



Material Stocked at Our Edmonton Warehouse

Finished Studs

A193 - B7, B7M	1/2" to 3-1/2" Diameter
A320 - L7, L7M	1/2" to 3-1/2" Diameter
A193 - B8 (304SS)	1/2" to 1-1/2" Diameter
A193 - B8M (316SS)	1/2" to 1-1/2" Diameter

Heavy Hex Nuts

A194 - 2H	3/8" to 3-1/2" Diameter
A194 - 2HM	1/2" to 2-1/2" Diameter
A194 Gr. 4 & Gr. L7	1/2" to 3-1/2" Diameter
A194 - L7M	1/2" to 3" Diameter
A194 - 8 & 8M	1/2" to 2" Diameter

Plated & Bare Redi-Rod

Plated 10' Lengths	1/4" to 1-1/2" Diameter
Bare 12' Lengths	1/4" to 1-1/2" Diameter

Cap Screws Plated & Bare

SAE Grade 5	1/4" to 1-1/2" Diameter
18-8 Stainless Steel	
316 Stainless Steel	

U-Bolts

Mild Steel Fig. 14 & 137 Black	1/2" to 30" Pipe Size	Fig. 137 - 304 Stainless Steel	1/2" to 18" Pipe Size
Mild Steel Fig. 137 Plated	1/2" to 24" Pipe Size	Fig. 137 - 316 Stainless Steel	1/2" to 16" Pipe Size

Full line of Gaskets available on request.



SERVICE • SELECTION • SATISFACTION

7823-25 Street NW, Edmonton, AB T6P 1N4 Canada
 Telephone: 780-440-2737 • Toll Free: 1-800-661-6923
 Facsimile: 780-440-4696 • Toll Free Fax: 1- 877-440-4601
 Website: www.mzind.com



A Proud Canadian Company

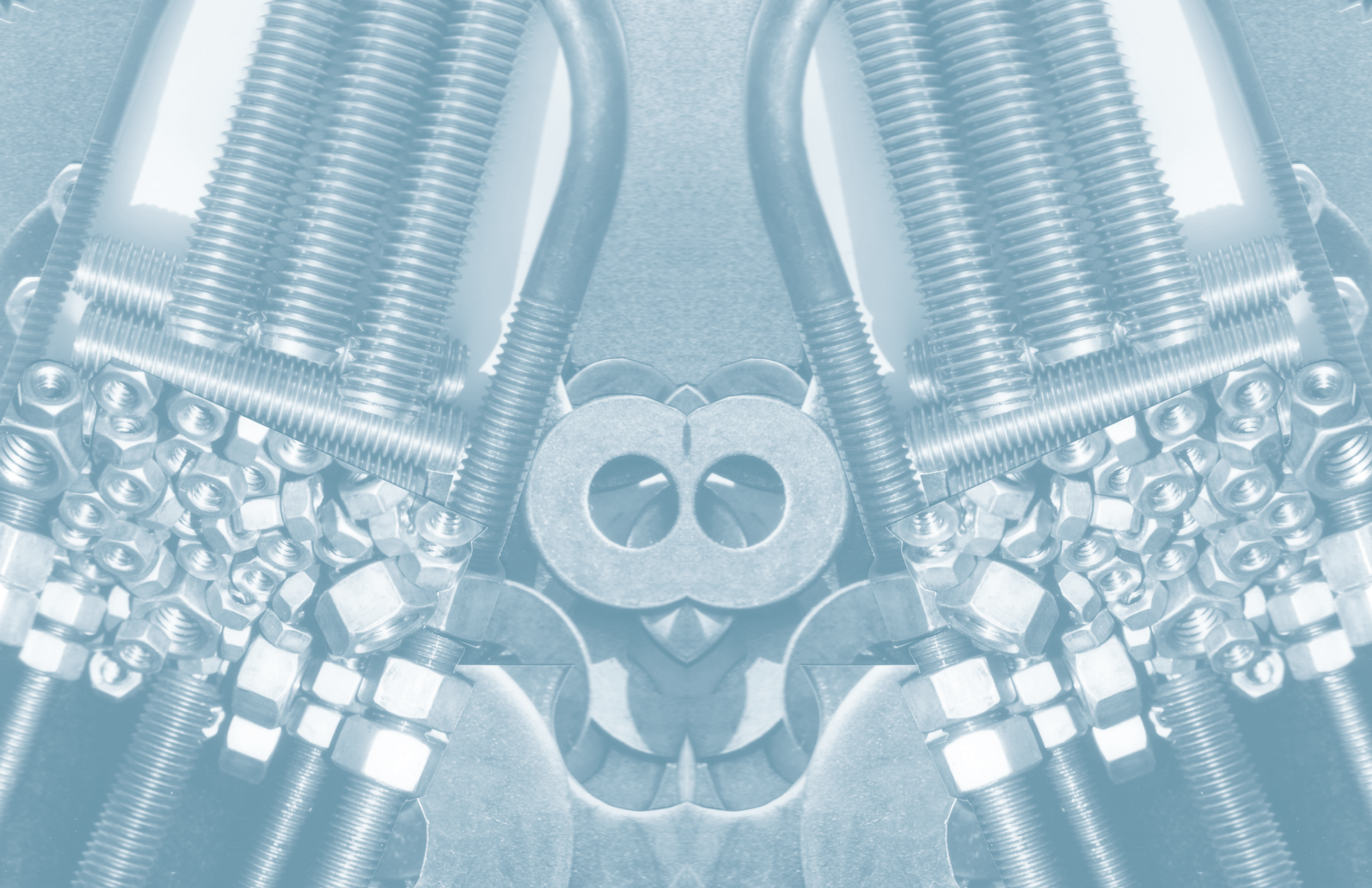
About This Catalogue: The figures and specifications gathered in the assembly of this booklet are, to our knowledge, correct and accurate. We trust this publication will become a valuable resource in the ordering and procurement of the products listed. We cannot, however, be held responsible for any inaccuracies contained herein, due to publishing error or specification change.

