



ACCURATE
MANUFACTURED
PRODUCTS
GROUP

Washers & Shims



CAT.Ver.15

Visit us online at ampg.com or email sales@ampg.com

8090 Woodland Drive
Indianapolis, IN 46278

p: 317.472.9000
f: 317.472.9010

“Beautiful Parts, Right Now”



Longevity

AMPG is a privately-owned family business started by current management in 1987. With the second generation in the business, already for many years, we are realizing a future of serving our customers, collaborating with our employees, and contributing to a vibrant domestic manufacturing economy.

Philosophy

We are proud to be an American manufacturer dedicated to solving large problems that affect small numbers of customers. We are committed to our team, our products, and our customers.

Our continuous capital investments in production equipment, employees, automation, and inspection technologies allows us to design thousands of new items a year, get them into large distributor channels and produce on demand small quantities in a few days.

Stock & Custom...**FAST**

As a precision manufacturer of specialized fasteners, architectural hardware, mechanical components and industrial accessories, AMPG stocks over 50,000 products. We also offer custom manufacturing supported by design, product testing and engineering services. To see the latest and most complete catalog of our over 50,000 different items, visit www.ampg.com.

How to Buy Our Products

Visit us [online](#), email us at sales@ampg.com or give us a call at **317.472.9000** and we can help you with your inquiry. Our stock line of parts ships same day from Indianapolis, Indiana.



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About AMPG



We Make Beautiful Parts, Right Now

AMPG (Accurate Manufactured Products Group) is a privately owned family business started by current management in 1987. Our 2nd generation is well experienced and active in the business and dedicated to keeping AMPG a closely held family firm.

We are Proud to be an American Manufacturer

AMPG is a Make to Stock Manufacturer of over 50,000 unique items. New products are our lifeblood, and we have a long term strategic plan in place to introduce thousands of new products each and every year.

Our 147,000 Sq Ft facility in Indianapolis supports low to medium volume manufacturing runs with over 80 late model and brand new CNC Lathes, Mills, and Thread Rolling equipment. AMPG has an aggressive investment program in the latest and most advanced Production, Automation, and Inspection equipment, as well as software and engineering systems to run our business as efficiently as possible.

ISO Certification to 9001:2015 was attained to anchor the culture of continual improvement both on and off the production floor. ISO 17065 Product Certification will be applied for in 2023, and ISO 17025 will be used to certify our in house Lab also in 2023. The latest in measuring, testing, and monitoring equipment is used to insure product quality and fast lead times. Lean principles guide the manufacturing process using robots, vision systems, and machine monitoring to enable continuous unmanned production around the clock.

Family Owned, Family Operated

AMPG began in Plainview, NY in 1987, and moved to Indianapolis, Indiana in 2004 in order to find the skilled machinists that are the foundation of our success. We are especially proud of our employee retention (as of 2022 all of our core team members will have over 15 years with the company), and the families second generation has over 18 years experience. We have a unique training method that allows us to grow our manufacturing capabilities to match our product and sales plan.

Our dedication to our employees is evidenced by their longevity and the numerous safety and healthiest employer awards we have won over the years.

Product Quality, Appearance and Quick Deliveries are Foundational Goals

AMPG makes and stocks hard-to-find fasteners, components, and fittings. We ship same day from our Indianapolis facility. We offer custom manufacturing capabilities including design, product testing, and engineering services. Our Made-to-Order program produces as little as one part within 7 days.

A Simple Philosophy

Provide a great customer experience by having beautiful, precise, and hard to find products ready to ship today.

“All AMPG Washers are Precision Made”

Washers are multipurpose fasteners that are vital in a variety of applications. In general, washers have two main functions: to distribute the pressure of the nut evenly over a surface without damage and to ensure that the nut is pressed against a smooth surface to reduce the chances of loosening over time. Ensure a tighter join with a lock washer, or pre-load it with a wave washer.

Shims can be used to incorporate spacing and clearance in all manner of applications. They can be use as a temporary solution or as a permanent component in many different settings. We offer standard and custom shims in a variety of materials, and in a comprehensive range of sizes and shapes.

AMPG has thousands of hard to find items, made in the USA. We specialize in non standard sizes – extra thick or extra thin. Also small quantities of traceable Military Specification washers. We manufacture a full line of machined product – countersunk washers, spherical washer sets, and others. We have a large line of square washers in many materials, in 2”, 3” and 4” square.

Ordering Washers:

Start by finding your Bolt Size. Then determine the Inner Diameter (ID) and the Outer Diameter (OD) as well as your Thickness needed for your project.

Some guidelines for choosing between the materials we produce are shown below.

Material Type	Specification	Tensile, psi	Yield, psi	Estimated Shear, psi	Elongation	Brinell Hardness	Rockwell Hardness
Brass 360	ASTM B16	58,000	45,000	29,000	25%	BHN 143	B78
Stainless Steel 18-8 (303)	ASTM A582	90,000	35,000	45,000	50%	BHN 160	B83
Stainless Steel 316 (316/316L)	ASTM A276	75,000	30,000	37,500	45%	BHN 160	B83
Stainless Steel High Five® (316 H5)	ASTM A276	125,000	100,000	62,500	26%	BHN 250	C25
Stainless Steel 17-4 PH	Cond A ASTM A564 TYPE 630	160,000	145,000	80,000	15%	BHN 332	C36
Steel 12L14	ASTM A108	78,000	60,000	39,000	15%	BHN 160	B84
Steel Alloy C4140/41L40 (Alloy)	ASTM A108 Cold ASTM A108 Thru Hard	105,000 140,000	85,000 n/a	52,500 70,000	15% n/a	BHN 187 BHN 300	B91 C32
Steel Grade 2	ASTM A307 Equivalent	60,000	36,000	30,000	18%	BHN160	B70
Titanium Grade 2	ASTM B348 GR 2	75,000	55,000	37,500	20%	BHN 163	B85

Note: Listed Mechanical Properties are obtained from various suppliers and is intended for comparison of materials, only. Values are based on raw material specifications. AMPG assumes no obligation and liability for the accuracy of this information. For critical applications, product testing may be appropriate.

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Washers

About Our Materials



Brass

Stainless Steel

Steel

Brass

- Brass is a softer material approximately two-thirds copper and one-third zinc.
- Provides good resistance to rust and atmospheric corrosion.
- Friction-resistant material used for gears, bearings, fasteners and valves.
- Nonmagnetic.

Stainless Steel 18-8 (303)

- Type 303 stainless offers excellent corrosion resistance.
- Resists chemicals, most dyes, food and nitric acid.
- Corrosion-resistant material used for screws, bushings, nuts and hardware.
- May be mildly magnetic.

Stainless Steel 316 (316/316L)

- Type 316 stainless offers superior corrosion resistance than Type 303 stainless.
- Resists salt water, acids, chlorides, alkalis and other industrial solvents.
- Low-maintenance material used in commercial kitchens and food processing.
- May be mildly magnetic.

**AMPG uses dual certified Type 316/316L stainless material. Meets all 316 stainless properties but has lower carbon content, making it more suitable for welding.*

Stainless Steel High Five® (316H5)

- High Five® Stainless is AMPG's higher strength grade of 316 stainless steel.
- Resists salt water, acids, chlorides, alkalis and other industrial solvents.
- Corrosion-resistance material with strength equivalent to Grade 5 steel materials.
- May be mildly magnetic.

Stainless Steel 17-4 PH

- Type 17-4 PH stainless maintains excellent corrosion resistance and strength at high temperatures.
- Resists chemicals, most dyes, food and nitric acid.
- High-strength material used for fittings, valves, bolts and shafts.
- Mildly magnetic.

Steel Carbon 12L14

- 12L14 steel is used in many general-purpose applications.
- Material requires a finish to resist rust, such as Black Oxide treatment or zinc plating.
- Low-strength material used for bushings, washers, inserts, fittings, screws and nuts.
- Magnetic.

Steel Alloy 4140/41L40 (Alloy Steel)

- Alloy 4140 is a "primary" material used high strength fasteners and components.
- Material requires a finish to resist rust, such as Black Oxide treatment or zinc plating.
- High-strength material that exceed Grade 8 used for socket screws, studs and components, only after heat treatment.
- Magnetic.

Titanium Gr 2

- Titanium Grade 2 is best known for being strong, lightweight and corrosion resistant.
- Resists chlorides, hypochlorites, chlorates, perchlorates and chlorine dioxide.
- Lightweight material used for chemical-processing equipment, heat exchangers and fasteners.
- Nonmagnetic.

About Our Finishes



Black Oxide

Black Oxide

Black oxide by itself provides virtually no protection against corrosive environments. Black oxide only offers moderate protection and thus ideally suited for indoor applications. This treatment provides an attractive and matte black finish. While steel is the usual substrate, other materials including stainless steel, alloy steel, copper and brass react equally well.



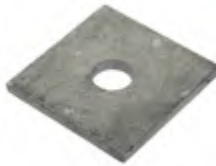
Nickel Plated

Nickel Plated

Nickel is used in plating fasteners primarily for esthetics purposes. It provides comparable corrosion resistance to zinc plating, but at a much higher cost.



Galvanized



Hot-Dipped Galvanized

Galvanized and Hot-Dipped Galvanized

Galvanizing involves the application of a layer of zinc. Galvanized metal has a thicker sacrificial protective finish than zinc plated metals. Hot dipped galvanizing puts the thickest possible coating on the metal resulting in superior corrosion resistance. Hot-dipped galvanized steel washers are 10 times as corrosion resistant as zinc plated washers. Hot dipped galvanized fasteners are frequently used in coastal environments. Hot-dipped galvanized washers are tapped slightly larger than regular washers to accommodate this thick coating.



Passivation

Passivation

Passivation is a non-electrolytic process typically using nitric or citric acid to remove contamination from the surface of stainless steel and titanium finished parts. During manufacturing, sulfides added to raw material for improved machinability or particles of iron from machining center cutting tools may transfer to the surface of the finished parts. Surface contamination can result in premature rust and can inhibit the formation of the oxide film which protects the material from corrosion. Passivation renders the material more rust resistant due to lack of iron to react with the atmosphere.



Plain and Oiled

Plain and Oiled

Plain steel fasteners with oil added provides mild rust resistance. For components used in indoor dry environment.



Zinc Plated



Yellow Zinc Plated

Zinc Plated, Yellow Zinc Plated

Steel fasteners can be electro-plated with zinc for better corrosion resistance and usually to a thickness .0002" - .0003". Fasteners that have been zinc plated have a silver finish. It is a sacrificial finish that corrodes before the underlying steel. Zinc plated washers are fairly corrosion resistant but will rust over time and quicker if the coating is damaged or if exposed to harsh elements. Applying a zinc yellow-chromate passivate over the zinc, improves corrosion resistance and yellow is commonly used to identify high-strength components such as Grade 8 materials.

Washers

18-8 SS, Steel, 17-4 PH,
Brass, 316H5 SS

Flat Washers — Inch

These washers are thicker than general purpose washers for covering large holes or for use as spacers and levelers. All of these washers are produced in the USA.

Tolerances: ID and OD are ± 0.010 inch.

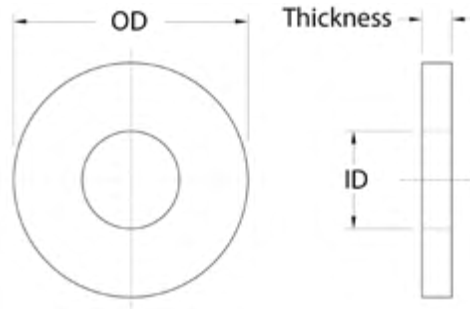
Thickness tolerance varies by size :

Up to 1/8 thickness is $+0.005 / -0.014$ inch.

From 1/8 to 9/32 thick is $+0.005 / -0.020$ inch.

Also known as:

- Component Flat Washer



Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish, Black Oxide Finish, Passivated
- Low Carbon Steel, Plain Finish, Black Oxide Finish
- Steel Medium Carbon, Thru Hardened, Yellow Zinc-Plated Finish
- Brass, Plain Finish
- 17-4 PH Stainless Steel, Plain Finish
- 316 H5 Stainless Steel, Plain Finish

AMPG Flat Washer Kits — Inch



ID	OD	Thickness	Alloy Hardened Steel, Black Oxide Part Number	Alloy Thru Hardened Steel, Yellow Zinc Part Number
Sizes 1/8 to 11/32	Sizes 5/16 to 3/4	Sizes 5/64 to 1/8	Z9108	—
Sizes 13/64 to 21/32	Sizes 1/2 to 1-3/8	Sizes 3/32 to 1/8	Z9107	—
Sizes 9/32 to 25/32	Sizes 5/8 to 1-5/8	Sizes 3/16 to 1/4	Z9212	—
Sizes 9/32 to 13/16	Sizes 5/8 to 1-15/32	Sizes 3/32 to 7/32	—	Z9291

AMPG Flat Washer Kits — Metric

ID	OD	Thickness	Alloy Hardened Steel, Black Oxide Part Number
Sizes 5.3 to 15mm	Sizes 11 to 25mm	Sizes 2 to 3mm	Z9109

Flat Washers – Inch



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
#0	.063	.125	.019	Z9150
#1	.078	.156	.019	Z9151
#2	.094	.187	.028	Z9152
#4	.125	.250	.062	Z9154
	.125	.312	.078	Z9085SS
#6	.156	.312	.062	Z9156
	.156	.375	.078	Z9086SS
#8	.171	.375	.062	Z9158
	.187	.438	.078	Z9087SS
	.187	.438	.078	Z9160
#10	.203	.500	.093	Z9094SS
	.265	.500	.078	Z9164
1/4	.281	.500	.078	Z9161
	.281	.625	.125	Z9095SS
1/4	.281	.625	.187	Z9200SS
	.281	.625	.125	Z9215
	.281	.625	.090 - .108	Z9270SS
5/16	.344	.625	.093	Z9162
	.344	.688	.100	Z9130
	.344	.688	.125	Z9216
	.344	.688	.090 - .108	Z9271SS
5/16	.344	.750	.125	Z9096SS
	.344	.750	.187	Z9201SS
3/8	.406	.750	.093	Z9163
	.406	.812	.125	Z9131
	.406	.812	.110 - .126	Z9272SS
	.406	.875	.125	Z9097SS
3/8	.406	1.000	.187	Z9202SS
	.406	1.000	.125	Z9217
7/16	.469	1.000	.125	Z9217-BOX*
	.469	.922	.125	Z9218
7/16	.469	.922	.110 - .126	Z9273SS

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
7/16	.469	1.000	.125	Z9098SS
	.469	1.000	.187	Z9203SS
1/2	.531	1.062	.190 - .208	Z9274SS
	.531	1.063	.187	Z9219
	.531	1.125	.125	Z9099SS-BOX*
	.531	1.125	.187	Z9204SS-BOX*
1/2	.531	1.125	.125	Z9099SS
	.531	1.125	.187	Z9204SS
9/16	.594	1.171	.168 - .191	Z9275SS
	.594	1.187	.187	Z9220
5/8	.656	1.312	.219	Z9221
	.656	1.312	.206 - .229	Z9276SS
	.656	1.375	.125	Z9100SS-BOX*
	.656	1.375	.125	Z9100SS
5/8	.656	1.375	.187	Z9205SS
	.781	1.625	.156	Z9101SS
3/4	.781	1.625	.125	Z9101SSL
	.781	1.625	.250	Z9206SS
	.812	1.469	.206 - .229	Z9277SS
3/4	.812	1.500	.219	Z9222
7/8	.906	1.750	.156	Z9102SS
	.906	1.750	.250	Z9207SS
	.938	1.750	.234 - .266	Z9278SS
1	1.031	2.000	.187	Z9103SS
	1.031	2.000	.219	Z9208SS
	1.031	2.000	.250	Z9209SS
	1.062	2.000	.234 - .266	Z9279SS
1-1/8	1.156	2.250	.219	Z9104SS
1-1/4	1.281	2.500	.281	Z9105SS

*Black Oxide Finish

Chart continued on next page

Washers

For product information and technical drawings, please see page D-1

Steel

Flat Washers – Inch



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Black Oxide Part Number
#0	.063	.125	.019	Z9150STL
#1	.078	.156	.019	Z9151STL
#2	.094	.187	.028	Z9152STL
#4	.125	.250	.062	Z9154STL
	.125	.312	.078	Z9085
#6	.156	.312	.062	Z9156STL
	.156	.375	.078	Z9086
#8	.171	.375	.062	Z9158STL
	.187	.438	.078	Z9087
	.187	.438	.078	Z9160STL
#10	.203	.500	.093	Z9094
1/4	.281	.500	.078	Z9161STL
	.281	.625	.125	Z9095
	.281	.625	.187	Z9200
5/16	.344	.625	.093	Z9162STL
	.344	.688	.125	Z9216STL
	.344	.750	.125	Z9096
	.344	.750	.187	Z9201
3/8	.406	.750	.093	Z9163STL
	.406	.875	.125	Z9097
	.406	1.000	.187	Z9202
	.406	1.000	.125	Z9217STL
7/16	.469	.922	.125	Z9218STL
	.469	1.000	.125	Z9098
	.469	1.000	.187	Z9203
1/2	.531	1.063	.187	Z9219STL
	.531	1.125	.125	Z9099
	.531	1.125	.187	Z9204
	.531	1.125	.187	Z9204
	.531	1.500	.219	Z9235
9/16	.594	1.187	.187	Z9220STL
	.656	1.312	.219	Z9221STL
5/8	.656	1.375	.125	Z9100
	.656	1.375	.187	Z9205
	.656	1.500	.219	Z9236
3/4	.781	1.625	.156	Z9101
	.781	1.625	.250	Z9206
	.781	1.875	.250	Z9237
	.812	1.500	.219	Z9222STL



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Black Oxide Part Number
7/8	.906	1.750	.156	Z9102
	.906	1.750	.250	Z9207
	.906	2.125	.298 to .328	Z9238
1	1.031	2.000	.187	Z9103
	1.031	2.000	.219	Z9208
	1.031	2.000	.250	Z9209STL
	1.062	2.500	.312	Z9239
1-1/8	1.156	2.250	.219	Z9104
1-1/4	1.281	2.500	.281	Z9105
	1.312	2.500	.344	Z9240
1-1/2	1.562	2.750	.375	Z9241



Steel Medium Carbon, Thru Hardened, Yellow Zinc

Bolt Size	ID	OD	Thickness	Steel, Yellow Zinc-Plated
1/4	.281	.625	.090 - .108	Z9270
5/16	.344	.688	.090 - .108	Z9271
3/8	.406	.812	.110 - .126	Z9272
7/16	.469	.922	.110 - .126	Z9273
1/2	.531	1.063	.190 - .208	Z9274
9/16	.594	1.171	.168 - .191	Z9275
5/8	.656	1.312	.206 - .229	Z9276
3/4	.812	1.469	.206 - .229	Z9277
7/8	.938	1.750	.234 - .266	Z9278
1	1.062	2.000	.234 - .266	Z9279
1-1/8	1.187	2.250	.234 - .266	Z9280
1-1/4	1.375	2.500	.234 - .266	Z9281
1-3/8	1.437	2.750	.234 - .266	Z9282
1-1/2	1.562	3.000	.234 - .266	Z9283

Flat Washers – Inch



Brass

Bolt Size	ID	OD	Thickness	Brass
#0	.063	.125	.019	Z9150BR
#1	.078	.156	.019	Z9151BR
#2	.094	.187	.028	Z9152BR
#4	.125	.250	.062	Z9154BR
	.125	.312	.078	Z9085BR
#6	.156	.312	.062	Z9156BR
	.156	.375	.078	Z9086BR
#8	.171	.375	.062	Z9158BR
	.187	.438	.078	Z9087BR
#10	.187	.438	.078	Z9160BR
	.203	.500	.093	Z9094BR
1/4	.281	.500	.078	Z9161BR
	.281	.625	.125	Z9095BR
1/4	.281	.625	.187	Z9200BR
	.344	.625	.093	Z9162BR
5/16	.344	.688	.125	Z9216BR
	.344	.750	.125	Z9096BR
5/16	.344	.750	.187	Z9201BR
	.406	.750	.093	Z9163BR
3/8	.406	.875	.125	Z9097BR
	.406	1.000	.187	Z9202BR
3/8	.406	1.000	.125	Z9217BR
	.469	.922	.125	Z9218BR
7/16	.469	1.000	.125	Z9098BR
	.531	1.063	.187	Z9219BR
1/2	.531	1.125	.125	Z9099BR
	.531	1.125	.187	Z9204BR
5/8	.656	1.312	.219	Z9221BR
	.656	1.375	.125	Z9100BR
5/8	.656	1.375	.187	Z9205BR
	.781	1.625	.156	Z9101BR
3/4	.781	1.625	.250	Z9206BR
	.812	1.500	.219	Z9222BR
7/8	.906	1.750	.156	Z9102BR
	.906	1.750	.250	Z9207BR
1	1.031	2.000	.187	Z9103BR
	1.031	2.000	.219	Z9208BR



17-4 PH SS

Bolt Size	ID	OD	Thickness	17-4 PH SS Part Number
#4	.125	.312	.078	Z9085-174
#6	.156	.375	.078	Z9086-174
#8	.187	.438	.078	Z9087-174
#10	.203	.500	.093	Z9094-174
1/4	.281	.625	.125	Z9095-174
	.281	.625	.187	Z9200-174
5/16	.344	.750	.125	Z9096-174
	.344	.750	.187	Z9201-174
3/8	.406	.875	.125	Z9097-174
	.406	1.000	.187	Z9202-174
7/16	.469	1.000	.187	Z9203-174
	.531	1.125	.125	Z9099-174
1/2	.531	1.125	.187	Z9204-174
	.656	1.375	.125	Z9100-174
5/8	.656	1.375	.187	Z9205-174
	.781	1.625	.156	Z9101-174
3/4	.781	1.625	.250	Z9206-174
	.906	1.750	.156	Z9102-174
7/8	.906	1.750	.250	Z9207-174
	1	1.031	2.000	.187	Z9103-174
1	1.031	2.000	.219	Z9208-174
	1-1/8	1.156	2.250	.219	Z9104-174
1-1/4	1.281	2.500	.281	Z9105-174
1-1/2	1.562	2.750	.375	Z9241-174



316 H5 SS

Bolt Size	ID	OD	Thickness	316 H5 SS Part Number
1/4	.281	.625	.094	Z9270-316H5
5/16	.344	.688	.094	Z9271-316H5
3/8	.406	.812	.125	Z9272-316H5
1/2	.531	1.063	.203	Z9274-316H5

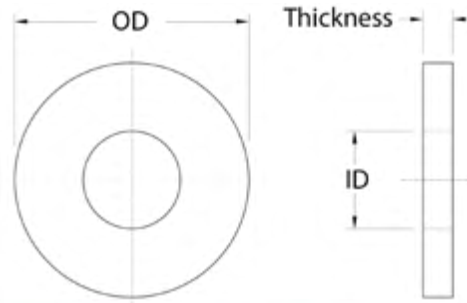
Washers

18-8 SS, 316 SS,
17-4 PH SS, Steel

Flat Washers — Metric

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- 17-4 PH Stainless Steel, Plain Finish
- Low Carbon Steel, Black Oxide Finish



18-8 Stainless Steel



316 Stainless Steel



17-4 PH Stainless Steel



Low Carbon Steel,
Black Oxide

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	17-4 PH SS Part Number	Steel, Black Oxide Part Number
M3	3.20	8.00	2.00	Z8803SS	Z8803-316	—	Z8803
	3.20	12.00	2.00	Z8840SS	Z8840-316	—	—
	3.20	12.00	3.00	—	—	—	Z8840
M4	4.30	10.00	2.00	Z8804SS	Z8804-316	—	Z8804
	4.30	14.00	3.00	Z8842SS	Z8842-316	—	Z8842
M5	5.30	11.00	2.00	Z8805SS	Z8805-316	—	Z8805
	5.30	12.00	3.00	—	—	Z90M05-174	—
	5.30	15.00	2.00	Z8844SS	Z8844-316	—	Z8844
M6	6.40	13.00	2.50	Z8806SS	Z8806-316	—	Z8806
	6.40	18.00	4.50	Z8846SS	Z8846-316	—	Z8846
M8	8.40	16.00	3.00	Z8808SS	Z8808-316	—	Z8808
	8.40	19.00	3.00	—	—	Z90M08-174	—
	8.40	22.00	3.00	Z8848SS	Z8848-316	—	Z8848
M10	10.50	19.00	3.00	Z8810SS	Z8810-316	—	Z8810
	10.50	22.00	3.00	—	—	Z90M10-174	—
	10.50	23.00	3.00	Z8850SS	Z8850-316	—	Z8850
M12	13.00	22.00	3.00	Z8812SS	Z8812-316	—	Z8812
	13.00	26.00	3.00	Z8852SS	Z8852-316	Z90M12-174	Z8852
	13.00	35.00	5.00	—	—	Z92M12-174	—
	13.00	38.00	6.30	Z8851SS	—	—	—
M12	13.00	50.00	6.30	Z8853SS	—	—	—
	13.00	76.00	6.30	Z8855SS	—	—	—
M14	15.00	25.00	3.00	Z8814SS	Z8814-316	—	Z8814
	15.00	26.00	3.00	—	—	Z90M14-174	—
	15.00	27.00	3.00	Z8854SS	Z8854-316	—	Z8854
	15.00	35.00	5.00	—	—	Z92M14-174	—
M16	17.00	28.00	3.50	Z8816SS	Z8816-316	—	Z8816
	17.00	28.00	3.50	Z8818SS	Z8818-316	—	—

18-8 SS, 316 SS,
17-4 PH SS, Steel

For product information and technical drawings, please see page D-5

Flat Washers – Metric



18-8 Stainless Steel



316 Stainless Steel



17-4 PH Stainless Steel



Low Carbon Steel,
Black Oxide

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	17-4 PH SS Part Number	Steel, Black Oxide Part Number
M16	17.00	32.00	3.50	Z8856SS	Z8856-316	–	Z8856
	17.00	35.00	3.00	–	–	Z90M16-174	–
	17.00	35.00	5.00	–	–	Z92M16-174	–
M18	20.00	32.00	3.50	Z8819SS	–	–	–
	20.00	38.00	6.30	Z8857SS	–	–	–
	20.00	42.00	4.00	–	–	Z90M18-174	–
	20.00	42.00	6.30	–	–	Z92M18-174	–
M18	20.00	50.00	6.30	Z8858SS	–	–	–
	20.00	76.00	6.30	Z8859SS	–	–	–
M20	21.00	35.00	3.50	Z8820SS	Z8820-316	–	Z8820
	21.00	35.00	5.00	Z8860SS	Z8860-316	–	Z8860
	22.00	38.00	6.30	Z8861SS	–	–	–
	22.00	45.00	4.00	–	–	Z90M20-174	–
M20	22.00	45.00	6.30	–	–	Z92M20-174	–
	22.00	50.00	6.30	Z8862SS	–	–	–
	22.00	76.00	6.30	Z8863SS	–	–	–
M24	25.00	40.00	4.00	Z8824SS	Z8824-316	–	Z8824
	25.00	43.00	4.00	Z8864SS	Z8864-316	–	Z8864
	26.00	76.00	6.30	Z8825SS	–	–	–
	26.00	76.00	9.5	Z8826SS	–	–	–
M30	31.00	44.00	4.00	Z8830SS	Z8830-316	–	Z8830
	31.00	48.00	4.00	Z8870SS	Z8870-316	–	Z8870
	32.00	76.00	6.30	Z8871SS	–	–	–
	32.00	76.00	9.50	Z8872SS	–	–	–
M36	37.00	50.00	5.00	Z8836SS	Z8836-316	–	Z8836
	37.00	50.00	7.50	Z8876SS	Z8876-316	–	Z8876
	38.50	76.00	6.30	Z8877SS	–	–	–
	38.50	76.00	9.50	Z8878SS	–	–	–

Component Thick (Spacer) Washers — Inch



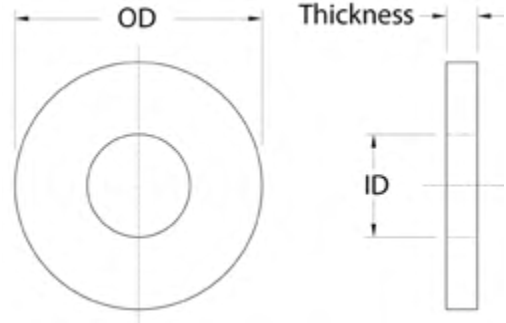
A thick washer used as a spacer where appearance and tight tolerance fit are not needed.

Materials and finishes offered in:

- Alloy Hardened Steel, Black Oxide Finish

Also known as:

- Spacer Washer



Bolt Size	ID	OD	Thickness	Alloy Hardened Steel, Black Oxide Part Number
1/4	.281	.781	.187	Z9200U
5/16	.344	.828	.187	Z9201U
3/8	.406	1.062	.187	Z9202U
7/16	.469	1.250	.187	Z9203U
1/2	.531	1.187	.187	Z9204U
5/8	.656	1.438	.187	Z9205U
3/4	.781	1.688	.250	Z9206U
7/8	.906	1.828	.250	Z9207U
1	1.031	2.062	.281	Z9208U

Welding Thick Washers — Inch



A stamped washer used for welding and other mechanical and construction applications.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- Low Carbon Steel, Black Oxide Finish

Also known as:

- AMPG Roughneck Washer



18-8 Stainless Steel



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	Steel, Black Oxide Part Number
3/8	.438	.875	.187	Z9090-SS	Z9090
1/2	.562	1.000	.187	Z9091-SS	Z9091
5/8	.719	1.250	.250	Z9092-SS	Z9092
3/4	.843	1.500	.250	Z9093-SS	Z9093

Steel,
18-8 SS



Machined Beveled Washers — Inch

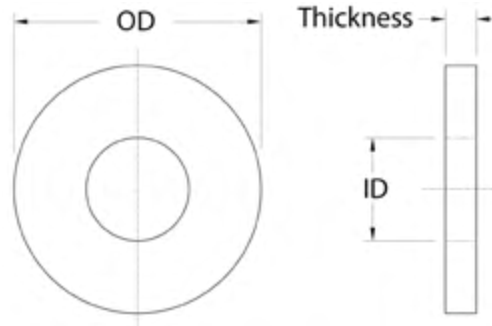
These Williams style washers are thicker and have a beveled outside edge. They are made by machining rather than stamping and are sometimes used in spacing, clamping and bolting applications due to their tighter tolerances and flat machined surfaces.

