

# PacificCoastBolt

CORPORATION

*Domestic Manufacturer and Distributor of Fasteners*



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**Domestic Manufacturer & Distributor of Fasteners**  
Construction ■ Waterworks ■ Energy/Petro-Chemical ■ Hi-Production OEM

## Manufacturing

- Large Raw Material Inventory
- Hot Heading from 1/4" - 2-1/4" Dia.
- Threading to 4-1/2" Dia.
- Small and Large Quantity Runs
- Short Runs/Quick Turnaround
- Q.C. Lab/Quality Assurance Program
- Specials Per Print

## Distribution

- Full Line Inventory
- 40,000 Sq. Ft. Warehouse
- Same Day Shipping & Delivery
- Fleet of Trucks Servicing So. Cal.
- Custom Labels and Packaging
- Mill Shipments
- Inventory Management/Stock & Release

**Emergency/After Hours # 562-807-1546**

## Bolts

- Hex/Heavy Hex
- Carriage
- Square
- Lag
- Plow
- Structural
- Tension Control
- Break Off
- Hydrant
- Oxnard
- T-Bolts
- Taper
- Track
- Coker
- Hanger
- Elevator
- Step
- Eye Bolts
- Rock Crusher
- Penta
- Foundation
- Anchor
- Embeds

## Nuts

- Hex
- Heavy Hex
- Jam
- Sleeve
- Coupling
- Locking
- Wing
- Cap
- Square
- Castle
- Slotted
- Hi
- Tee

## Gaskets

- Composition
- Non-Asbestos
- Neoprene
- Rubber
- Phenolic
- Red Rubber
- Meter
- Spiral Wound
- Insulation Kits
- All Types, Styles and Sizes

## Flange Kits

- Carbon Steel
  - Alloy Steel
  - Stainless Steel
- Custom Packing Available  
Custom Printed Labels  
Boxes or Bags

Specific Material Grades Upon Request

## Studs

- Full Thread
- Single End
- Chisel Points
- Double Ends
- Tap Ends
- Stud & Nut Sets
- Step Down

## Platings and Coatings

- Zinc
- Cadmium
- Mechanical Galvanize
- Hot Dip Galvanize
- Black Oxide
- Teflon
- Xylan
- Fluorokote #1

Other platings  
and coatings available  
upon request

## Anchor Products

- Foundation Bolts
- Anchor Bolt Sleeves
- Embeds
- Chemical Epoxy Anchors
- Wedge
- Sleeve
- Drop-In
- Nail
- Plastic
- Hollow Wall
- Concrete Screws
- Toggle Bolts
- Lag Shields

## Threaded Rod

- All Materials
- 10' and 12' Lengths
- Diameters Up To 3"

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## Shop Capabilities

Heading thru 2-1/4"

Hex, Heavy Hex  
Carriage  
Coker  
"T" Head  
Track  
Square Head  
Metric

Threading 1/4" thru 4-1/2"

UNC, UNF, UN, Lag, Metric,  
Acme

Socket Cap Screws

3/8" thru 1-1/4"

Nuts

3/8" thru 2"

Bending

Welding (L.A. City Approved)

Embeds

Specials Made to Order

## Materials

- A36, A307 (Grade A, B & C)
- SAE Grade 2, 5, 8
- ASTM A449, A572, A588, A325, A354 BD, A490
- ASTM A194 - 2H, 2HM, 4, 7, 8, 8A, 8M, 8MA
- ASTM A193 - B7, B7M, B16, B6, B8, B8M, B8 Class II, B8M Class II
- ASTM A320 - B8, B8M, L7, L7M
- ASTM A453 - Grade 660
- 18-8, T304, T316, 410, Stainless Steel
- Brass, Silicone Bronze,
- Monel (NICU Alloy), K-Monel
- Other Exotic Alloys Available

## Framing Channel Strut/Pipe Hangers & Hardware

- Channel-Strut
- Clevis Hangers
- Spring Nuts
- Fittings
- Pipe Clamps
- Beam Clamps
- Angular Fittings & Brackets

## Wire & Forged Hardware

- U-Bolts
- Eye Bolts
- Turnbuckles
- Clevis

## Rivets

- Blind
- Solid
- Semi-Tubular

## Washers

- Flat
- Lock
- Bevel
- Structural
- Load Indicating
- OGEE
- Specials

## Socket Products

- Socket Caps
- Button
- Flat
- Set Screws
- Square Head
- Shoulder Bolt
- Hex Keys

## Skateboard Hardware

- Screws
- Colored Screws
- King Pins
- Locknuts
- Cup Washers
- Custom Packaging Available
- Specials Made to Order

## Pins

- Cotter
- Dowel
- Roll

## Screws

- Machine
- Tapping
- Wood
- Self Drilling
- Dry Wall
- Specials

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## Pipe Schedules (Sizes)