2008 PRODUCT CATALOGUE



SERVICE • SELECTION • SATISFACTION

Custom Manufacturing



HEAVY HEX HEAD BOLTS - WEIGHT PER 100
PIECES - IN POUNDS - 1/2”TO 1-1/2” DIAMETER

Diameter	Length								
	1/2”	5/8”	3/4”	7/8”	1”	1-1/8”	1-1/4”	1-3/8”	1-1/2”
1	9.96	17.50	27.70						
1-1/4	11.26	19.20	30.30	44.70	61.50				
1-1/2	12.65	21.20	32.90	48.30	67.03	88.80	118.40		
1-3/4	13.96	23.40	36.00	52.20	72.55	95.80	127.00	159.00	202.00
2	15.36	25.50	39.10	56.40	78.08	102.80	135.60	169.25	214.42
2-1/4	16.76	27.90	42.30	60.60	83.60	109.80	144.20	180.25	226.85
2-1/2	18.16	29.80	45.50	64.90	89.12	116.80	152.80	190.87	239.27
2-3/4	19.56	32.00	48.50	69.10	94.65	123.80	161.40	201.50	251.70
3	20.86	34.20	51.60	73.32	100.17	128.80	170.00	208.00	260.12
3-1/4	22.26	36.30	54.70	77.55	105.70	135.80	176.00	218.63	272.54
3-1/2	23.66	38.50	57.80	81.79	111.22	142.80	184.60	229.25	284.97
3-3/4	25.06	40.60	60.90	86.00	116.75	149.90	193.20	239.87	297.39
4	26.46	42.80	64.00	90.22	119.50	156.90	201.80	250.49	309.82
4-1/4	27.76	45.00	67.10	94.45	125.03	163.90	210.40	261.12	322.24
4-1/2	29.16	47.10	70.20	98.67	130.55	170.90	219.00	271.74	334.67
4-3/4	30.56	49.30	73.40	102.90	136.07	177.90	227.60	282.36	347.09
5	31.96	51.40	76.50	107.12	141.60	184.90	236.20	292.99	359.52
5-1/4	33.36	53.60	79.60	111.35	147.12	191.90	244.80	303.61	371.94
5-1/2	34.66	55.80	82.70	115.57	152.65	198.90	253.40	314.24	384.37
5-3/4	36.06	57.90	85.70	119.79	158.17	205.90	262.00	324.86	396.79
6	37.46	60.00	88.70	124.02	163.70	212.90	270.60	335.49	409.22
6-1/4	38.86	62.20	91.70	128.24	169.22	219.90	279.20	346.11	421.64
6-1/2	40.26	64.40	94.70	132.47	174.75	226.80	287.80	356.74	434.07
6-3/4	41.56	66.60	98.70	136.69	180.27	233.80	296.40	367.36	446.49
7	42.96	68.70	101.70	140.92	185.80	240.80	305.00	377.99	458.92
7-1/4	44.36	70.90	104.70	145.14	191.32	247.80	313.60	388.62	471.34
7-1/2	45.76	73.00	107.70	149.37	196.85	254.80	322.20	399.24	483.77
7-3/4	47.06	75.20	110.70	153.95	202.37	261.80	330.80	409.86	496.19
8	48.46	77.30	113.70	157.82	207.90	268.80	339.40	420.49	508.62
8-1/4	49.86	79.50	116.70	162.04	213.42	275.80	348.00	431.11	521.04
8-1/2	51.26	81.60	119.70	166.27	218.95	282.80	356.60	441.74	533.47
8-3/4	52.56	83.80	122.70	170.49	224.47	289.80	365.20	452.36	545.89
9	53.96	85.90	125.70	174.72	230.00	296.80	373.80	462.99	558.32
9-1/4	55.34	88.05	128.80	178.94	235.52	303.80	382.40	473.61	570.74
9-1/2	56.71	90.20	131.90	183.17	241.05	310.80	391.00	484.24	583.17
9-3/4	58.09	92.35	135.00	187.39	246.57	317.80	399.60	494.86	595.60
10	59.46	94.50	138.10	191.62	252.10	324.80	408.20	505.49	608.02
10-1/4	60.84	96.65	141.20	195.84	257.62	331.80	416.80	516.11	620.45
10-1/2	62.21	98.80	144.30	200.07	263.15	338.80	425.40	526.74	632.87
10-3/4	63.58	100.95	147.40	204.29	268.67	345.80	434.00	537.36	645.29
11	64.96	103.10	150.50	208.52	274.20	352.80	442.60	547.99	657.72
11-1/4	66.34	105.25	153.60	212.74	279.72	359.80	451.20	558.61	670.14
11-1/2	67.71	107.40	156.70	216.97	285.25	366.80	459.80	569.24	682.52
11-3/4	69.09	109.55	159.80	221.19	290.77	373.80	468.40	579.86	695.00
12	70.46	111.70	162.90	225.42	296.30	380.80	477.00	590.49	707.72
For Each Additional Inch - Add	5.50	8.60	12.40	16.90	22.10	28.00	34.40	42.50	49.70

Overview

M & Z Industrial Supply Ltd. offers quality, dedicated and committed service.

With inventory expertise and superior service, our staff is able to commit to the distribution of quality industrial fasteners. Our focus is the determination to meet all of your fastener needs as well as *total customer satisfaction*.

Our computerized programs allow us to instantly and efficiently provide traceability of all shipments to give you “Peace of Mind”.

“ON TIME DELIVERY” is our goal in providing you with the highest quality products “TWENTY FOUR SEVEN”.

Trusted Quality Products and a Dedicated
Committment to Service since 1979



M & Z Industrial Supply Ltd., is a Canadian company owned by local investors and was formed in 1979 to supply fasteners to the petrochemical, forestry and mining industries. The requirements then are the same as today, dedication to superior service, inventory expertise and the determination to meet the client’s needs to one hundred percent satisfaction. We operate out of a company owned office and warehouse facility of approximately 64,000 square feet.

Our computerized programs allow us to instantly provide traceability of shipments and tracking of the largest stocked inventory of fasteners, which provides you, the customer, with ON TIME DELIVERY. Our Motto: “If we don’t have it, we find it,” is no better expressed than by our exceptional order desk sales staff.

We pride ourselves in the ability to provide customer satisfaction 24/7 and the sourcing of consistently high quality products as a major goal. All departments in our company, from the warehouse to inside sales, to accounting, to management, strive for excellence and the opportunity to meet your needs.

As an organization dedicated to building partnerships of success, we have, and will continue to help with your inventories to sustain movement and growth. We will also provide you with a reputable organization to enhance your place and role as a distributor to the particular industry you are involved with.

M & Z Industrial Supply Ltd. in partnership with Strathcona Mfg Inc. allows us to meet your needs in a timely manner.

GIVE US A TRY.



APPROXIMATE SHIPPING WEIGHTS - ALLOY AND CARBON STEEL STUDS

3” TO 6-3/4” LENGTH - 1/2” TO 1-1/8” DIAMETER

WEIGHT IN LBS. PER 100 PIECES						
Length In Inches	Diameter					
	1/2"	5/8"	3/4"	7/8"	1"	1-1/8"
3	14	21-1/2	31-1/2	40	56	72
3-1/4	15	23-1/2	34	43-1/2	60-1/2	78
3-1/2	16-1/4	25-1/4	36-1/2	47	65	84
3-3/4	17-1/4	27-1/4	39	50-1/2	69-1/2	90
4	18-1/2	29	42	53-1/2	74-1/2	96
4-1/4	19-1/2	30-3/4	44-1/2	57	79	102
4-1/2	20-3/4	32-1/2	47	60-1/2	83-1/2	108
4-3/4	21-3/4	34-1/4	49-1/2	64	88	114
5	23	36	52-1/2	67	93	120
5-1/4	24-1/4	37-3/4	55	70-1/2	97-1/2	126
5-1/2	25-1/2	39-1/2	57-1/2	74	102	132
5-3/4	26-3/4	41-1/4	60	77-1/2	106-1/2	138
6	28	43	63	80	112	144
6-1/4	29	44-3/4	65-1/2	83-1/2	116-1/2	150
6-1/2	30-1/4	46-1/2	68	87	121	156
6-3/4	31-1/4	48-1/2	70-1/2	90	125-1/2	162
Add For 1/4" Length	1-1/8	1-3/4	2-5/8	3-1/2	4-3/4	6
Studs with One Nut Added	6-1/2	11-1/2	18	29	39	57
Studs with Two Nuts Added	13	23	36	58	78	114

3” TO 6-3/4” LENGTH - 1-1/4” TO 2” DIAMETER

WEIGHT IN LBS. PER 100 PIECES							
Length In Inches	Diameter						
	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"
3	92						
3-1/4	99-3/4						
3-1/2	107-1/2						
3-3/4	115-1/4						
4	123						
4-1/4	130-3/4						
4-1/2	138-1/2						
4-3/4	146-1/4						
5	154	187	230	270	316	367	438
5-1/4	161-3/4	196-1/4	241	283	332	385	460
5-1/2	169-1/2	206	253	297	348	403	482
5-3/4	177-1/4	215	264	310	364	421	504
6	184	224	276	324	380	440	526
6-1/4	191-3/4	233	287	337	396	458	548
6-1/2	199-1/2	243	299	351	412	476	570
6-3/4	207-1/4	252	312	364	428	494	592
Add For 1/4" Length	7-3/4	9-1/2	11-1/2	13-1/2	16	18-1/2	22
Studs with One Nut Added	76	97	124	162	204	233	279
Studs with Two Nuts Added	152	194	248	342	408	466	558