Materials and finishes offered in:

- Steel, Oiled
- Low Carbon Steel, Oiled
- Low Carbon Steel, Zinc-Plated Finish
- 18-8 Stainless Steel, Plain Finish

Also known as:

- Williams Washer
- Spacing Washer



Steel, Oiled



Low Carbon Steel, Oiled



Low Carbon Steel, Zinc Plated



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	Steel, Oiled Part Number	Low Carbon Steel, Oiled Part Number	Low Carbon Steel, Zinc Plated Part Number	18-8 SS Part Number
#10	.203	.500	.093	Z9180-BEV	Z9180-BEV-H	Z9180-BEV-HZN	Z9180-BEV-SS
1/4	.281	.625	.125	Z9181-BEV	Z9181-BEV-H	Z9181-BEV-HZN	Z9181-BEV-SS
5/16	.344	.750	.125	Z9182-BEV	Z9182-BEV-H	Z9182-BEV-HZN	Z9182-BEV-SS
3/8	.406	.875	.125	Z9183-BEV	Z9183-BEV-H	Z9183-BEV-HZN	Z9183-BEV-SS
7/16	.469	1.000	.156	Z9184-BEV	Z9184-BEV-H	Z9184-BEV-HZN	Z9184-BEV-SS
1/2	.531	1.000	.187	Z9185-BEV	Z9185-BEV-H	Z9185-BEV-HZN	Z9185-BEV-SS
5/8	.656	1.250	.250	Z9186-BEV	Z9186-BEV-H	Z9186-BEV-HZN	Z9186-BEV-SS
3/4	.781	1.500	.250	Z9187-BEV	Z9187-BEV-H	Z9187-BEV-HZN	Z9187-BEV-SS
7/8	.906	1.750	.250	Z9188-BEV	Z9188-BEV-H	Z9188-BEV-HZN	Z9188-BEV-SS
1	1.031	2.000	.312	Z9189-BEV	Z9189-BEV-H	Z9189-BEV-HZN	Z9189-BEV-SS
1-1/8	1.156	2.250	.312	Z9190-BEV	Z9190-BEV-H	Z9190-BEV-HZN	Z9190-BEV-SS
1-1/4	1.281	2.250	.312	Z9191-BEV	Z9191-BEV-H	Z9191-BEV-HZN	Z9191-BEV-SS

Machined Straight Side Washers – Inch

These washers are made by machining rather than stamping. Stamped flat washers have a sloped side, where the die break from regular stamping presses occurs. These washers have straight sides and provide a finished appearance.

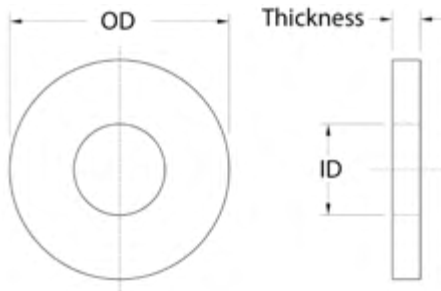
Turned – Not Stamped

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- Steel, Oiled, Plain Finish
- Alloy Hardened Steel, Black Oxide Finish
- Low Carbon Steel, Nickel-Plated

Also known as:

- Dress Flat Washer
- Machined Dress Washer



18-8 Stainless Steel



Steel, Oiled with Plain Finish



Alloy Hardened Steel,
Black Oxide



Low Carbon Steel,
Nickel Plated

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	Steel, Oiled Part Number	Alloy Hardened Steel, Black Oxide Part Number	Low Carbon Steel, Nickel Plated Part Number
#4	.115	.247	.056 - .071	Z0701SS	–	–	–
#5	.128	.250	.060 - .064	–	–	Z0351	–
#6	.143	.317	.056 - .071	Z0702SS	–	–	–
#8	.169	.369	.056 - .071	Z0703SS	–	–	–
	.193	.375	.060 - .064	–	–	Z0352	–
#10	.203	.500	.093	–	Z9180	–	–
	.203	.438	.072 - .084	Z0704SS	–	Z0353	–
	.203	.500	.093	Z9094M-SS	–	–	Z9094M
#12	.250	.500	.060 - .064	–	–	–	–
	.255	.500	.072 - .084	Z0705SS	–	–	–
1/4	.281	.625	.125	Z9095M-SS	Z9181	–	Z9095M
	.322	.625	.087 - .099	Z0706SS	–	–	–
5/16	.316	.625	.091 - .095	–	–	Z0354	–
	.344	.750	.125	Z9096M-SS	Z9182	–	Z9096M
3/8	.378	.750	.123 - .127	–	–	Z0355	–
	.383	.750	.087 - .099	Z0707SS	–	–	–
	.406	.875	.125	Z9097M-SS	Z9183	–	Z9097M
7/16	.469	1.000	.125	Z9098M-SS	–	–	Z9098M
	.503	1.000	.185 - .189	–	–	Z0356	–
1/2	.531	1.000	.187	–	Z9185	–	–
	.531	1.125	.125	Z9099M-SS	–	–	Z9099M
5/8	.656	1.250	.250	–	Z9186	–	–
	.656	1.375	.125	Z9100M-SS	–	–	Z9100M
3/4	.781	1.500	.250	–	Z9187	–	–
	.781	1.625	.156	Z9101M-SS	–	–	Z9101M
7/8	.906	1.750	.156	Z9102M-SS	–	–	Z9102M
	.906	1.750	.250	–	Z9188	–	–
1	1.031	2.000	.187	Z9103M-SS	–	–	Z9103M
	1.031	2.000	.312	–	Z9189	–	–
1-1/8	1.156	2.250	.312	–	Z9190	–	–
1-1/4	1.281	2.250	.312	–	Z9191	–	–

Large OD (Fender) Washers – Inch



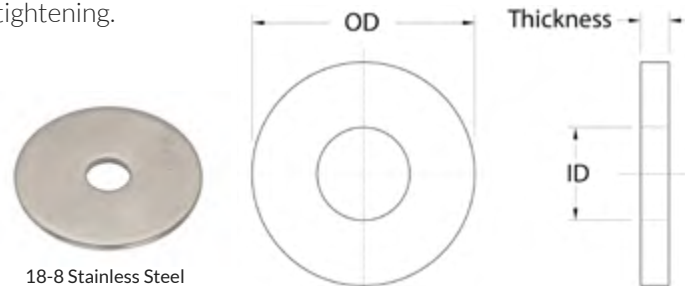
A Large OD washer is similar in shape to a standard washer, differs in that the outside diameter is traditionally much larger in proportion to the inside hole. These flat washers are commonly used to spread the load on thin sheet metal and so named after their use on automobile fenders. The large OD design allows the washer to be placed under the head of a bolt or nut, and helps distribute the load when tightening.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- Steel, Zinc-Plated Finish
- Low Carbon Steel, Black Oxide Finish

Also known as:

- Fender Washer



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
#4	.125	.312	.031	Z0538-188
	.140	.625	.024 - .040	Z0448-188
#6	.156	.375	.031	Z0539-188
	.156	.562	.040-.054	Z0449-188
#8	.171	.375	.031	Z0540-188
	.171	.750	.033 - .047	Z0450-188
	.187	.750	.043 - .057	Z0451-188
#10	.203	.438	.031	Z0541-188
	.203	.500	.033 - .047	Z0452-188
	.203	.688	.033 - .047	Z0453-188
	.203	.688	.033 - .047	Z0453-188-BX*
#10	.203	.750	.033 - .047	Z0455-188
	.203	1.000	.033 - .047	Z0454-188
	.219	1.250	.043 - .057	Z0456-188
#12	.250	.500	.043 - .057	Z0542-188
	.265	.500	.043 - .057	Z0457-188
1/4	.265	.562	.056 - .071	Z0458-188
	.265	.875	.056 - .071	Z0459-188
	.281	.625	.050	Z0543-188
1/4	.281	1.000	.040 - .060	Z0460-188
	.281	1.250	.040 - .060	Z0461-188
	.281	1.500	.053 - .073	Z0462-188
	.281	1.500	.125	Z9680SS
1/4	.281	2.000	.053 - .073	Z0463-188
	.328	.625	.056 - .071	Z0464-188
5/16	.344	.750	.050	Z0544-188
	.344	1.250	.040 - .060	Z0465-188
	.344	1.250	.040 - .060	Z0465-188-BOX*

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
5/16	.344	1.500	.053 - .073	Z0466-188
	.344	2.000	.053 - .073	Z0467-188
3/8	.344	2.000	.053 - .073	Z0467-188-BOX*
	.390	.875	.050	Z0545-188
	.406	1.250	.040 - .060	Z0468-188
3/8	.406	1.250	.040 - .060	Z0468-188-BOX*
	.406	1.500	.053 - .073	Z0469-188
	.406	1.500	.053 - .073	Z0469-188-BOX*
3/8	.406	1.625	.056 - .071	Z0470-188
	.406	2.000	.053 - .073	Z0471-188
	.406	2.000	.053 - .073	Z0471-188-BOX*
7/16	.500	1.125	.062	Z0546-188
	.531	1.500	.042 - .052	Z0472-188
1/2	.531	2.000	.042 - .052	Z0473-188
	.531	2.000	.125	Z9688SS
	.531	2.000	.250	Z9689SS
1/2	.562	1.250	.062	Z0547-188
9/16	.578	1.062	.062	Z0548-188
	.688	1.500	.078	Z0549-188
5/8	.688	2.500	.125	Z9690SS
	.688	2.500	.250	Z9691SS
3/4	.812	1.750	.109	Z0621-188
7/8	.938	2.000	.109	Z0622-188
1	1.062	2.000	.109	Z0623-188
1-1/8	1.187	2.500	.125	Z0624-188
1-1/4	1.312	2.750	.125	Z0625-188
1-1/2	1.562	3.250	.125	Z0626-188

*Black Oxide finish

Washers

For product information and technical drawings, please see page D-10

316 SS

Large OD (Fender) Washers – Inch



316 Stainless Steel

Bolt Size	ID	OD	Thickness	316 SS Part Number
#4	.125	.312	.031	Z0538-316
#6	.141	.625	.024 - .040	Z0448-316
	.156	.562	.040 - .054	Z0449-316
#8	.171	.375	.031	Z0540-316
	.171	.750	.033 - .047	Z0450-316
#10	.188	.750	.043 - .057	Z0451-316
	.203	.438	.031	Z0541-316
	.203	.500	.033 - .047	Z0452-316
	.203	.688	.033 - .047	Z0453-316
#10	.203	.750	.033 - .047	Z0455-316
	.203	1.000	.033 - .047	Z0454-316
#12	.219	1.250	.043 - .057	Z0456-316
	.250	.500	.043 - .057	Z0542-316
1/4	.266	.500	.043 - .057	Z0457-316
	.266	.562	.056 - .071	Z0458-316
	.266	.875	.056 - .071	Z0459-316
	.281	.625	.050	Z0543-316
1/4	.281	1.000	.040 - .060	Z0460-316
	.281	1.250	.040 - .060	Z0461-316
	.281	1.500	.053 - .073	Z0462-316
	.281	2.000	.053 - .073	Z0463-316
5/16	.328	.625	.056 - .071	Z0464-316
	.344	.750	.050	Z0544-316
	.344	1.250	.040 - .060	Z0465-316
	.344	1.500	.053 - .073	Z0466-316
5/16	.344	2.000	.053 - .073	Z0467-316
	.391	0.875	.050	Z0545-316
3/8	.406	1.250	.040 - .060	Z0468-316
	.406	1.500	.053 - .073	Z0469-316
	.406	1.625	.056 - .071	Z0470-316
3/8	.406	2.000	.053 - .073	Z0471-316
7/16	.500	1.125	.063	Z0546-316
	.531	1.500	.240 - .260	Z0830-316
	.531	1.500	.365 - .385	Z0831-316
	.531	2.000	.240 - .260	Z0833-316
	.531	2.000	.365 - .385	Z0834-316
1/2	.531	3.000	.240 - .260	Z0836-316
	.531	3.000	.365 - .385	Z0837-316
	.531	1.500	.042 - .052	Z0472-316
	.531	2.000	.042 - .052	Z0473-316
1/2	.563	1.250	.063	Z0547-316
9/16	.578	1.062	.063	Z0548-316
5/8	.688	1.500	.078	Z0549-316

Bolt Size	ID	OD	Thickness	316 SS Part Number
5/8	.688	1.500	.240 - .260	Z0838-316
	.688	1.500	.365 - .385	Z0839-316
	.688	2.000	.240 - .260	Z0840-316
	.688	2.000	.365 - .385	Z0841-316
5/8	.688	3.000	.240 - .260	Z0842-316
	.688	3.000	.365 - .385	Z0843-316
3/4	.813	1.500	.240 - .260	Z0845-316
	.813	1.500	.365 - .385	Z0846-316
	.813	1.750	.109	Z0621-316
	.813	1.750	.240 - .260	Z0848-316
3/4	.813	1.750	.365 - .385	Z0849-316
	.813	2.000	.240 - .260	Z0851-316
7/8	.813	2.000	.365 - .385	Z0852-316
	.938	2.000	.109	Z0622-316
1	1.062	2.250	.110 - .140	WAS1.062X2.25X.125T316
	1.062	2.500	.125	WAS1.062X2.5X.125T316
	1.062	2.850	.110 - .140	WAS1.062X2.85X.125-316
	1.063	2.000	.109	Z0623-316
1	1.063	2.500	.240 - .260	Z0854-316
	1.063	2.500	.365 - .385	Z0855-316
1-1/8	1.187	2.500	.125	Z0624-316
	1.313	2.750	.125	Z0625-316
1-1/4	1.313	3.000	.240 - .260	Z0857-316
	1.313	3.000	.365 - .385	Z0858-316
	1.313	4.000	.240 - .260	Z0859-316
1-1/4	1.313	4.000	.365 - .385	Z0860-316
	1.563	2.500	.136-.192	WAS1.375X2.5X.156T316
1-1/2	1.563	3.000	.136-.192	WAS1.375X3X.187T316
	1.563	3.250	.125	Z0626-316
	1.563	3.250	.240 - .260	Z0862-316
	1.563	3.250	.365 - .385	Z0863-316
1-1/2	1.563	3.500	.240 - .260	Z0864-316
	1.563	3.500	.365 - .385	Z0865-316
	1.563	4.000	.240 - .260	Z0866-316
	1.563	4.000	.365 - .385	Z0867-316
1-3/8	2.125	3.500	.153 - .213	WAS1.625X3.5X.187T316
	1.625	2.750	.100 - .180	WAS1.5X2.75X.125T316
1-3/4	2.625	4.000	.153 - .213	WAS1.875X4X.187T316
	2.125	3.000	.240 - .260	Z0869-316
2	2.125	3.000	.365 - .385	Z0870-316
	2.375	4.500	.210 - .280	WAS2.375X4.5X.25T316
2-1/2	2.625	4.500	.240 - .260	Z0871-316
	2.625	4.500	.365 - .385	Z0872-316
3	3.125	5.000	.228 - .310	WAS3.125X5X.250T316
	3.125	5.500	.240 - .260	Z0873-316
	3.125	5.500	.365 - .385	Z0874-316
3-1/2	3.625	6.500	.240 - .260	Z0875-316
	3.625	6.500	.365 - .385	Z0876-316
4	4.125	7.500	.240 - .260	Z0877-316
	4.125	7.500	.365 - .385	Z0878-316

Large OD (Fender) Washers – Inch



Steel, Zinc Plated

Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number
#6	.140	.625	.024 - .040	Z0448
	.156	.562	.042 - .052	Z0449
	.156	.750	.036 - .065	Z0480
	.156	.875	.036 - .065	Z0629
#8	.171	.750	.042 - .052	Z0450
	.187	.750	.042 - .052	Z0451
	.187	1.000	.036 - .065	Z0481
	.203	.750	.051 - .080	Z0630
#8	.203	1.000	.051 - .080	Z0631
	.203	1.250	.051 - .080	Z0632
#10	.203	.500	.042 - .052	Z0452
	.203	.688	.042 - .052	Z0453
	.203	.750	.042 - .052	Z0455
#10	.203	.750	.051 - .080	Z0627
	.203	1.000	.042 - .052	Z0454
	.219	.750	.063 - .083	Z0628
#10	.219	1.000	.125	Z9678
	.219	1.250	.042 - .052	Z0456
#10	.219	1.500	.036 - .065	Z0482
	.265	.500	.042 - .052	Z0457
1/4	.265	.562	.042 - .052	Z0458
	.265	.875	.042 - .052	Z0459
	.281	1.000	.042 - .052	Z0460
1/4	.281	1.250	.042 - .052	Z0461
	.281	1.500	.042 - .052	Z0462
	.281	1.500	.051 - .080	Z0633
1/4	.281	2.000	.042 - .052	Z0463
	.281	2.500	.051 - .080	Z0483
	.281	3.000	.051 - .080	Z0484
5/16	.328	.625	.042 - .052	Z0464
	.344	1.250	.042 - .052	Z0465
	.344	1.500	.042 - .052	Z0466
	.344	1.500	.051 - .080	Z0635
5/16	.344	1.625	.051 - .080	Z0634
	.344	2.000	.042 - .052	Z0467
	.344	2.000	.051 - .080	Z0636
5/16	.344	2.500	.051 - .080	Z0485
	.344	3.000	.051 - .080	Z0486

Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number
3/8	.406	1.250	.042 - .052	Z0468
	.406	1.500	.042 - .052	Z0469
	.406	1.500	.051 - .080	Z0637
	.406	1.625	.042 - .052	Z0470
3/8	.406	2.000	.042 - .052	Z0471
	.406	2.000	.051 - .080	Z0638
	.406	3.000	.051 - .080	Z0487
1/2	.531	1.500	.042 - .052	Z0472
	.531	1.500	.051 - .080	Z0639
	.531	2.000	.042 - .052	Z0473
1/2	.531	2.000	.051 - .080	Z0650
	.531	3.000	.051 - .080	Z0488



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Black Oxide Part Number
1/4	.281	.750	.130 - .150	Z9285
5/16	.344	.875	.130 - .150	Z9286
3/8	.406	1.000	.130 - .150	Z9287
1/2	.531	1.375	.146 - .166	Z9289
5/8	.656	1.750	.146 - .166	Z9290
3/4	.812	2.000	.240 - .260	Z9293
1	1.062	2.500	.240 - .260	Z9294



Extra Thick Fender Flat Washers — Inch

A series of extra thick and extra wide Fender Washers. Available in 1/8, 1/4, 3/8 and 1/2 inch thicknesses.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- Low Carbon Steel, Zinc Plated



Low Carbon Steel, Zinc Plated



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number	18-8 SS Part Number
#10	.219	1.000	.125	Z9678	Z9678SS
	.219	1.000	.250	Z9679	—
1/4	.281	1.500	.125	Z9680	—
	.281	1.500	.250	Z9681	—
5/16	.344	2.000	.125	Z9682	Z9682SS
	.344	2.000	.250	Z9683	Z9683SS
3/8	.406	2.000	.125	Z9684	Z9684SS
	.406	2.000	.250	Z9685	Z9685SS
1/2	.531	2.000	.125	Z9688	Z9688SS
	.531	2.000	.250	Z9689	Z9689SS
	.562	3.000	.250	Z9670	—
5/8	.688	2.500	.125	Z9690	Z9690SS
	.688	2.500	.250	Z9691	Z9691SS
	.688	3.000	.250	Z9671	—
3/4	.812	3.000	.125	Z9692	—
	.812	3.000	.250	Z9693	Z9693SS
	.812	3.000	.375	Z9698	—
	.813	2.000	.150	—	WAS812X2X.187T188
7/8	.938	3.000	.250	Z9673	—
	.938	3.250	.125	Z9694	—
	.938	3.250	.250	Z9695	Z9695SS
	.938	3.250	.375	Z9699	—
1	1.062	3.250	.250	Z9674	Z9674SS
	1.062	3.500	.125	Z9696	Z9696SS
	1.062	3.500	.250	Z9697	—
	1.062	3.500	.375	Z9677	—
1-1/8	1.250	2.250	.125	—	WAS1.25X2.25X.125T188
1-1/4	1.375	4.000	.500	Z9675	Z9675SS
1-5/8	1.750	3.750	.153 - .213	—	WAS1.75X3.75X187T303
1-3/4	1.812	3.875	.170 - .200	—	WAS1.812X3.875X.187T188



Dock Washers — Inch

An extra thick and extra wide washer. These washers are used for joining or spacing wood to wood and wood to metal parts.

Materials and finishes offered in:

- Low Carbon Steel, Zinc Plated
- Low Carbon Steel, Galvanized Finish



Low Carbon Steel, Zinc Plated



Low Carbon Steel, Galvanized

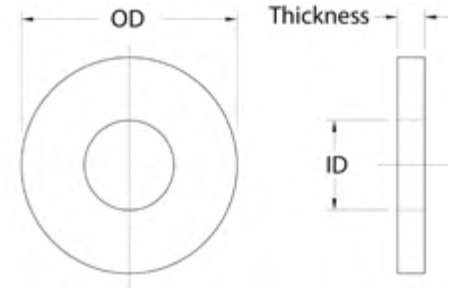
Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number	Steel, Galvanized Part Number
1/2	9/16	3	1/4	Z9670	Z9670G
5/8	11/16	3	1/4	Z9671	Z9671G
3/4	13/16	3	1/4	Z9693	Z9693G
7/8	15/16	3	1/4	Z9673	Z9673G
1	1-1/16	3-1/4	1/4	Z9674	Z9674G
1-1/4	1-3/8	4	1/2	Z9675	Z9675G

Steel, 18-8 SS,
Alloy



Extra Large OD Washers — Inch

This flat washer provides an extra-large bearing surface for use with 1-3/8" to 4" anchor bolts, screws and nuts. Used on machinery, presses, large diameter bolts, shafts, studs and rollers or wherever a large flat washer is needed. Larger OD washers distribute heavier loads over a wider surface. Higher loads require a studier washer to carry the excessive clamp strength and prevent embedment.



Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- Thru Hardened Alloy, Black Oxide Finish
- Steel, Hot Dip Galvanized
- Low Carbon Steel, Black Oxide Finish

Also known as:

- Jumbo Washer



18-8 Stainless Steel



Thru Hardened Alloy, Black Oxide

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	Thru Hardened Alloy, Black Oxide Part Number
1-3/8	1.500	2.750	.250	Z9250SS	Z9250
1-1/2	1.625	3.000	.125	Z9251SS	—
	1.625	3.000	.250	Z9252SS	Z9252
1-3/4	1.875	3.375	.250	Z9254SS	Z9254
2	2.125	3.750	.250	Z9256SS	Z9256
2-1/2	2.625	4.500	.312	Z9258SS	Z9258
3	3.125	5.500	.312	Z9260SS	Z9260
3-1/2	3.625	6.500	.312	Z9262SS	Z9262
4	4.125	7.500	.312	Z9264SS	Z9264



Steel, Hot Dip Galvanized



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Hot Dip Galvanized Part Number
1-1/2	1.750	4.000	.312	Z9265LCG
	1.750	4.000	.313	Z9253-HDG
1-3/4	2.000	4.000	.312	Z9266LCG
	2.000	4.000	.313	Z9255-HDG
2	2.250	4.000	.312	Z9267LCG
	2.250	4.000	.313	Z9257-HDG
2-1/2	2.750	4.500	.312	Z9268LCG
	2.750	4.500	.313	Z9259-HDG
3	3.250	5.500	.312	Z9269LCG
	3.250	5.500	.313	Z9261-HDG

Bolt Size	ID	OD	Thickness	Steel, Black Oxide Part Number
1-3/8	1.500	2.750	.250	Z9250LC
1-1/2	1.625	3.000	.250	Z9252LC
1-3/4	1.875	3.375	.250	Z9254LC
2	2.125	3.750	.250	Z9256LC



Military Specification Washers — Inch

Mil Spec washers are made in accordance with meticulous material and production criteria, which ensure optimal performance. This means they're produced with the utmost uniformity and reliability. An appropriate choice for some aerospace, automotive and industrial applications. Certification is available if requested at the time of order placement. Passivation provides added protection against oxidation and corrosion.

All Military Spec Washers are passivated to certain specs :

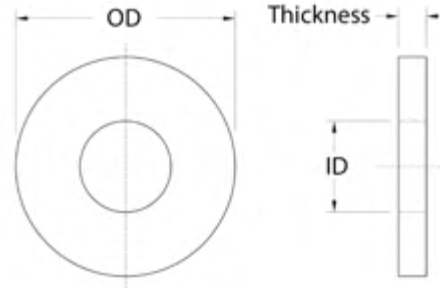
AN960 is Passivate QQ-P-35

NAS1149 is Passivate AMS 2700 Method 1, Type 6, Class 1

MS15795 is Passivate ASTM A380

Materials and finishes offered in:

- 18-8 Stainless Steel, Passivated



AN960 MIL SPEC

Bolt Size	ID	OD	Thickness	Pack Amount	18-8 SS Part Number
#2	.099	.250	.006 - .026	100	AN960-C2L
	.099	.250	.022 - .042	100	AN960-C2
#3	.105	.250	.006 - .026	100	AN960-C3L
	.105	.250	.022 - .042	100	AN960-C3
#4	.125	.312	.006 - .026	100	AN960-C4L
	.125	.312	.022 - .042	100	AN960-C4
#6	.149	.375	.006 - .026	100	AN960-C6L
	.149	.375	.022 - .042	100	AN960-C6
#8	.174	.375	.006 - .026	100	AN960-C8L
	.174	.375	.022 - .042	100	AN960-C8
#10	.203	.438	.022 - .042	100	AN960-C10L
	.203	.438	.053 - .073	100	AN960-C10
#11	.234	.625	.055 - .075	Bulk	AN960-C11
1/4	.265	.500	.022 - .042	50	AN960-C416L
	.265	.500	.053 - .073	50	AN960-C416
5/16	.328	.562	.022 - .042	50	AN960-C516L
	.328	.562	.053 - .073	50	AN960-C516
3/8	.390	.625	.022 - .042	50	AN960-C616L
	.390	.625	.053 - .073	50	AN960-C616
7/16	.453	.750	.022 - .042	25	AN960-C716L
	.453	.750	.053 - .073	25	AN960-C716
1/2	.515	.875	.022 - .042	25	AN960-C816L
	.515	.875	.053 - .073	25	AN960-C816
9/16	.578	1.062	.053 - .073	25	AN960-C916
5/8	.640	1.187	.053 - .073	25	AN960-C1016
3/4	.765	1.312	.080 - .100	25	AN960-C1216
7/8	.890	1.500	.080 - .100	25	AN960-C1416
1	1.015	1.750	.080 - .100	25	AN960-C1616



NAS620 MIL SPEC

Bolt Size	ID	OD	Thickness	Pack Amount	18-8 SS Part Number
#0	.063	.099	.014 - .018	100	NAS620-C0
#2	.089	.149	.014 - .018	100	NAS620-C2
#3	.102	.180	.014 - .018	100	NAS620-C3L
	.102	.180	.028 - .036	100	NAS620-C3
#4	.115	.209	.014 - .018	100	NAS620-C4L
	.115	.209	.028 - .036	100	NAS620-C4
#5	.128	.238	.014 - .018	100	NAS620-C5L
	.128	.238	.028 - .036	100	NAS620-C5
#6	.143	.267	.014 - .018	100	NAS620-C6L
	.143	.267	.028 - .036	100	NAS620-C6
#8	.169	.304	.014 - .018	100	NAS620-C8L
	.169	.304	.028 - .036	100	NAS620-C8
#10	.195	.354	.028 - .036	50	NAS620-C10L
	.195	.354	.059 - .067	50	NAS620-C10
1/4	.255	.468	.028 - .036	50	NAS620-C416L
	.255	.468	.059 - .067	50	NAS620-C416

18-8 SS

Military Specification Washers – Inch

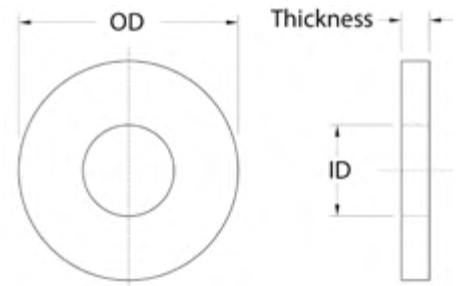


All Military Spec Washers are passivated to certain specs :

AN960 is Passivate QQ-P-35

NAS1149 is Passivate AMS 2700 Method 1, Type 6, Class 1

MS15795 is Passivate ASTM A380



NAS1149 MIL SPEC

Bolt Size	ID	OD	Thickness	Pack Amount	18-8 SS Part Number
#2	.099	.250	.028 - .036	100	NAS1149-CN232R
#3	.105	.250	.028 - .036	100	NAS1149-CN332R
#4	.125	.312	.028 - .036	100	NAS1149-CN432R
#5	.140	.438	.037 - .047	100	NAS1149-CN542R
#6	.149	.375	.028 - .036	100	NAS1149-CN632R
#8	.174	.375	.028 - .036	100	NAS1149-CN832R
#10	.203	.438	.028 - .036	100	NAS1149-C0332R
	.203	.438	.057 - .069	100	NAS1149-C0363R
1/4	.265	.500	.028 - .036	50	NAS1149-C0432R
	.265	.500	.057 - .069	50	NAS1149-C0463R
5/16	.328	.562	.028 - .036	50	NAS1149-C0532R
	.328	.562	.057 - .069	50	NAS1149-C0563R
3/8	.390	.625	.028 - .036	50	NAS1149-C0632R
	.390	.625	.057 - .069	50	NAS1149-C0663R
7/16	.453	.750	.028 - .036	25	NAS1149-C0732R
	.453	.750	.057 - .069	25	NAS1149-C0763R
1/2	.515	.875	.028 - .036	25	NAS1149-C0832R
	.515	.875	.057 - .069	25	NAS1149-C0863R
9/16	.578	1.062	.028 - .036	10	NAS1149-C0963R
5/8	.640	1.187	.057 - .069	5	NAS1149-C1063R
3/4	.765	1.312	.082 - .098	5	NAS1149-C1290R
7/8	.890	1.500	.082 - .098	5	NAS1149-C1490R
1	1.015	1.750	.082 - .098	1	NAS1149-C1690R