Nominal	O.D. Inches	PIPE SCHEDULES WALL THICKNESS															
		5s	5	10s	10	20	30	40s & E.H.	40	60	80s & E.H.	80	100	120	140	160	Dbl. E.H.
1/8	.405		.035	.049	.049			.068	.068		.095	.095					
1/4	.540		.049	.065	.065			.088	.088		.119	.119					
3/8	.675		.049	.065	.065			.091	.091		.126	.126					
1/2	.840	.065	.065	.083	.083			.109	.109		.147	.147				.187	.294
3/4	1.050	.065	.065	.083	.083			.113	.113		.154	.154				.218	.308
1	1.315	.065	.065	.109	.109			.133	.133		.179	.179				.250	.358
1-1/4	1.660	.065	.065	.109	.109			.140	.140		.191	.191				.250	.382
1-1/2	1.900	.065	.065	.109	.109			.145	.145		.200	.200				.281	.400
2	2.375	.065	.065	.109	.109			.154	.154		.218	.218				.343	.436
2-1/2	2.875	.083	.083	.120	.120			.203	.203		.276	.276				.375	.552
3	3.5	.083	.083	.120	.120			.216	.216		.300	.300				.437	.600
3-1/2	4.000	.083	.083	.120	.120			.226	.226		.318	.318					.636
4	4.500	.083	.083	.120	.120			.237	.237	.281	.337	.337		.437		.531	.674
4-1/2	5.000							.247			.355						.710
5	5.563	.109	.109	.134	.134			.258	.258		.375	.375		.500		.625	.750
6	6.625	.109	.109	.134	.134			.280	.280		.432	.432		.562		.718	.864
7	7.625							.301			.500						.875
8	8.625	.109	.109	.148	.148	.250	.277	.322	.322	.406	.500	.500	.593	.718	.812	.906	.875
9	9.625							.342			.500						
10	10.750	.134	.134	.165	.165	.250	.307	.365	.365	.500	.500	.593	.718	.843	1.000	1.125	
11	11.750							.375			.500						
12	12.750	.156	.165	.180	.180	.250	.330	.375	.406	.562	.500	.687	.843	1.000	1.125	1.312	
14	14.000	.156		.188	.250	.312	.375	.375	.437	.593	.500	.750	.937	1.093	1.250	1.406	
16	16.000	.165		.188	.250	.312	.375	.375	.500	.656	.500	.843	1.031	1.218	1.437	1.593	
18	18.000	.165		.188	.250	.312	.437	.375	.562	.750	.500	.937	1.156	1.375	1.562	1.781	
20	20.000	.188		.218	.250	.375	.500	.375	.593	.812	.500	1.031	1.280	1.500	1.750	1.968	
24	24.000	.218		.250	.250	.375	.562	.375	.687	.968	.500	1.218	1.531	1.812	2.062	2.343	
26	26.000				.312	.500		.375			.500						
28	28.000				.312	.500	.625	.375									
30	30.000	.250		.312	.312	.500	.625	.375			.500						
32	32.000				.312	.500	.625	.375	.688		.500						
34	34.000				.312	.500	.625	.375	.688								
36	36.000				.312		.625	.375	.750		.500						

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**REFERENCE CHART**  
**FLANGE TO FLANGE - STANDARD FACING\***  
**ALL STANDARD PRESSURE RATINGS**

Pipe Size	CLASS 125 Cast Iron Flanges 150 lb. Forged Steel Flanges		CLASS 250 Cast Iron Flanges 300 lb. Forged Steel Flanges		400 lb. Forged Steel Flanges	
	No.	Stud-Bolts Dia. x Length	No.	Stud-Bolts Dia. x Length	No.	Stud-Bolts Dia. x Length
1/2	4	1/2 x 2-1/2	4	1/2 x 2-3/4	4	1/2 x 3-1/4
3/4	4	1/2 x 2-1/2	4	5/8 x 3-1/4	4	5/8 x 3-3/4
1	4	1/2 x 2-3/4	4	5/8 x 3-1/4	4	5/8 x 3-3/4
1-1/4	4	1/2 x 2-3/4	4	5/8 x 3-1/2	4	5/8 x 4
1-1/2	4	1/2 x 3	4	3/4 x 3-3/4	4	3/4 x 4-1/2
2	4	5/8 x 3-1/2	8	5/8 x 3-3/4	8	5/8 x 4-1/2
2-1/2	4	5/8 x 3-3/4	8	3/4 x 4-1/4	8	3/4 x 5
3	4	5/8 x 3-3/4	8	3/4 x 4-1/2	8	3/4 x 5-1/4
3-1/2	8	5/8 x 3-3/4	8	3/4 x 4-1/2	8	7/8 x 5-3/4
4	8	5/8 x 3-3/4	8	3/4 x 4-3/4	8	7/8 x 5-3/4
5	8	3/4 x 4	8	3/4 x 5	8	7/8 x 6
6	8	3/4 x 4-1/4	12	3/4 x 5	12	7/8 x 6-1/4
8	8	3/4 x 4-1/2	12	7/8 x 5-3/4	12	1 x 7
10	12	7/8 x 4-3/4	16	1 x 6-1/2	16	1-1/8 x 7-3/4
12	12	7/8 x 5	16	1-1/8 x 7	16	1-1/4 x 8-1/4
14	12	1 x 5-1/2	20	1-1/2 x 7-1/4	20	1-1/4 x 8-1/2
16	16	1 x 5-1/2	20	1-1/4 x 7-3/4	20	1-3/8 x 9
18	16	1-1/8 x 6	24	1-1/4 x 8	24	1-3/8 x 9-1/4
20	20	1-1/8 x 6-1/2	24	1-1/4 x 8-1/4	24	1-1/2 x 9-3/4
24	20	1-1/4 x 7	24	1-1/2 x 9-1/4	24	1-3/4 x 10-3/4