7” TO 12” LENGTH - 1/2” TO 1-1/8” DIAMETER

WEIGHT IN LBS. PER 100 PIECES						
Length In Inches	Diameter					
	1/2"	5/8"	3/4"	7/8"	1"	1-1/8"
7	32-1/2	50-1/2	73-1/2	93	130-1/2	168
7-1/4	33-1/2	52-1/4	76	96-1/2	135	174
7-1/2	34-3/4	54-1/4	78-1/2	100	139-1/2	180
7-3/4	35-3/4	56-1/4	81	103-1/2	144	186
8	37	58	84	107	149	192
8-1/4	38-1/4	59-3/4	86-1/2	110-1/2	153-1/2	198
8-1/2	39-1/2	61-1/2	89	114	158	204
8-3/4	40-3/4	63	91-1/2	117	162-1/2	210
9	42	64-1/2	94-1/2	120	167-1/2	220
9-1/4			97	123-1/2	172	222
9-1/2			99-1/2	127	176-1/2	228
9-3/4			102	130-1/2	181	236
10			105	134	186	240
10-1/4					190-1/2	246
10-1/2					195	252
10-3/4					199-1/2	258
11					204-1/2	264
11-1/4					209	270
11-1/2					213-1/2	276
11-3/4					218	282
12					224	288
Add For 1/4" Length	1-1/8	1-3/4	2-5/8	3-1/2	4-3/4	6
Studs with One Nut Added	6-1/2	11-1/2	18	29	39	57
Studs with Two Nuts Added	13	23	36	58	78	114

7” TO 12” LENGTH - 1-1/4” TO 2” DIAMETER

WEIGHT IN LBS. PER 100 PIECES							
Length In Inches	Diameter						
	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"
7	215	261	322	378	443	513	614
7-1/4	222-3/4	270	333	391	459	531	636
7-1/2	230-1/2	280	345	405	475	549	668
7-3/4	238-1/2	289	356	418	491	567	680
8	246	298	368	432	506	586	702
8-1/4	253-3/4	307	379	445	522	604	724
8-1/2	261-1/2	317	391	459	538	622	746
8-3/4	269-1/4	326	402	472	554	640	768
9	277	336	414	486	570	660	789
9-1/4	284-3/4	345	425	499	586	678	811
9-1/2	292-1/2	355	437	513	602	696	833
9-3/4	300-1/4	364	448	526	618	714	855
10	308	374	460	540	632	733	877
10-1/4	315-3/4	383	471	553	648	751	899
10-1/2	323-1/2	392	483	567	664	769	921
10-3/4	331-1/4	401	494	580	680	787	943
11	338	410	506	594	696	806	965
11-1/4	345-3/4	419	517	607	712	824	978
11-1/2	353-1/2	429	529	621	728	842	1009
11-3/4	361-1/4	438	540	634	744	861	1031
12	368	448	552	648	760	880	1052
Add For 1/4" Length	7-3/4	9-1/2	11-1/2	13-1/2	16	18-1/2	22
Studs with One Nut Added	76	97	124	162	204	233	279
Studs with Two Nuts Added	152	194	248	324	408	466	558

SUGGESTED ASSEMBLY TORQUE VALUES TO PRODUCE CORRESPONDING BOLT LOADS

Size	Tensile Stress Area A _s Square Inch	SA193 & ASTM 193 B7 Studs with A194 2H Heavy Hex Nuts		
		Clamp Load P. Lb.s	Tightening Torque	
			Dry K= .223 Ft. Lbs.	Lubed K = .167 Ft. Lbs.
1/2 - 13	0.138	10,350	96	72
9/16 - 12	0.177	13,275	139	104
5/8 - 11	0.220	16,500	192	143
3/4 - 10	0.327	24,525	342	256
7/8 - 9	0.452	33,900	551	413
1 - 8	0.594	44,550	828	620
1-1/8 - 8	0.776	58,200	1217	911
1-1/4 - 8	0.984	73,800	1714	1284
1-3/8 - 8	1.215	91,125	2328	1744
1-1/2 - 8	1.471	110,325	3076	2303
1-5/8 - 8	1.769	132,675	4006	3000
1-3/4 - 8	2.06	154,500	5024	3763
1-7/8 - 8	2.41	180,750	6298	4716
2 - 8	2.74	205,500	7638	5720
2-1/4 - 8	3.52	264,000	11,038	8266
2-1/2 - 8	4.40	330,000	15,331	11,481

Size	Tensile Stress Area A _s Square Inch	SA320 & ASTM A320 L7 Studs with A194 Grade 4 or Grade L7 Heavy Hex Nuts		
		Clamp Load P. Lb.s	Tightening Torque	
			Dry K= .223 Ft. Lbs.	Lubed K = .167 Ft. Lbs.
1/2 - 13	0.138	10,350	96	72
9/16 - 12	0.177	13,275	139	104
5/8 - 11	0.220	16,500	192	143
3/4 - 10	0.327	24,525	342	256
7/8 - 9	0.452	33,900	551	413
1 - 8	0.594	44,550	828	620
1-1/8 - 8	0.776	58,200	1217	911
1-1/4 - 8	0.984	73,800	1714	1284
1-3/8 - 8	1.215	91,125	2328	1744
1-1/2 - 8	1.471	110,325	3076	2303
1-5/8 - 8	1.769	132,675	4006	3000
1-3/4 - 8	2.06	154,500	5024	3763
1-7/8 - 8	2.41	180,750	6298	4716
2 - 8	2.74	205,500	7638	5720
2-1/4 - 8	3.52	264,000	11,038	8266
2-1/2 - 8	4.40	330,000	15,331	11,481

Size	SA193 & ASTM 193 B7M Studs with A194 2HM Heavy Hex Nuts		
	Clamp Load P. Lb.s	Tightening Torque	
		Dry K= .223 Ft. Lbs.	Lubed K = .167 Ft. Lbs.
1/2 - 13	7,866	73	55
9/16 - 12	10,089	105	79
5/8 - 11	12,540	146	109
3/4 - 10	18,639	260	194
7/8 - 9	25,764	419	314
1 - 8	33,858	629	471
1-1/8 - 8	44,232	925	692
1-1/4 - 8	56,088	1303	976
1-3/8 - 8	69,255	1770	1325
1-1/2 - 8	83,847	2337	1750
1-5/8 - 8	100,833	3045	2280
1-3/4 - 8	177,420	3818	2860
1-7/8 - 8	137,370	4786	3584
2 - 8	156,180	5805	4347
2-1/4 - 8	200,640	8389	6282
2-1/2 - 8	250,800	11,652	8726

Size	SA320 & ASTM A320 L7M Studs with A194 L7M Heavy Hex Nuts		
	Clamp Load P. Lb.s	Tightening Torque	
		Dry K= .223 Ft. Lbs.	Lubed K = .167 Ft. Lbs.
1/2 - 13	7,866	73	55
9/16 - 12	10,089	105	79
5/8 - 11	12,540	146	109
3/4 - 10	18,639	260	194
7/8 - 9	25,764	419	314
1 - 8	33,858	629	471
1-1/8 - 8	44,232	925	692
1-1/4 - 8	56,088	1303	976
1-3/8 - 8	69,255	1770	1325
1-1/2 - 8	83,847	2337	1750
1-5/8 - 8	100,833	3045	2280
1-3/4 - 8	177,420	3818	2860
1-7/8 - 8	137,370	4786	3584
2 - 8	156,180	5805	4347
2-1/4 - 8	200,640	8389	6282
2-1/2 - 8	250,800	11,652	8726

NOTES:

1. Tightening torque values from the formula T=KDP, where T = tightening torque, lb. ft. K - torque friction coefficient, D = nominal bolt diameter, in.; and P = bolt clamping load developed by tightening, lb.
2. Clamp load is also known as preload or initial load in tension on bolt. Clamp load (lb.) is calculated by arbitrarily assuming useable bolt strength is 75% of bolt proof load (PSI) times the stress area (sq. in.) of threaded section of each bolt size. Higher or lower values of clamp load can be used depending on the application requirements and the judgement of the designer.
3. No proof load has been established by ASTM. Value shown in table are assumed at 95% of yield strength.