MS15795 MIL SPEC

Bolt Size	ID	OD	Thickness	Pack Amount	18-8 SS Part Number
#1	.078	.187	.016 - .025	100	MS15795-801
#2	.094	.250	.016 - .025	100	MS15795-802
#4	.125	.250	.017 - .028	100	MS15795-803
	.125	.312	.032 - .040	100	MS15795-804
#6	.156	.312	.027 - .048	100	MS15795-805
	.156	.375	.036 - .065	100	MS15795-806
#8	.187	.375	.036 - .065	100	MS15795-807
	.187	.438	.036 - .065	100	MS15795-841
#10	.219	.438	.036 - .065	100	MS15795-808
	.219	.500	.036 - .065	100	MS15795-842
#12	.250	.562	.051 - .080	50	MS15795-809
1/4	.281	.625	.051 - .080	50	MS15795-810
	.312	.734	.051 - .080	50	MS15795-811
5/16	.344	.688	.051 - .080	50	MS15795-812
	.375	.875	.064 - .104	25	MS15795-813
3/8	.406	.812	.051 - .080	25	MS15795-814
	.438	1.000	.064 - .104	25	MS15795-815
7/16	.469	.922	.051 - .080	25	MS15795-816
	.500	1.250	.064 - .104	5	MS15795-817
1/2	.531	1.062	.074 - .121	5	MS15795-818
	.562	1.375	.086 - .132	5	MS15795-819
5/8	.656	1.312	.074 - .121	5	MS15795-820
	.688	1.750	.108 - .160	5	MS15795-821
3/4	.812	1.469	.108 - .160	5	MS15795-822
	.812	2.000	.122 - .177	1	MS15795-823
7/8	.938	1.750	.108 - .160	1	MS15795-824
	.938	2.250	.136 - .192	1	MS15795-825
1	1.062	2.000	.108 - .160	1	MS15795-826
	1.062	2.500	.136 - .192	1	MS15795-827

Standard SAE Washers — Inch



Flat washers distribute pressure of a threaded fastener to prevent damage during tightening. These SAE style washers meet ASME B18.21.1. SAE washers generally have a smaller ID and OD than other standard flat washers.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- Titanium Grade 2, Plain Finish
- 316 H5 Stainless Steel, Plain Finish



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
#4	.125	.312	.024 - .040	WAS404#4
#6	.156	.375	.036 - .065	WAS404#6
#8	.187	.438	.036 - .065	WAS404#8
#10	.219	.500	.036 - .065	WAS404#10
#12	.250	.562	.051 - .080	WAS404#12
1/4	.281	.625	.051 - .080	WAS40414
5/16	.344	.688	.051 - .080	WAS40451
3/8	.406	.812	.051 - .080	WAS40438
7/16	.469	.922	.051 - .080	WAS40471
1/2	.531	1.062	.074 - .121	WAS40412
5/8	.656	1.312	.074 - .121	WAS40458
3/4	.812	1.500	.108 - .160	WAS40434
1	1.062	2.000	.108 - .160	WAS40401



316 Stainless Steel

Bolt Size	ID	OD	Thickness	316 SS Part Number
#4	.125	.312	.024 - .040	WAS405#4
#6	.156	.375	.036 - .065	WAS405#6
#8	.187	.438	.036 - .065	WAS405#8
#10	.219	.500	.036 - .065	WAS405#10
#12	.250	.562	.051 - .080	WAS405#12
1/4	.281	.625	.051 - .080	WAS40514
5/16	.344	.688	.051 - .080	WAS40551
3/8	.406	.812	.051 - .080	WAS40538
7/16	.469	.922	.051 - .080	WAS40571
1/2	.531	1.062	.074 - .121	WAS40512
5/8	.656	1.312	.074 - .121	WAS40558
3/4	.812	1.500	.108 - .160	WAS40534
1	1.062	2.000	.108 - .160	WAS40501



316 H5 Stainless Steel

Bolt Size	ID	OD	Thickness	316 H5 SS Part Number
#10	.219	.500	.036 - .065	WAS407#10
1/4	.281	.625	.051 - .080	WAS40714
5/16	.344	.688	.051 - .080	WAS40751
3/8	.406	.812	.051 - .080	WAS40738
1/2	.531	1.062	.057 - .067	WAS40712



Titanium Grade 2

Bolt Size	ID	OD	Thickness	Ti2 Part Number
#2	.094	.250	.012 - .018	WAS406#2
#3	.109	.250	.025 - .040	WAS406#3
#4	.125	.250	.025 - .040	WAS406#4
#6	.156	.375	.036 - .065	WAS406#6
#8	.188	.438	.036 - .065	WAS406#8
#10	.219	.500	.036 - .065	WAS406#10
1/4	.281	.625	.051 - .080	WAS40614
5/16	.344	.688	.051 - .080	WAS40651
3/8	.406	.812	.051 - .080	WAS40638
1/2	.531	1.062	.057 - .067	WAS40612

316 H5, Ti2
18-8 SS, 316 SS

Standard USS Washers – Inch



USS washers generally have a larger ID and OD than SAE washers.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish



18-8 Stainless Steel



316 Stainless Steel

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number
#10	.250	.562	.036 - .065	WAS504#10	WAS505#10
1/4	.312	.750	.051 - .080	WAS50414	WAS50514
5/16	.375	.875	.064 - .104	WAS50451	WAS50551
3/8	.438	1.000	.064 - .104	WAS50438	WAS50538
7/16	.500	1.250	.064 - .104	WAS50471	WAS50571
1/2	.562	1.375	.074 - .121	WAS50412	WAS50512
9/16	.625	1.500	.086 - .132	WAS50491	WAS50591
5/8	.688	1.750	.108 - .160	WAS50458	WAS50558
3/4	.812	2.000	.122 - .177	WAS50434	WAS50534
7/8	.938	2.250	.136 - .192	WAS50478	WAS50578
1	1.062	2.500	.136 - .192	WAS50401	WAS50501

Standard DIN Washers – Metric



Flat washers are an essential part of any fastener assembly. As they serve to incorporate spacing and distribute load when placed between a nut and bolt, they will help prevent wear and distortion of installation surfaces over time. Use them to make maintenance easier by allowing for smoother loosening and tightening of components. These USA made metric washers meet DIN 125.

Materials and finishes offered in:

- 316 H5 Stainless Steel, Plain Finish
- Titanium Grade 2, Plain Finish



316 H5 Stainless Steel



Titanium Grade 2

Bolt Size	ID	OD	Thickness	316 H5 SS Part Number
M5	5.30	10.00	.90 - 1.10	WAS407M5
M6	6.40	12.00	1.40 - 1.80	WAS407M6
M8	8.40	16.00	1.40 - 1.80	WAS407M8
M10	10.50	20.00	1.80 - 2.20	WAS407M10
M12	13.00	24.00	2.30 - 2.70	WAS407M12

Bolt Size	ID	OD	Thickness	Ti2 Part Number
M2	2.20	5.00	.20 - .40	WAS406M2
M2.5	2.70	6.00	.40 - .60	WAS406M2.5
M3	3.20	7.00	.40 - .60	WAS406M3
M3.5	3.70	8.00	.40 - .60	WAS406M3.5
M4	4.30	9.00	.70 - .90	WAS406M4
M5	5.30	10.00	.90 - 1.10	WAS406M5
M6	6.40	12.00	1.40 - 1.80	WAS406M6
M8	8.40	16.00	1.40 - 1.80	WAS406M8
M10	10.50	20.00	1.80 - 2.20	WAS406M10
M12	13.00	24.00	2.30 - 2.70	WAS406M12

Washers

18-8 SS, 316 SS, Steel,
Alum, Brass, Copper



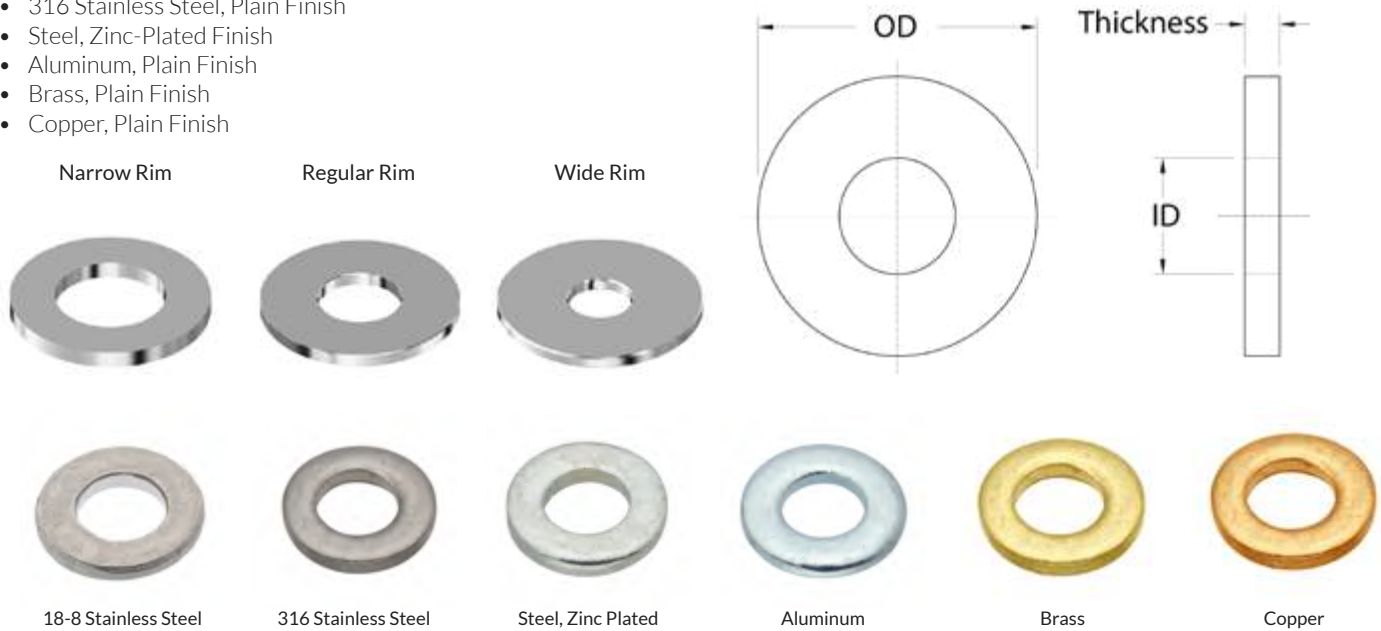
ASME Type B Washers — Inch

Type B is a series of flat washers with tighter tolerances where outside diameters are categorized as Narrow, Regular or Wide for specific bolt sizes.

All washers are stamped and made in the USA. Type B washers are manufactured to the ASME B18.21.1 specification.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- Steel, Zinc-Plated Finish
- Aluminum, Plain Finish
- Brass, Plain Finish
- Copper, Plain Finish



Narrow Rim

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Zinc Plated Part Number	Aluminum Part Number	Brass Part Number	Copper Part Number
#0	.068	.125	.022 - .028	WASB#0N8	WASB#0N316	WASB#0NZ	WASB#0NAL	WASB#0NBR	WASB#0NCU
#1	.084	.156	.022 - .028	WASB#1N8	WASB#1N316	WASB#1NZ	WASB#1NAL	WASB#1NBR	WASB#1NCU
#2	.094	.187	.022 - .028	WASB#2N8	WASB#2N316	WASB#2NZ	WASB#2NAL	WASB#2NBR	WASB#2NCU
#4	.125	.250	.028 - .036	WASB#4N8	WASB#4N316	WASB#4NZ	WASB#4NAL	WASB#4NBR	WASB#4NCU
#6	.156	.312	.028 - .036	WASB#6N8	WASB#6N316	WASB#6NZ	WASB#6NAL	WASB#6NBR	WASB#6NCU
#8	.187	.375	.036 - .045	WASB#8N8	WASB#8N316	WASB#8NZ	WASB#8NAL	WASB#8NBR	WASB#8NCU
#10	.203	.406	.036 - .045	WASB#10N8	WASB#10N316	WASB#10NZ	WASB#10NAL	WASB#10NBR	WASB#10NCU
1/4	.281	.500	.056 - .071	WASB14N8	WASB14N316	WASB14NZ	WASB14NAL	WASB14NBR	WASB14NCU
5/16	.344	.625	.056 - .071	WASB51N8	WASB51N316	WASB51NZ	WASB51NAL	WASB51NBR	WASB51NCU
3/8	.406	.734	.056 - .071	WASB38N8	WASB38N316	WASB38NZ	WASB38NAL	WASB38NBR	WASB38NCU
7/16	.469	.875	.056 - .071	WASB71N8	WASB71N316	WASB71NZ	WASB71NAL	WASB71NBR	WASB71NCU
1/2	.531	1.000	.056 - .071	WASB12N8	WASB12N316	WASB12NZ	WASB12NAL	WASB12NBR	WASB12NCU
9/16	.594	1.125	.056 - .071	WASB91N8	WASB91N316	WASB91NZ	WASB91NAL	WASB91NBR	WASB91NCU
5/8	.656	1.250	.090 - .112	WASB58N8	WASB58N316	WASB58NZ	WASB58NAL	WASB58NBR	WASB58NCU
3/4	.812	1.375	.090 - .112	WASB34N8	WASB34N316	WASB34NZ	WASB34NAL	WASB34NBR	WASB34NCU
7/8	.938	1.469	.090 - .112	WASB78N8	WASB78N316	WASB78NZ	WASB78NAL	WASB78NBR	WASB78NCU
1	1.062	1.750	.090 - .112	WASB80N8	WASB80N316	WASB80NZ	WASB80NAL	WASB80NBR	WASB80NCU
1-1/8	1.187	2.000	.090 - .112	WASB81N8	WASB81N316	WASB81NZ	WASB81NAL	WASB81NBR	WASB81NCU
1-1/4	1.312	2.250	.146 - .174	WASB82N8	WASB82N316	WASB82NZ	WASB82NAL	WASB82NBR	WASB82NCU

Chart continued on next page

18-8 SS, 316 SS, Steel,
Alum, Brass, Copper

For product information and technical drawings, please see page D-19

ANSI TYPE B Washers – Inch



Regular Rim

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Zinc Plated Part Number	Aluminum Part Number	Brass Part Number	Copper Part Number
#0	.068	.187	.022 - .028	WASB#0R8	WASB#0R316	WASB#0RZ	WASB#0RAL	WASB#0RBR	WASB#0RCU
#1	.084	.219	.022 - .028	WASB#1R8	WASB#1R316	WASB#1RZ	WASB#1RAL	WASB#1RBR	WASB#1RCU
#2	.094	.250	.028 - .036	WASB#2R8	WASB#2R316	WASB#2RZ	WASB#2RAL	WASB#2RBR	WASB#2RCU
#4	.125	.375	.036 - .045	WASB#4R8	WASB#4R316	WASB#4RZ	WASB#4RAL	WASB#4RBR	WASB#4RCU
#6	.156	.438	.036 - .045	WASB#6R8	WASB#6R316	WASB#6RZ	WASB#6RAL	WASB#6RBR	WASB#6RCU
#8	.187	.500	.036 - .045	WASB#8R8	WASB#8R316	WASB#8RZ	WASB#8RAL	WASB#8RBR	WASB#8RCU
#10	.203	.562	.036 - .045	WASB#10R8	WASB#10R316	WASB#10RZ	WASB#10RAL	WASB#10RBR	WASB#10RCU
1/4	.281	.734	.056 - .071	WASB14R8	WASB14R316	WASB14RZ	WASB14RAL	WASB14RBR	WASB14RCU
5/16	.344	.875	.056 - .071	WASB51R8	WASB51R316	WASB51RZ	WASB51RAL	WASB51RBR	WASB51RCU
3/8	.406	1.000	.056 - .071	WASB38R8	WASB38R316	WASB38RZ	WASB38RAL	WASB38RBR	WASB38RCU
7/16	.469	1.125	.056 - .071	WASB71R8	WASB71R316	WASB71RZ	WASB71RAL	WASB71RBR	WASB71RCU
1/2	.531	1.250	.090 - .112	WASB12R8	WASB12R316	WASB12RZ	WASB12RAL	WASB12RBR	WASB12RCU
9/16	.594	1.469	.090 - .112	WASB91R8	WASB91R316	WASB91RZ	WASB91RAL	WASB91RBR	WASB91RCU
5/8	.656	1.750	.090 - .112	WASB58R8	WASB58R316	WASB58RZ	WASB58RAL	WASB58RBR	WASB58RCU
3/4	.812	2.000	.090 - .112	WASB34R8	WASB34R316	WASB34RZ	WASB34RAL	WASB34RBR	WASB34RCU
7/8	.938	2.250	.146 - .174	WASB78R8	WASB78R316	WASB78RZ	WASB78RAL	WASB78RBR	WASB78RCU
1	1.062	2.500	.146 - .174	WASB80R8	WASB80R316	WASB80RZ	WASB80RAL	WASB80RBR	WASB80RCU
1-1/8	1.187	2.750	.146 - .174	WASB81R8	WASB81R316	WASB81RZ	WASB81RAL	WASB81RBR	WASB81RCU
1-1/4	1.312	3.000	.146 - .174	WASB82R8	WASB82R316	WASB82RZ	WASB82RAL	WASB82RBR	WASB82RCU



Wide Rim

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Zinc Plated Part Number	Aluminum Part Number	Brass Part Number	Copper Part Number
#0	.068	.250	.022 - .028	WASB#0W8	WASB#0W316	WASB#0WZ	WASB#0WAL	WASB#0WBR	WASB#0WCU
#1	.084	.281	.028 - .036	WASB#1W8	WASB#1W316	WASB#1WZ	WASB#1WAL	WASB#1WBR	WASB#1WCU
#2	.094	.344	.028 - .036	WASB#2W8	WASB#2W316	WASB#2WZ	WASB#2WAL	WASB#2WBR	WASB#2WCU
#4	.125	.438	.036 - .045	WASB#4W8	WASB#4W316	WASB#4WZ	WASB#4WAL	WASB#4WBR	WASB#4WCU
#6	.156	.562	.036 - .045	WASB#6W8	WASB#6W316	WASB#6WZ	WASB#6WAL	WASB#6WBR	WASB#6WCU
#8	.187	.625	.056 - .071	WASB#8W8	WASB#8W316	WASB#8WZ	WASB#8WAL	WASB#8WBR	WASB#8WCU
#10	.203	.734	.056 - .071	WASB#10W8	WASB#10W316	WASB#10WZ	WASB#10WAL	WASB#10WBR	WASB#10WCU
1/4	.281	1.000	.056 - .071	WASB14W8	WASB14W316	WASB14WZ	WASB14WAL	WASB14WBR	WASB14WCU
5/16	.344	1.125	.056 - .071	WASB51W8	WASB51W316	WASB51WZ	WASB51WAL	WASB51WBR	WASB51WCU
3/8	.406	1.250	.090 - .112	WASB38W8	WASB38W316	WASB38WZ	WASB38WAL	WASB38WBR	WASB38WCU
7/16	.469	1.469	.090 - .112	WASB71W8	WASB71W316	WASB71WZ	WASB71WAL	WASB71WBR	WASB71WCU
1/2	.531	1.750	.090 - .112	WASB12W8	WASB12W316	WASB12WZ	WASB12WAL	WASB12WBR	WASB12WCU
9/16	.594	2.000	.090 - .112	WASB91W8	WASB91W316	WASB91WZ	WASB91WAL	WASB91WBR	WASB91WCU
5/8	.656	2.250	.146 - .174	WASB58W8	WASB58W316	WASB58WZ	WASB58WAL	WASB58WBR	WASB58WCU
3/4	.812	2.500	.146 - .174	WASB34W8	WASB34W316	WASB34WZ	WASB34WAL	WASB34WBR	WASB34WCU
7/8	.938	2.750	.146 - .174	WASB78W8	WASB78W316	WASB78WZ	WASB78WAL	WASB78WBR	WASB78WCU
1	1.062	3.000	.146 - .174	WASB80W8	WASB80W316	WASB80WZ	WASB80WAL	WASB80WBR	WASB80WCU
1-1/8	1.187	3.250	.146 - .174	WASB81W8	WASB81W316	WASB81WZ	WASB81WAL	WASB81WBR	WASB81WCU
1-1/4	1.312	3.500	.234 - .266	WASB82W8	WASB82W316	WASB82WZ	WASB82WAL	WASB82WBR	WASB82WCU

Non-Metal Washers – Inch

AMPG stocks flat washers that are also available in non-metal materials. Fiberglass flat washers are insulators of electrical and thermal energy. Also chemically resistant and having a high strength to weight ratio. Color of these washers may be either light tan and/or green. Nylatron flat washers are non abrasive and have low surface friction and made from Nylatron® GS PA66. MDS cast nylon material has superior bearing and wear properties. Phenolic is a tough and lightweight material that resists distortion caused by pressure. Used in electronics, and where moisture resistance is required. Teflon washers are ideal in for low-temperature applications and are often used as insulators in electronic equipment.

Materials and finishes offered in:

- Fiberglass, Green/Tan Finish
- Nylatron, Gray Finish
- Phenolic, Red/Brown Finish
- Teflon, White Finish



Fiberglass

Bolt Size	ID	OD	Thickness	Fiberglass Part Number
#2	.094	.250	.016	Z8300
	.105	.255	.031	Z8302
#3	.105	.255	.062	Z8304
	.105	.255	.125	Z8306
#4	.122	.218	.016	Z8308
	.122	.310	.031	Z8310
#6	.125	.317	.062	Z8312
	.143	.500	.062	Z8314
#8	.174	.381	.031	Z8316
	.174	.562	.062	Z8318
#10	.203	.438	.062	Z8320
1/4	.265	.500	.031	Z8322
5/16	.316	.562	.062	Z8324
3/8	.378	.750	.062	Z8326
1/2	.515	.875	.062	Z8328
5/8	.640	1.193	.093	Z8330
3/4	.765	1.312	.093	Z8332
1	1.015	1.750	.093	Z8334



Teflon

Bolt Size	ID	OD	Thickness	Teflon Part Number
3/8	.390	.625	.032	WAS390625032TEFLON
	.406	.687	.032	WAS40626875032TEFLON
7/16	.475	.625	.032	WAS475625032TEFLON
1/2	.550	.850	.031	WAS550850031TEFLON



Nylatron

Bolt Size	ID	OD	Thickness	Nylatron Part Number
#3	.105	.247	.031	Z8380
#4	.118	.219	.031	Z8382
#6	.143	.312	.031	Z8384
#8	.174	.375	.031	Z8386
#10	.203	.460	.031	Z8388
1/4	.265	.500	.031	Z8390
5/16	.322	.562	.031	Z8392
3/8	.383	.500	.031	Z8394
1/2	.531	.875	.031	Z8396



Phenolic

Bolt Size	ID	OD	Thickness	Phenolic Part Number
#4	.125	.312	.045	Z8400
	.125	.312	.062	Z8402
#6	.156	.375	.045	Z8404
	.156	.500	.062	Z8406
#8	1.178	.500	.062	Z8408
#10	.203	.632	.062	Z8410
1/4	.281	.625	.062	Z8412
5/16	.328	.562	.062	Z8414
3/8	.383	.625	.062	Z8416

18-8 SS,
Alloy

Easy On Slotted Washers — Inch



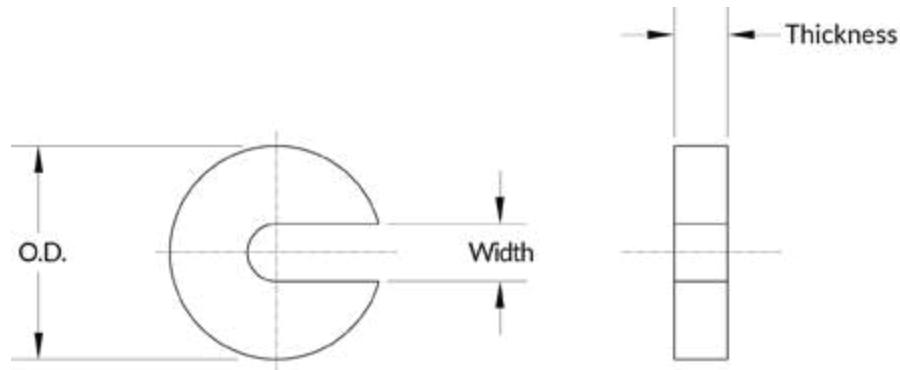
The slot allows addition or removal of the washer without taking the assembly completely apart.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- Low Carbon Steel, Black Oxide Finish

Also known as:

- C Washers



Stainless Steel



Low Carbon Steel, Black Oxide

Bolt Size	Width	OD	Thickness	18-8 SS Part Number	Steel, Black Oxide Part Number
1/4	.281	.750	.250	Z9420SS	Z9420
	.281	1.000	.250	Z9421SS	Z9421
	.281	1.750	.250	—	Z9438
5/16	.344	1.250	.312	Z9422SS	Z9422
	.406	1.250	.375	Z9424SS	Z9424
3/8	.406	1.500	.375	Z9425SS	Z9425
	.406	1.750	.375	Z9426SS	Z9426
	.406	2.000	.375	—	Z9439
3/8	.406	2.500	.375	—	Z9440
1/2	.531	1.875	.375	Z9428SS	Z9428
	.531	2.250	.375	Z9429SS	Z9429
	.531	2.000	.375	—	Z9441
5/8	.656	2.125	.375	Z9431SS	Z9431
3/4	.781	2.500	.438	Z9433SS	Z9433
1	1.031	2.500	.438	Z9434SS	Z9434
	1.031	3.000	.562	—	Z9442
1-1/4	1.281	3.000	.625	—	Z9443
	1.312	3.000	.438	Z9437SS	Z9437

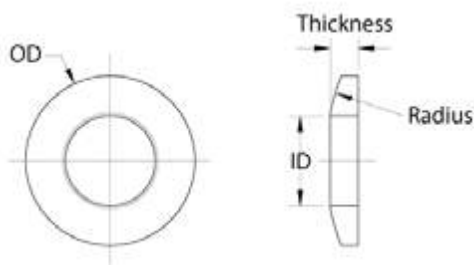


Alignment (Spherical) Washers

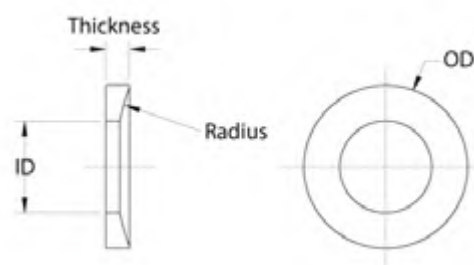
Also known as equalizing, leveling, self-aligning, and spherical washers. A male & female pair are a great solution for fastening a non-parallel surface and clamping uneven parts together. The male washer has a convex bottom surface, while the female has a matching concave top. The male washer has a slightly narrower ID than the female washer while both have the same radius. This allows a bolt to pass through both washers to compensate for misaligned surfaces. A pair of spherical washers have a 3-4° angle of correction. Ideal for die and fixturing applications.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- Low Carbon Steel, Black Oxide Finish



Male Washer



Female Washer



18-8 SS Male Washer



18-8 SS Female Washer



18-8 SS Set

Bolt Size	Radius	Male				Female				Set	
		ID	OD	Thickness	18-8 SS Male Part Number	ID	OD	Thickness	18-8 SS Female Part Number	Thickness	18-8 SS Spherical Set Part Number
3/16, 1/4	.750	.281	.625	.120	Z9450M-SS	.313	.625	.120	Z9450F-SS	.188	Z9450SETSS
5/16, 3/8	1.250	.406	.875	.130	Z9454M-SS	.438	.875	.156	Z9454F-SS	.250	Z9454SETSS
1/2	1.500	.531	1.125	.188	Z9458M-SS	.563	1.125	.188	Z9458F-SS	.313	Z9458SETSS
5/8	1.750	.656	1.375	.188	Z9462M-SS	.688	1.375	.219	Z9462F-SS	.313	Z9462SETSS
3/4	2.250	.781	1.625	.219	Z9466M-SS	.813	1.625	.265	Z9466F-SS	.375	Z9466SETSS
7/8	2.500	.938	1.750	.240	Z9470M-SS	1.000	1.750	.240	Z9470F-SS	.375	Z9470SETSS
1	2.750	1.062	2.000	.330	Z9474M-SS	1.125	2.000	.290	Z9474F-SS	.500	Z9474SETSS
1-1/8	3.000	1.187	2.250	.281	Z9478M-SS	1.250	2.250	.350	Z9478F-SS	.500	Z9478SETSS
1-1/4	3.000	1.312	2.500	.312	Z9484M-SS	1.375	2.500	.350	Z9484F-SS	.500	Z9484SETSS
1-1/2	3.000	1.562	2.875	.350	Z9488M-SS	1.625	2.875	.390	Z9488F-SS	.500	Z9488SETSS

Chart continued on next page

Alignment (Spherical) Washers – Inch



316 SS Male Washer



316 SS Female Washer



316 SS Set

Bolt Size	Radius	Male				Female				Set	
		ID	OD	Thickness	316 SS Male Part Number	ID	OD	Thickness	316 SS Female Part Number	Thickness	316 SS Spherical Set Part Number
3/16, 1/4	.750	.281	.625	.120	Z9450M-316	.313	.625	.120	Z9450F-316	.188	Z9450SET316
5/16, 3/8	1.250	.406	.875	.130	Z9454M-316	.438	.875	.156	Z9454F-316	.250	Z9454SET316
1/2	1.500	.531	1.125	.188	Z9458M-316	.563	1.125	.188	Z9458F-316	.313	Z9458SET316
5/8	1.750	.656	1.375	.188	Z9462M-316	.688	1.375	.219	Z9462F-316	.313	Z9462SET316
3/4	2.250	.781	1.625	.219	Z9466M-316	.813	1.625	.265	Z9466F-316	.375	Z9466SET316
7/8	2.500	.938	1.750	.240	Z9470M-316	1.000	1.750	.240	Z9470F-316	.375	Z9470SET316
1	2.750	1.062	2.000	.330	Z9474M-316	1.125	2.000	.290	Z9474F-316	.500	Z9474SET316
1-1/8	3.000	1.187	2.250	.281	Z9478M-316	1.250	2.250	.350	Z9478F-316	.500	Z9478SET316
1-1/4	3.000	1.312	2.500	.312	Z9484M-316	1.375	2.500	.350	Z9484F-316	.500	Z9484SET316
1-1/2	3.000	1.562	2.875	.350	Z9488M-316	1.625	2.875	.390	Z9488F-316	.500	Z9488SET316