Pipe Size	600 Lb. Forged Steel Flanges		900 Lb. Forged Steel Flanges		1500 Lb. Forged Steel Flanges		2500 Lb. Forged Steel Flanges	
	No.	Stud-Bolts Dia. x Length	No.	Stud-Bolts Dia. x Length	No.	Stud-Bolts Dia. x Length	No.	Stud-Bolts Dia. x Length
1/2	4	1/2 x 3-1/4	4	3/4 x 4-1/2	4	3/4 x 4-1/2	4	3/4 x 5
3/4	4	5/8 x 3-3/4	4	3/4 x 4-3/4	4	3/4 x 4-3/4	4	3/4 x 5-1/4
1	4	5/8 x 3-3/4	4	7/8 x 5-1/4	4	7/8 x 5-1/4	4	7/8 x 5-3/4
1-1/4	4	5/8 x 4	4	7/8 x 5-1/4	4	7/8 x 5-1/4	4	1 x 6-1/4
1-1/2	4	3/4 x 4-1/2	4	1 x 5-3/4	4	1 x 5-3/4	4	1-1/8 x 7
2	8	5/8 x 4-1/2	8	7/8 x 6	8	7/8 x 6	8	1 x 7-1/4
2-1/2	8	3/4 x 5	8	1 x 6-1/2	8	1 x 6-1/2	8	1-1/8 x 8
3	8	3/4 x 5-1/4	8	7/8 x 6	8	1-1/8 x 7-1/4	8	1-1/4 x 9
2-1/2	8	7/8 x 5-3/4	-	-	-	-	-	-
4	8	7/8 x 6	8	1-1/8 x 7	8	1-1/4 x 8	8	1-1/2 X 10-1/4
5	8	1 x 6-3/4	8	1-1/4 x 7-3/4	8	1-1/2 x 10	8	1-3/4 X 12
6	12	1 x 7	12	1-1/8 x 7-3/4	12	1-3/8 x 10-1/2	8	2 X 14
8	12	1-1/8 x 7-3/4	12	1-3/8 x 9	12	1-5/8 x 11-3/4	12	2 X 15-1/2
10	16	1-1/4 x 8-3/4	16	1-3/8 x 9-1/2	12	1-7/8 x 13-1/2	12	2-1/2 X 19-1/2
12	20	1-1/4 x 9	20	1-3/8 x 10-1/4	16	2 x 15	12	2-3/4 x 21-1/2
14	20	1-3/8 x 9-1/2	20	1-1/2 x 11	16	2-1/4 x 16-1/2	-	-
16	20	1-1/2 x 10-1/4	20	1-5/8 x 11-1/2	16	2-1/2 x 18	-	-
18	20	1-5/8 x 11	20	1-7/8 x 13	16	2-3/4 x 19-1/2	-	-
20	24	1-5/8 x 11-1/2	20	2 x 14	16	3 x 21-1/2	-	-
24	24	1-7/8 x 13	20	2-1/2 x 17-1/2	16	3-1/2 x 24-1/2	-	-

NOTE: This chart lists overall lengths of studs.

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# 150 Lb. Flange Kits

(Bolt w/Nut)

SIZE	PCS	BOLT SIZE
2"	4	5/8 X 2 1/2
3"	4	5/8 X 3
4"	8	5/8 X 3
5"	8	3/4 X 3
6"	8	3/4 X 3 1/4
6"-8"	8	3/4 X 3 1/4
8"	8	3/4 X 3 1/2
10"	12	7/8 X 3 3/4
10"-12"	12	7/8 X 3 3/4
12"	12	7/8 X 4
14"	12	1 X 4 1/2
16"	16	1 X 4 1/2
18"	16	1 1/8 X 5
20"	20	1 1/8 X 5
24"	20	1 1/4 X 5 1/2
30"	28	1 1/4 X 6
36"	32	1 1/2 X 7
42"	36	1 1/2 X 7 1/2