*Grade 7M nuts at a hardness not exceeding 235HB (or equivalent) shall be used with Grade B7M studs.

Overview



STRATHCONA
MANUFACTURING INC.

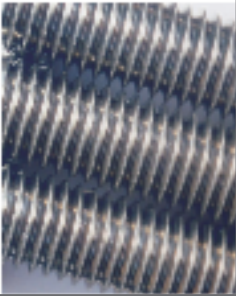
Strathcona Manufacturing Inc. (SMI) started operations in 1993 in response to a need for a manufacturer of specialty grade full thread stud bolts that could supply a quality product on a timely basis. We now manufacture B7M, L7M and L7 stud bolts in 17 diameters ranging from ½ to 3 inches. All stud bolts are manufactured in accordance with ASTM standards A193 for B7M or A320 for L7M and L7.

Since 1993 our manufacturing facilities have expanded from 5000 to 15 000 square feet with all manufacturing and testing processes performed in-house except for heat treatment which is subcontracted and steel supply which is purchased cold drawn in sizes suitable for thread rolling. We inventory steel of all diameters at all times and can store over 1 million pounds of cold drawn steel.

SMI computer systems use our own custom written software to organize and track orders and their related steel information, all test results and all other information required to produce our MTR's. The computer system has terminals at all work-stations to help document, track and analyze data such as thread profiles, hardness and more to help ensure product quality throughout the manufacturing processes.

SMI continues to maintain an exclusive stud bolt supply contract with M&Z allowing us to dedicate all planning and production activities to M&Z requirements only. We have expanded our equipment lines over the years to allow the manufacture of several diameters of stud bolts simultaneously thereby helping meet demand on a timely basis.

Our goal is to continually work towards improving product quality as well as the efficiency and flexibility of production processes to better meet changing demand requirements.



ROUND BEND U BOLTS - TYPE 137 - DIMENSIONS

Pipe Size In Inches	U-Bolt Stock Diameter In Inches	Inside Width Between Leg In Inches	Length Inside Leg In Inches	Thread Length In Inches	Approximate Weight Per 100 In Lbs.
1/2	1/4	15/16	3-1/4	2-3/8	7.4
3/4	1/4	1-1/8	3-5/16	2-3/8	7.7
1	1/4	1-3/8	3-7/16	2-3/8	8.1
1/2	3/8	15/16	3-1/4	2-3/8	19.0
3/4	3/8	1-1/8	3-5/16	2-3/8	19.7
1	3/8	1-3/8	3-7/16	2-3/8	21.0
1-1/4	3/8	1-11/16	3-3/4	2-3/8	22.5
1-1/2	3/8	2	4	2-1/2	24.3
2	3/8	2-7/16	4-1/2	2 1/2	27.3
2-1/2	1/2	2-15/16	5-1/4	3	57.3
3	1/2	3-9/16	5-3/16	3	63.5
3-1/2	1/2	4-1/16	6-5/16	3	69.4
4	1/2	4-9/16	6-13/16	3	74.9
5	1/2	5-5/8	7-13/16	3	86.7
6	5/8	6-3/4	9-1/2	3-3/4	162.0
8	5/8	8-3/4	11-1/2	3-3/4	200.4
10	3/4	10-7/8	13-13/16	4	364.6
12	7/8	12-7/8	16-1/16	4-1/4	561.7
14	7/8	14-1/8	17-5/16	4-1/4	618.8
16	7/8	16-1/8	19-5/16	4-1/4	676.6
18	1	18-1/8	21-11/16	4-3/4	1040
20	1	20-1/8	23-11/16	4-3/4	1130
24	1	24-1/8	27-11/16	4-3/4	1330
30	1	30-1/8	33-11/16	4-3/4	1620
36	1	36-1/8	39-11/16	4-3/4	1900



M&Z stocks a full range of B7, L7, B8 & B8M Heavy Hex Bolt Blanks.

We specialize in cutting and threading to order as well as the custom manufacturing of Step Studs and Collar Bolts.

Full in-house cutting and threading facilities.

HEAT-TREATED ALLOY STUDS, BOLTS, NUTS AND THREADED BARS

Alloy Steel Stud Bolting Materials

The following grades of heat treated alloy steel studs are commonly used for high-pressure or extreme service in diameters of 1/4 inch to 4 inches inclusive. Other grades and other diameters are available on special order.

ASTM A193, Grade B7
A heat treated chromium-molybdenum steel widely used for medium high temperature service. (Liquid quench -50° - 900° F. Air quench -40° - 900° F.)

ASTM A193, Grade B7M
Similar to B7 studs except that the minimum yield and tensile strength requirements are reduced and the hardness controlled to 235 Brinell maximum. Designed for use in corrosive environments. (-50° - 900°F.).

ASTM A193, Grade B16
A heat treated chromium-molybdenum steel for high pressure, high temperature service.(-50° - 1100°F)

ASTM A320, Grade L7
This grade is intended for low temperature service down to minus 150°F and has a minimum Charpy impact value of 20 ft. lbs. at this temperature. (-50° - 1100°F.)

ASTM A320, Grade L7M
Similar to L7 studs except that the minimum yield and tensile strength requirements are reduced and the hardness controlled to 235 Brinell maximum. This stud is designed for use in low temperature corrosive environments. (-150° - 1100°F.)

ASTM A320, Grade L43
This grade is intended for low temperature service down to minus 150°F and has a minimum Charpy impact value of 20 ft. lbs. at this temperature. Available in sizes up to 4 in. (-150° - 1100°F)

ASTM A193, Grade B8
These Chromium-Nickel (AISI 304) austenitic steel studs are used in corrosive environments. (-325° - 1500°F.)

ASTM A193, Grade B8M
These Chromium-Nickel Molybdenum (AISI 316) austenitic steel studs are used in corrosive environments. (-325° -1500°F.)

Carbon And Alloy Steel Nuts

ASTM A194, Latest Revision, Grade 2H
Suitable for high temperatures and high pressure conditions.

ASTM A194, Grade 2HM
Similar to 2H nuts except this grade is designed for use in corrosive environments.

ASTM A194, Latest Revision, Grade 4
Heat treated molybdenum steel nuts suitable for severe temperature and pressure conditions.

ASTM A194, Latest Revision, Grade L7
New stamping as per ASTM is 7L. Heat treated chrome-molybdenum steel nuts suitable for extreme temperature and pressure conditions. Suitable for sub-zero service conditions and have minimum Charpy impact values of ASTM spec. A320. Grade 7 down to 150°F.

ASTM A194, Grade L7M
New stamping as per ASTM is 7ML. Similar to grade L7 nuts except this grade is designed for use in corrosive environments.

ASTM A194, Grade 8/8M
Stainless steel nuts designed for use in corrosive environments.



NOTES REGARDING FASTENER IDENTIFICATION MARKING

1. In addition to the indicated grade marking, all grades included in this table must be marked for manufacturer identification.

2. While hex heads are shown, grade markings apply equally to products with other head configurations.

3. Hardness are Brindell Hardness numbers.

4. A325 Type 1 bolts may also be marked with 3 radial lines 120 degrees apart in addition to the A325 marking.

5. The bolt manufacturer, at his option, may add other markings to indicate the use of atmospheric corrosion resistant steel.