Steel, Black Oxide Male Washer



Steel, Black Oxide Female Washer



Steel, Black Oxide Set

Bolt Size	Radius	Male				Female				Set	
		ID	OD	Thickness	Steel, Black Oxide Male Part Number	ID	OD	Thickness	Steel, Black Oxide Female Part Number	Thickness	Steel, Black Oxide Spherical Set Part Number
1/4	.750	.281	.625	.120	Z9450M	.312	.625	.120	Z9450F	.187	Z9450SET
3/8	1.250	.406	.875	.130	Z9454M	.438	.875	.156	Z9454F	.250	Z9454SET
1/2	1.500	.531	1.125	.187	Z9458M	.562	1.125	.187	Z9458F	.312	Z9458SET
5/8	1.750	.656	1.375	.187	Z9462M	.688	1.375	.219	Z9462F	.312	Z9462SET
3/4	2.250	.781	1.625	.219	Z9466M	.812	1.625	.265	Z9466F	.375	Z9466SET
7/8	2.500	.938	1.750	.240	Z9470M	1.000	1.750	.240	Z9470F	.375	Z9470SET
1	2.750	1.062	2.000	.330	Z9474M	1.125	2.000	.290	Z9474F	.500	Z9474SET
1-1/8	3.000	1.187	2.250	.281	Z9478M	1.250	2.250	.350	Z9478F	.500	Z9478SET
1-1/4	3.000	1.312	2.500	.312	Z9484M	1.375	2.500	.350	Z9484F	.500	Z9484SET
1-1/2	3.000	1.562	2.875	.350	Z9488M	1.625	2.875	.390	Z9488F	.500	Z9488SET

Alignment (Spherical) Washers – Metric



18-8 SS Male Washer



18-8 SS Female Washer



18-8 SS Set

Bolt Size	Radius	Male				Female				Set	
		ID	OD	Thickness	18-8 SS Male Part Number	ID	OD	Thickness	18-8 SS Female Part Number	Thickness	18-8 SS Spherical Set Part Number
M6	M9	6.40	12.00	2.30	Z9521M	7.10	12.00	2.80	Z9521F	4.20	Z9521SET
M8	M12	8.40	17.00	3.20	Z9523M	9.60	17.00	3.50	Z9523F	5.60	Z9523SET
M10	M15	10.50	21.00	4.00	Z9525M	12.00	21.00	4.20	Z9525F	6.50	Z9525SET
M12	M17	13.00	24.00	4.60	Z9527M	14.20	24.00	5.00	Z9527F	8.00	Z9527SET
M16	M22	17.00	30.00	5.30	Z9531M	19.00	30.00	6.20	Z9531F	9.60	Z9531SET
M20	M27	21.00	36.00	6.30	Z9533M	23.20	36.00	7.50	Z9533F	11.70	Z9533SET
M24	M32	25.00	44.00	8.20	Z9535M	28.00	44.00	9.50	Z9535F	15.20	Z9535SET
M30	M41	31.00	56.00	11.20	Z9537M	35.00	56.00	12.00	Z9537F	19.20	Z9537SET



Steel, Black Oxide Male Washer



Steel, Black Oxide Female Washer



Steel, Black Oxide Set

Bolt Size	Radius	Male				Female				Set	
		ID	OD	Thickness	Steel, Black Oxide Male Part Number	ID	OD	Thickness	Steel, Black Oxide Female Part Number	Thickness	Steel, Black Oxide Spherical Set Part Number
M6	M9	6.40	12.00	2.30	Z9520M	7.10	12.00	2.80	Z9520F	4.20	Z9520SET
M8	M12	8.40	17.00	3.20	Z9522M	9.60	17.00	3.50	Z9522F	5.60	Z9522SET
M10	M15	10.50	21.00	4.00	Z9524M	12.00	21.00	4.20	Z9524F	6.50	Z9524SET
M12	M17	13.00	24.00	4.60	Z9526M	14.20	24.00	5.00	Z9526F	8.00	Z9526SET
M14	M22	15.00	28.00	5.00	Z9528M	16.50	28.00	5.60	Z9528F	9.00	Z9528SET
M16	M22	17.00	30.00	5.30	Z9530M	19.00	30.00	6.20	Z9530F	9.60	Z9530SET
M20	M27	21.00	36.00	6.30	Z9532M	23.20	36.00	7.50	Z9532F	11.70	Z9532SET
M24	M32	25.00	44.00	8.20	Z9534M	28.00	44.00	9.50	Z9534F	15.20	Z9534SET
M30	M41	31.00	56.00	11.20	Z9536M	35.00	56.00	12.00	Z9536F	19.20	Z9536SET



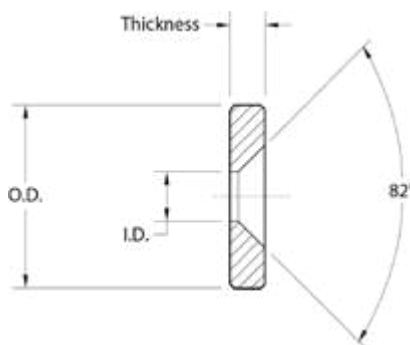
Countersunk Washers – Inch & Metric

A countersunk washer is also known as a finishing washer and dress washer, AMPG washers are machined to be sturdier, offer a larger OD, and provide greater bearing surface than stamped countersunk washers. Flat and oval head screws sit flush within them for a neater appearance. For inch screws, washers are available in 90° and 100° countersunk angles. For metric screws, washers are available with a 90° and 100° countersunk angles. The 90° countersunk is the common angle for commercial metric flat head screws. The majority of military specification screws and rivets are 100°. The 100° countersink angle distribute pressure over a wide area to prevent crushing soft materials. The greater the angle, the greater the bearing surface and the less likely the screw is to pull through thinner materials such as sheet metal. Inch made to AMPG 2002. FIN.05. Made in the USA.

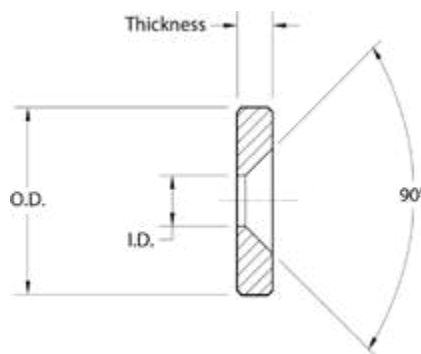
Tolerances: ±.010 inch

Materials and finishes offered in:

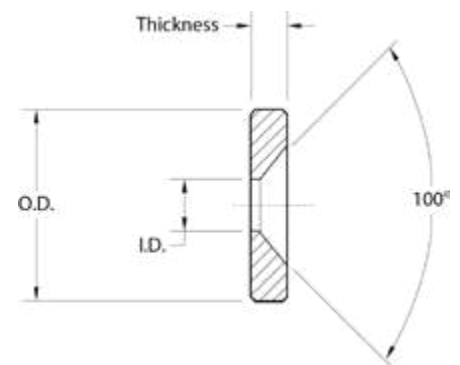
- 18-8 Stainless Steel, Plain Finish
- 316 Stainless Steel, Plain Finish
- Low Carbon Steel, Black Oxide Finish



82° Countersunk, Inch & Metric



90° Countersunk, Metric



100° Countersunk, Inch & Metric



18-8 Stainless Steel



316 Stainless Steel



Low Carbon Steel, Black Oxide

Washers

For product information and technical drawings, please see page D-26

18-8 SS, 316 SS,
Steel

82° Countersunk Washers – Inch



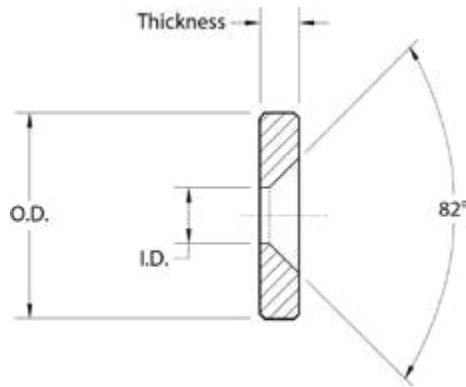
18-8 SS



316 SS



Steel, Black Oxide



Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Black Oxide Part Number
#4	.125	.438	.084 - .104	Z9972-SS	Z9972-316	Z9972
#5	.140	.500	.094 - .114	Z9978-SS	Z9978-316	Z9978
#6	.156	.562	.097 - .117	Z9979-SS	Z9979-316	Z9979
#8	.187	.750	.125	Z9930SS	Z9930-316	Z9930
#8	.187	1.000	.125	Z9931SS	Z9931-316	Z9931
#10	.203	.812	.140	Z9932SS	Z9932-316	Z9932
#10	.203	1.125	.140	Z9933SS	—	Z9933
#10	.203	1.250	.140	Z9934SS	Z9934-316	Z9934
1/4	.281	1.250	.281	Z9935SS	Z9935-316	Z9935
1/4	.281	1.375	.281	Z9936SS	—	Z9936
1/4	.281	1.500	.281	Z9937SS	—	Z9937
1/4	.281	1.750	.281	Z9938SS	—	Z9938
1/4	.281	2.000	.281	Z9939SS	Z9939-316	Z9939
5/16	.313	1.250	0.125	Z9973SS	—	—
5/16	.344	1.250	.198 - .218	Z9973-SS	Z9973-316	Z9973
—	.425	1.250	.125	Z9974SS	—	—

100° Countersunk Washers – Inch



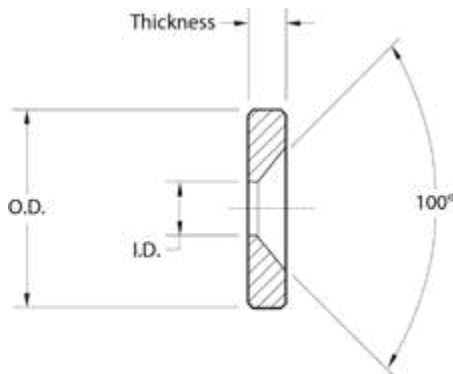
18-8 SS



316 SS



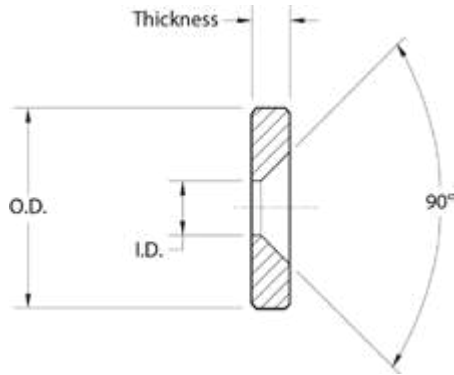
Steel, Black Oxide



Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Black Oxide Part Number
#4	.125	.438	.084 - .104	Z9972E-SS	Z9972E-316	Z9972E
#5	.140	.500	.084 - .104	Z9978E-SS	Z9978E-316	Z9978E
#6	.156	.562	.084 - .104	Z9979E-SS	Z9979E-316	Z9979E
#8	.188	.750	.115 - .135	Z9930E-SS	Z9930E-316	Z9930E
#8	.188	1.000	.115 - .135	Z9931E-SS	Z9931E-316	Z9931E
#10	.203	.812	.130 - .151	Z9932E-SS	Z9932E-316	Z9932E
#10	.203	1.250	.130 - .151	Z9934E-SS	Z9934E-316	Z9934E
1/4	.281	1.250	.271 - .291	Z9935E-SS	Z9935E-316	Z9935E
1/4	.281	2.000	.271 - .291	Z9939E-SS	Z9939E-316	Z9939E

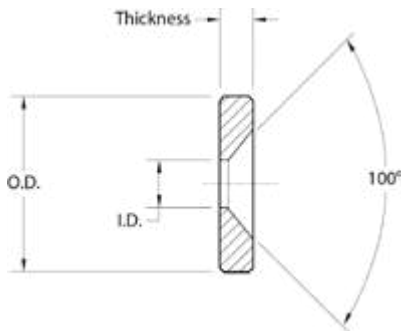
Chart continued on next page

90° Countersunk Washers – Metric



Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Black Oxide Part Number
M3	3.20	12.00	2.50	Z9972MSS	Z9972M-316	Z9972M
M3.5	3.70	14.00	2.50	Z9979MSS	Z9979M-316	Z9979M
M4	4.30	16.00	3.00	Z9920SS	Z9920-316	Z9920
	4.30	20.00	3.00	–	–	Z9921
M5	5.30	22.00	3.50	Z9922SS	Z9922-316	Z9922
	5.30	25.00	3.50	Z9923SS	–	Z9923
	5.30	28.00	3.50	–	–	Z9924
M6	6.40	32.00	4.00	Z9925SS	Z9925-316	Z9925
	6.40	36.00	4.00	–	–	Z9926
	6.40	40.00	4.00	Z9927SS	–	Z9927
	6.40	45.00	4.00	–	–	Z9928
M6	6.40	52.00	4.00	–	–	Z9929
M8	8.40	32.00	4.80	Z9973MSS	Z9973M-316	Z9973M

100° Countersunk Washers – Metric



Bolt Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Steel, Black Oxide Part Number
M3	3.20	12.00	2.50	Z9972ME-SS	Z9972ME-316	Z9972ME
M4	4.30	16.00	3.00	Z9920E-SS	Z9920E-316	Z9920E
M5	5.30	22.00	3.50	Z9922E-SS	Z9922E-316	Z9922E
M6	6.40	32.00	4.00	Z9925E-SS	Z9925E-316	Z9925E

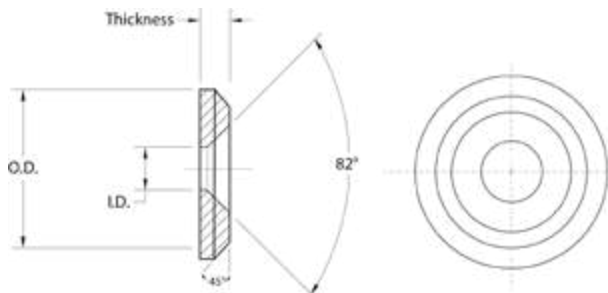
Countersunk (Pyramid) Washers – Inch



These countersunk finishing washers are machined out of Type 316 Stainless Steel. Our pyramid-style washer was developed for an application where an exceptional aesthetic finish was required. These washers are countersunk to accept 82° Flat Head and 82° Oval Head machine screws. Ideal for use on furniture, cabinetry, instrument framing, face plates, where a contemporary look is preferred.

Materials and finishes offered in:

- 316 Stainless Steel, Plain Finish



316 Stainless Steel

Bolt Size	ID	OD	Thickness	316 SS Part Number
#10	.203	.625	.125	ZPYR#10625-316
1/4	.281	.750	.125	ZPYR14750-316

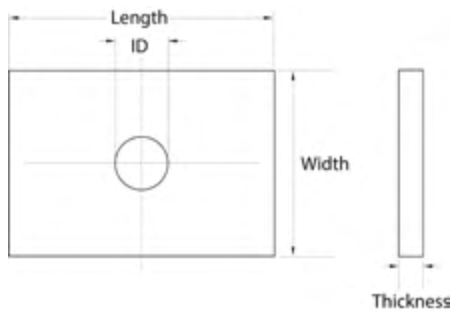


Bearing Plates — Inch

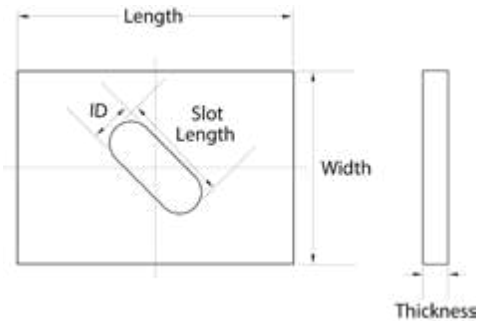
Also known as square or rectangular washers. Bearing Plates are used in array of fastening applications. With their flat sides, bearing plates are designed to prevent rotation and fit in restricted spaces that do not accommodate round washers, such as slots and channels. An excellent part for shimming and providing a large and extra thick bearing surface. They are commonly used in machining & metal working, construction, electrical and automotive applications. Square washers offer wider and thicker dimensions making them good for distributing heavier loads than round washers. One popular use is with woodwork and timber construction. Since they develop more friction when tightened against wood, this type of washer is specified for seismic applications. Testing has shown square washers function better than round washers which tend to fold up and split during an earthquake. Other specialty square & rectangular washers are Case-Hardened Tooling Washers for Work Holding, Bearing Plate Washers for Anchor Bolts, Back-Up Washers for Blind Rivets and Square and Slotted ID Washers.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish



18-8 Stainless Steel



Slotted, 18-8 Stainless Steel

Size	ID	Width	Length	Thickness	18-8 SS Part Number
1/2	.563	3.000	4.500	.230 - .250	Z8751-188
	.563	1.937	2.250	.360 - .390	Z8787-188
5/8	.688	2.000	1.500	.170 - .200	Z8770-188
	.688	3.000	4.500	.230 - .250	Z8752-188
	.688	4.000	1.250	.170 - .200	Z8773-188
5/8	.688	4.000	1.500	.170 - .200	Z8774-188
	.688	4.000	1.687	.170 - .200	Z8775-188
	.688	4.000	2.000	.230 - .250	Z8753-188
3/4	.813	3.000	4.500	.230 - .250	Z8754-188
	.813	6.000	5.750	.230 - .250	Z8755-188
7/8	.813	6.000	5.750	.360 - .390	Z8776-188
	.938	1.937	2.250	.360 - .390	Z8756-188

Size	ID (Slot)	Slot Length	Width	Length	Thickness	18-8 SS Part Number
1/2	.563	1.750	3.000	4.500	.230 - .250	Z8751-SLOT-188
5/8	.688	1.750	3.000	4.500	.230 - .250	Z8771-SLOT-188
3/4	.813	1.750	3.000	4.500	.230 - .250	Z8754-SLOT-188

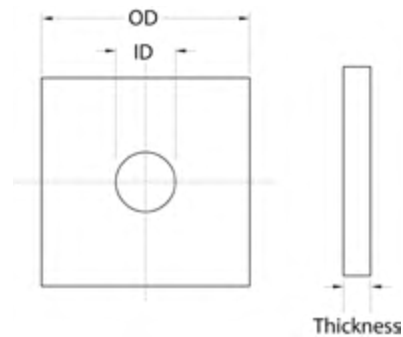


Square Flat Washers – Inch & Metric

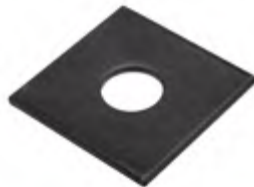
Square and rectangular washers are used in array of fastening applications. With their flat sides, square and rectangular washers are designed to prevent rotation and fit in restricted spaces that do not accommodate round washers, such as slots and channels. An excellent part for shimming and providing a large and extra thick bearing surface. They are commonly used in machining and metal working, construction, electrical and automotive applications. Square washers offer wider and thicker dimensions making them good for distributing heavier loads than round washers. One popular use is with woodwork and timber construction. Since they develop more friction when tightened against wood, this type of washer is specified for seismic applications. Testing has shown square washers function better than round washers which tend to fold up and split during an earthquake. Other specialty square & rectangular washers are Case-Hardened Tooling Washers for Work Holding, Bearing Plate Washers for Anchor Bolts, Back-Up Washers for Blind Rivets and Square and Slotted ID Washers.

Materials and finishes offered in:

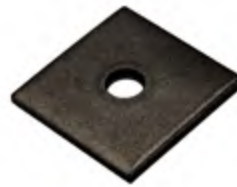
- 18-8 Stainless Steel, Plain Finish
- Low Carbon Steel, Galvanized Finish
- Low Carbon Steel, Black Oxide Finish
- Low Carbon Steel, Case Hardened, Black Oxide Finish
- Low Carbon Steel, Zinc-Plated Finish
- Low Carbon Steel, Hot Dip Galvanized Finish
- Low Carbon Steel, Diamond Back, Galvanized Finish
- Fiberglass, Green/Tan Finish



18-8 Stainless Steel



Low Carbon Steel, Black Oxide



Low Carbon Steel,
Case Hardened, Black Oxide



Low Carbon Steel, Galvanized



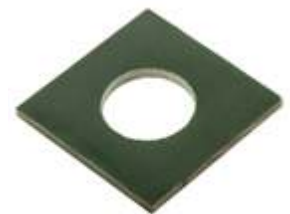
Low Carbon Steel, Zinc Plated



Low Carbon Steel,
Hot Dip Galvanized



Low Carbon Steel,
Diamond Back, Galvanized



Fiberglass, Green Tan

Washers

For product information and technical drawings, please see page D-30

18-8 SS

Square Washers — Inch



18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
1/4	.313	2.000	.112 - .128	Z8926-188
	.313	2.000	.170 - .200	Z8935-188
	.313	2.000	.235 - .265	Z8950SS
3/8	.438	2.000	.112 - .128	Z8927-188
	.438	2.000	.170 - .200	Z8936-188
	.438	2.000	.235 - .265	Z8952SS
7/16	.500	2.000	.235 - .265	Z8953SS
	.563	2.000	.112 - .128	Z8928-188
1/2	.563	2.000	.170 - .200	Z8937-188
	.563	2.000	.235 - .265	Z8954SS
1/2	.563	3.000	.141 - .187	Z8955-188
	.563	3.000	.235 - .265	Z8880SS
5/8	.688	2.000	.112 - .128	Z8929-188
	.688	2.000	.170 - .200	Z8938-188
	.688	2.000	.235 - .265	Z8956SS
5/8	.688	2.500	.235 - .265	Z8956-188
	.688	3.000	.235 - .265	Z8881SS
	.688	3.000	.485 - .515	Z8778-188
	.688	4.000	.235 - .265	Z8892SS
5/8	.688	4.000	.485 - .515	Z8777-188
3/4	.813	2.000	.112 - .128	Z8931-188
	.813	2.000	.170 - .200	Z8939-188
	.813	2.000	.235 - .265	Z8958SS
3/4	.813	2.500	.235 - .265	Z8757-188
	.813	3.000	.235 - .265	Z8948SS
	.813	3.000	.485 - .515	Z8780-188
	.813	4.000	.235 - .265	Z8893SS
3/4	.813	4.000	.485 - .515	Z8779-188
7/8	.938	2.000	.112 - .128	Z8932-188
	.938	2.000	.170 - .200	Z8941-188
	.938	2.000	.235 - .265	Z8960-188

Bolt Size	ID	OD	Thickness	18-8 SS Part Number
7/8	.938	2.000	.235 - .265	Z8960SS
	.938	3.000	.235 - .265	Z8883SS
	.938	3.000	.298 - .328	Z8761-188
	.938	4.000	.235 - .265	Z8894SS
1	1.063	2.000	.112 - .128	Z8933-188
	1.063	2.000	.170 - .200	Z8949-188
	1.063	2.000	.235 - .265	Z8962SS
1	1.063	3.000	.235 - .265	Z8884SS
	1.063	3.000	.485 - .515	Z8782-188
	1.063	3.500	.360 - .390	Z8762-188
1	1.063	4.000	.235 - .265	Z8895SS
	1.063	4.000	.485 - .515	Z8781-188
1-1/4	1.313	2.000	.112 - .128	Z8934-188
	1.313	2.000	.170 - .200	Z8951-188
	1.313	2.000	.235 - .265	Z8963SS
1-1/4	1.313	3.000	.220 - .280	Z8885SS
	1.313	3.000	.485 - .515	Z8784-188
	1.313	4.000	.485 - .515	Z8783-188
1-1/2	1.563	3.000	.485 - .515	Z8786-188
	1.563	4.000	.485 - .515	Z8785-188



Slotted Square, 18-8 Stainless Steel

Size	ID (Slot)	Slot Length	OD	Thickness	18-8 SS Part Number
1/2	.563	1.750	3.000	.141 - .187	Z8955-SLOT-188
	.563	1.750	3.000	.235 - .265	Z8880-SLOT-SS
5/8	.688	1.750	3.000	.141 - .187	Z8758-SLOT-188
	.688	1.750	3.000	.235 - .265	Z8759-SLOT-188
3/4	.813	1.750	3.000	.235 - .265	Z8948-SLOT-SS

Chart continued on next page

Square Washers – Inch



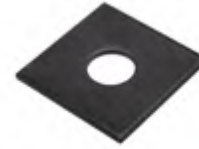
Low Carbon Steel, Case Hardened, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Hardened, Black Oxide Part Number
1/4	.313	2.000	.235-.265	Z8950H
3/8	.438	2.000	.235-.265	Z8952H
7/16	.500	2.000	.235-.265	Z8953H
1/2	.563	2.000	.235-.265	Z8954H
1/2	.563	3.000	.235-.265	Z8880H
	.688	2.000	.235-.265	Z8956H
5/8	.688	3.000	.235-.265	Z8881H
	.688	4.000	.235-.265	Z8892H
	.813	2.000	.235-.265	Z8958H
3/4	.813	3.000	.235-.265	Z8948H
	.813	4.000	.235-.265	Z8893H
	.938	2.000	.235-.265	Z8960H
7/8	.938	3.000	.235-.265	Z8883H
	.938	4.000	.235-.265	Z8894H
	1.063	2.000	.235-.265	Z8962H
1	1.063	3.000	.235-.265	Z8884H
	1.063	4.000	.235-.265	Z8895H
	1.313	2.000	.235-.265	Z8963H
1-1/4	1.313	3.000	.235-.265	Z8885H
	1.313	4.000	.220-.280	Z8896H
1-1/2	1.563	3.000	.235-.265	Z8886H
	1.563	4.000	.220-.280	Z8897H
1-3/4	1.813	4.000	.220-.280	Z8898H
	1.938	3.000	.235-.265	Z8879H
2	2.063	4.000	.235-.265	Z8899H



Low Carbon Steel, Diamond Back, Galvanized

Bolt Size	ID	OD	Thickness	Steel Diamond Back, Galvanized Part Number
1/4	.313	2.000	.235 - .265	Z8950D
3/8	.438	2.000	.235 - .265	Z8952D
1/2	.563	2.000	.235 - .265	Z8954D
5/8	.688	2.000	.235 - .265	Z8956D
3/4	.813	2.000	.235 - .265	Z8958D
1	1.063	2.000	.235 - .265	Z8962D



Low Carbon Steel, Black Oxide

Bolt Size	ID	OD	Thickness	Steel, Black Oxide Part Number
1/4	.313	2.000	.112 - .128	Z8926-BOX
	.313	2.000	.170 - .200	Z8935-BOX
3/8	.438	2.000	.112 - .128	Z8927-BOX
	.438	2.000	.170 - .200	Z8936-BOX
	.563	2.000	.112 - .128	Z8928-BOX
1/2	.563	2.000	.112 - .128	Z8940-BOX
	.563	2.000	.170 - .200	Z8937-BOX
	.688	2.000	.112 - .128	Z8929-BOX
5/8	.688	2.000	.112 - .128	Z8942-BOX
	.688	2.000	.170 - .200	Z8938-BOX
	.813	2.000	.112 - .128	Z8931-BOX
3/4	.813	2.000	.112 - .128	Z8945-BOX
	.813	2.000	.170 - .200	Z8939-BOX
7/8	.938	2.000	.112 - .128	Z8932-BOX
	.938	2.000	.170 - .200	Z8941-BOX
1	1.063	2.000	.112 - .128	Z8933-BOX
	1.063	2.000	.170 - .200	Z8949-BOX
1-1/4	1.313	2.000	.112 - .128	Z8934-BOX
	1.313	2.000	.170 - .200	Z8951-BOX



Low Carbon Steel, Hot Dip Galvanized

Bolt Size	ID	OD	Thickness	Steel, Hot Dip Galvanized Part Number
1/2	.563	3.000	.235 - .265	Z8880-HDG
5/8	.688	3.000	.235 - .265	Z8881-HDG
	.688	4.000	.235 - .265	Z8892-HDG
3/4	.813	3.000	.235 - .265	Z8882-HDG
	.813	4.000	.235 - .265	Z8893-HDG
7/8	.938	3.000	.235 - .265	Z8883-HDG
	.938	4.000	.235 - .265	Z8894-HDG
1	1.063	3.000	.235 - .265	Z8884-HDG
	1.063	4.000	.235 - .265	Z8895-HDG

Chart continued on next page

Square Washers — Inch



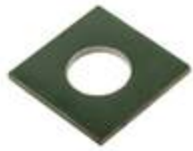
Low Carbon Steel, Zinc Plated

Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number
1/4	.313	2.000	.112 - .128	Z8926-ZN
3/8	.438	2.000	.112 - .128	Z8927-ZN
	.563	2.000	.112 - .128	Z8928-ZN
1/2	.563	2.000	.112 - .128	Z8940-ZN
	.563	2.000	.170 - .200	Z8937-ZN
	.563	2.000	.220 - .280	Z8954-ZN
	.563	2.000	.220 - .280	Z8955-ZN
1/2	.563	3.000	.112 - .128	Z8862-ZN
	.563	3.000	.170 - .200	Z8872-ZN
	.563	3.000	.220 - .280	Z8880-ZN
	.688	2.000	.112 - .128	Z8929-ZN
5/8	.688	2.000	.112 - .128	Z8942-ZN
	.688	2.000	.170 - .200	Z8938-ZN
	.688	2.000	.220 - .280	Z8957-ZN
	.688	2.000	.235 - .265	Z8956-ZN
5/8	.688	3.000	.112 - .128	Z8863-ZN
	.688	3.000	.170 - .200	Z8873-ZN
	.688	3.000	.220 - .280	Z8881-ZN
	.688	4.000	.112 - .128	Z8727-ZN
5/8	.688	4.000	.170 - .200	Z8735-ZN
	.688	4.000	.220 - .280	Z8892-ZN
	.813	2.000	.112 - .128	Z8945-ZN
3/4	.813	2.000	.170 - .200	Z8939-ZN
	.813	2.000	.220 - .280	Z8958-ZN
	.813	3.000	.112 - .128	Z8865-ZN
	.813	3.000	.170 - .200	Z8874-ZN
3/4	.813	3.000	.220 - .280	Z8882-ZN
	.813	4.000	.112 - .128	Z8728-ZN
	.813	4.000	.170 - .200	Z8736-ZN
3/4	.813	4.000	.220 - .280	Z8893-ZN
	.938	2.000	.112 - .128	Z8932-ZN
7/8	.938	2.000	.170 - .200	Z8941-ZN
	.938	2.000	.220 - .280	Z8960-ZN
	.938	3.000	.112 - .128	Z8866-ZN
	.938	3.000	.170 - .200	Z8875-ZN
7/8	.938	3.000	.220 - .280	Z8883-ZN
	.938	4.000	.112 - .128	Z8729-ZN
	.938	4.000	.170 - .200	Z8737-ZN