**NOTE: FOR REFERENCE ONLY, SIZES MAY VARY WITH NON-STANDARD FLANGES**

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# AWWA Standard Steel-Hub Flanges, Class E\* (275 psi)

**NEW:**

**Table 4 Class E  
(C-207-94)**

Nominal Pipe Size in.	OD of Flange in.	ID of Flange in.	Thickness of Flange in.	Overall Thickness in.	Diameter of Hub	Drilling Template		
						Number of Bolt Holes	Diameter of Bolt Holes in.	Diameter of Bolt Circle in.
4	9.00	4.57	0.938	1.312	5.312	8	0.750	7.50
5	10.00	5.66	0.938	1.438	6.438	8	0.875	8.50
6	11.00	6.72	1.000	1.562	7.562	8	0.875	9.50
8	13.50	8.72	1.125	1.750	9.688	8	0.875	11.75
10	16.00	10.88	1.188	1.938	12.000	12	1.000	14.25
12	19.00	12.88	1.250	2.188	14.375	12	1.000	17.00
14	21.00	14.19	1.375	2.250	15.750	12	1.125	18.75
16	23.50	16.19	1.438	2.500	18.000	16	1.125	21.25
18	25.00	18.19	1.562	2.688	19.875	16	1.250	22.75
20	27.50	20.19	1.688	2.875	22.000	20	1.250	25.00
22	29.50	22.19	1.812	3.125	24.000	20	1.375	27.25
24	32.00	24.19	1.875	3.250	26.125	20	1.375	29.50
26	34.25	26.19	2.000	3.375	28.500	24	1.375	31.75
28	36.50	28.19	2.062	3.438	30.750	28	1.375	34.00
30	38.75	30.19	2.125	3.500	32.750	28	1.375	36.00
32	41.75	32.19	2.250	3.625	35.000	28	1.625	38.50
34	43.75	34.19	2.312	3.688	37.000	32	1.625	40.50
36	46.00	36.19	2.375	3.750	39.250	32	1.625	42.75
38	48.75	38.19	2.375	3.750	41.750	32	1.625	45.25
40	50.75	40.19	2.500	3.875	43.750	36	1.625	47.25
42	53.00	42.19	2.625	4.000	46.000	36	1.625	49.50
44	55.25	44.19	2.625	4.000	48.000	40	1.625	51.75
46	57.25	46.19	2.688	4.062	50.000	40	1.625	53.75
48	59.50	48.19	2.750	4.125	52.250	44	1.625	56.00
50	61.75	50.19	2.750	4.125	54.250	44	1.875	58.25
52	64.00	52.19	2.875	4.250	56.500	44	1.875	60.50
54	66.25	54.19	3.000	4.375	58.750	44	1.875	62.75
60	73.00	60.19	3.125	4.500	65.250	52	1.875	69.25
66	80.00	66.19	3.375	4.875	71.500	52	1.875	76.00
72	86.50	72.19	3.500	5.000	78.500	60	1.875	82.50
78	93.00	78.19	3.875	5.375	84.500	64	2.125	89.00
84	99.75	84.19	3.875	5.375	90.500	64	2.125	95.50
90	106.50	90.19	4.250	5.750	96.750	68	2.438	102.00
96	113.25	96.19	4.250	5.750	102.750	68	2.438	108.50

**NOTES:**

1. Hub flanges are to be used on pipe that has an OD equal to the nominal pipe size in the first column.

\* Pressure rating at atmospheric temperature is 275 psi. These flanges have the same diameter and drilling as ANSI/ASME B16.1 class 125 cast iron flanges. In sizes 24 in. and smaller they also match ANSI/ASME B16.5 150 psi standard for steel flanges.

§ The thickness of a 150 psi flange from which the raised face has been removed shall be no less than dimension T minus 0.06 in.

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# 300 Lb. Flange Kits

(Bolt w/Nut)

SIZE	PCS	BOLT SIZE
4"	8	3/4 x 3-1/2
5"	8	3/4 x 4
6"	12	3/4 x 4-1/2
8"	12	7/8 x 4-1/2
10"	16	1 x 5
12"	16	1-1/8 x 5-1/2
14"	20	1-1/8 x 6
16"	20	1-1/4 x 6-1/2
18"	24	1-1/4 x 6-1/2
20"	24	1-1/4 x 7
24"	24	1-1/2 x 8
30"	28	1-3/4 x 9
36"	32	2 x 10
42"	36	2 x 10-1/2

**NOTE: FOR REFERENCE ONLY, SIZES MAY VARY WITH NON-STANDARD FLANGES**

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## AWWA Standard Steel-Ring Flanges, Class F\* (300 psi)