6. A354 Grade BD products, in sizes 1-1/2" and smaller, are identified as shown and, at the manufacturer's option, may have the letters BD added. Larger sizes are marked only BD.
7. Specifications:

SAE J429

ASTM A307

ASTM A449

ASTM 325

ASTM A354

ASTM A490

ASTM A193-B7

Mechanical and material requirements for externally threaded fasteners

Carbon steel externally threaded standard fasteners

Quenched and tempered steel bolts and studs

High strength bolts for structural steel joints

Quenched and tempered alloy steel bolts, studs and other externally threaded fasteners

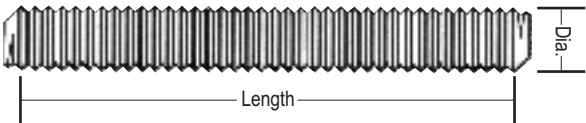
Heat treated steel structural bolts, 150 ksi minimum tensile strength

Quenched and tempered alloy steel heavy hex bolts

STUD & BOLT THREAD PITCHES AND STUD BOLT MEASUREMENT INFORMATION

Bolt Diameter in Inches	Stud UN Threads Per Inch	Bolts UNC Threads Per Inch	Bolts UNF Threads Per Inch	Wrench Sizes
1/4	20	20	28	
5/16	18	18	24	
3/8	16	16	24	
7/16	14	14	20	
1/2	13	13	20	7/8
9/16	12	12	18	
5/8	11	11	18	1-1/6
3/4	10	10	16	1-1/4
7/8	9	9	14	1-7/16
1	8	8	12	1-5/8
1-1/8	8	7	12	1-13/16
1-1/4	8	7	12	2
1-3/8	8	6	12	2-3/16
1-1/2	8	6	12	2-3/8
1-5/8	8			2-9/16
1-3/4	8	5		2-3/4
1-7/8	8			2-15/16
2	8	4-1/2		3-1/8
2-1/4	8	4-1/2		3-1/2
2-1/2	8	4		3-7/8
2-3/4	8	4		4-1/4
3	8	4		4-5/8
3-1/4	8	4		
3-1/2	8	4		
3-3/4	8	4		
4	8	4		

MEASUREMENT INFORMATION



In order to avoid any confusion when ordering, we suggest conforming to the Industrial Fasteners Institute measures as shown here. Please be sure, when ordering by overall length, that it is clearly indicated as such.

TOLERANCES ON STUD BOLT LENGTHS

All our stud bolts have been manufactured according to the requirements of ANSI standard B16.5, as outlined by the Industrial Fasteners Institute. All studs are measured from the first full thread to the last full thread. Flat chamfer points are not included in this measurement. Actual length tolerances are as follows:

Length in Inches	Tolerances in Inches
Length up to 12	+ or - 1/16
Over 12 to 18	+ or - 1/8
Over 18	+ or - 1/8

Threads are UNC-2A for all sizes 1 inch and under and 8UN-2A for sizes over 1 inch.

MECHANICAL REQUIREMENTS

ASTM A-193 ASME SA-193 Grade	Minimum Tempering Temperature deg. F (deg C)	Tensile Strength min. ksi (MPa)	Yield Strength min. ksi (MPa)	Elongation in 2" (50mm) Min. %	Reduction of Area Min. %	Hardness Maximum
B5	1100 (593)	100 (690)	80 (550)	16	50	-
B6	1100 (593)	110 (760)	85 (585)	15	50	-
B7 2-1/2" & under in diameter	1100 (593)	125 (860)	105 (725)	16	50	-
over 2-1/2" to 4" in diameter	1100 (593)	115 (790)	95 (655)	16	50	-
B7M 2-1/2" & under in diameter	1150 (620)	100 (690)	80 (550)	18	50	235 HB (99HRB) See note 1
over 2-1/2" to 4" in diameter	1150 (620)	100 (690)	80 (550)	18	50	235 HB (99HRB) See note 1
B16 2-1/2" & under in diameter	1200 (650)	125 (860)	105 (725)	18	50	-
over 2-1/2" to 4" in diameter	1200 (650)	110 (760)	95 (655)	17	45	-
	Heat Treatment					
B8 Class 1	Carbide Solution treated	75 (515)	30 (205)	30	50	223 HB (96HRB) See note 2
Class 2	Carbide solution treated & strain hardened					
3/4" & under		125 (860)	100 (690)	12	35	321 HB (35HRC) See note 2
over 3/4" to 1" incl.		115 (790)	80 (550)	15	35	"
over 1" to 1-1/4" incl.		105 (725)	65 (450)	20	35	"
over 1-1/4" to 1-1/2" incl.		100 (690)	50 (345)	28	45	
B8M Class 1	Caribe solution treated	75 (515)	30 (205)	30	50	223 HB (96HRB) See note 2
Class 2	Carbide solution treated & strain hardened					
3/4" & under		110 (760)	95 (655)	15	45	321 HB (35HRC) See note 2
over 3/4" to 1" incl.		100 (690)	80 (550)	20	45	"
over 1" to 1-1/4" incl.		95 (655)	65 (450)	25	45	"
over 1-1/4" to 1-1/2" incl.		90 (620)	50 (345)	30	45	"

Note 1: In order to meet the tensile requirements, the hardness shall be no less than 201 HB or 94 HRB
Note 2: For 3/4" in diameter and under, maximum hardness of 241 HB or 100 HRB is permitted
See ASTM & ASME Books or Standards for allowing variations and for other mechanical and testing requirements.

MECHANICAL REQUIREMENTS

ASTM A-320 ASME SA320 Grade	Heat Treatment	Tensile Strength min. ksi (MPa)	Yield Strength min. ksi (MPa)	Elongation in 2" (50mm) Min. %	Reduction of Area Min. %	Hardness Maximum
L7 2-1/2" & under	Quenched and tempered	125 (860)	105 (725)	16	50	-
L43 4" & under	Quenched and tempered	125 (860)	105 (725)	16	50	-
L7M 2-1/2" & under	Quenched and tempered at 1150 deg. F (620 deg. C) min.	100 (690)	80 (550)	18	50	235 HB (99HRB) See note 4 "

Note 4: In order to meet the tensile requirements, the hardness shall be no less than 200 HB or 93 HRB

ASTM A-194 ASME SA194 Grade	Minimum Tempering Temperature deg. F (deg. C)	Brinnell Hardness	Rockwell Hardness	
			C Scale	B Scale
2H Up to and incl. 1-1/2" Over 1-1/2"	850 (455)	248 - 352	24 - 34	
2HM	1150 (620)	212 - 352	38 max.	95 min.
L7M	1100 (595)	159 - 237	22 max.	
3	1050 (565)	159 - 237	22 max.	
4 & L7	1100 (595)	248 - 352	24 - 38	
6	1100 (595)	248 - 352	24 - 38	
8 & 8M		228 - 271	20 - 28	
		126 - 300		60 - 105

IMPACT ENERGY ABSORPTION REQUIREMENTS

ASTM A-194 ASME SA194		Minimum Average Impact Value for Ea. Set of 3 Specimens 10 X 10 X 50mm ft - lbs (Joules)
Grade 4 Grade L7 Grade L7M	at - 150 deg. F (- 101 deg. C) at - 150 deg. F (- 101 deg. C) at - 100 deg. F (- 73 deg. C)	(note 5) 20 (27) 20 (27)
ASTM A-320 ASME SA320 Grade L7 Grade L7M Grade L43	at - 150 deg. F (- 101 deg. C) at - 100 deg. F (- 73 deg. C) at - 150 deg. F (- 101 deg. C)	20 (27) 20 (27) 20 (27)

Note 5: Although ASTM calls for Charpy impact values in accordance with ASTM A-320 Grade L7 for both Grade 4 and Grade 7 nuts, chemical requirements preclude guaranteeing 20 ft.-lbs. for Grade 4. We offer Grade 4 with minimum 15 ft.-lbs. (20J) values. Where minimum 20 ft.-lbs. (27J) is needed, we recommend Grade 7. See ASTM & ASME Books or Standards for allowing variations for other mechanical and testing requirements.