Bolt Size	ID	OD	Thickness	Steel, Zinc Plated Part Number
7/8	.938	4.000	.220 - .280	Z8894-ZN
	1.063	2.000	.112 - .128	Z8933-ZN
1	1.063	2.000	.170 - .200	Z8949-ZN
	1.063	2.000	.220 - .280	Z8962-ZN
	1.063	3.000	.112 - .128	Z8867-ZN
	1.063	3.000	.170 - .200	Z8877-ZN
1	1.063	3.000	.220 - .280	Z8884-ZN
	1.063	4.000	.112 - .128	Z8730-ZN
	1.063	4.000	.170 - .200	Z8738-ZN
1	1.063	4.000	.220 - .280	Z8895-ZN
	1.313	2.000	.112 - .128	Z8934-ZN
1-1/4	1.313	2.000	.170 - .200	Z8951-ZN
	1.313	2.000	.220 - .280	Z8963-ZN
	1.313	3.000	.112 - .128	Z8868-ZN
	1.313	3.000	.170 - .200	Z8878-ZN
1-1/4	1.313	3.000	.220 - .280	Z8885-ZN
	1.313	4.000	.112 - .128	Z8731-ZN
	1.313	4.000	.170 - .200	Z8739-ZN
1-1/4	1.313	4.000	.220 - .280	Z8896-ZN
	1.563	3.000	.112 - .128	Z8869-ZN
1-1/2	1.563	3.000	.170 - .200	Z8891-ZN
	1.563	3.000	.220 - .280	Z8886-ZN
	1.563	4.000	.112 - .128	Z8732-ZN
1-1/2	1.563	4.000	.170 - .200	Z8740-ZN
	1.563	4.000	.220 - .280	Z8897-ZN
	1.813	3.000	.112 - .128	Z8871-ZN
1-3/4	1.813	3.000	.170 - .200	Z8702-ZN
	1.813	3.000	.220 - .280	Z8879-ZN
	1.813	4.000	.112 - .128	Z8733-ZN
1-3/4	1.813	4.000	.170 - .200	Z8741-ZN
	1.813	4.000	.220 - .280	Z8898-ZN
	2.063	4.000	.220 - .280	Z8899-ZN
2	2.063	4.000	.112 - .128	Z8734-ZN
	2.063	4.000	.170 - .200	Z8742-ZN

Chart continued on next page

Square Washers – Inch



Fiberglass

Bolt Size	ID	OD	Thickness	Fiberglass Part Number
1/4	.266	2.000	.125	Z8340
3/8	.391	2.000	.125	Z8342
1/2	.516	2.000	.125	Z8344
5/8	.640	2.000	.125	Z8346
	.640	2.000	.125	Z8366
3/4	.766	2.000	.125	Z8348
	.766	2.000	.125	Z8368
1	1.016	2.000	.125	Z8350
	1.016	2.000	.125	Z8370



Low Carbon Steel, Galvanized

Bolt Size	ID	OD	Thickness	Steel, Galvanized Part Number
1/4	.313	2.000	.235 - .265	Z8950G
3/8	.438	2.000	.235 - .265	Z8952G
	.563	2.000	.112 - .128	Z8940G
1/2	.563	2.000	.235 - .265	Z8954G
	.688	2.000	.112 - .128	Z8942G
5/8	.688	2.000	.235 - .265	Z8956G
	.688	2.250	.170 - .200	Z8944G
3/4	.813	2.000	.112 - .128	Z8945G
	.813	2.000	.235 - .265	Z8958G
	.813	2.250	.170 - .200	Z8946G
3/4	.813	3.000	.170 - .200	Z8947G
	.813	3.000	.235 - .265	Z8948G
7/8	.938	2.000	.235 - .265	Z8960G
1	1.063	2.000	.235 - .265	Z8962G
	1.313	3.000	.235 - .265	Z8885G
1-1/4	1.313	4.000	.235 - .265	Z8896G
	1.313	2.000	.235 - .265	Z8963G
1-1/2	1.563	3.000	.235 - .265	Z8886G
	1.563	4.000	.235 - .265	Z8897G
1-3/4	1.938	3.000	.235 - .265	Z8879G
	1.938	4.000	.235 - .265	Z8898G
2	2.063	4.000	.235 - .265	Z8899G

Square Washer – Metric



18-8 Stainless Steel



Low Carbon Steel, Black Oxide



Low Carbon Steel, Galvanized

Bolt Size	ID	OD	Thickness	18-8 SS Part Number	Steel, Black Oxide Part Number	Steel, Galvanized Part Number
M6	9.00	50.00	6.00	Z8906SS	Z8906	Z8906-G
M8	11.00	50.00	6.00	Z8908SS	Z8908	Z8908-G
M10	13.00	50.00	6.00	Z8910SS	Z8910	Z8910-G
M12	16.00	50.00	6.00	Z8912SS	Z8912	Z8912-G
M14	18.00	50.00	6.00	Z8914SS	Z8914	Z8914-G
M16	22.00	50.00	6.00	Z8916SS	Z8916	Z8916-G
M20	26.00	50.00	6.00	Z8920SS	Z8920	Z8920-G
M22	28.00	50.00	6.00	Z8922SS	Z8922	Z8922-G
M24	32.00	50.00	6.00	Z8924SS	Z8924	Z8924-G
M30	38.00	50.00	6.00	Z8930SS	Z8930	Z8930-G

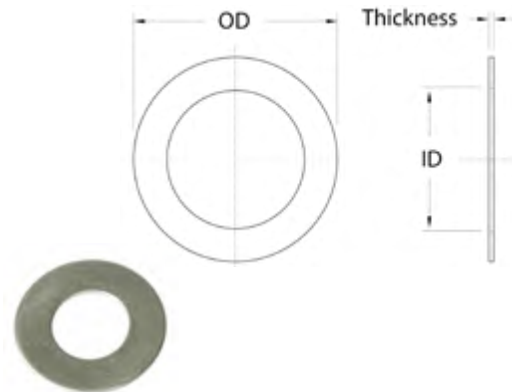
Wide Rim Shims — Inch



Sometimes called Machinery Bushings or Oversized Shims. Originally used as a wear shim between two moving parts.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish



18-8 Stainless Steel

Bolt Size	Shaft Size	OD	Thickness	18-8 SS Part Number
1/2	.500	.875	.048	Z9940SS
	.500	.875	.075	Z9954SS
5/8	.625	1.250	.048	Z9944SS
	.625	1.250	.075	Z9956SS
3/4	.750	1.250	.048	Z9946SS
	.750	1.500	.048	Z9948SS
	.750	1.250	.075	Z9958SS
	.750	1.500	.075	Z9960SS
1	1.000	2.000	.048	Z9950SS
	1.000	2.000	.075	Z9962SS
1-1/4	1.250	1.875	.075	Z9964SS
1-1/2	1.500	2.250	.075	Z9968SS

Peel Away Shims — Inch



Brass shims have good strength and are corrosion resistant. Remove layers with a utility knife until you get the thickness you need. Layers are bonded with adhesive.

Tolerances:

ID and OD are ± 0.01 inch.

Thickness is ± 0.003 inch.

Materials and finishes offered in:

- Brass, Plain Finish



Brass

Bolt Size	Shaft Size	OD	Thickness	Brass Part Number
1/8	.135	.234	.031	Z9975
3/16	.193	.375	.031	Z9976
1/4	.255	.500	.031	Z9977



Horseshoe Shims – Inch

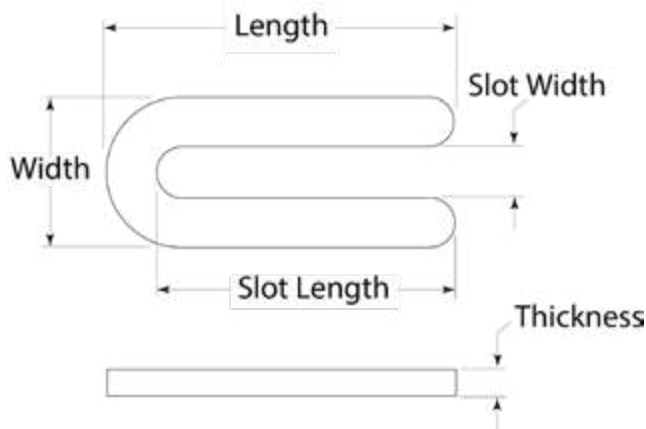
A fully machined Horseshoe Shim manufactured out of Type 316 Stainless Steel. Used where regular plastic shims are prohibited, where a fire resistant shim is specified, and where the installer needs to weld to the shim. Also used where installing handrails, guardrails, etc.

Thickness tolerances:

±.01 inch

Materials and finishes offered in:

- 316 Stainless Steel, Plain



316 Stainless Steel

Length	Width	Nominal Slot Width	Actual Slot Length	Nominal Slot Length	Minimum Bolt Size	Maximum Bolt Size	Thickness	316 SS Part Number
2	1-1/2	1/2	17/32	1-1/2	1/4	1/2	.063	Z8424
2-5/8	1-7/8	5/8	21/32	2	1/4	5/8	.063	Z8426
3	2-5/16	13/16	25/32	2-1/4	1/4	3/4	.063	Z8428
3-1/2	1-1/2	1/2	17/32	3	1/4	1/2	.063	Z8430
2	1-1/2	1/2	17/32	1-1/2	1/4	1/2	.125	Z8432
2-5/8	1-7/8	5/8	21/32	2	1/4	5/8	.125	Z8434
3	2-5/16	13/16	25/32	2-1/4	1/4	3/4	.125	Z8436
3-1/2	1-1/2	1/2	17/32	3	1/4	1/2	.125	Z8438
2	1-1/2	1/2	17/32	1-1/2	1/4	1/2	.250	Z8440
2-5/8	1-7/8	5/8	21/32	2	1/4	5/8	.250	Z8442
3	2-5/16	13/16	25/32	2-1/4	1/4	3/4	.250	Z8444
3-1/2	1-1/2	1/2	17/32	3	1/4	1/2	.250	Z8446



Shims for Shoulder Diameters – Inch

Lengthening Shim Washer

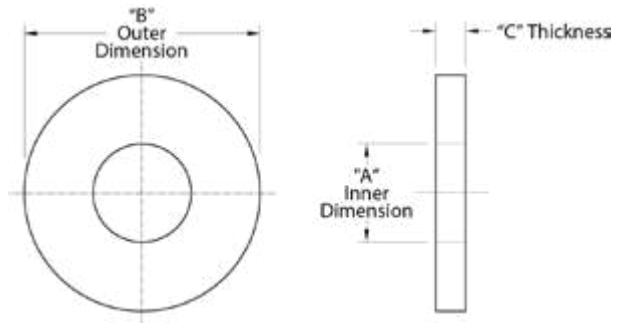
Add these washers over the threads of our stainless steel shoulder screws, and you extend the shoulder, making the shoulder longer for more bearing surface. OD matches shoulder diameter. 25 shims per pack.

Shortening Shim Washer

Slip these washers over the shoulder of our stainless steel shoulder screws, and you reduce the shoulder length, making the shoulder shorter for more clearance under the head. OD matches head diameter of the shoulder screw. 25 shims per pack.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish (packs of 25)



Lengthening

Fits Shoulder Size	Fits Thread Size	"A" ID	"B" OD	"C" Thickness	18-8 SS Part Number
1/4	#10	.171 - .182	.239 - .243	.0045 - .0055	Z9888-005
				.014 - .018	Z9888-016
				.027 - .033	Z9888-032
5/16	1/4	.234 - .245	.301 - .305	.0045 - .0055	Z9889-005
				.014 - .018	Z9889-016
				.027 - .033	Z9889-030
3/8	5/16	.289 - .300	.363 - .367	.0045 - .0055	Z9890-005
				.014 - .018	Z9890-016
				.027 - .033	Z9890-030
1/2	3/8	.352 - .363	.489 - .493	.0045 - .0055	Z9891-005
				.014 - .018	Z9891-016
				.027 - .033	Z9891-030
5/8	1/2	.473 - .484	.614 - .618	.014 - .018	Z9892-016
				.027 - .033	Z9892-030

Shortening

Fits Shoulder Size	"A" ID	"B" OD	"C" Thickness	18-8 SS Part Number
1/4	.251 - .262	.373 - .377	.0045 - .0055	Z9895-005
			.014 - .018	Z9895-016
			.027 - .033	Z9895-030
5/16	.314 - .325	.436 - .440	.0045 - .0055	Z9896-005
			.014 - .018	Z9896-016
			.027 - .033	Z9896-030
3/8	.376 - .387	.561 - .565	.0045 - .0055	Z9897-005
			.014 - .018	Z9897-016
			.027 - .033	Z9897-030
1/2	.501 - .512	.748 - .752	.0045 - .0055	Z9898-005
			.014 - .018	Z9898-016
			.027 - .033	Z9898-030
5/8	.626 - .637	.873 - .877	.014 - .018	Z9899-016
			.027 - .033	Z9899-030
3/4	.751 - .762	.998 - 1.002	.014 - .018	Z9899-116
			.027 - .033	Z9899-130

18-8 SS, 316 SS,
Brass



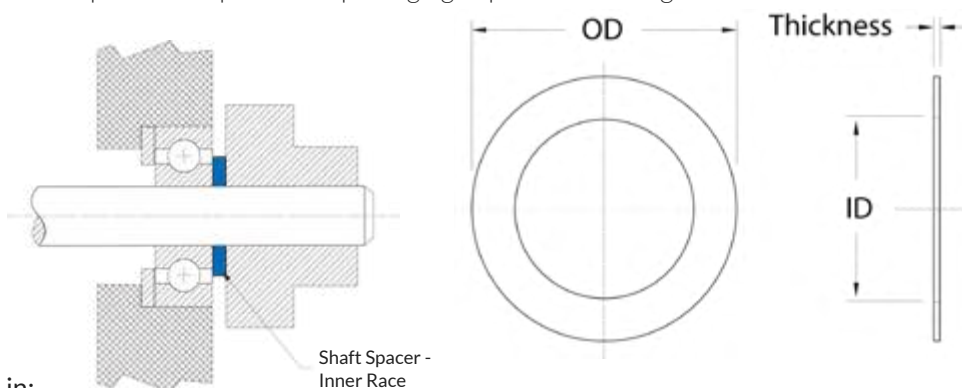
Shims for Shafts (Inner Race Spacers) — Inch

Used for Inner Race Spacers on shafts, or for a precision special dimensioned flat washer. Precision manufactured to extra tight tolerances. These shims are packed in a protective packaging to prevent bending.

10-25 pcs. per Pkg.

Thickness tolerances:

- .001 - .008 ± .005
- .010 - .016 ± .001
- .020 ± .002 (Stainless)
- .020 ± .002 (Brass)



Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish (packs of 25)
- 316 Stainless Steel, Plain Finish (packs of 10)
- Brass, Plain Finish (packs of 10)



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
1/32	.032 - .037	.104 - .114	.001	Z9986-001	—	—
			.002	Z9986-002	—	—
			.003	Z9986-003	—	—
			.004	Z9986-004	—	—
1/32	.032 - .037	.104 - .114	.005	Z9986-005	—	—
			.006	Z9986-006	—	—
			.008	Z9986-008	—	—
			.010	Z9986-010	—	—
1/32	.032 - .037	.104 - .114	.012	Z9986-012	—	—
			.015	Z9986-014	—	—
			.016	Z9986-016	—	—
			3/64	.047 - .052	.120 - .130	.001	Z9987-001	—	—
.002	Z9987-002	—				—
.003	Z9987-003	—				—
.004	Z9987-004	—				—
3/64	.047 - .052	.120 - .130	.005	Z9987-005	—	—
			.006	Z9987-006	—	—
			.008	Z9987-008	—	—
			.010	Z9987-010	—	—
3/64	.047 - .052	.120 - .130	.012	Z9987-012	—	—

Chart continued on next page

Shims for Shafts (Inner Race Spacers) — Inch



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
3/64	.047 - .052	.120 - .130	.015	Z9987-014	—	—
			.016	Z9987-016	—	—
			.001	Z9988-001	—	—
1/16	.063 - .068	.151 - .161	.002	Z9988-002	—	—
			.003	Z9988-003	—	—
			.004	Z9988-004	—	—
			.005	Z9988-005	—	—
1/16	.063 - .068	.151 - .161	.006	Z9988-006	—	—
			.008	Z9988-008	—	—
			.010	Z9988-010	—	—
			.012	Z9988-012	—	—
1/16	.063 - .068	.151 - .161	.015	Z9988-014	—	—
			.016	Z9988-016	—	—
			.001	Z9701	Z9701-316	Z9701-BR
			.002	Z9702	Z9702-316	Z9702-BR
5/64	.079 - .084	.159 - .169	.003	Z9703	Z9703-316	Z9703-BR
			.004	Z9704	Z9704-316	Z9704-BR
			.005	Z9705	Z9705-316	Z9705-BR
			.006	Z9706	Z9706-316	Z9706-BR
5/64	.079 - .084	.159 - .169	.008	Z9708	Z9708-316	Z9708-BR
			.010	Z9710	Z9710-316	Z9710-BR
			.012	Z9712	Z9712-316	Z9712-BR
			.015	Z9714	Z9714-316	Z9714-BR
5/64	.079 - .084	.159 - .169	.016	Z9716	Z9716-316	Z9716-BR
			.001	Z9719	—	Z9719-BR
			.002	Z9720	—	Z9720-BR
			.003	Z9721	—	Z9721-BR
3/32	.093 - .098	.198 - .208	.004	Z9722	—	Z9722-BR
			.005	Z9723	Z9723-316	Z9723-BR
			.006	Z9724	Z9724-316	Z9724-BR
			.008	Z9728	Z9728-316	Z9728-BR
3/32	.093 - .098	.198 - .208	.010	Z9730	Z9730-316	Z9730-BR
			.012	Z9732	Z9732-316	Z9732-BR
			.015	Z9734	Z9734-316	Z9734-BR
			.016	Z9736	Z9736-316	Z9736-BR

18-8 SS is available in packs of 25
316 SS and Brass are available in packs of 10

Chart continued on next page

Shims for Shafts (Inner Race Spacers) — Inch



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
1/8	.125 - .130	.182 - .192	.001	Z9741	—	Z9741-BR
			.002	Z9742	—	Z9742-BR
			.003	Z9743	—	Z9743-BR
			.004	Z9744	—	Z9744-BR
1/8	.125 - .130	.182 - .192	.005	Z9745	Z9745-316	Z9745-BR
			.006	Z9746	Z9746-316	Z9746-BR
			.008	Z9748	Z9748-316	Z9748-BR
			.010	Z9750	Z9750-316	Z9750-BR
1/8	.125 - .130	.182 - .192	.012	Z9752	Z9752-316	Z9752-BR
			.015	Z9754	Z9754-316	Z9754-BR
			.016	Z9756	Z9756-316	Z9756-BR
			3/16	.188 - .193	.245 - .255	.001	Z9761	—	Z9761-BR
.002	Z9762	—				Z9762-BR
.003	Z9763	—				Z9763-BR
.004	Z9764	—				Z9764-BR
3/16	.188 - .193	.245 - .255	.005	Z9765	Z9765-316	Z9765-BR
			.006	Z9766	Z9766-316	Z9766-BR
			.008	Z9768	Z9768-316	Z9768-BR
			.010	Z9770	Z9770-316	Z9770-BR
3/16	.188 - .193	.245 - .255	.012	Z9772	Z9772-316	Z9772-BR
			.015	Z9774	Z9774-316	Z9774-BR
			.016	Z9776	Z9776-316	Z9776-BR
			1/4	.250 - .255	.375 - .380	.001	Z9781	—	Z9781-BR
.002	Z9782	—				Z9782-BR
.003	Z9783	—				Z9783-BR
.004	Z9784	—				Z9784-BR
1/4	.250 - .255	.375 - .380	.005	Z9785	Z9785-316	Z9785-BR
			.006	Z9786	Z9786-316	Z9786-BR
			.008	Z9788	Z9788-316	Z9788-BR
			.010	Z9790	Z9790-316	Z9790-BR
1/4	.250 - .255	.375 - .380	.012	Z9792	Z9792-316	Z9792-BR
			.015	Z9794	Z9794-316	Z9794-BR
			.016	Z9796	Z9796-316	Z9796-BR
			5/16	.313 - .318	.495 - .505	.001	Z9801	—	Z9801-BR
.002	Z9802	—				Z9802-BR
.003	Z9803	—				Z9803-BR
.004	Z9804	—				Z9804-BR

18-8 SS is available in packs of 25

316 SS and Brass are available in packs of 10

Chart continued on next page

Shims for Shafts (Inner Race Spacers) — Inch



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
5/16	.313 - .318	.495 - .505	.005	Z9805	Z9805-316	Z9805-BR
			.006	Z9806	Z9806-316	Z9806-BR
			.008	Z9808	Z9808-316	Z9808-BR
			.009	Z9809	—	Z9809-BR
5/16	.313 - .318	.495 - .505	.010	Z9810	Z9810-316	Z9810-BR
			.012	Z9812	Z9812-316	Z9812-BR
			.015	Z9814	Z9814-316	Z9814-BR
			.016	Z9816	Z9816-316	Z9816-BR
3/8	.375 - .380	.557 - .567	.001	Z9821	—	Z9821-BR
			.002	Z9822	—	Z9822-BR
			.003	Z9823	—	Z9823-BR
			.004	Z9824	—	Z9824-BR
3/8	.375 - .380	.557 - .567	.005	Z9825	Z9825-316	Z9825-BR
			.006	Z9826	Z9826-316	Z9826-BR
			.008	Z9828	Z9828-316	Z9828-BR
			.010	Z9830	Z9830-316	Z9830-BR
3/8	.375 - .380	.557 - .567	.012	Z9832	Z9832-316	Z9832-BR
			.015	Z9834	Z9834-316	Z9834-BR
			.016	Z9836	Z9836-316	Z9836-BR
			.001	Z9841	—	Z9841-BR
1/2	.500 - .505	.745 - .755	.002	Z9842	—	Z9842-BR
			.003	Z9843	—	Z9843-BR
			.004	Z9844	—	Z9844-BR
			.005	Z9845	Z9845-316	Z9845-BR
1/2	.500 - .505	.745 - .755	.006	Z9846	Z9846-316	Z9846-BR
			.008	Z9848	Z9848-316	Z9848-BR
			.010	Z9850	Z9850-316	Z9850-BR
			.012	Z9852	Z9852-316	Z9852-BR
1/2	.500 - .505	.745 - .755	.015	Z9854	Z9854-316	Z9854-BR
			.016	Z9856	Z9856-316	Z9856-BR

18-8 SS is available in packs of 25
316 SS and Brass are available in packs of 10

18-8 SS, 316 SS,
Brass



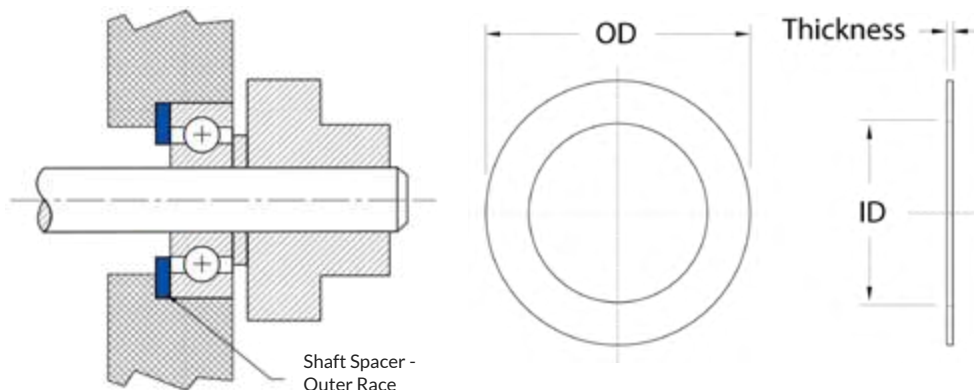
Shims for Bearings (Outer Race Spacers) — Inch

Used for Outer Race Spacers on shafts, or for a precision special dimensioned flatwasher. Precision manufactured to extra tight tolerances.

10-25 pcs. per Pkg.

Thickness tolerances:

- .001 - .008 ± .005
- .010 - .015 ± .001
- .020 ± .002 (Stainless)
- .020 ± .002 (Brass)



Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish (packs of 25)
- 316 Stainless Steel, Plain Finish (packs of 10)
- Brass, Plain Finish (packs of 10)



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
Fits Bearing Size 3/64 x 5/32	.088 - .093	.148 - .153	.003	Z9880-3	—	Z9880-3-BR
			.005	Z9880-5	Z9880-5-316	Z9880-5-BR
			.007	Z9880-7	Z9880-7-316	Z9880-7-BR
			.010	Z9880-10	Z9880-10-316	Z9880-10-BR
			.020	Z9880-20	Z9880-20-316	Z9880-20-BR
Fits Bearing Size .055 x 3/16	.123 - .128	.173 - .178	.003	Z9881-3	—	Z9881-3-BR
			.005	Z9881-5	Z9881-5-316	Z9881-5-BR
			.007	Z9881-7	Z9881-7-316	Z9881-7-BR
			.010	Z9881-10	Z9881-10-316	Z9881-10-BR
			.020	Z9881-20	Z9881-20-316	Z9881-20-BR
Fits Bearing Size 5/64 x 1/4 & 1/8 x 1/4	.167 - .172	.243 - .248	.003	Z9882-3	—	Z9882-3-BR
			.005	Z9882-5	Z9882-5-316	Z9882-5-BR
			.007	Z9882-7	Z9882-7-316	Z9882-7-BR
			.010	Z9882-10	Z9882-10-316	Z9882-10-BR
			.020	Z9882-20	Z9882-20-316	Z9882-20-BR

18-8 SS is available in packs of 25
316 SS and Brass are available in packs of 10

Shims for Bearings (Outer Race Spacers) — Inch



18-8 Stainless Steel



316 Stainless Steel



Brass

Size	ID	OD	Thickness	18-8 SS Part Number	316 SS Part Number	Brass Part Number
Fits Bearing Size 3/32 x 5/16 & 1/8 x 5/16	.206 - .211	.305 - .310	.003	Z9883-3	—	Z9883-3-BR
			.005	Z9883-5	Z9883-5-316	Z9883-5-BR
			.007	Z9883-7	Z9883-7-316	Z9883-7-BR
			.010	Z9883-10	Z9883-10-316	Z9883-10-BR
			.020	Z9883-20	Z9883-20-316	Z9883-20-BR
Fits Bearing Size 1/8 x 3/8 & 3/16 x 3/8	.253 - .258	.368 - .373	.003	Z9884-3	—	Z9884-3-BR
			.005	Z9884-5	Z9884-5-316	Z9884-5-BR
			.007	Z9884-7	Z9884-7-316	Z9884-7-BR
			.010	Z9884-10	—	Z9884-10-BR
			.020	Z9884-20	Z9884-20-316	Z9884-20-BR
Fits Bearing Size 3/16 x 1/2 & 1/4 x 1/2	.378 - .383	.493 - .498	.002	—	—	Z9885-2-BR
			.003	Z9885-3	—	Z9885-3-BR
			.005	Z9885-5	Z9885-5-316	Z9885-5-BR
			.007	Z9885-7	Z9885-7-316	Z9885-7-BR
			.010	Z9885-10	Z9885-10-316	Z9885-10-BR
Fits Bearing Size 1/4 x 5/8	.503 - .508	.618 - .623	.020	Z9885-20	Z9885-20-316	Z9885-20-BR
			.003	Z9886-3	—	Z9886-3-BR
			.005	Z9886-5	Z9886-5-316	Z9886-5-BR
			.007	Z9886-7	Z9886-7-316	Z9886-7-BR
			.010	Z9886-10	Z9886-10-316	Z9886-10-BR
Fits 5/8 Shaft Size	.632	.750	.008	Z9886-20	Z9886-20-316	Z9886-20-BR
Fits Bearing Size 3/8 x 7/8	.687 - .692	.868 - .873	.008	Z9878	—	—
			.003	Z9887-3	—	Z9887-3-BR
			.005	Z9887-5	Z9887-5-316	Z9887-5-BR
			.007	Z9887-7	Z9887-7-316	Z9887-7-BR*
			.010	Z9887-10	Z9887-10-316	Z9887-10-BR
			.020	Z9887-20	Z9887-20-316	Z9887-20-BR

18-8 SS is available in packs of 25
 316 SS and Brass are available in packs of 10
 * Z9887-7-BR available in packs of 25

18-8 SS

Shims for D Shafts – Inch



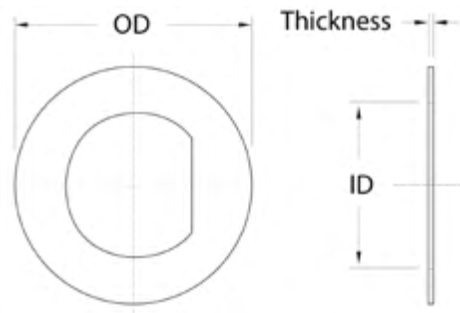
Shaped to fit and made from 18-8 stainless steel.

Thickness tolerances:

± .005 inch

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain



18-8 Stainless Steel

Bolt Size	Shaft Size	OD	Thickness	18-8 SS Part Number
1/4	.250	.750	.031	Z0595
	.250	.750	.062	Z0596
	.250	.750	.125	Z0597
3/8	.375	1.000	.031	Z0560
	.375	1.000	.062	Z0561
	.375	1.000	.125	Z0562
1/2	.500	1.125	.031	Z0565
	.500	1.125	.062	Z0566
	.500	1.125	.125	Z0567
5/8	.625	1.250	.031	Z0570
	.625	1.250	.062	Z0571
	.625	1.250	.125	Z0572
3/4	.750	1.625	.031	Z0575
	.750	1.625	.062	Z0576
	.750	1.625	.125	Z0577
1	1.000	1.750	.031	Z0580
	1.000	1.750	.062	Z0581
	1.000	1.750	.125	Z0582

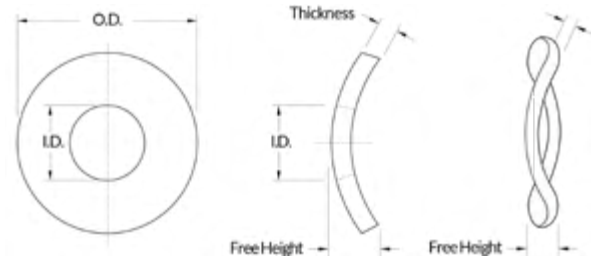
Wave Washers — Single and Triple Wave — Inch



These wave washers act as springs because of their flexible shape. Used on shafts, and in assemblies where tolerance are too large, these washers expand/compress to take up the space. They can also be used to reduce vibration.