**NEW:**

**Table 6 Class F  
(C-207-94)**

Nominal Pipe Size in.	OD of Flange in.	ID of Flange in.	Thickness of Flange in.	Drilling Template		
				Number of Bolt Holes	Diameter of Bolt Holes in.	Diameter of Bolt Circle in.
4	10.00	4.57	1.13	8	0.875	7.88
5	11.00	5.66	1.21**	8	0.875	9.25
6	12.50	6.73	1.31**	12	0.875	10.62
8	15.00	8.73	1.31**	12	1.000	13.00
10	17.50	10.88	1.50**	16	1.125	15.25
12	20.50	12.88	1.63**	16	1.250	17.75
14	23.00	14.19	1.94	20	1.250	20.25
16	25.50	16.19	2.14**	20	1.375	22.50
18	28.00	18.19	2.25**	24	1.375	24.75
20	30.50	20.19	2.33**	24	1.375	27.00
22	33.00	22.19	2.50	24	1.375	29.25
24	36.00	24.19	2.69	24	1.625	32.00
26	38.25	26.25	3.00	28	1.875	34.50
28	40.75	28.25	3.13	28	1.875	37.00
30	48.00	30.25	3.15**	28	1.875	39.25
32	45.25	32.25	3.25	28	1.875	41.50
34	47.50	34.25	3.38	28	1.875	43.50
36	50.00	36.25	3.46**	32	2.125	46.00
38	52.25	38.25	3.50	32	2.125	48.00
40	54.25	40.25	3.63	36	2.125	50.25
42	57.00	42.25	3.81**	36	2.125	52.75
44	59.25	44.25	4.00	36	2.125	55.00
46	61.50	46.25	4.13	40	2.125	57.25
48	65.00	48.25	4.50**	40	2.125	60.75

**NOTES:**

\* Pressure rating at atmospheric temperature is 300 psi. These flanges have the same diameter and drilling as ANSI/ASME B16.2 class 250 cast iron flanges.



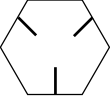
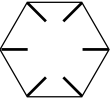

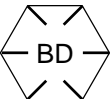





\*\* Denotes dimension change.

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## ASTM & SAE Grade Markings for Steel Bolts and Screws

Grading* Marking	Specification	Material	Bolt & Screw Size, Inches	Min. Yield Strength	Min. Tensile Strength
	ASTM A307 GR A	Low or Medium Carbon Steel	1/4" thru 4"	_____	60,000
	ASTM A307 GR B	Low or Medium Carbon Steel	1/4" thru 4"	_____	60,000 100,000 Max.
	ASTM A449 J429 GR5	Medium Carbon Steel Quenched and Tempered	1/4" thru 1" 1" thru 1-1/2" 1-1/2" thru 3"	85,000 74,000 55,000	120,000 105,000 90,000
	J429 GR8	Medium Carbon Alloy Steel Quenched and Tempered	1/4" thru 1-1/2"	120,000	150,000
	ASTM A354 GR BC	Alloy Steel Quenched and Tempered	1/4" thru 2-1/2" over 2-1/2" - 4"	109,000 99,000	125,000 115,000
	ASTM A354 GR BD	Alloy Steel Quenched and Tempered	1/4" thru 2-1/2" over 2-1/2" - 4"	130,000 115,000	150,000 140,000
	ASTM A193 GR B7	Chrom - Moly Steel Quenched and Tempered	2-1/2" & under over 2-1/2" thru 4" over 4" thru 7"	105,000 95,000 75,000	125,000 115,000 100,000
	ASTM A193 GR B16	Chrom - Moly - Vanadium - Steel Quenched and Tempered	2-1/2" & under over 2-1/2" thru 4" over 4" thru 7"	105,000 95,000 85,000	125,000 110,000 100,000
	ASTM A325 Type 1	Medium Carbon Steel Quenched and Tempered	1/2" thru 1" 1-1/8" thru 1-1/2"	85,000 74,000	120,000 105,000
	ASTM A325 Type 3	Weather Resistant Steel Quenched and Tempered	1/2" thru 1" 1-1/8" thru 1-1/2"	85,000 74,000	120,000 105,000
	ASTM A490	Alloy Steel Quenched and Tempered	1/2" thru 1-1/2"	120,000	150,000

\*Manufacturer's ID also appears.

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## ASTM & SAE Grade Markings for Steel Bolts and Screws

Grading* Marking	Specification	Material	Bolt & Screw Size, Inches	Min. Yield Strength	Min. Tensile Strength
	18 - 8 18 Chromium 8 Nickel	"300" Series Stainless Steel	All Diameters	30,000*	70,000*
	ASTM A193 / A320 GR B8 CL-1	Solution Treated 304 - 304L Stainless Steel	All Diameters	30,000	75,000
	ASTM A193 / A320 GR B8M CL-1	Solution Treated 316 - 316L Stainless Steel	All Diameters	30,000	75,000
	ASTM A193 / A320 GR B8A CL-1A	304 - 304L Stainless Steel Solution Treated in Finished Condition	All Diameters	30,000	75,000
	ASTM A193 / A320 GR B8MA CL - 1A	316 - 316L Stainless Steel Solution Treated in Finished Condition	All Diameters	30,000	75,000
	ASTM A193 GR B6	410 Stainless Steel Quenched and Tempered	1/4" thru 4"	85,000	110,000
	ASTM A193 GR B8C CL-1	347 Stainless Steel Solution Treated	All Diameters	30,000	75,000
	ASTM A193 GR B8T CL-1	321 Stainless Steel Solution Treated	All Diameters	30,000	75,000
	ASTM A193 GR B8R	Nitronic 50 Solution Treated	All Diameters	55,000	100,000
	ASTM A193 GR B8S	Nitronic 60 Solution Treated	All Diameters	50,000	95,000
	ASTM F593 Cond. AH	17 - 4 PH (Type 630) Annealed and Age Hardened	1/4" thru 1-1/2"	105,000	135,000