We have a full range of in-house equipment, regularly calibrated, to cover your gauging and hardness requirements and assure that you will receive only the highest quality products.



Under the strict guidelines of our Quality Assurance Manual and Quality Control Program, we will process your orders that meet your requirements.

Mill Test Reports and Certifications are available, upon request, with each order.

FASTENER IDENTIFICATION MARKING

Grade Identification Marking	Specifications	Material	Nominal Size	Proof Load Stress ksi	Tensile Strength Min. ksi	Hardness Rockwell	
						Min.	Max.
 No Markings	SAE J429 Grade 1	Low or Medium Carbon Steel	1/4 through 1-1/2	33	60	B70	B100
	SAE J429 Grade 2		1/4 through 3/4 over 3/4 through 1-1/2	55 33	74 60	B80 B70	B100 B100
	ASTM A307 - Grade A		1/4 through 4	-	60	B69	B100
	ASTM A307 - Grade B		1/4 through 4	-	60 min 100 max	B69	B95
 A325	SAE J429 - Grade 5 ASTM A449 - Type 1	Medium Carbon Steel, Quenched and Tempered	1/4 through 1 over 1 through 1-1/2	85 74	120 105	C25 C19	C34 C30
 A325	ASTM A325 - Type 1	Medium Carbon Steel, Quenched and Tempered	1/2 through 1 over 1 to 1-1/2	85 74	120 105	C24 C19	C35 C31
 A325	ASTM A325 - Type 2	Low Carbon Martensite Steel, Quenched and Tempered					
 A325	ASTM A325 - Type 3 Refer to Note 5 - Page 12	Atmospheric Corrosion Resistant Steel, Quenched and Tempered					
 BC	ASTM A354 - Grade BC	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 through 2-1/2 over 2-1/2 through 4	105 95	125 115	C26 C22	C36 C33
 A490	SAE J429 - Grade 8	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 through 1-1/2	120	150	C33	C39
	ASTM A354 - Grade BD Refer to Note 6 - Page 12		1/4 through 2-1/2 over 2-1/2 through 4	120 105	150 140	C33 C33	C39 C39
 A490	SAE J429 - Grade B2	Low Carbon Martensite Steel, Quenched and Tempered	1/4 through 1	120	150	C33	C39
 A490	ASTM A490 - Type 1	Medium Carbon Alloy Steel, Quenched and Tempered	1/2 through 1-1/2	120	150 min. 170 max.	C33	C38
 A490	ASTM A490 - Type 2	Low Carbon Martensite Steel, Quenched and Tempered	1/2 through 1	120	150 min. 170 max.	C33	C38
 A490	ASTM A490 - Type 3 Refer to Note 5 - Page 12	Atmospheric Corrosion Resistant Steel, Quenched and Tempered	1/2 through 1-1/2	120	150 min. 170 max.	C33	C38
 B7	ASTM A-193 - Grade B7	4140 Alloy Steel Quenched and Tempered	1/2 to 3-1/2	105	125 min.		

Grade Identification markings for popular grades of carbon steel, externally threaded fasteners

CARTON QUANTITIES FOR ALL STUDS & NUTS

Length	Diameter								
	1/2"	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4"	1-3/8"	1-1/2"
1-3/4	400								
2	350	200	100						
2-1/4	350	200	100						
2-1/2	300	200	100						
2-3/4	300	150	100						
3	250	150	100	75					
3-1/4	200	150	100	75					
3-1/2	200	120	100	50					
3-3/4	200	120	100	50					
4	200	100	80	50	40	25			
4-1/4	200	100	80	50	40	25			
4-1/2	200	100	80	50	40	25			
4-3/4	200	100	80	50	40	25			
5	200	100	60	50	40	25			
5-1/4		100	60	50	40	25			
5-1/2	200	100	60	45	40	25			
5-3/4		100	60	45	35	25			
6	100	80	60	40	35	25	20		
6-1/4		80	60	40	35	25			
6-1/2		80	50	40	25	25	20		
6-3/4		80	50	40	25	25	20		
7		70	50	40	25	20	20	15	
7-1/4		70	50	40	25	20	20		
7-1/2		70	50	30	25	20	20		
7-3/4			50	30	25	20	15		
8		60	50	30	25	20	15		
8-1/4		60	50	25	25	20	15		
8-1/2		60	50	25	25	20	15		
8-3/4		50	50	25	25	20	15		
9		50	50	25	25	20	15	15	10
9-1/4				25	25	20	15		
9-1/2			25	25	25	20	15	10	10
9-3/4				25	25	15	15	10	
10			25	25	25	15	15	10	10
10-1/4								10	
10-1/2			25			15	10	10	10
10-3/4								10	
11			25	20	20	15	10	10	
11-1/4									
11-1/2			25	20	20				
11-3/4									
12			25	20	20	15			10
Nuts	600	325	200	130	90	65	50	35	30
Wrench Size	7/8	1-1/16	1-1/4	1-7/16	1-5/8	1-13/16	2	2-3/16	2-3/8

BOLTING DIMENSIONS FOR ANSI FLANGES ALL SIZES AS PER ANSI B16.5-1988

ANSI 150 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
					Raised Face		Ring Joint		
Inches	MM	Inches	MM		Inches	MM	Inches	MM	
1/2	12.70	1/2	12.70	4	2-1/4	57.15	-	-	-
3/4	19.05	1/2	12.70	4	2-1/2	63.50	-	-	-
1	25.40	1/2	12.70	4	2-1/2	63.50	3	76.20	R15
1-1/4	31.75	1/2	12.70	4	2-3/4	69.85	3-1/4	82.55	R17
1-1/2	38.10	1/2	12.70	4	2-3/4	69.85	3-1/4	82.55	R19
2	50.80	5/8	15.88	4	3-1/4	82.55	3-3/4	95.25	R22
2-1/2	63.50	5/8	15.88	4	3-1/2	88.90	4	101.60	R25
3	76.20	5/8	15.88	4	3-1/2	88.90	4-1/4	107.95	R29
3-1/2	88.90	5/8	15.88	8	3-1/2	88.90	4-1/4	107.95	R33
4	101.60	5/8	15.88	8	3-1/2	88.90	4-1/4	107.95	R36
5	127.00	3/4	19.05	8	3-3/4	95.25	4-1/2	114.30	R40
6	152.40	3/4	19.05	8	4	101.60	4-1/2	114.30	R43
8	203.20	3/4	19.05	8	4-1/4	107.95	4-3/4	120.65	R48
10	254.00	7/8	22.23	12	4-3/4	120.65	5-1/4	133.35	R52
12	304.80	7/8	22.23	12	4-3/4	120.65	5-1/2	139.70	R56
14	355.60	1	25.40	12	5-1/4	133.35	6	152.40	R59
16	406.40	1	25.40	16	5-1/2	139.70	6	152.40	R64
18	457.20	1-1/8	28.58	16	6	152.40	6-1/2	165.10	R68
20	508.00	1-1/8	28.58	20	6-1/4	158.75	7	177.80	R72
22	558.80	1-1/4	31.75	20	6-1/2	165.10	7-1/4	184.15	R80
24	609.60	1-1/4	31.75	20	7	177.80	7-3/4	196.85	R76

