020	1699	
1-1/2 x 8	2-3/8"	1.491	81,000	119,570	1,629	1,495	1,868	2,092	2,242	2,347	2,989	4,484	2,242	673	1345	2242	
1-5/8 x 8	2-9/16"	1.774	58,000	101,853	1,503	1,379	1,724	1,931	2,069	2,165	2,759	4,138	2,069	621	1241	2069	
1-3/4 x 8	2-3/4"	2.081	58,000	119,496	1,899	1,743	2,178	2,440	2,614	2,736	3,485	5,228	2,614	784	1568	2614	
1-7/8 x 8	2-15/16"	2.413	58,000	138,549	2,360	2,165	2,706	3,031	3,247	3,399	4,330	6,494	3,247	974	1948	3247	
2 x 8	3-1/8"	2.769	58,000	159,009	2,889	2,650	3,313	3,710	3,975	4,161	5,300	7,950	3,975	1193	2385	3975	
2-1/8 x 8	3-5/16"	3.150	58,000	180,878	3,491	3,203	4,004	4,484	4,805	5,029	6,406	9,609	4,805	1441	2883	4805	
2-1/4 x 8	3-1/2"	3.555	58,000	204,156	4,172	3,828	4,785	5,359	5,742	6,010	7,656	11,484	5,742	1723	3445	5742	
2-3/8 x 8	3-11/16"	3.985	58,000	228,843	4,937	4,529	5,661	6,341	6,794	7,111	9,058	13,588	6,794	2038	4076	6794	
2-1/2 x 8	3-7/8"	4.440	58,000	254,938	5,789	5,311	6,639	7,436	7,967	8,339	10,622	15,934	7,967	2390	4780	7967	
2-3/4 x 8	4-1/4"	5.422	58,000	311,354	7,777	7,135	8,919	9,989	10,703	11,202	14,270	21,406	10,703	3211	6422	10703	
3 x 8	4-5/8"	6.503	58,000	373,404	10,175	9,335	11,669	13,069	14,003	14,656	18,670	28,005	14,003	4201	8402	14003	

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