\*Manufacturer's ID also appears.

\*Cold forming greatly increases these values. Actual properties will be considerably higher.

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# STEEL

Chart derived from SAE/ASTM/AISI Steel Materials

UNS	Number (SAE/AISI)	Type of Steel	Description
G10xx0	10xx	Carbon	C, Mn, P, S
G11xx0	11xx	Carbon	C, Mn, P, S
G13xx0	13xx	Manganese	1.75% Mn
G23xx0	23xx	Nickel Steel	3.50% Ni
G25xx0	25xx	Nickel Steel	5.00% Ni
G31xx0	31xx	Nickel-Chromium	1.25% Ni & .65% Cr
G33xx0	33xx	Nickel-Chromium	3.00% Ni & 1.57% Cr
	303xx	Nickel-Chromium	Corrosion & Heat Resistant
G40xx0	40x	Molybdenum	.25% Mo
G41xx0	41xx	Molybdenum	.95% Cr
G43xx0	43xx	Nickel-Chromium-Moldeb	1.82% Ni, .50% Cr, .25% Mo
G47xx0	47xx	Nickel-Chromium-Moldeb	1.05% Ni, .45% Cr, .20% Mo
G86xx0	86xx	Nickel-Chromium-Moldeb	.55% Ni, .50% Cr, .20% Mo
G87xx0	87xx	Nickel-Chromium-Moldeb	.55% Ni, .50% Cr, .25% Mo
G93xx0	93xx	Nickel-Chromium-Moldeb	3.25% Ni, 1.20% Cr, .12% Mo
G98xx0	98xx	Nickel-Chromium-Moldeb	1.00% Ni, .80% Cr, .25% Mo
G46xx0	46xx	Nickel-Moldeb	1.57% Ni, .20% Mo
G48xx0	48xx	Nickel-Moldeb	3.50% Bi, 0.25% Mo
G50xx0	50xx	Chromium	.27-.50% Cr, Low Chromium
G51xx0	51xx	Chromium	.80-1.05% Cr, Low Chromium
	51xxx	Chromium	1.02% Cr, Medium Chromium
G52xx0	52xxx	Chromium	1.45% Cr, High Chromium
	514xx	Chromium	Corrosion & Heat Chromium
G61xx0	61xx	Chromium-Vanadium	.95% Cr, 0.15
	92xx	Silicon-Manganese	.65-.87% Mn, .85-2.00 Si

General: Carbon steels are regarded as steels containing not more than 0.5% manganese and 0.5% silicon, all other steels being regarded as alloy steels.

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# COMMON STOCK STEEL

## General Purpose

**1010** - General purpose steel. Good weldability and forming and extruding characteristics. Often used for general structure and automotive bodies.

**1015** - General purpose low carbon plate with predictable qualities. Has excellent welding and bending properties. Structural applications.

**1020** - Good general purpose low carbon plate. Good machinability and formability. Used in automotive camshafts and similar applications.

**1025** - Plate. Higher carbon plate for greater strength. Has optimal combination of strength, weldability and good form retaining after machining.

**1045** - Medium carbon steel. Often used for bolts, studs and shaft parts. High strength and hardness.

## Hot Rolled Carbon Steel

**1018, 1029 (HR, CF)** - Low carbon steel. Has good hardening properties, fair machinability. Readily brazed and welded.

**1117 (HR, CF)** - Low carbon, high manganese steel. Good machinability, case hardening is deep and uniform. Good for bending, broaching and most deforming without cracking.

## Medium Carbon - Direct Hardening

**1035 (HR)** - Intermediate carbon higher in strength and hardness than low carbon steel. Used for studs, bolts, etc.

**1040, 1045 (HR, CF)** - Used when greater strength and hardness is desired in the as rolled condition. Good for hammer forge processes. Uses include gears, shafts, axles, bolts and studs.

**1050 (CF)** - Strain hardened, stress relieved material 100 K.S.I. yield strength.

**1141 (HR, CF)** - Improved machinability and better heat treatment response (surface hardness is deeper and more uniform) than plain carbon steels. Uses include gears, shafts, axles, bolts, studs, pins, etc.