Materials and finishes offered in:

- 18-8 Stainless Steel, Plain Finish, Black Oxide
- 316 Stainless Steel, Plain Finish



Single Wave, 18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	Free Height	18-8 SS Part Number	18-8 SS, Black Oxide Part Number	316 SS Part Number
#0	.068	.165 - .175	.010	.035 - .050	WAV100SS	WAV100SSB	WAV100SS316
#2	.094	.125 - .135	.004	.020 - .040	WAV102SS	WAV102SSB	WAV102SS316
#4	.118	.235 - .245	.008	.031 - .056	WAV104SS	WAV104SSB	WAV104SS316
#5	.130 - .140	.240 - .250	.004	.045 - .055	WAV105SS	WAV105SSB	WAV105SS316
	.130 - .140	.240 - .250	.006	.034	WAV111SS	WAV111SSB	WAV111SS316
#6	.143 - .153	.265 - .275	.005	.046 - .062	WAV106SS	WAV106SSB	WAV106SS316
	.143 - .153	.265 - .275	.007	.035	WAV112SS	WAV112SSB	WAV112SS316
#8	.160 - .170	.280 - .290	.006	.028 - .053	WAV108SS	WAV108SSB	WAV108SS316
	.169 - .179	.317 - .327	.008	.042	WAV113SS	WAV113SSB	WAV113SS316
#10	.195 - .205	.297 - .307	.010	.041 - .061	WAV110SS	WAV110SSB	WAV110SS316
	.195 - .205	.365 - .375	.009	.047	WAV114SS	WAV114SSB	WAV114SS316
1/4	.260 - .270	.485 - .495	.011	.063	WAV115SS	WAV115SSB	WAV115SS316
5/16	.322 - .332	.607 - .617	.013	.077	WAV116SS	WAV116SSB	WAV116SS316



Triple Wave, 18-8 Stainless Steel

Bolt Size	ID	OD	Thickness	Free Height	18-8 SS Part Number	18-8 SS, Black Oxide Part Number	316 SS Part Number
#2	.094	.166 - .171	.010	.030 - .040	WAV302SS	WAV302SSB	WAV302SS316
#4	.125	.245 - .255	.005	.015 - .025	WAV304SS	WAV304SSB	WAV304SS316
#5	.128 - .133	.187 - .192	.005	.025 - .035	WAV305SS	WAV305SSB	WAV305SS316
#6	.145 - .150	.240 - .245	.006	.035 - .050	WAV306SS	WAV306SSB	WAV306SS316
#8	.190 - .200	.240 - .250	.006	.035 - .055	WAV308SS	WAV308SSB	WAV308SS316
#10	.203 - .208	.365 - .385	.005	.021 - .041	WAV310SS	WAV310SSB	WAV310SS316

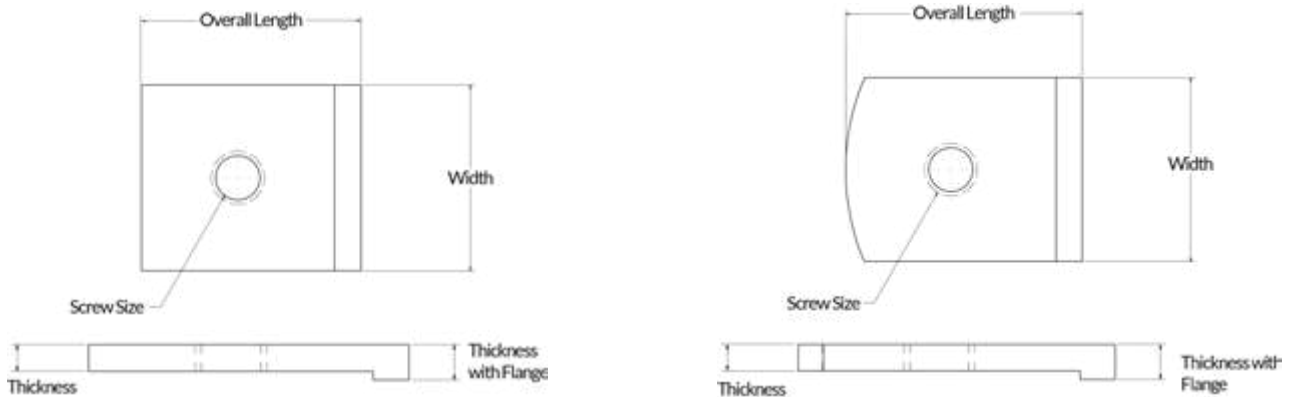


Tapped Flange Washers – Inch

The threaded hole and the raised flange make these washers very easy to tighten down. These washers are used for crossarm anti-split bolts and where crossarm braces attach to the crossarm. The flange allows the washer to be tightened with a crescent wrench. The tapped through hole used with a nut provides a secure double nut connection. Available in square or rounded corners.

Materials and finishes offered in:

- Steel, Hot Dip Galvanized Finish



Square Corners, Steel, Hot Dip Galvanized

Bolt Size	Overall Length	Washer Width	Thickness	Thickness w/Flange	Steel, Galvanized Part Number
1/2-13	3.500	3.000	.187	.250	Z8887-STL-SQ
	3.500	3.000	.187	.250	Z8888-STL-SQ
5/8-11	3.500	3.000	.187	.250	Z8889-STL-SQ
	3.500	3.000	.187	.250	Z8890-STL-SQ



Round Corners, Steel, Hot Dip Galvanized

Bolt Size	Overall Length	Washer Width	Thickness	Thickness w/Flange	Steel, Galvanized Part Number
1/2-13	2.250	1.750	.187	.250	Z8887-STL-RC
	2.250	1.750	.187	.250	Z8888-STL-RC
5/8-11	2.250	1.750	.187	.250	Z8889-STL-RC
	2.250	1.750	.187	.250	Z8890-STL-RC

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.032 - .037	n/a	.104 - .114	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-001	D-38
.032 - .037	n/a	.104 - .114	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-002	D-38
.032 - .037	n/a	.104 - .114	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-003	D-38
.032 - .037	n/a	.104 - .114	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-004	D-38
.032 - .037	n/a	.104 - .114	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-005	D-38
.032 - .037	n/a	.104 - .114	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-006	D-38
.032 - .037	n/a	.104 - .114	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-008	D-38
.032 - .037	n/a	.104 - .114	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-010	D-38
.032 - .037	n/a	.104 - .114	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-012	D-38
.032 - .037	n/a	.104 - .114	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-014	D-38
.032 - .037	n/a	.104 - .114	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9986-016	D-38
.047 - .052	n/a	.120 - .130	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-001	D-38
.047 - .052	n/a	.120 - .130	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-002	D-38
.047 - .052	n/a	.120 - .130	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-003	D-38
.047 - .052	n/a	.120 - .130	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-004	D-38
.047 - .052	n/a	.120 - .130	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-005	D-38
.047 - .052	n/a	.120 - .130	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-006	D-38
.047 - .052	n/a	.120 - .130	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-008	D-38
.047 - .052	n/a	.120 - .130	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-010	D-38
.047 - .052	n/a	.120 - .130	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-012	D-38
.047 - .052	n/a	.120 - .130	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-014	D-39
.047 - .052	n/a	.120 - .130	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9987-016	D-39
.063	#0	.125	.019	Brass	n/a	Flat Washer	Round	Z9150BR	D-4
.063	#0	.125	.019	Steel	n/a	Flat Washer	Round	Z9150STL	D-3
.063	#0	.099	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C0	D-15
.063	#0	.125	.019	18-8 S/S	n/a	Flat Washer	Round	Z9150	D-2
.063 - .068	n/a	.151 - .161	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-001	D-39
.063 - .068	n/a	.151 - .161	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-002	D-39
.063 - .068	n/a	.151 - .161	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-003	D-39
.063 - .068	n/a	.151 - .161	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-004	D-39
.063 - .068	n/a	.151 - .161	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-005	D-39
.063 - .068	n/a	.151 - .161	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-006	D-39
.063 - .068	n/a	.151 - .161	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-008	D-39
.063 - .068	n/a	.151 - .161	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-010	D-39
.063 - .068	n/a	.151 - .161	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-012	D-39
.063 - .068	n/a	.151 - .161	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-014	D-39
.063 - .068	n/a	.151 - .161	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9988-016	D-39
.067	#0	.165 - .175	.010	18-8 S/S	n/a	Wave	Round	WAV100SS	D-45
.068	#0	.125	.022 - .028	Steel	Zinc	ANSI Type B	Round	WASB#ONZ	D-19
.068	#0	.125	.022 - .028	18-8 S/S	n/a	ANSI Type B	Round	WASB#ON8	D-19
.068	#0	.125	.022 - .028	316 S/S	n/a	ANSI Type B	Round	WASB#ON316	D-19
.068	#0	.187	.022 - .028	316 S/S	n/a	ANSI Type B	Round	WASB#OR316	D-20
.068	#0	.188	.022 - .028	Steel	Zinc	ANSI Type B	Round	WASB#ORZ	D-20
.068	#0	.188	.022 - .028	18-8 S/S	n/a	ANSI Type B	Round	WASB#OR8	D-20
.068	#0	.250	.022 - .028	Steel	Zinc	ANSI Type B	Round	WASB#OWZ	D-20
.068	#0	.250	.022 - .028	18-8 S/S	n/a	ANSI Type B	Round	WASB#OW8	D-20
.068	#0	.250	.022 - .028	316 S/S	n/a	ANSI Type B	Round	WASB#OW316	D-20
.078	#1	.156	.019	18-8 S/S	n/a	Flat Washer	Round	Z9151	D-2
.078	#1	.156	.019	Brass	n/a	Flat Washer	Round	Z9151BR	D-4
.078	#1	.156	.019	Steel	n/a	Flat Washer	Round	Z9151STL	D-3
.078	#1	.188	.016 - .025	18-8 S/S	n/a	Mil Spec	Round	MS15795-801	D-16
.079 - .084	5/64	.159 - .169	.001	316 S/S	n/a	Shims for Shafts	Round	Z9701-316	D-39

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.079 -.084	n/a	.159 -.169	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9701	D-39
.079 -.084	n/a	.159 -.169	.001	Brass	n/a	Shims for Shafts	Round	Z9701-BR	D-39
.079 -.084	5/64	.159 -.169	.002	316 S/S	n/a	Shims for Shafts	Round	Z9702-316	D-39
.079 -.084	n/a	.159 -.169	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9702	D-39
.079 -.084	n/a	.159 -.169	.002	Brass	n/a	Shims for Shafts	Round	Z9702-BR	D-39
.079 -.084	5/64	.159 -.169	.003	316 S/S	n/a	Shims for Shafts	Round	Z9703-316	D-39
.079 -.084	n/a	.159 -.169	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9703	D-39
.079 -.084	n/a	.159 -.169	.003	Brass	n/a	Shims for Shafts	Round	Z9703-BR	D-39
.079 -.084	5/64	.159 -.169	.004	316 S/S	n/a	Shims for Shafts	Round	Z9704-316	D-39
.079 -.084	n/a	.159 -.169	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9704	D-39
.079 -.084	n/a	.159 -.169	.004	Brass	n/a	Shims for Shafts	Round	Z9704-BR	D-39
.079 -.084	n/a	.159 -.169	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9705	D-39
.079 -.084	n/a	.159 -.169	.005	316 S/S	n/a	Shims for Shafts	Round	Z9705-316	D-39
.079 -.084	n/a	.159 -.169	.005	Brass	n/a	Shims for Shafts	Round	Z9705-BR	D-39
.079 -.084	n/a	.159 -.169	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9706	D-39
.079 -.084	n/a	.159 -.169	.006	316 S/S	n/a	Shims for Shafts	Round	Z9706-316	D-39
.079 -.084	n/a	.159 -.169	.006	Brass	n/a	Shims for Shafts	Round	Z9706-BR	D-39
.079 -.084	n/a	.159 -.169	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9708	D-39
.079 -.084	n/a	.159 -.169	.008	316 S/S	n/a	Shims for Shafts	Round	Z9708-316	D-39
.079 -.084	n/a	.159 -.169	.008	Brass	n/a	Shims for Shafts	Round	Z9708-BR	D-39
.079 -.084	n/a	.159 -.169	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9710	D-39
.079 -.084	n/a	.159 -.169	.010	316 S/S	n/a	Shims for Shafts	Round	Z9710-316	D-39
.079 -.084	n/a	.159 -.169	.010	Brass	n/a	Shims for Shafts	Round	Z9710-BR	D-39
.079 -.084	n/a	.159 -.169	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9712	D-39
.079 -.084	n/a	.159 -.169	.012	316 S/S	n/a	Shims for Shafts	Round	Z9712-316	D-39
.079 -.084	n/a	.159 -.169	.012	Brass	n/a	Shims for Shafts	Round	Z9712-BR	D-39
.079 -.084	n/a	.159 -.169	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9714	D-39
.079 -.084	n/a	.159 -.169	.015	316 S/S	n/a	Shims for Shafts	Round	Z9714-316	D-39
.079 -.084	n/a	.159 -.169	.015	Brass	n/a	Shims for Shafts	Round	Z9714-BR	D-39
.079 -.084	n/a	.159 -.169	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9716	D-39
.079 -.084	n/a	.159 -.169	.016	316 S/S	n/a	Shims for Shafts	Round	Z9716-316	D-39
.079 -.084	n/a	.159 -.169	.016	Brass	n/a	Shims for Shafts	Round	Z9716-BR	D-39
.084	#1	.156	.022 -.028	Steel	Zinc	ANSI Type B	Round	WASB#1NZ	D-19
.084	#1	.156	.022 -.028	18-8 S/S	n/a	ANSI Type B	Round	WASB#1N8	D-19
.084	#1	.156	.022 -.028	316 S/S	n/a	ANSI Type B	Round	WASB#1N316	D-19
.084	#1	.219	.022 -.028	Steel	Zinc	ANSI Type B	Round	WASB#1RZ	D-20
.084	#1	.219	.022 -.028	18-8 S/S	n/a	ANSI Type B	Round	WASB#1R8	D-20
.084	#1	.219	.022 -.028	316 S/S	n/a	ANSI Type B	Round	WASB#1R316	D-20
.084	#1	.281	.022 -.028	Steel	Zinc	ANSI Type B	Round	WASB#1WZ	D-20
.084	#1	.281	.022 -.028	18-8 S/S	n/a	ANSI Type B	Round	WASB#1W8	D-20
.084	#1	.219	.028 -.036	316 S/S	n/a	ANSI Type B	Round	WASB#1W316	D-20
.088 -.093	3/64 x 5/32	.148 -.153	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9880-3	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.003	Brass	n/a	Shims for Bearing	Round	Z9880-3-BR	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9880-5	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.005	316 S/S	n/a	Shims for Bearing	Round	Z9880-5-316	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.005	Brass	n/a	Shims for Bearing	Round	Z9880-5-BR	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9880-7	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.007	316 S/S	n/a	Shims for Bearing	Round	Z9880-7-316	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.007	Brass	n/a	Shims for Bearing	Round	Z9880-7-BR	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9880-10	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.010	316 S/S	n/a	Shims for Bearing	Round	Z9880-10-316	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.010	Brass	n/a	Shims for Bearing	Round	Z9880-10-BR	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9880-20	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.020	316 S/S	n/a	Shims for Bearing	Round	Z9880-20-316	D-42
.088 -.093	3/64 x 5/32	.148 -.153	.020	Brass	n/a	Shims for Bearing	Round	Z9880-20-BR	D-42

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.089	#2	.149	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C2	D-15
.091	#2	.125 - .135	.004	18-8 S/S	n/a	Wave	Round	WAV102SS	D-45
.093 - .098	n/a	.198 - .208	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9719	D-39
.093 - .098	n/a	.198 - .208	.001	Brass	n/a	Shims for Shafts	Round	Z9719-BR	D-39
.093 - .098	n/a	.198 - .208	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9720	D-39
.093 - .098	n/a	.198 - .208	.002	Brass	n/a	Shims for Shafts	Round	Z9720-BR	D-39
.093 - .098	n/a	.198 - .208	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9721	D-39
.093 - .098	n/a	.198 - .208	.003	Brass	n/a	Shims for Shafts	Round	Z9721-BR	D-39
.093 - .098	n/a	.198 - .208	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9722	D-39
.093 - .098	n/a	.198 - .208	.004	Brass	n/a	Shims for Shafts	Round	Z9722-BR	D-39
.093 - .098	n/a	.198 - .208	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9723	D-39
.093 - .098	n/a	.198 - .208	.005	316 S/S	n/a	Shims for Shafts	Round	Z9723-316	D-39
.093 - .098	n/a	.198 - .208	.005	Brass	n/a	Shims for Shafts	Round	Z9723-BR	D-39
.093 - .098	n/a	.198 - .208	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9724	D-39
.093 - .098	n/a	.198 - .208	.006	316 S/S	n/a	Shims for Shafts	Round	Z9724-316	D-39
.093 - .098	n/a	.198 - .208	.006	Brass	n/a	Shims for Shafts	Round	Z9724-BR	D-39
.093 - .098	n/a	.198 - .208	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9728	D-39
.093 - .098	n/a	.198 - .208	.008	316 S/S	n/a	Shims for Shafts	Round	Z9728-316	D-39
.093 - .098	n/a	.198 - .208	.008	Brass	n/a	Shims for Shafts	Round	Z9728-BR	D-39
.093 - .098	n/a	.198 - .208	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9730	D-39
.093 - .098	n/a	.198 - .208	.010	316 S/S	n/a	Shims for Shafts	Round	Z9730-316	D-39
.093 - .098	n/a	.198 - .208	.010	Brass	n/a	Shims for Shafts	Round	Z9730-BR	D-39
.093 - .098	n/a	.198 - .208	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9732	D-39
.093 - .098	n/a	.198 - .208	.012	316 S/S	n/a	Shims for Shafts	Round	Z9732-316	D-39
.093 - .098	n/a	.198 - .208	.012	Brass	n/a	Shims for Shafts	Round	Z9732-BR	D-39
.093 - .098	n/a	.198 - .208	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9734	D-39
.093 - .098	n/a	.198 - .208	.015	316 S/S	n/a	Shims for Shafts	Round	Z9734-316	D-39
.093 - .098	n/a	.198 - .208	.015	Brass	n/a	Shims for Shafts	Round	Z9734-BR	D-39
.093 - .098	n/a	.198 - .208	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9736	D-39
.093 - .098	n/a	.198 - .208	.016	316 S/S	n/a	Shims for Shafts	Round	Z9736-316	D-39
.093 - .098	n/a	.198 - .208	.016	Brass	n/a	Shims for Shafts	Round	Z9736-BR	D-39
.094	#2	.250	.016	Fiberglass	n/a	Non-Metal	Round	Z8300	D-21
.094	#2	.187	.028	18-8 S/S	n/a	Flat Washer	Round	Z9152	D-2
.094	#2	.187	.028	Brass	n/a	Flat Washer	Round	Z9152BR	D-4
.094	#2	.187	.028	Steel	n/a	Flat Washer	Round	Z9152STL	D-4
.094	#2	.250	.016 - .025	18-8 S/S	n/a	Mil Spec	Round	MS15795-802	D-16
.094	#2	.187	.022 - .028	Steel	Zinc	ANSI Type B	Round	WASB#2NZ	D-19
.094	#2	.187	.022 - .028	18-8 S/S	n/a	ANSI Type B	Round	WASB#2N8	D-19
.094	#2	.250	.028 - .036	Steel	Zinc	ANSI Type B	Round	WASB#2RZ	D-20
.094	#2	.250	.028 - .036	18-8 S/S	n/a	ANSI Type B	Round	WASB#2R8	D-20
.094	#2	.344	.028 - .036	Steel	Zinc	ANSI Type B	Round	WASB#2WZ	D-20
.094	#2	.344	.028 - .036	18-8 S/S	n/a	ANSI Type B	Round	WASB#2W8	D-20
.094	#2	.250	.012 - .018	Titanium	n/a	SAE Standard	Round	WAS406#2	D-17
.094	#2	.187	.022 - .028	316 S/S	n/a	ANSI Type B	Round	WASB#2N316	D-19
.094	#2	.250	.028 - .036	316 S/S	n/a	ANSI Type B	Round	WASB#2R316	D-20
.094	#2	.344	.028 - .036	316 S/S	n/a	ANSI Type B	Round	WASB#2W316	D-20
.095	#2	.166	.010	18-8 S/S	n/a	Wave	Round	WAV302SS	D-45
.099	#2	.250	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN232R	D-16
.099	#2	.250	.006 - .026	18-8 S/S	n/a	Mil Spec	Round	AN960-C2L	D-15
.099	#2	.250	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C2	D-15
.102	#3	.180	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C3	D-15
.102	#3	.180	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C3L	D-15
.105	#3	.255	.031	Fiberglass	n/a	Non-Metal	Round	Z8302	D-21
.105	#3	.250	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN332R	D-16
.105	#3	.255	.062	Fiberglass	n/a	Non-Metal	Round	Z8304	D-21

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.105	#3	.255	.125	Fiberglass	n/a	Non-Metal	Round	Z8306	D-21
.105	#3	.250	.006 - .026	18-8 S/S	n/a	Mil Spec	Round	AN960-C3L	D-15
.105	#3	.250	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C3	D-15
.108	#3	.247	.031	Nylatron	n/a	Non-Metal	Round	Z8380	D-21
.109	#3	.250	.025 - .040	Titanium	n/a	SAE Standard	Round	WAS406#3	D-17
.115	#4	.209	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C4	D-15
.115	#4	.209	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C4L	D-15
.116	#3	.250	.062	18-8 S/S	n/a	Machined	Round	Z0701SS	D-9
.118	#4	.235 - .245	.008	18-8 S/S	n/a	Wave	Round	WAV104SS	D-45
.120	#4	.220	.031	Nylatron	n/a	Non-Metal	Round	Z8382	D-21
.122	#4	.218	.016	Fiberglass	n/a	Non-Metal	Round	Z8308	D-21
.122	#4	.310	.031	Fiberglass	n/a	Non-Metal	Round	Z8310	D-21
.123 - .128	.055 x 3/16	.173 - .178	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9881-3	D-42
.123 - .128	.055 x 3/16	.173 - .178	.003	Brass	n/a	Shims for Bearing	Round	Z9881-3-BR	D-42
.123 - .128	.055 x 3/16	.173 - .178	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9881-5	D-42
.123 - .128	.055 x 3/16	.173 - .178	.005	316 S/S	n/a	Shims for Bearing	Round	Z9881-5-316	D-42
.123 - .128	.055 x 3/16	.173 - .178	.005	Brass	n/a	Shims for Bearing	Round	Z9881-5-BR	D-42
.123 - .128	.055 x 3/16	.173 - .178	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9881-7	D-42
.123 - .128	.055 x 3/16	.173 - .178	.007	316 S/S	n/a	Shims for Bearing	Round	Z9881-7-316	D-42
.123 - .128	.055 x 3/16	.173 - .178	.007	Brass	n/a	Shims for Bearing	Round	Z9881-7-BR	D-42
.123 - .128	.055 x 3/16	.173 - .178	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9881-10	D-42
.123 - .128	.055 x 3/16	.173 - .178	.010	316 S/S	n/a	Shims for Bearing	Round	Z9881-10-316	D-42
.123 - .128	.055 x 3/16	.173 - .178	.010	Brass	n/a	Shims for Bearing	Round	Z9881-10-BR	D-42
.123 - .128	.055 x 3/16	.173 - .178	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9881-20	D-42
.123 - .128	.055 x 3/16	.173 - .178	.020	316 S/S	n/a	Shims for Bearing	Round	Z9881-20-316	D-42
.123 - .128	.055 x 3/16	.173 - .178	.020	Brass	n/a	Shims for Bearing	Round	Z9881-20-BR	D-42
.125	#4	.245	.005	18-8 S/S	n/a	Wave	Round	WAV304SS	D-45
.125	#4	.312	.032	316 S/S	n/a	Fender	Round	Z0538-316	D-11
.125	#4	.312	.032	18-8 S/S	n/a	Fender	Round	Z0538-188	D-10
.125	#4	.312	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN432R	D-16
.125	#4	.312	.045	Phenolic	n/a	Non-Metal	Round	Z8400	D-21
.125	#4	.317	.062	Fiberglass	n/a	Non-Metal	Round	Z8312	D-21
.125	#4	.250	.063	18-8 S/S	n/a	Flat Washer	Round	Z9154	D-2
.125	#4	.250	.063	Brass	n/a	Flat Washer	Round	Z9154BR	D-4
.125	#4	.250	.063	Steel	n/a	Flat Washer	Round	Z9154STL	D-3
.125	#4	.312	.063	Phenolic	n/a	Non-Metal	Round	Z8402	D-21
.125	#4	.312	.078	Steel	n/a	Flat Washer	Round	Z9085	D-3
.125	#4	.312	.078	Brass	n/a	Flat Washer	Round	Z9085BR	D-4
.125	#4	.312	.078	18-8 S/S	n/a	Flat Washer	Round	Z9085SS	D-2
.125	#4	.312	.078	17-4 S/S	n/a	Flat Washer	Round	Z9085-174	D-4
.125	#4	.312	.006 - .026	18-8 S/S	n/a	Mil Spec	Round	AN960-C4L	D-15
.125	#4	.250	.017 - .028	18-8 S/S	n/a	Mil Spec	Round	MS15795-803	D-16
.125	#4	.312	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C4	D-15
.125	#4	.250	.025 - .040	Titanium	n/a	SAE Standard	Round	WAS406#4	D-17
.125	#4	.312	.025 - .040	18-8 S/S	n/a	SAE Standard	Round	WAS404#4	D-17
.125	#4	.312	.025 - .040	316 S/S	n/a	SAE Standard	Round	WAS405#4	D-17
.125	#4	.250	.028 - .036	Steel	Zinc	ANSI Type B	Round	WASB#4NZ	D-19
.125	#4	.250	.028 - .036	18-8 S/S	n/a	ANSI Type B	Round	WASB#4N8	D-19
.125	#4	.250	.028 - .036	316 S/S	n/a	ANSI Type B	Round	WASB#4N316	D-19
.125	#4	.312	.032 - .040	18-8 S/S	n/a	Mil Spec	Round	MS15795-804	D-16
.125	#4	.375	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#4RZ	D-20
.125	#4	.375	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#4R8	D-20
.125	#4	.375	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#4R316	D-20
.125	#4	.438	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#4WZ	D-20
.125	#4	.438	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#4W8	D-20

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.125	#4	.438	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#4W316	D-20
.125	#4	.438	.084 - .104	18-8 S/S	n/a	Countersunk	Round	Z9972-SS	D-27
.125	#4	.438	.084 - .104	18-8 S/S	n/a	Countersunk	Round	Z9972E-SS	D-27
.125	#4	.438	.084 - .104	316 S/S	n/a	Countersunk	Round	Z9972E-316	D-27
.125	#4	.438	.084 - .104	Steel	Black Ox	Countersunk	Round	Z9972E	D-27
.125	#4	.438	.084 - .104	316 S/S	n/a	Countersunk	Round	Z9972-316	D-27
.125	#4	.438	.084 - .104	Steel	Black Ox	Countersunk	Round	Z9972	D-27
.125 - .130	n/a	.182 - .192	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9741	D-40
.125 - .130	n/a	.182 - .192	.001	Brass	n/a	Shims for Shafts	Round	Z9741-BR	D-40
.125 - .130	n/a	.182 - .192	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9742	D-40
.125 - .130	n/a	.182 - .192	.002	Brass	n/a	Shims for Shafts	Round	Z9742-BR	D-40
.125 - .130	n/a	.182 - .192	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9743	D-40
.125 - .130	n/a	.182 - .192	.003	Brass	n/a	Shims for Shafts	Round	Z9743-BR	D-40
.125 - .130	n/a	.182 - .192	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9744	D-40
.125 - .130	n/a	.182 - .192	.004	Brass	n/a	Shims for Shafts	Round	Z9744-BR	D-40
.125 - .130	n/a	.182 - .192	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9745	D-40
.125 - .130	n/a	.182 - .192	.005	316 S/S	n/a	Shims for Shafts	Round	Z9745-316	D-40
.125 - .130	n/a	.182 - .192	.005	Brass	n/a	Shims for Shafts	Round	Z9745-BR	D-40
.125 - .130	n/a	.182 - .192	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9746	D-40
.125 - .130	n/a	.182 - .192	.006	316 S/S	n/a	Shims for Shafts	Round	Z9746-316	D-40
.125 - .130	n/a	.182 - .192	.006	Brass	n/a	Shims for Shafts	Round	Z9746-BR	D-40
.125 - .130	n/a	.182 - .192	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9748	D-40
.125 - .130	n/a	.182 - .192	.008	316 S/S	n/a	Shims for Shafts	Round	Z9748-316	D-40
.125 - .130	n/a	.182 - .192	.008	Brass	n/a	Shims for Shafts	Round	Z9748-BR	D-40
.125 - .130	n/a	.182 - .192	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9750	D-40
.125 - .130	n/a	.182 - .192	.010	316 S/S	n/a	Shims for Shafts	Round	Z9750-316	D-40
.125 - .130	n/a	.182 - .192	.010	Brass	n/a	Shims for Shafts	Round	Z9750-BR	D-40
.125 - .130	n/a	.182 - .192	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9752	D-40
.125 - .130	n/a	.182 - .192	.012	316 S/S	n/a	Shims for Shafts	Round	Z9752-316	D-40
.125 - .130	n/a	.182 - .192	.012	Brass	n/a	Shims for Shafts	Round	Z9752-BR	D-40
.125 - .130	n/a	.182 - .192	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9754	D-40
.125 - .130	n/a	.182 - .192	.015	316 S/S	n/a	Shims for Shafts	Round	Z9754-316	D-40
.125 - .130	n/a	.182 - .192	.015	Brass	n/a	Shims for Shafts	Round	Z9754-BR	D-40
.125 - .130	n/a	.182 - .192	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9756	D-40
.125 - .130	n/a	.182 - .192	.016	316 S/S	n/a	Shims for Shafts	Round	Z9756-316	D-40
.125 - .130	n/a	.182 - .192	.016	Brass	n/a	Shims for Shafts	Round	Z9756-BR	D-40
.128	#5	.187	.005	18-8 S/S	n/a	Wave	Round	WAV305SS	D-45
.128	#5	.238	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C5	D-15
.128	#5	.238	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C5L	D-15
.130	#5	.240 - .250	.004	18-8 S/S	n/a	Wave	Round	WAV105SS	D-45
.130	#5	.240	.006	18-8 S/S	n/a	Wave	Round	WAV111SS	D-45
.130	#5	.250	.062	4140 Stl	Black Ox	Machined	Round	Z0351	D-9
.135	1/8	.234	.032	Brass	n/a	Peel Away Shims	Round	Z9975	D-35
.140	#5	.438	.042	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN542R	D-16
.140	#6	.625	.024 - .038	Steel	Zinc	Fender	Round	Z0448	D-12
.140	#6	.625	.024 - .038	18-8 S/S	n/a	Fender	Round	Z0448-188	D-10
.140	#6	.625	.024 - .038	316 S/S	n/a	Fender	Round	Z0448-316	D4
.140	#5	.500	.084 - .104	18-8 S/S	n/a	Countersunk	Round	Z9978E-SS	D-27
.140	#5	.500	.084 - .104	316 S/S	n/a	Countersunk	Round	Z9978E-316	D-27
.140	#5	.500	.084 - .104	Steel	Black Ox	Countersunk	Round	Z9978E	D-27
.140	#5	.500	.094 - .114	18-8 S/S	n/a	Countersunk	Round	Z9978-SS	D-27
.140	#5	.500	.094 - .114	316 S/S	n/a	Countersunk	Round	Z9978-316	D-27
.140	#5	.500	.094 - .114	Steel	Black Ox	Countersunk	Round	Z9978	D-27
.142	#6	.312	.031	Nylatron	n/a	Non-Metal	Round	Z8384	D-21
.142	#6	.500	.062	Fiberglass	n/a	Non-Metal	Round	Z8314	D-21