ANSI 300 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
					Raised Face		Ring Joint		
Inches	MM	Inches	MM		Inches	MM	Inches	MM	
1/2	12.70	1/2	12.70	4	2-1/2	63.50	3	76.20	R11
3/4	19.05	5/8	15.88	4	3	76.20	3-1/4	82.55	R13
1	25.40	5/8	15.88	4	3-1/4	82.55	3-1/4	82.55	R16
1-1/4	31.75	5/8	15.88	4	3-1/4	82.55	3-3/4	95.25	R18
1-1/2	38.10	3/4	19.05	4	3-1/2	88.90	4	101.60	R20
2	50.80	5/8	15.88	8	3-1/2	88.90	4-1/4	107.95	R23
2-1/2	63.50	3/4	19.05	8	4	101.60	4-1/2	114.30	R26
3	76.20	3/4	19.05	8	4-1/4	107.95	5	127.00	R31
3-1/2	88.90	3/4	19.05	8	4-1/4	107.95	5	127.00	R34
4	101.60	3/4	19.05	8	4-1/2	114.30	5-1/4	133.35	R37
5	127.00	3/4	19.05	8	4-3/4	120.65	5-1/4	133.35	R41
6	152.40	3/4	19.05	12	4-3/4	120.65	5-3/4	146.05	R45
8	203.20	AS7/8	22.23	12	5-1/2	139.70	6-1/4	158.75	R49
10	254.00	1	25.40	16	6-1/4	158.75	7-1/4	184.15	R53
12	304.80	1-1/8	28.58	16	6-3/4	171.45	7-1/2	190.50	R57
14	355.60	1-1/8	28.58	20	7	177.80	7-3/4	196.85	R61
16	406.40	1-1/4	31.75	20	7-1/2	190.50	8-1/4	209.55	R65
18	457.20	1-1/4	31.75	24	7-3/4	196.85	8-1/2	215.90	R69
20	508.00	1-1/4	31.75	24	8-1/4	209.55	9-1/4	234.95	R73
22	558.80	1-1/2	38.10	24	8-3/4	222.25	9-3/4	247.65	R81
24	609.60	1-1/2	38.10	24	9-1/4	234.95	10-1/4	260.35	R77

ANSI 400 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
					Raised Face		Ring Joint		
Inches	MM	Inches	MM		Inches	MM	Inches	MM	
1/2	12.70	1/2	12.70	4	3	76.20	3	76.20	R11
3/4	19.05	5/8	15.88	4	3-1/2	88.90	3-1/2	88.90	R13
1	25.40	5/8	15.88	4	3-1/2	88.90	3-1/2	88.90	R16
1-1/4	31.75	5/8	15.88	4	3-3/4	95.25	3-3/4	95.25	R18
1-1/2	38.10	3/4	19.05	4	4-1/4	107.95	4-1/4	107.95	R20
2	50.80	5/8	15.88	8	4-1/4	107.95	4-1/4	107.95	R23
2-1/2	63.50	3/4	19.05	8	4-3/4	120.65	4-3/4	120.65	R26
3	76.20	3/4	19.05	8	5	127.00	5	127.00	R31
3-1/2	88.90	7/8	22.23	8	5-1/2	139.70	5-1/2	139.70	R34
4	101.60	7/8	22.23	8	5-1/2	139.70	5-1/2	139.70	R37
5	127.00	7/8	22.23	8	5-3/4	146.05	5-3/4	146.05	R41
6	152.40	7/8	22.23	12	6	152.40	6	152.40	R45
8	203.20	1	25.40	12	6-3/4	171.45	6-3/4	171.45	R49
10	254.00	1-1/8	28.58	16	7-1/2	190.50	7-1/2	190.50	R53
12	304.80	1-1/4	31.75	16	8	203.20	8	203.20	R57
14	355.60	1-1/4	31.75	20	8-1/4	209.55	8-1/4	209.55	R61
16	406.40	1-3/8	34.93	20	8-3/4	222.25	8-3/4	222.25	R65
18	457.20	1-3/8	34.93	24	9	228.60	9	228.60	R69
20	508.00	1-1/2	38.10	24	9-1/2	241.30	9-1/2	247.65	R73
22	558.80	1-5/8	41.28	24	10	254.00	10-1/2	266.70	R81
24	609.60	1-3/4	44.45	24	10-1/2	266.70	11	279.40	R77

ANSI 600 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
					Raised Face		Ring Joint		
Inches	MM	Inches	MM		Inches	MM	Inches	MM	
1/2	12.70	1/2	12.70	4	3	76.20	3	76.20	R11
3/4	19.05	5/8	15.88	4	3-1/4	82.55	3-1/4	82.55	R13
1	25.40	5/8	15.88	4	3-1/2	88.90	3-1/2	88.90	R16
1-1/4	31.75	5/8	15.88	4	3-3/4	95.25	3-3/4	95.25	R18
1-1/2	38.10	3/4	19.05	4	4-1/4	107.95	4-1/4	107.95	R20
2	50.80	5/8	15.88	8	4-1/4	107.95	4-1/2	114.30	R23
2-1/2	63.50	3/4	19.05	8	5	127.00	5-1/4	133.35	R26
3	76.20	3/4	19.05	8	5	127.00	5-1/4	133.35	R31
3-1/2	88.90	7/8	22.23	8	5-1/2	139.70	5-1/2	139.70	R34
4	101.60	7/8	22.23	8	5-3/4	146.05	6	152.40	R37
5	127.00	1	25.40	8	6-1/2	165.10	6-1/2	165.10	R41
6	152.40	1	25.40	12	6-3/4	171.45	7	177.80	R45
8	203.20	1-1/8	28.58	12	7-3/4	196.85	8	203.20	R49
10	254.00	1-1/4	31.75	16	8-1/2	215.90	8-3/4	222.25	R53
12	304.80	1-1/4	31.75	20	8-3/4	222.25	9	228.60	R57
14	355.60	1-3/8	34.93	20	9-1/4	234.95	9-1/2	241.30	R61
16	406.40	1-1/2	38.10	20	10	254.00	10-1/4	260.35	R65
18	457.20	1-5/8	41.28	20	10-3/4	273.05	11	279.40	R69
20	508.00	1-5/8	41.28	24	11-1/2	292.10	11-3/4	298.45	R73
22	558.80	1-3/4	44.45	24	12	304.80	12-1/2	317.50	R81
24	609.60	1-7/8	47.63	24	13	330.20	13-1/2	342.90	R77

BOLTING DIMENSIONS FOR ANSI FLANGES
ALL SIZES AS PER ANSI B16.5-1988

ANSI 900 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
Inches	MM	Inches	MM		Raised Face		Ring Joint		
					Inches	MM	Inches	MM	
1/2	12.70	3/4	19.05	4	4	101.60	4-1/4	107.95	R12
3/4	19.05	3/4	19.05	4	4-1/4	107.95	4-1/2	114.30	R14
1	25.40	7/8	22.23	4	4-3/4	120.65	5	127.00	R16
1-1/4	31.75	7/8	22.23	4	5	127.00	5	127.00	R18
1-1/2	38.10	1	25.40	4	5-1/4	133.35	5-1/2	139.70	R20
2	50.80	7/8	22.23	8	5-1/2	139.70	5-3/4	146.05	R24
2-1/2	63.50	1	25.40	8	6-1/4	158.75	6-1/4	158.75	R27
3	76.20	7/8	22.23	8	5-1/2	139.70	5-3/4	146.05	R31
4	101.60	1-1/8	28.58	8	6-1/2	165.10	6-3/4	171.45	R37
5	127.00	1-1/4	31.75	8	7-1/2	190.50	7-1/2	190.50	R41
6	152.40	1-1/8	28.58	12	7-1/2	190.50	7-3/4	196.85	R45
8	203.20	1-3/8	34.93	12	8-1/2	215.90	8-3/4	222.25	R49
10	254.00	1-3/8	34.93	16	9	228.60	9-1/4	234.95	R53
12	304.80	1-3/8	34.93	20	9-3/4	247.65	10	254.00	R57
14	355.60	1-1/2	38.10	20	10-1/2	266.70	11	279.40	R62
16	406.40	1-5/8	41.28	20	11	279.40	11-1/2	292.10	R66
18	457.20	1-7/8	47.63	20	12-3/4	323.85	13-1/4	336.55	R70
20	508.00	2	50.80	20	13-1/2	342.90	14-1/4	361.95	R74
24	609.60	2-1/2	63.50	20	17	431.80	18	457.20	R78