## Screw Stock

**1215 (HR, CF)** - Fast cutting steel is considered the standard screw stock. Cutting speeds and machining characteristics are excellent.

## Medium Carbon Alloy Bars - Annealed

**4140/4150** - Widely used general purpose alloys, low in cost. A broad range of strength and toughness is attainable through variations in heat treatment. Used for forgings, tubing and fittings.

**4340** - Highly alloyed steel, normally 1.8% Ni, .80% Chromium and .25% molybdenum. High strength characteristics. Used for heavily stressed parts operating in fatigue and other heavy duty conditions.

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# STAINLESS STEEL

<i>UNS#</i>	<i>ALLOY</i>	<i>C</i>	<i>Mn</i>	<i>Cr</i>	<i>Mo</i>	<i>Ni</i>	<i>Fe</i>	<i>Si</i>	<i>P</i>	<i>S</i>	<i>Al</i>	<i>Cu</i>	<i>Zn</i>	<i>OTHER</i>
S30400	SST-304	.08	2	18-20	--	8-10.5	BAL	1	.045	.03	--	--	--	--
S30403	SST-304L	.03	2	18-20	--	8-12	BAL	1	.045	.03	--	--	--	--
S31600	SST-316	.08	2	16-18	2-3	10-14	BAL	1	.045	.03	--	--	--	--
S31603	SST-316L	.03	2	16-18	2-3	10-14	BAL	1	.045	.03	--	--	--	--
S32100	SST-321	.08	2	17-19	--	9-12	BAL	1	.045	.03	--	--	--	Ti 5xC Min.
N08330	SST-330	.08	2	17-20	--	34-37	BAL	.75-1.5	.03	.03	--	1	--	--
S34700	SST-347	.08	2	17-29	.75	9-13	BAL	1	.045	.03%	--	.50	--	--
S41000	SST-410	.15	1	11.5-13.5	--	--	BAL	1	.045	.03	--	--	--	--
S43000	SST-430	.12	1	16-18	--	--	BAL	1	.045	.03	--	--	--	--

**303** - Free machining for use in automatic machining operations. High corrosion resistant

**304** - The most widely used of the stainless steels. Offers good corrosion resistance to many environments. Has good formability and can be readily welded.

**309** - Used in high temperature applications. High scale resistance. Corrosion resistance superior to 304. Resists corrosion when welded.

**316** - Better corrosion resistance as well as higher strength at elevated temperatures than 304. Often used for pumps, valves, chemical equipment and marine applications. Most popular of stainless steels.

**409** - Lowest cost stainless - used extensively in automotive exhaust systems. Excellent formability and weldability. Because of its economy and good resistance to oxidation and corrosion, this stainless offers many opportunities for a wide range of parts.

**410** - Heat-treatable stainless used widely where corrosion is not severe - air, fresh water, some chemicals and food acids.

**416** - Free machining variation of 410 with useful corrosion resistance to natural food acids, basic salts, water and most atmospheres.

**430** - Is the most popular of the non-hardenable chromium stainless steels. It combines good corrosion and heat resistance with good mechanical properties. Oxidation resistance to 1500 deg F widely used in both industrial and consumer products.

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# Wrench Sizes for Bolts or Nuts

Bolt Diameter	Across the flats Standard Hex	Across the flats Heavy Hex
0.2500	0.3750	0.5000
0.3125	0.4688	0.5938
0.3750	0.5625	0.6875
0.4375	0.6563	0.7813
0.5000	0.7500	0.8750
0.5625	0.8438	0.9688
0.6250	0.9375	1.0625
0.7500	1.1250	1.2500
0.8750	1.3125	1.4375
1.0000	1.5000	1.6250
1.1250	1.6875	1.8125
1.2500	1.8750	2.0000
1.3750	2.0625	2.1875
1.5000	2.2500	2.3750
1.6250	2.4375	2.5625
1.7500	2.6250	2.7500
1.8750	2.8125	2.9375
2.000	3.000	3.1250
2.2500	3.3750	3.5000
2.5000	3.7500	3.8750
2.7500	4.1250	4.2500
3.0000	4.5000	4.6250
3.2500	4.8750	5.0000
3.5000	5.2500	5.3750
3.7500	5.6250	5.7500
4.0000	6.0000	6.1250

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This table is offered as the suggested maximum torque values for threaded products and is only a guide.