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.143	#6	.265	.005	18-8 S/S	n/a	Wave	Round	WAV106SS	D-45
.143	#6	.265	.007	18-8 S/S	n/a	Wave	Round	WAV112SS	D-45
.143	#6	.267	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C6	D-15
.143	#6	.267	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C6L	D-15
.144	#6	.312	.062	18-8 S/S	n/a	Machined	Round	Z0702SS	D-9
.145	#6	.240	.006	18-8 S/S	n/a	Wave	Round	WAV306SS	D-45
.149	#6	.375	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN632R	D-16
.149	#6	.375	.006 - .026	18-8 S/S	n/a	Mil Spec	Round	AN960-C6L	D-15
.149	#6	.375	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C6	D-15
.153	#6	.375	.045	Phenolic	n/a	Non-Metal	Round	Z8404	D-21
.153	#6	.500	.063	Phenolic	n/a	Non-Metal	Round	Z8406	D-21
.156	#6	.375	.032	18-8 S/S	n/a	Fender	Round	Z0539-188	D-10
.156	#6	.312	.027 - .048	18-8 S/S	n/a	Mil Spec	Round	MS15795-805	D-16
.156	#6	.312	.028 - .036	Steel	Zinc	ANSI Type B	Round	WASB#6NZ	D-19
.156	#6	.312	.028 - .036	18-8 S/S	n/a	ANSI Type B	Round	WASB#6N8	D-19
.156	#6	.312	.028 - .036	316 S/S	n/a	ANSI Type B	Round	WASB#6N316	D-19
.156	#6	.438	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#6RZ	D-20
.156	#6	.438	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#6R8	D-20
.156	#6	.438	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#6R316	D-20
.156	#6	.562	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#6W316	D-20
.156	#6	.375	.036 - .065	18-8 S/S	n/a	Mil Spec	Round	MS15795-806	D-16
.156	#6	.375	.036 - .065	18-8 S/S	n/a	SAE Standard	Round	WAS404#6	D-17
.156	#6	.375	.036 - .065	316 S/S	n/a	SAE Standard	Round	WAS405#6	D-17
.156	#6	.375	.036 - .065	Titanium	n/a	SAE Standard	Round	WAS406#6	D-17
.156	#6	.750	.036 - .065	Steel	Zinc	Fender	Round	Z0480	D-12
.156	#6	.875	.036 - .065	Steel	Zinc	Fender	Round	Z0629	D-12
.156	#6	.561	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#6WZ	D-20
.156	#6	.561	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#6W8	D-20
.156	#6	.562	.040 - .054	Steel	Zinc	Fender	Round	Z0449	D-12
.156	#6	.562	.040 - .054	18-8 S/S	n/a	Fender	Round	Z0449-188	D-10
.156	#6	.562	.040 - .054	316 S/S	n/a	Fender	Round	Z0449-316	D-11
.156	#6	.562	.084 - .104	18-8 S/S	n/a	Countersunk	Round	Z9979E-SS	D-27
.156	#6	.562	.084 - .104	316 S/S	n/a	Countersunk	Round	Z9979E-316	D-27
.156	#6	.562	.084 - .104	Steel	Black Ox	Countersunk	Round	Z9979E	D-27
.156	#6	.562	.097 - .117	18-8 S/S	n/a	Countersunk	Round	Z9979-SS	D-27
.156	#6	.562	.097 - .117	316 S/S	n/a	Countersunk	Round	Z9979-316	D-27
.156	#6	.562	.097 - .117	Stl Cased	Black Ox	Countersunk	Round	Z9979	D-27
.156	#6	.312	.063	18-8 S/S	n/a	Flat Washer	Round	Z9156	D-2
.156	#6	.312	.063	Brass	n/a	Flat Washer	Round	Z9156BR	D-4
.156	#6	.312	.063	Steel	n/a	Flat Washer	Round	Z9156STL	D-3
.156	#6	.375	.078	Steel	n/a	Flat Washer	Round	Z9086	D-3
.156	#6	.375	.078	Brass	n/a	Flat Washer	Round	Z9086BR	D-4
.156	#6	.375	.078	18-8 S/S	n/a	Flat Washer	Round	Z9086SS	D-2
.156	#6	.375	.078	17-4 S/S	n/a	Flat Washer	Round	Z9086-174	D-4
.160	#8	.280	.006	18-8 S/S	n/a	Wave	Round	WAV108SS	D-45
.167 - .172	5/64 x 1/4	.243 - .248	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9882-3	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.003	Brass	n/a	Shims for Bearing	Round	Z9882-3-BR	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9882-5	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.005	316 S/S	n/a	Shims for Bearing	Round	Z9882-5-316	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.005	Brass	n/a	Shims for Bearing	Round	Z9882-5-BR	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9882-7	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.007	316 S/S	n/a	Shims for Bearing	Round	Z9882-7-316	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.007	Brass	n/a	Shims for Bearing	Round	Z9882-7-BR	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9882-10	D-42

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.167 - .172	5/64 x 1/4	.243 - .248	.010	316 S/S	n/a	Shims for Bearing	Round	Z9882-10-316	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.010	Brass	n/a	Shims for Bearing	Round	Z9882-10-BR	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9882-20	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.020	316 S/S	n/a	Shims for Bearing	Round	Z9882-20-316	D-42
.167 - .172	5/64 x 1/4	.243 - .248	.020	Brass	n/a	Shims for Bearing	Round	Z9882-20-BR	D-42
.169	#8	.317	.008	18-8 S/S	n/a	Wave	Round	WAV113SS	D-45
.169	#8	.375	.062	18-8 S/S	n/a	Machined	Round	Z0703SS	D-9
.169	#8	.304	.014 - .018	18-8 S/S	n/a	Mil Spec	Round	NAS620-C8	D-15
.169	#8	.304	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C8L	D-15
.171 - .182	1/4	.239 - .243	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9888-005	D-37
.171 - .182	1/4	.239 - .243	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9888-016	D-37
.171 - .182	1/4	.239 - .243	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9888-032	D-37
.172	#8	.375	.063	18-8 S/S	n/a	Flat Washer	Round	Z9158	D-2
.172	#8	.375	.063	Brass	n/a	Flat Washer	Round	Z9158BR	D-4
.172	#8	.375	.063	Steel	n/a	Flat Washer	Round	Z9158STL	D-3
.172	#8	.375	.032	316 S/S	n/a	Fender	Round	Z0540-316	D-11
.172	#8	.375	.032	18-8 S/S	n/a	Fender	Round	Z0540-188	D-10
.172	#8	.750	.033 - .047	Steel	Zinc	Fender	Round	Z0450	D-12
.172	#8	.750	.033 - .047	18-8 S/S	n/a	Fender	Round	Z0450-188	D-10
.172	#8	.750	.033 - .047	316 S/S	n/a	Fender	Round	Z0450-316	D-11
.173	#8	.375	.031	Nylatron	n/a	Non-Metal	Round	Z8386	D-21
.174	#8	.375	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-CN832R	D-16
.174	#8	.375	.006 - .026	18-8 S/S	n/a	Mil Spec	Round	AN960-C8L	D-15
.174	#8	.375	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C8	D-15
.175	#8	.380	.031	Fiberglass	n/a	Non-Metal	Round	Z8316	D-21
.177	#8	.500	.062	Phenolic	n/a	Non-Metal	Round	Z8408	D-21
.178	#8	.562	.062	Fiberglass	n/a	Non-Metal	Round	Z8318	D-21
.187	#8	.375	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#8N316	D-19
.187	#8	.500	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#8R316	D-20
.187	#8	.625	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB#8W316	D-20
.188	#8	.437	.078	Steel	n/a	Flat Washer	Round	Z9087	D-3
.188	#8	.437	.078	Brass	n/a	Flat Washer	Round	Z9087BR	D-3
.188	#8	.437	.078	18-8 S/S	n/a	Flat Washer	Round	Z9087SS	D-2
.188	#8	.437	.078	17-4 S/S	n/a	Flat Washer	Round	Z9087-174	D-4
.188	#8	.437	.078	18-8 S/S	n/a	Flat Washer	Round	Z9160	D-2
.188	#8	.437	.078	Brass	n/a	Flat Washer	Round	Z9160BR	D-4
.188	#8	.437	.078	Steel	n/a	Flat Washer	Round	Z9160STL	D-3
.188	#8	.750	.125	Stl Cased	Black Ox	Countersunk	Round	Z9930	D-27
.188	#8	.750	.125	316 S/S	n/a	Countersunk	Round	Z9930-316	D-27
.188	#8	.750	.125	18-8 S/S	n/a	Countersunk	Round	Z9930SS	D-27
.188	#8	1.000	.125	Stl Cased	Black Ox	Countersunk	Round	Z9931	D-27
.188	#8	1.000	.125	18-8 S/S	n/a	Countersunk	Round	Z9931SS	D-27
.188	#8	1.000	.125	316 S/S	n/a	Countersunk	Round	Z9931-316	D-27
.188	#8	.375	.036 - .065	18-8 S/S	n/a	Mil Spec	Round	MS15795-807	D-16
.188	#8	.438	.036 - .065	18-8 S/S	n/a	Mil Spec	Round	MS15795-841	D-16
.188	#8	.438	.036 - .065	18-8 S/S	n/a	SAE Standard	Round	WAS404#8	D-17
.188	#8	.438	.036 - .065	316 S/S	n/a	SAE Standard	Round	WAS405#8	D-17
.188	#8	1.000	.036 - .065	Steel	Zinc	Fender	Round	Z0481	D-12
.188	#8	.375	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#8NZ	D-19
.188	#8	.375	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#8N8	D-19
.188	#8	.500	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#8RZ	D-20
.188	#8	.500	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#8R8	D-20
.188	#8	.625	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB#8WZ	D-20
.188	#8	.625	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB#8W8	D-20
.188	#8	.438	.036 - .065	Titanium	n/a	SAE Standard	Round	WAS406#8	D-17

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.188	#8	.750	.043 - .057	Steel	Zinc	Fender	Round	Z0451	D-12
.188	#8	.750	.043 - .057	18-8 S/S	n/a	Fender	Round	Z0451-188	D-10
.188	#8	.750	.043 - .057	316 S/S	n/a	Fender	Round	Z0451-316	D-11
.188	#8	.750	.115 - .135	18-8 S/S	n/a	Countersunk	Round	Z9930E-SS	D-27
.188	#8	.750	.115 - .135	316 S/S	n/a	Countersunk	Round	Z9930E-316	D-27
.188	#8	.750	.115 - .135	Steel	Black Ox	Countersunk	Round	Z9930E	D-27
.188	#8	1.000	.115 - .135	18-8 S/S	n/a	Countersunk	Round	Z9931E-SS	D-27
.188	#8	1.000	.115 - .135	316 S/S	n/a	Countersunk	Round	Z9931E-316	D-27
.188	#8	1.000	.115 - .135	Steel	Black Ox	Countersunk	Round	Z9931E	D-27
.188 - .193	n/a	.245 - .255	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9761	D-40
.188 - .193	n/a	.245 - .255	.001	Brass	n/a	Shims for Shafts	Round	Z9761-BR	D-40
.188 - .193	n/a	.245 - .255	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9762	D-40
.188 - .193	n/a	.245 - .255	.002	Brass	n/a	Shims for Shafts	Round	Z9762-BR	D-40
.188 - .193	n/a	.245 - .255	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9763	D-40
.188 - .193	n/a	.245 - .255	.003	Brass	n/a	Shims for Shafts	Round	Z9763-BR	D-40
.188 - .193	n/a	.245 - .255	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9764	D-40
.188 - .193	n/a	.245 - .255	.004	Brass	n/a	Shims for Shafts	Round	Z9764-BR	D-40
.188 - .193	n/a	.245 - .255	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9765	D-40
.188 - .193	n/a	.245 - .255	.005	316 S/S	n/a	Shims for Shafts	Round	Z9765-316	D-40
.188 - .193	n/a	.245 - .255	.005	Brass	n/a	Shims for Shafts	Round	Z9765-BR	D-40
.188 - .193	n/a	.245 - .255	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9766	D-40
.188 - .193	n/a	.245 - .255	.006	316 S/S	n/a	Shims for Shafts	Round	Z9766-316	D-40
.188 - .193	n/a	.245 - .255	.006	Brass	n/a	Shims for Shafts	Round	Z9766-BR	D-40
.188 - .193	n/a	.245 - .255	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9768	D-40
.188 - .193	n/a	.245 - .255	.008	316 S/S	n/a	Shims for Shafts	Round	Z9768-316	D-40
.188 - .193	n/a	.245 - .255	.008	Brass	n/a	Shims for Shafts	Round	Z9768-BR	D-40
.188 - .193	n/a	.245 - .255	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9770	D-40
.188 - .193	n/a	.245 - .255	.010	316 S/S	n/a	Shims for Shafts	Round	Z9770-316	D-40
.188 - .193	n/a	.245 - .255	.010	Brass	n/a	Shims for Shafts	Round	Z9770-BR	D-40
.188 - .193	n/a	.245 - .255	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9772	D-40
.188 - .193	n/a	.245 - .255	.012	316 S/S	n/a	Shims for Shafts	Round	Z9772-316	D-40
.188 - .193	n/a	.245 - .255	.012	Brass	n/a	Shims for Shafts	Round	Z9772-BR	D-40
.188 - .193	n/a	.245 - .255	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9774	D-40
.188 - .193	n/a	.245 - .255	.015	316 S/S	n/a	Shims for Shafts	Round	Z9774-316	D-40
.188 - .193	n/a	.245 - .255	.015	Brass	n/a	Shims for Shafts	Round	Z9774-BR	D-40
.188 - .193	n/a	.245 - .255	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9776	D-40
.188 - .193	n/a	.245 - .255	.016	316 S/S	n/a	Shims for Shafts	Round	Z9776-316	D-40
.188 - .193	n/a	.245 - .255	.016	Brass	n/a	Shims for Shafts	Round	Z9776-BR	D-40
.190	#8	.240	.006	18-8 S/S	n/a	Wave	Round	WAV308SS	D-45
.192	#8	.375	.062	4140 Stl	Black Ox	Machined	Round	Z0352	D-9
.193	3/16	.375	.032	Brass	n/a	Laminated	Round	Z9976	D-35
.195	#10	.365	.009	18-8 S/S	n/a	Wave	Round	WAV114SS	D-45
.195	#10	.297	.010	18-8 S/S	n/a	Wave	Round	WAV110SS	D-45
.195	#10	.354	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C10	D-15
.195	#10	.354	.059 - .067	18-8 S/S	n/a	Mil Spec	Round	NAS620-C10L	D-15
.196	#10	.437	.078	18-8 S/S	n/a	Machined	Round	Z0704SS	D-9
.200	#10	.625	0.125	316 S/S	n/a	Pyramid	Round	ZPYR#10625-316	D-28
.201	#10	.460	.031	Nylatron	n/a	Non-Metal	Round	Z8388	D-21
.202	#10	.632	.063	Phenolic	n/a	Non-Metal	Round	Z8410	D-21
.203	#10	.365	.005	18-8 S/S	n/a	Wave	Round	WAV310SS	D-45
.203	#10	.438	.032	316 S/S	n/a	Fender	Round	Z0541-316	D-11
.203	#10	.438	.032	18-8 S/S	n/a	Fender	Round	Z0541-188	D-10
.203	#10	.438	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0332R	D-16
.203	#10	.443	.062	Fiberglass	n/a	Non-Metal	Round	Z8320	D-21
.203	#10	.438	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0363R	D-16

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.203	#10	.500	.093	Stl Cased	Nickel	Machined	Round	Z9094M	D-9
.203	#10	.500	.093	18-8 S/S	n/a	Machined	Round	Z9094M-SS	D-9
.203	#10	.500	.093	Steel	Plain	Machined	Round	Z9180	D-9
.203	#10	.438	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C10L	D-15
.203	#10	.688	.033 - .047	18-8 S/S	n/a	Fender	Round	Z0453-188	D-10
.203	#10	.688	.033 - .047	316 S/S	n/a	Fender	Round	Z0453-316	D-11
.203	#10	.688	.033 - .047	18-8 S/S	Black Ox	Flat Washer	Round	Z0453-188-BX	D-10
.203	#10	.688	.042 - .052	Steel	Zinc	Fender	Round	Z0453	D-12
.203	#10	.750	.033 - .047	Steel	Zinc	Fender	Round	Z0455	D-12
.203	#10	.750	.033 - .047	18-8 S/S	n/a	Fender	Round	Z0455-188	D-10
.203	#10	.750	.033 - .047	316 S/S	n/a	Fender	Round	Z0455-316	D-11
.203	#10	.500	.033 - .047	Steel	Zinc	Fender	Round	Z0452	D-12
.203	#10	.500	.033 - .047	18-8 S/S	n/a	Fender	Round	Z0452-188	D-10
.203	#10	.500	.033 - .047	316 S/S	n/a	Fender	Round	Z0452-316	D-11
.203	#10	1.000	.033 - .047	Steel	Zinc	Fender	Round	Z0454	D-12
.203	#10	1.000	.033 - .047	18-8 S/S	n/a	Fender	Round	Z0454-188	D-10
.203	#10	1.000	.033 - .047	316 S/S	n/a	Fender	Round	Z0454-316	D-11
.203	#10	.406	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#10NZ	D-19
.203	#10	.406	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#10N8	D-19
.203	#10	.406	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#10N316	D-19
.203	#10	.562	.036 - .045	Steel	Zinc	ANSI Type B	Round	WASB#10RZ	D-20
.203	#10	.562	.036 - .045	18-8 S/S	n/a	ANSI Type B	Round	WASB#10R8	D-20
.203	#10	.562	.036 - .045	316 S/S	n/a	ANSI Type B	Round	WASB#10R316	D-20
.203	#10	.750	.051 - .080	Steel	Zinc	Fender	Round	Z0627	D-12
.203	#8	.750	.051 - .080	Steel	Zinc	Fender	Round	Z0630	D-12
.203	#8	1.250	.051 - .080	Steel	Zinc	Fender	Round	Z0632	D-12
.203	#8	1.000	.051 - .080	Steel	Zinc	Fender	Round	Z0631	D-12
.203	#10	.438	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C10	D-15
.203	#10	.734	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB#10WZ	D-20
.203	#10	.734	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB#10W8	D-20
.203	#10	.734	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB#10W316	D-20
.203	#10	.812	.130 - .151	18-8 S/S	n/a	Countersunk	Round	Z9932E-SS	D-27
.203	#10	.812	.130 - .151	316 S/S	n/a	Countersunk	Round	Z9932E-316	D-27
.203	#10	.812	.130 - .151	Steel	Black Ox	Countersunk	Round	Z9932E	D-27
.203	#10	1.250	.130 - .151	18-8 S/S	n/a	Countersunk	Round	Z9934E-SS	D-27
.203	#10	1.250	.130 - .151	316 S/S	n/a	Countersunk	Round	Z9934E-316	D-27
.203	#10	1.250	.130 - .151	Steel	Black Ox	Countersunk	Round	Z9934E	D-27
.203	#10	.500	.094	Steel	n/a	Flat Washer	Round	Z9094	D-3
.203	#10	.500	.094	Brass	n/a	Flat Washer	Round	Z9094BR	D-4
.203	#10	.500	.094	18-8 S/S	n/a	Flat Washer	Round	Z9094SS	D-2
.203	#10	.500	.094	17-4 S/S	n/a	Flat Washer	Round	Z9094-174	D-4
.203	#10	.500	.094	Soft Stl	Plain	Beveled FW	Round	Z9180-BEV	D-8
.203	#10	.500	.094	Stl Cased	n/a	Beveled FW	Round	Z9180-BEV-H	D-8
.203	#10	.500	.094	Stl Cased	Zinc	Beveled FW	Round	Z9180-BEV-HZN	D-8
.203	#10	.500	.094	18-8 S/S	n/a	Beveled FW	Round	Z9180-BEV-SS	D-8
.203	#10	.812	.141	Stl Cased	Black Ox	Countersunk	Round	Z9932	D-27
.203	#10	.812	.141	316 S/S	n/a	Countersunk	Round	Z9932-316	D-27
.203	#10	.812	.141	18-8 S/S	n/a	Countersunk	Round	Z9932SS	D-27
.203	#10	1.125	.141	Stl Cased	Black Ox	Countersunk	Round	Z9933	D-27
.203	#10	1.125	.141	18-8 S/S	n/a	Countersunk	Round	Z9933SS	D-27
.203	#10	1.250	.141	Stl Cased	Black Ox	Countersunk	Round	Z9934	D-27
.203	#10	1.250	.141	18-8 S/S	n/a	Countersunk	Round	Z9934SS	D-27
.203	#10	1.250	.141	316 S/S	n/a	Countersunk	Round	Z9934-316	D-27
.206 - .211	3/32 x 5/16	.305 - .310	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9883-3	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.003	Brass	n/a	Shims for Bearing	Round	Z9883-3-BR	D-43

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.206 - .211	3/32 x 5/16	.305 - .310	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9883-5	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.005	316 S/S	n/a	Shims for Bearing	Round	Z9883-5-316	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.005	Brass	n/a	Shims for Bearing	Round	Z9883-5-BR	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9883-7	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.007	316 S/S	n/a	Shims for Bearing	Round	Z9883-7-316	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.007	Brass	n/a	Shims for Bearing	Round	Z9883-7-BR	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9883-10	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.010	316 S/S	n/a	Shims for Bearing	Round	Z9883-10-316	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.010	Brass	n/a	Shims for Bearing	Round	Z9883-10-BR	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9883-20	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.020	316 S/S	n/a	Shims for Bearing	Round	Z9883-20-316	D-43
.206 - .211	3/32 x 5/16	.305 - .310	.020	Brass	n/a	Shims for Bearing	Round	Z9883-20-BR	D-43
.219	#10	1.000	.125	18-8 S/S	n/a	Fender-XT	Round	Z9678SS	D-13
.219	#10	1.000	.125	Steel	Zinc	Fender-XT	Round	Z9678	D-12
.219	#10	1.000	.250	Steel	Zinc	Fender-XT	Round	Z9679	D-13
.219	#10	.438	.036 - .065	18-8 S/S	n/a	Mil Spec	Round	MS15795-808	D-16
.219	#10	1.500	.036 - .065	Steel	Zinc	Fender	Round	Z0482	D-12
.219	#10	.500	.036 - .065	18-8 S/S	n/a	Mil Spec	Round	MS15795-842	D-16
.219	#10	.500	.036 - .065	18-8 S/S	n/a	SAE Standard	Round	WAS404#10	D-17
.219	#10	.500	.036 - .065	316 S/S	n/a	SAE Standard	Round	WAS405#10	D-17
.219	#10	.500	.036 - .065	316 H5 S/S	n/a	SAE Standard	Round	WAS407#10	D-17
.219	#10	.500	.036 - .065	Titanium	n/a	SAE Standard	Round	WAS406#10	D-17
.219	#10	1.250	.043 - .057	Steel	Zinc	Fender	Round	Z0456	D-12
.219	#10	1.250	.043 - .057	18-8 S/S	n/a	Fender	Round	Z0456-188	D-10
.219	#10	1.250	.043 - .057	316 S/S	n/a	Fender	Round	Z0456-316	D-11
.219	#10	.750	.063 - .083	Steel	Zinc	Fender	Round	Z0628	D-12
.219	#10	.500	.090 - .108	316 H5 S/S	n/a	SAE Standard	Round	Z9263-316H5	D-17
.234	#11	.625	.055 - .075	18-8 S/S	n/a	Mil Spec	Round	AN960-C11	D-15
.234 - .245	5/16	.301 - .305	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9889-005	D-37
.234 - .245	5/16	.301 - .305	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9889-016	D-37
.234 - .245	5/16	.301 - .305	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9889-030	D-37
.250	1/4	.750	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0595	D-44
.250	#12	.500	.045	316 S/S	n/a	Fender	Round	Z0542-316	D-11
.250	#12	.500	.045	18-8 S/S	n/a	Fender	Round	Z0542-188	D-10
.250	1/4	.750	.063	18-8 S/S	n/a	Shims for D Shafts	Round	Z0596	D-44
.250	1/4	.750	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0597	D-44
.250	#10	.563	.036 - .065	18-8 S/S	n/a	USS Standard	Round	WAS504#10	D-18
.250	#10	.563	.036 - .065	316 S/S	n/a	USS Standard	Round	WAS505#10	D-18
.250	#12	.562	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-809	D-16
.250	#12	.563	.051 - .080	18-8 S/S	n/a	SAE Standard	Round	WAS404#12	D-17
.250	#12	.563	.051 - .080	316 S/S	n/a	SAE Standard	Round	WAS405#12	D-17
.250 - .255	n/a	.375 - .380	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9781	D-40
.250 - .255	n/a	.375 - .380	.001	Brass	n/a	Shims for Shafts	Round	Z9781-BR	D-40
.250 - .255	n/a	.375 - .380	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9782	D-40
.250 - .255	n/a	.375 - .380	.002	Brass	n/a	Shims for Shafts	Round	Z9782-BR	D-40
.250 - .255	n/a	.375 - .380	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9783	D-40
.250 - .255	n/a	.375 - .380	.003	Brass	n/a	Shims for Shafts	Round	Z9783-BR	D-40
.250 - .255	n/a	.375 - .380	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9784	D-40
.250 - .255	n/a	.375 - .380	.004	Brass	n/a	Shims for Shafts	Round	Z9784-BR	D-40
.250 - .255	n/a	.375 - .380	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9785	D-40
.250 - .255	n/a	.375 - .380	.005	316 S/S	n/a	Shims for Shafts	Round	Z9785-316	D-40
.250 - .255	n/a	.375 - .380	.005	Brass	n/a	Shims for Shafts	Round	Z9785-BR	D-40
.250 - .255	n/a	.375 - .380	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9786	D-40
.250 - .255	n/a	.375 - .380	.006	316 S/S	n/a	Shims for Shafts	Round	Z9786-316	D-40
.250 - .255	n/a	.375 - .380	.006	Brass	n/a	Shims for Shafts	Round	Z9786-BR	D-40