ANSI 1500 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
Inches	MM	Inches	MM		Raised Face		Ring Joint		
					Inches	MM	Inches	MM	
1/2	12.70	3/4	19.05	4	4	101.60	4-1/4	107.95	R12
3/4	19.05	3/4	19.05	4	4-1/4	107.95	4-1/2	114.30	R14
1	25.40	7/8	22.23	4	4-3/4	120.65	5	127.00	R16
1-1/4	31.75	7/8	22.23	4	5	127.00	5	127.00	R18
1-1/2	38.10	1	25.40	4	5-1/4	133.35	5-1/2	139.70	R20
2	50.80	7/8	22.23	8	5-1/2	139.70	5-3/4	146.05	R24
2-1/2	63.50	1	25.40	8	6-1/4	158.75	6-1/4	158.75	R27
3	76.20	1-1/8	28.58	8	6-3/4	171.45	7	177.80	R35
4	101.60	1-1/4	31.75	8	7-1/2	190.50	7-3/4	196.85	R39
5	127.00	1-1/2	38.10	8	9-3/4	247.65	9-3/4	247.65	R44
6	152.40	1-3/8	34.93	12	10	254.00	10-1/2	266.70	R46
8	203.20	1-5/8	41.28	12	11-1/4	285.75	11-3/4	298.45	R50
10	254.00	1-7/8	47.63	12	13-1/4	336.55	13-1/2	342.90	R54
12	304.80	2	50.80	16	14-3/4	374.65	15-1/4	387.35	R58
14	355.60	2-1/4	57.15	16	16	406.40	16-3/4	425.45	R63
16	406.40	2-1/2	63.50	16	17-1/2	444.50	18-1/2	469.90	R67
18	457.20	2-3/4	69.85	16	19-1/4	488.95	20-1/4	514.35	R71
20	508.00	3	76.20	16	21	533.40	22-1/4	565.15	R75
24	609.60	3-1/2	88.90	16	24	609.60	25-1/2	647.70	R79

ANSI 2500 LB FLANGES

Nominal Pipe Size		Diameter Of Studs		No. of Studs	Stud Bolt Length				Ring Joint Gasket No.
Inches	MM	Inches	MM		Raised Face		Ring Joint		
					Inches	MM	Inches	MM	
1/2	12.70	3/4	19.05	4	4-3/4	120.65	4-3/4	120.65	R13
3/4	19.05	3/4	19.05	4	4-3/4	120.65	5	127.00	R16
1	25.40	7/8	22.23	4	5-1/4	133.35	5-1/2	139.70	R18
1-1/4	31.75	1	25.40	4	6	152.40	6	152.40	R21
1-1/2	38.10	1-1/8	28.58	4	6-1/2	165.10	6-3/4	171.45	R23
2	50.80	1	25.40	8	6-3/4	171.45	7	177.80	R26
2-1/2	63.50	1-1/8	28.58	8	7-3/4	196.85	8	203.20	R28
3	76.20	1-1/4	31.75	8	8-1/2	215.90	9	228.60	R32
4	101.60	1-1/2	38.10	8	9-3/4	247.65	10-1/4	260.35	R38
5	127.00	1-3/4	44.45	8	11-3/4	298.45	12-1/4	311.15	R42
6	152.40	2	50.80	8	13-1/2	342.90	14	355.60	R47
8	203.20	2	50.80	12	15	381.00	15-1/2	393.70	R51
10	254.00	2-1/2	63.50	12	19	482.60	20	508.00	R55
12	304.80	2-3/4	69.85	12	21	533.40	22	558.80	R60



BOLTING DIMENSIONS FOR API FLANGES

2000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
2-1/16	R23	8	5/8 X 4-1/2
2-9/16	R26	8	3/4 X 5
3-1/8	R31	8	3/4 X 5-1/4
4-1/16	R37	8	7/8 X 6
5-1/8	R41	8	1 X 6-3/4
7-1/16	R45	12	1 X 7
9	R49	12	1-1/8 X 8
11	R53	16	1-1/4 X 8-3/4
13-5/8	R57	20	1-1/4 X 9
16-3/4	R65	20	1-1/2 X 10-1/4
21-1/4	R73	24	1-5/8 X 11-3/4
26-3/4	BX167	20	1-3/4 X 13-3/4

3000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
3-1/8	R31	8	7/8 X 6
4-1/16	R37	8	1-1/8 X 7
5-1/8	R41	8	1-1/4 X 7-3/4
7-1/16	R45	12	1-1/8 X 8
9	R49	12	1-3/8 X 9
11	R53	16	1-3/8 X 9-1/2
13-5/8	R57	20	1-3/8 X 10-1/4
16-3/4	R66	20	1-5/8 X 11-3/4
20-3/4	R74	20	2 X 14-1/2
26-3/4	BX168	24	2 X 17

5000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
2-1/16	R24	8	7/8 X 6
2-9/16	R27	8	1 X 6-1/2
3-1/8	R35	8	1-1/8 X 7-1/4
4-1/16	R39	8	1-1/4 X 8
5-1/8	R44	8	1-1/2 X 10
7-1/16	R46	12	1-3/8 X 10-3/4
9	R50	12	1-5/8 X 12
11	R54	12	1-7/8 X 13-3/4
13-5/8	BX160	16	1-5/8 X 12-1/2
16-3/4	BX162	16	1-7/8 X 14-1/2
18-3/4	BX163	20	2 X 17-1/2
21-1/4	BX165	24	2 X 18-3/4

10,000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
1-13/16	BX151	8	3/4 X 5
2-1/16	BX152	8	3/4 X 5-1/4
2-9/16	BX153	8	7/8 X 6
3-1/16	BX154	8	1 X 6-3/4
4-1/16	BX155	8	1-1/8 X 8
5-1/8	BX169	12	1-1/8 X 8-3/4
7-1/16	BX156	12	1-1/2 X 11-1/4
9	BX157	16	1-1/2 X 13
11	BX158	16	1-3/4 X 15
13-5/8	BX159	20	1-7/8 X 17-1/4
16-3/4	BX162	24	1-7/8 X 17-1/2
18-3/4	BX164	24	2-1/4 X 22-1/2
21-1/4	BX166	24	2-1/4 X 24-1/2

15,000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
1-13/16	BX151	8	7/8 X 5-1/2
2-1/16	BX152	8	7/8 X 6
2-9/16	BX153	8	1 X 6-3/4
3-1/16	BX154	8	1-1/8 X 7-1/2
4-1/16	BX155	8	1-3/8 X 9-1/4
7-1/16	BX156	16	1-1/2 X 12-3/4
9	BX157	16	1-7/8 X 15-3/4
11	BX158	20	2 X 19-1/4
13-5/8	BX159	20	2-1/4 X 21-1/4
18-3/4	BX164	20	3 X 26-3/4

25,000 LB W.P.

Nominal Size Inches	Gasket API Number	Number Of Studs	Stud Bolt Size Inches
1-13/16	BX151	8	1 X 7-1/2
2-1/16	BX152	8	1-1/8 X 8-1/4
2-9/16	BX153	8	1-1/4 X 9-1/4
3-1/16	BX154	8	1-3/8 X 10
4-1/16	BX155	8	1-3/4 X 12-1/4
7-1/16	BX156	16	2 X 17-1/2
9	BX157	16	2-1/2 X 22-1/2
11	BX158	16	2-3/4 X 23-3/4
13-5/8	BX159	20	3 X 30