Bolt Size	18-8 Stainless Steel	Brass	Aluminum 2024-T4	316 Stainless Steel	Nylon
2 - 56	2.5	2.0	1.4	2.6	0.44
4 - 40	5.2	4.3	2.9	5.5	1.19
4 - 48	6.6	5.4	3.6	6.9	
6 - 32	9.6	7.9	5.3	10.1	2.14
6 - 40	12.1	9.9	6.6	12.7	
8 - 32	19.8	16.2	10.8	20.7	4.30
8 - 36	22.0	18.0	12.0	23.0	
10 - 24	22.8	18.6	13.8	23.8	6.61
10 - 32	31.7	25.9	19.2	33.1	8.20
1/4" - 20	75.2	61.5	45.6	78.8	16.00
1/4" - 28	94.0	77.0	57.0	99.0	20.80
5/16" - 18	132.0	107.0	80.0	138.0	34.90
5/16" - 24	142.0	116.0	86.0	147.0	
3/8" - 16	236.0	192.0	143.0	247.0	
3/8" - 24	259.0	212.0	157.0	271.0	
7/16" - 14	376.0	317.0	228.0	393.0	
7/16" - 20	400.0	357.0	242.0	418.0	
1/2" - 13	517.0	422.0	313.0	542.0	
1/2" - 20	541.0	443.0	328.0	565.0	
9/16" - 12	682.0	558.0	413.0	713.0	
9/16" - 18	752.0	615.0	456.0	787.0	
5/8" - 11	1110.0	907.0	715.0	1160.0	
5/8" - 18	1244.0	1016.0	798.0	1301.0	
3/4" - 10	1530.0	1249.0	980.0	1582.0	
3/4" - 16	1490.0	1220.0	958.0	1558.0	
7/8" - 9	2328.0	1905.0	1495.0	2430.0	
7/8" - 14	2318.0	1895.0	1490.0	2420.0	
1' - 8	3440.0	2815.0	2205.0	3595.0	
1" - 14	3110.0	2545.0	1995.0	3250.0	

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# Anchor Bolt Sleeve Applications

**Basic Use:** The Wilson Anchor Bolt Sleeve is used as an in-place form to provide a grout pocket around an anchor bolt and is used to form a pocket into which a bolt may be grouted. Also may be used where metal pipe is objectionable due to rusting or cost. Use in food processing areas is not a problem due to the inert polyethylene.

**Limitations:** The Wilson Anchor Bolt Sleeve is not recommended where high heat is used, such as inside an oven.

## Technical Services

Assistance in the application, selection and use of Wilson products is available through the manufacturer or area representative free of charge.

## Technical Data

See Table 1 for material test data. Each Sleeve is approximately twice the bolt diameter with a depth of 8 bolt diameters, minimum

Tests by a state Department of Transportation laboratory indicates that the Wilson Anchor Bolt Sleeve provided greater pullout strength than the regular grout pocket

The grout pocket was formed in a concrete mass and the sleeve of the same size was cast into the mass. After curing the concrete, #5 reinforcing bars were set in each pocket, using expanding grout. When cured, both bars were given a tensile load. The standard pocket failed when the bar with the grout attached pulled out. The Wilson Anchor Bolt Sleeve retained the grout and failure occurred around the bar. The sleeve remained intact.

When used as a sleeve for anchor bolts the product is in an in-place form and not considered a structural member.

Due to its configuration 180 psi is the maximum compressive loading.

## Technical Information

**Table 1: Material and Testing Data**

Plastic:	High Density Polyethylene
Density gms/cc:	ASTM D 1505-68 .956
Vicat Softening Point °F:	ASTM D 1525-70 256 °F/124 °C
Brittleness Temperature °F:	ASTM D 746-70 -180 °F/-118 °C
Torch Application	Slow Burn
Compression Test	180 psi/12.7 kg/sq. cm.

**Table 2: Grout Volume Required**

Bolt Size	Bolt Size	Shells Per Carton	Cubic Inches of Grout Per Shell/Carton		Bags of Grout Per Carton
1/2"	2" x 5"	100	15.95	1595	1.06
3/4"	2" x 5"	100	15.16	1516	1.11
5/8"	2" x 7"	100	21.41	2141	1.42
3/4"	2" x 7"	100	20.50	2050	1.36
7/8"	2" x 7"	100	19.52	1952	1.30
1"	3" x 10"	50	65.80	3290	2.19
1-1/4"	3" x 10"	50	61.40	3070	2.04
1-1/2"	4" x 15"	20	167.60	3352	2.23
1-3/4"	4" x 15"	20	158.00	3160	2.11
2"	4" x 18"	20	176.76	3525	2.35
2-1/4"	4" x 18"	20	161.82	3236	2.15
2-1/2"	6" x 24"	10	575.28	5753	3.82
3"	6" x 24"	10	523.44	5235	3.48

NOTE: Grout Estimate based on .87 cu. ft. yield per 100 lb. of non-corrosive grout.

## Composition and Materials

The Wilson Anchor Bolt Sleeve is manufactured of high impact plastic. It is non-rusting, non-conductive and lightweight. Single unit construction provides for reduction in installation labor because no welding, threading or cleaning is required. The configuration

is such that the grout and concrete "lock" it in place, providing greater pullout strength than with straight pipes.

## Sizes

Available in fifteen standard sizes. See Table 2: Size Schedule (4" and 5" not shown).

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## Notes

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