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.250 - .255	n/a	.375 - .380	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9788	D-40
.250 - .255	n/a	.375 - .380	.008	316 S/S	n/a	Shims for Shafts	Round	Z9788-316	D-40
.250 - .255	n/a	.375 - .380	.008	Brass	n/a	Shims for Shafts	Round	Z9788-BR	D-40
.250 - .255	n/a	.375 - .380	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9790	D-40
.250 - .255	n/a	.375 - .380	.010	316 S/S	n/a	Shims for Shafts	Round	Z9790-316	D-40
.250 - .255	n/a	.375 - .380	.010	Brass	n/a	Shims for Shafts	Round	Z9790-BR	D-40
.250 - .255	n/a	.375 - .380	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9792	D-40
.250 - .255	n/a	.375 - .380	.012	316 S/S	n/a	Shims for Shafts	Round	Z9792-316	D-40
.250 - .255	n/a	.375 - .380	.012	Brass	n/a	Shims for Shafts	Round	Z9792-BR	D-40
.250 - .255	n/a	.375 - .380	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9794	D-40
.250 - .255	n/a	.375 - .380	.015	316 S/S	n/a	Shims for Shafts	Round	Z9794-316	D-40
.250 - .255	n/a	.375 - .380	.015	Brass	n/a	Shims for Shafts	Round	Z9794-BR	D-40
.250 - .255	n/a	.375 - .380	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9796	D-40
.250 - .255	n/a	.375 - .380	.016	316 S/S	n/a	Shims for Shafts	Round	Z9796-316	D-40
.250 - .255	n/a	.375 - .380	.016	Brass	n/a	Shims for Shafts	Round	Z9796-BR	D-40
.251 - .262	1/4	.373 - .377	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9895-005	D-37
.251 - .262	1/4	.373 - .377	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9895-016	D-37
.251 - .262	1/4	.373 - .377	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9895-030	D-37
.253 - .258	1/8 x 3/8	.363 - .367	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9884-3	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.003	Brass	n/a	Shims for Bearing	Round	Z9884-3-BR	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9884-5	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.005	316 S/S	n/a	Shims for Bearing	Round	Z9884-5-316	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.005	Brass	n/a	Shims for Bearing	Round	Z9884-5-BR	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9884-7	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.007	316 S/S	n/a	Shims for Bearing	Round	Z9884-7-316	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.007	Brass	n/a	Shims for Bearing	Round	Z9884-7-BR	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9884-10	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.010	316 S/S	n/a	Shims for Bearing	Round	Z9884-10-316	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.010	Brass	n/a	Shims for Bearing	Round	Z9884-10-BR	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9884-20	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.020	316 S/S	n/a	Shims for Bearing	Round	Z9884-20-316	D-43
.253 - .258	1/8 x 3/8	.363 - .367	.020	Brass	n/a	Shims for Bearing	Round	Z9884-20-BR	D-43
.255	1/4	.500	.032	Brass	n/a	Peel Away Shims	Round	Z9977	D-35
.255	1/4	.500	.062	4140 Stl	Black Ox	Machined	Round	Z0353	D-9
.255	1/4	.468	.029 - .035	18-8 S/S	n/a	Mil Spec	Round	NAS620-C416L	D-15
.255	1/4	.468	.059 - .067	18-8 S/S	n/a	Mil Spec	Round	NAS620-C416	D-15
.257	3/8	.500	.078	18-8 S/S	n/a	Machined	Round	Z0705SS	D-9
.260	1/4	.485	.011	18-8 S/S	n/a	Wave	Round	WAV115SS	D-45
.262	1/4	.500	.031	Nylatron	n/a	Non-Metal	Round	Z8390	D-21
.265	1/4	.500	.031	Fiberglass	n/a	Non-Metal	Round	Z8322	D-21
.265	1/4	.500	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0432R	D-16
.265	1/4	.500	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0463R	D-16
.265	1/4	.500	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C416L	D-15
.265	1/4	.500	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C416	D-15
.266	1/4	.500	.078	18-8 S/S	n/a	Flat Washer	Round	Z9164	D-2
.266	1/4	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8340	D-34
.266	1/4	.875	.042 - .052	Steel	Zinc	Fender	Round	Z0459	D-12
.266	1/4	.500	.043 - .057	Steel	Zinc	Fender	Round	Z0457	D-12
.266	1/4	.500	.043 - .057	18-8 S/S	n/a	Fender	Round	Z0457-188	D-10
.266	1/4	.500	.043 - .057	316 S/S	n/a	Fender	Round	Z0457-316	D-11
.266	1/4	.563	.056 - .070	Steel	Zinc	Fender	Round	Z0458	D-12
.266	1/4	.563	.056 - .070	18-8 S/S	n/a	Fender	Round	Z0458-188	D-10
.266	1/4	.563	.056 - .070	316 S/S	n/a	Fender	Round	Z0458-316	D-11
.266	1/4	.875	.056 - .070	18-8 S/S	n/a	Fender	Round	Z0459-188	D-10
.266	1/4	.875	.056 - .070	316 S/S	n/a	Fender	Round	Z0459-316	D-11

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.281	1/4	.625	.045	18-8 S/S	n/a	Fender	Round	Z0543-188	D-10
.281	1/4	.625	.050	316 S/S	n/a	Fender	Round	Z0543-316	D-11
.281	1/4	.625	.125	Stl Cased	Nickel	Machined	Round	Z9095M	D-9
.281	1/4	.625	.125	18-8 S/S	n/a	Machined	Round	Z9095M-SS	D-9
.281	1/4	.625	.125	Steel	Plain	Component Thick	Round	Z9181	D-9
.281	1/4	.625	.125	18-8 S/S	n/a	Flat Washer	Round	Z9215	D-2
.281	1/4	.625	.188	Steel	n/a	Flat Washer	Round	Z9200	D-3
.281	1/4	.625	.188	Brass	n/a	Flat Washer	Round	Z9200BR	D-4
.281	1/4	.625	.188	18-8 S/S	n/a	Flat Washer	Round	Z9200SS	D-2
.281	1/4	.625	.188	17-4 S/S	n/a	Flat Washer	Round	Z9200-174	D-4
.281	1/4	1.750	.250	Steel Cased	Black Ox	C Washer	Round	Z9438	D-22
.281	1/4	.625	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-810	D-16
.281	1/4	.625	.051 - .080	18-8 S/S	n/a	SAE Standard	Round	WAS40414	D-17
.281	1/4	.625	.051 - .080	316 S/S	n/a	SAE Standard	Round	WAS40514	D-17
.281	1/4	.625	.051 - .080	316 H5 S/S	n/a	SAE Standard	Round	WAS40714	D-17
.281	1/4	.625	.051 - .080	Titanium	n/a	SAE Standard	Round	WAS40614	D-17
.281	1/4	.500	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB14N316	D-19
.281	1/4	.734	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB14RZ	D-20
.281	1/4	.734	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB14R8	D-20
.281	1/4	.734	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB14R316	D-20
.281	1/4	1.000	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB14W316	D-20
.281	1/4	.500	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB14NZ	D-19
.281	1/4	.500	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB14N8	D-19
.281	1/4	1.250	.271 - .291	18-8 S/S	n/a	Countersunk	Round	Z9935E-SS	D-27
.281	1/4	1.250	.271 - .291	316 S/S	n/a	Countersunk	Round	Z9935E-316	D-27
.281	1/4	1.250	.271 - .291	Steel	Black Ox	Countersunk	Round	Z9935E	D-27
.281	1/4	2.000	.271 - .291	18-8 S/S	n/a	Countersunk	Round	Z9939E-SS	D-27
.281	1/4	2.000	.271 - .291	316 S/S	n/a	Countersunk	Round	Z9939E-316	D-27
.281	1/4	2.000	.271 - .291	Steel	Black Ox	Countersunk	Round	Z9939E	D-27
.281	1/4	1.000	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB14WZ	D-20
.281	1/4	1.000	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB14W8	D-20
.281	1/4	.625	.063	Phenolic	n/a	Non-Metal	Round	Z8412	D-21
.281	1/4	.500	.078	18-8 S/S	n/a	Flat Washer	Round	Z9161	D-2
.281	1/4	.500	.078	Brass	n/a	Flat Washer	Round	Z9161BR	D-4
.281	1/4	.500	.078	Steel	n/a	Flat Washer	Round	Z9161STL	D-3
.281	1/4	.625	.094	Steel	Zinc Yel	Flat Washer	Round	Z9270	D-3
.281	1/4	.625	.094	316 H5 S/S	n/a	Flat Washer	Round	Z9270-316H5	D-4
.281	1/4	.625	.094	18-8 S/S	n/a	Flat Washer	Round	Z9270SS	D-2
.281	3/16 or 1/4	.625	.120	Stl Cased	Black Ox	Spherical	Round	Z9450M	D-24
.281	3/16 or 1/4	.625	.120	316 S/S	n/a	Spherical	Round	Z9450M-316	D-24
.281	3/16 or 1/4	.625	.120	18-8 S/S	n/a	Spherical	Round	Z9450M-SS	D-23
.281	1/4	.625	.125	Steel	n/a	Flat Washer	Round	Z9095	D-3
.281	1/4	.625	.125	Brass	n/a	Flat Washer	Round	Z9095BR	D-4
.281	1/4	.625	.125	18-8 S/S	n/a	Flat Washer	Round	Z9095SS	D-2
.281	1/4	.625	.125	17-4 S/S	n/a	Flat Washer	Round	Z9095-174	D-4
.281	1/4	.625	.125	Soft Stl	Plain	Beveled FW	Round	Z9181-BEV	D-8
.281	1/4	.625	.125	Stl Cased	Plain	Beveled FW	Round	Z9181-BEV-H	D-8
.281	1/4	.625	.125	Stl Cased	Zinc	Beveled FW	Round	Z9181-BEV-HZN	D-8
.281	1/4	.625	.125	18-8 S/S	n/a	Beveled FW	Round	Z9181-BEV-SS	D-8
.281	1/4	1.500	.125	Steel	n/a	Fender-XT	Round	Z9680	D-13
.281	1/4	1.500	.125	18-8 S/S	n/a	Fender-XT	Round	Z9680SS	D-10
.281	1/4	.781	.188	Stl Cased	n/a	Component Thick	Round	Z9200U	D-7
.281	#10-1/4	.750	.250	Stl Cased	Black Ox	Easy On Slotted	Round	Z9420	D-22
.281	#10-1/4	.750	.250	18-8 S/S	n/a	Easy On Slotted	Round	Z9420SS	D-22

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.281	#10-1/4	1.000	.250	Stl Cased	Black Ox	Easy On Slotted	Round	Z9421	D-22
.281	#10-1/4	1.000	.250	18-8 S/S	n/a	Easy On Slotted	Round	Z9421SS	D-22
.281	1/4	1.500	.250	Steel	n/a	Fender-XT	Round	Z9681	D-13
.281	1/4	1.250	.281	Stl Cased	Black Ox	Countersunk	Round	Z9935	D-27
.281	1/4	1.250	.281	18-8 S/S	n/a	Countersunk	Round	Z9935SS	D-27
.281	1/4	1.250	.281	316 S/S	n/a	Countersunk	Round	Z9935-316	D-27
.281	1/4	1.375	.281	Stl Cased	Black Ox	Countersunk	Round	Z9936	D-27
.281	1/4	1.375	.281	18-8 S/S	n/a	Countersunk	Round	Z9936SS	D-27
.281	1/4	1.500	.281	Stl Cased	Black Ox	Countersunk	Round	Z9937	D-27
.281	1/4	1.500	.281	18-8 S/S	n/a	Countersunk	Round	Z9937SS	D-27
.281	1/4	1.750	.281	Stl Cased	Black Ox	Countersunk	Round	Z9938	D-27
.281	1/4	1.750	.281	18-8 S/S	n/a	Countersunk	Round	Z9938SS	D-27
.281	1/4	2.000	.281	Stl Cased	Black Ox	Countersunk	Round	Z9939	D-27
.281	1/4	2.000	.281	18-8 S/S	n/a	Countersunk	Round	Z9939SS	D-27
.281	1/4	2.000	.281	316 S/S	n/a	Countersunk	Round	Z9939-316	D-27
.281	1/4	1.000	.040 - .060	Steel	Zinc	Fender	Round	Z0460	D-12
.281	1/4	1.000	.040 - .060	18-8 S/S	n/a	Fender	Round	Z0460-188	D-10
.281	1/4	1.000	.040 - .060	316 S/S	n/a	Fender	Round	Z0460-316	D-11
.281	1/4	1.250	.040 - .060	Steel	Zinc	Fender	Round	Z0461	D-12
.281	1/4	1.250	.040 - .060	18-8 S/S	n/a	Fender	Round	Z0461-188	D-10
.281	1/4	1.250	.040 - .060	316 S/S	n/a	Fender	Round	Z0461-316	D-11
.281	1/4	1.500	.051 - .080	Steel	Zinc	Fender	Round	Z0633	D-12
.281	1/4	2.500	.051 - .080	Steel	Zinc	Fender	Round	Z0483	D-12
.281	1/4	3.000	.051 - .080	Steel	Zinc	Fender	Round	Z0484	D-12
.281	1/4	1.500	.052 - .072	Steel	Zinc	Fender	Round	Z0462	D-12
.281	1/4	1.500	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0462-188	D-10
.281	1/4	1.500	.052 - .072	316 S/S	n/a	Fender	Round	Z0462-316	D-11
.281	1/4	2.000	.052 - .072	Steel	Zinc	Fender	Round	Z0463	D-12
.281	1/4	2.000	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0463-188	D-10
.281	1/4	2.000	.052 - .072	316 S/S	n/a	Fender	Round	Z0463-316	D-11
.281	1/4	.750	.130 - .150	Stl Cased	Black Ox	Fender	Round	Z9285	D-12
.283	1/4	.750	.125	316 S/S	n/a	Pyramid	Round	ZPYR14750-316	D-28
.289 - .300	3/8	.363 - .367	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9890-005	D-37
.289 - .300	3/8	.363 - .367	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9890-016	D-37
.289 - .300	3/8	.363 - .367	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9890-030	D-37
.313	3/16 or 1/4	.625	.120	Stl Cased	Black Ox	Spherical	Round	Z9450F	D-24
.313	3/16 or 1/4	.625	.120	316 S/S	n/a	Spherical	Round	Z9450F-316	D-24
.313	3/16 or 1/4	.625	.120	18-8 S/S	n/a	Spherical	Round	Z9450F-SS	D-23
.313	1/4	2.000	.250	Steel	Galv.	Square	Square	Z8950G	D-34
.313	1/4	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8950D	D-32
.313	1/4	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8950H	D-32
.313	1/4	2.000	.250	18-8 S/S	n/a	Square	Square	Z8950SS	D-31
.313	1/4	.734	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-811	D-16
.313	1/4	.750	.051 - .080	18-8 S/S	n/a	USS Standard	Round	WAS50414	D-18
.313	1/4	.750	.051 - .080	316 S/S	n/a	USS Standard	Round	WAS50514	D-18
.313	1/4	1.250	.125	Steel	Black Ox	Countersunk	Round	Z9973	D-27
.313	1/4	1.250	.125	18-8 S/S	n/a	Countersunk	Round	Z9973-SS	D-27
.313	1/4	1.250	.125	316 S/S	n/a	Countersunk	Round	Z9973-316	D-27
.313	5/16	1.250	.125	18-8 S/S	n/a	Countersunk	Round	Z9973SS	
.313	1/4	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8926-188	D-31
.313	1/4	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8926-BOX	D-32
.313	1/4	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8926-ZN	D-33
.313	1/4	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8935-188	D-31
.313	1/4	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8935-BOX	D-32

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.313 - .318	n/a	.495 - .505	.001	Brass	n/a	Shims for Shafts	Round	Z9801-BR	D-40
.313 - .318	n/a	.495 - .505	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9801	D-40
.313 - .318	n/a	.495 - .505	.002	Brass	n/a	Shims for Shafts	Round	Z9802-BR	D-40
.313 - .318	n/a	.495 - .505	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9802	D-40
.313 - .318	n/a	.495 - .505	.003	Brass	n/a	Shims for Shafts	Round	Z9803-BR	D-40
.313 - .318	n/a	.495 - .505	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9803	D-40
.313 - .318	n/a	.495 - .505	.004	Brass	n/a	Shims for Shafts	Round	Z9804-BR	D-40
.313 - .318	n/a	.495 - .505	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9804	D-40
.313 - .318	n/a	.495 - .505	.005	316 S/S	n/a	Shims for Shafts	Round	Z9805-316	D-41
.313 - .318	n/a	.495 - .505	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9805	D-41
.313 - .318	n/a	.495 - .505	.005	Brass	n/a	Shims for Shafts	Round	Z9805-BR	D-41
.313 - .318	n/a	.495 - .505	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9806	D-41
.313 - .318	n/a	.495 - .505	.006	Brass	n/a	Shims for Shafts	Round	Z9806-BR	D-41
.313 - .318	n/a	.495 - .505	.006	316 S/S	n/a	Shims for Shafts	Round	Z9806-316	D-41
.313 - .318	n/a	.495 - .505	.008	316 S/S	n/a	Shims for Shafts	Round	Z9808-316	D-41
.313 - .318	n/a	.495 - .505	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9808	D-41
.313 - .318	n/a	.495 - .505	.008	Brass	n/a	Shims for Shafts	Round	Z9808-BR	D-41
.313 - .318	5/16	.495 - .505	.009	Brass	n/a	Shims for Shafts	Round	Z9809-BR	D-41
.313 - .318	n/a	.495 - .505	.009	18-8 S/S	n/a	Shims for Shafts	Round	Z9809	D-41
.313 - .318	n/a	.495 - .505	.010	316 S/S	n/a	Shims for Shafts	Round	Z9810-316	D-41
.313 - .318	n/a	.495 - .505	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9810	D-41
.313 - .318	n/a	.495 - .505	.010	Brass	n/a	Shims for Shafts	Round	Z9810-BR	D-41
.313 - .318	n/a	.495 - .505	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9812	D-41
.313 - .318	n/a	.495 - .505	.012	Brass	n/a	Shims for Shafts	Round	Z9812-BR	D-41
.313 - .318	n/a	.495 - .505	.012	316 S/S	n/a	Shims for Shafts	Round	Z9812-316	D-41
.313 - .318	n/a	.495 - .505	.015	316 S/S	n/a	Shims for Shafts	Round	Z9814-316	D-41
.313 - .318	n/a	.495 - .505	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9814	D-41
.313 - .318	n/a	.495 - .505	.015	Brass	n/a	Shims for Shafts	Round	Z9814-BR	D-41
.313 - .318	n/a	.495 - .505	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9816	D-41
.313 - .318	n/a	.495 - .505	.016	Brass	n/a	Shims for Shafts	Round	Z9816-BR	D-41
.313 - .318	n/a	.495 - .505	.016	316 S/S	n/a	Shims for Shafts	Round	Z9816-316	D-41
.314	5/16	.562	.062	Fiberglass	n/a	Non-Metal	Round	Z8324	D-21
.314 - .325	5/16	.436 - .440	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9896-005	D-37
.314 - .325	5/16	.436 - .440	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9896-016	D-37
.314 - .325	5/16	.436 - .440	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9896-030	D-37
.318	5/16	.625	.093	4140 Stl	Black Ox	Machined	Round	Z0354	D-9
.322	5/16	0.607	.013	18-8 S/S	n/a	Wave	Round	WAV116SS	D-45
.322	5/16	.562	.031	Nylatron	n/a	Non-Metal	Round	Z8392	D-21
.322	5/16	.625	.093	18-8 S/S	n/a	Machined	Round	Z0706SS	D-9
.328	5/16	.562	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0532R	D-16
.328	5/16	.562	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0563R	D-16
.328	5/16	.569	.063	Phenolic	n/a	Non-Metal	Round	Z8414	D-21
.328	5/16	.562	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C516L	D-15
.328	5/16	.562	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C516	D-15
.328	5/16	.625	.056 - .070	Steel	Zinc	Fender	Round	Z0464	D-11
.328	5/16	.625	.056 - .070	18-8 S/S	n/a	Fender	Round	Z0464-188	D-10
.328	5/16	.625	.056 - .070	316 S/S	n/a	Fender	Round	Z0464-316	D-11
.343	5/16	.750	.188	Steel	n/a	Flat Washer	Round	Z9201	D-3
.343	5/16	.750	.188	Brass	n/a	Flat Washer	Round	Z9201BR	D-4
.343	5/16	.750	.188	18-8 S/S	n/a	Flat Washer	Round	Z9201SS	D-2
.344	5/16	.625	.094	18-8 S/S	n/a	Flat Washer	Round	Z9162	D-2
.344	5/16	.625	.094	Brass	n/a	Flat Washer	Round	Z9162BR	D-4
.344	5/16	.625	.094	Steel	n/a	Flat Washer	Round	Z9162STL	D-3
.344	5/16	.687	.094	316 H5 S/S	n/a	Flat Washer	Round	Z9271-316H5	D-4
.344	5/16	.687	.100	18-8 S/S	n/a	Flat Washer	Round	Z9130	D-2

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.344	5/16	.687	.125	18-8 S/S	n/a	Flat Washer	Round	Z9216	D-2
.344	5/16	.687	.125	Brass	n/a	Flat Washer	Round	Z9216BR	D-4
.344	5/16	.687	.125	Steel	n/a	Flat Washer	Round	Z9216STL	D-3
.344	5/16	.687	.125	Steel	Zinc Yel	Flat Washer	Round	Z9271	D-3
.344	5/16	.687	.125	18-8 S/S	n/a	Flat Washer	Round	Z9271SS	D-2
.344	5/16	.750	.125	Steel	n/a	Flat Washer	Round	Z9096	D-3
.344	5/16	.750	.125	Brass	n/a	Flat Washer	Round	Z9096BR	D-4
.344	5/16	.750	.125	18-8 S/S	n/a	Flat Washer	Round	Z9096SS	D-2
.344	5/16	.750	.125	18-8 S/S	n/a	Flat Washer	Round	Z9096-174	D-4
.344	5/16	.750	.125	Stl Cased	Nickel	Machined	Round	Z9096M	D-9
.344	5/16	.750	.125	18-8 S/S	n/a	Machined	Round	Z9096M-SS	D-9
.344	5/16	.750	.125	Steel	Plain	Component Thick	Round	Z9182	D-9
.344	5/16	.750	.125	Soft Stl	Plain	Beveled FW	Round	Z9182-BEV	D-8
.344	5/16	.750	.125	Stl Cased	Plain	Beveled FW	Round	Z9182-BEV-H	D-8
.344	5/16	.750	.125	Stl Cased	Zinc	Beveled FW	Round	Z9182-BEV-HZN	D-8
.344	5/16	.750	.125	18-8 S/S	n/a	Beveled FW	Round	Z9182-BEV-SS	D-8
.344	5/16	2.000	.125	Steel	n/a	Fender-XT	Round	Z9682	D-13
.344	5/16	2.000	.125	18-8 S/S	n/a	Fender-XT	Round	Z9682SS	D-13
.344	5/16	.828	.188	Stl Cased	n/a	Component Thick	Round	Z9201U	D-7
.344	5/16	2.000	.250	Steel	n/a	Fender-XT	Round	Z9683	D-13
.344	5/16	2.000	.250	18-8 S/S	n/a	Fender-XT	Round	Z9683SS	D-13
.344	5/16	1.250	.313	Stl Cased	Black Ox	Easy On Slotted	Round	Z9422	D-22
.344	5/16	1.250	.313	18-8 S/S	n/a	Easy On Slotted	Round	Z9422SS	D-22
.344	5/16	1.250	.040 - .060	Steel	Zinc	Fender	Round	Z0465	D-12
.344	5/16	1.250	.040 - .060	18-8 S/S	n/a	Fender	Round	Z0465-188	D-10
.344	5/16	1.250	.040 - .060	18-8 S/S	Black Ox	Fender	Round	Z0465-188-BOX	D-10
.344	5/16	1.250	.040 - .060	316 S/S	n/a	Fender	Round	Z0465-316	D-11
.344	5/16	.688	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-812	D-16
.344	5/16	.688	.051 - .080	18-8 S/S	n/a	SAE Standard	Round	WAS40451	D-17
.344	5/16	.688	.051 - .080	316 S/S	n/a	SAE Standard	Round	WAS40551	D-17
.344	5/16	1.500	.051 - .080	Steel	Zinc	Fender	Round	Z0635	D-12
.344	5/16	1.625	.051 - .080	Steel	Zinc	Fender	Round	Z0634	D-12
.344	5/16	2.000	.051 - .080	Steel	Zinc	Fender	Round	Z0636	D-12
.344	5/16	2.500	.051 - .080	Steel	Zinc	Fender	Round	Z0485	D-12
.344	5/16	3.000	.051 - .080	Steel	Zinc	Fender	Round	Z0486	D-12
.344	5/16	1.500	.052 - .072	Steel	Zinc	Fender	Round	Z0466	D-12
.344	5/16	1.500	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0466-188	D-10
.344	5/16	1.500	.052 - .072	316 S/S	n/a	Fender	Round	Z0466-316	D-11
.344	5/16	2.000	.052 - .072	Steel	Zinc	Fender	Round	Z0467	D-12
.344	5/16	2.000	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0467-188	D-10
.344	5/16	2.000	.052 - .072	18-8 S/S	Black Ox	Fender	Round	Z0467-188-BOX	D-10
.344	5/16	2.000	.052 - .072	316 S/S	n/a	Fender	Round	Z0467-316	D-11
.344	5/16	.875	.056 - .070	Steel	Zinc	ANSI Type B	Round	WASB51RZ	D-20
.344	5/16	.875	.056 - .070	18-8 S/S	n/a	ANSI Type B	Round	WASB51R8	D-20
.344	5/16	1.125	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB51WZ	D-20
.344	5/16	1.125	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB51W316	D-20
.344	5/16	1.125	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB51W8	D-20
.344	5/16	.625	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB51NZ	D-19
.344	5/16	.625	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB51N8	D-19
.344	5/16	.875	.130 - .150	Stl Cased	Black Ox	Fender	Round	Z9286	D-12
.344	5/16	.750	.050	316 S/S	n/a	Fender	Round	Z0544-316	D-11
.344	5/16	.750	.050	18-8 S/S	n/a	Fender	Round	Z0544-188	D-10
.344	5/16	.750	.188	17-4 S/S	n/a	Flat Washer	Round	Z9201-174	D-4
.344	5/16	.688	.051 - .080	Titanium	n/a	SAE Standard	Round	WAS40651	D-17
.344	5/16	.688	.051 - .080	316 H5 S/S	n/a	SAE Standard	Round	WAS40751	D-17

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.344	5/16	.625	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB51N316	D-19
.344	5/16	.875	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB51R316	D-20
.352 - .363	1/2	.489 - .493	.004 - .005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9891-005	D-37
.352 - .363	1/2	.489 - .493	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9891-016	D-37
.352 - .363	1/2	.489 - .493	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9891-030	D-37
.375	3/8	1.000	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0560	D-44
.375	3/8	1.000	.063	18-8 S/S	n/a	Shims for D Shafts	Round	Z0561	D-44
.375	3/8	1.000	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0562	D-44
.375	5/16	.875	.064 - .104	18-8 S/S	n/a	Mil Spec	Round	MS15795-813	D-16
.375	5/16	.875	.064 - .104	18-8 S/S	n/a	USS Standard	Round	WAS50451	D-18
.375	5/16	.875	.064 - .104	316 S/S	n/a	USS Standard	Round	WAS50551	D-18
.375 - .380	n/a	.557 - .567	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9821	D-41
.375 - .380	n/a	.557 - .567	.001	Brass	n/a	Shims for Shafts	Round	Z9821-BR	D-41
.375 - .380	n/a	.557 - .567	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9822	D-41
.375 - .380	n/a	.557 - .567	.002	Brass	n/a	Shims for Shafts	Round	Z9822-BR	D-41
.375 - .380	n/a	.557 - .567	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9823	D-41
.375 - .380	n/a	.557 - .567	.003	Brass	n/a	Shims for Shafts	Round	Z9823-BR	D-41
.375 - .380	n/a	.557 - .567	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9824	D-41
.375 - .380	n/a	.557 - .567	.004	Brass	n/a	Shims for Shafts	Round	Z9824-BR	D-41
.375 - .380	n/a	.557 - .567	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9825	D-41
.375 - .380	n/a	.557 - .567	.005	316 S/S	n/a	Shims for Shafts	Round	Z9825-316	D-41
.375 - .380	n/a	.557 - .567	.005	Brass	n/a	Shims for Shafts	Round	Z9825-BR	D-41
.375 - .380	n/a	.557 - .567	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9826	D-41
.375 - .380	n/a	.557 - .567	.006	316 S/S	n/a	Shims for Shafts	Round	Z9826-316	D-41
.375 - .380	n/a	.557 - .567	.006	Brass	n/a	Shims for Shafts	Round	Z9826-BR	D-41
.375 - .380	n/a	.557 - .567	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9828	D-41
.375 - .380	n/a	.557 - .567	.008	316 S/S	n/a	Shims for Shafts	Round	Z9828-316	D-41
.375 - .380	n/a	.557 - .567	.008	Brass	n/a	Shims for Shafts	Round	Z9828-BR	D-41
.375 - .380	n/a	.557 - .567	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9830	D-41
.375 - .380	n/a	.557 - .567	.010	316 S/S	n/a	Shims for Shafts	Round	Z9830-316	D-41
.375 - .380	n/a	.557 - .567	.010	Brass	n/a	Shims for Shafts	Round	Z9830-BR	D-41
.375 - .380	n/a	.557 - .567	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9832	D-41
.375 - .380	n/a	.557 - .567	.012	316 S/S	n/a	Shims for Shafts	Round	Z9832-316	D-41
.375 - .380	n/a	.557 - .567	.012	Brass	n/a	Shims for Shafts	Round	Z9832-BR	D-41
.375 - .380	n/a	.557 - .567	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9834	D-41
.375 - .380	n/a	.557 - .567	.015	316 S/S	n/a	Shims for Shafts	Round	Z9834-316	D-41
.375 - .380	n/a	.557 - .567	.015	Brass	n/a	Shims for Shafts	Round	Z9834-BR	D-41
.375 - .380	n/a	.557 - .567	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9836	D-41
.375 - .380	n/a	.557 - .567	.016	316 S/S	n/a	Shims for Shafts	Round	Z9836-316	D-41
.375 - .380	n/a	.557 - .567	.016	Brass	n/a	Shims for Shafts	Round	Z9836-BR	D-41
.376 - .387	3/8	.561 - .565	.005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9897-005	D-37
.376 - .387	3/8	.561 - .565	.016	18-8 S/S	n/a	Shims for Shoulders	Round	Z9897-016	D-37
.376 - .387	3/8	.561 - .565	.030	18-8 S/S	n/a	Shims for Shoulders	Round	Z9897-030	D-37
.378 - .383	3/16 x 1/2	.493 - .498	.002	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-2-BR	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-3	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.003	Brass	n/a	Shims for Bearing	Round	Z9885-3-BR	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-5	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.005	316 S/S	n/a	Shims for Bearing	Round	Z9885-5-316	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.005	Brass	n/a	Shims for Bearing	Round	Z9885-5-BR	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-7	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.007	316 S/S	n/a	Shims for Bearing	Round	Z9885-7-316	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.007	Brass	n/a	Shims for Bearing	Round	Z9885-7-BR	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-10	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.010	316 S/S	n/a	Shims for Bearing	Round	Z9885-10-316	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.010	Brass	n/a	Shims for Bearing	Round	Z9885-10-BR	D-43

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.378 - .383	3/16 x 1/2	.493 - .498	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9885-20	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.020	316 S/S	n/a	Shims for Bearing	Round	Z9885-20-316	D-43
.378 - .383	3/16 x 1/2	.493 - .498	.020	Brass	n/a	Shims for Bearing	Round	Z9885-20-BR	D-43
.380	3/8	.750	.062	Fiberglass	n/a	Non-Metal	Round	Z8326	D-21
.380	3/8	.750	.125	4140 Stl	Black Ox	Machined	Round	Z0355	D-9
.383	3/8	.506	.031	Nylatron	n/a	Non-Metal	Round	Z8394	D-21
.385	3/8	.625	.063	Phenolic	n/a	Non-Metal	Round	Z8416	D-21
.386	3/8	.750	.093	18-8 S/S	n/a	Machined	Round	Z07075S	D-9
.390	3/8	.625	.032	Teflon	n/a	Non-Metal	Round	WAS390625032TEFLON	D-21
.390	3/8	.625	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0632R	D-16
.390	3/8	.875	.050	316 S/S	n/a	Fender	Round	Z0545-316	D-11
.390	3/8	.875	.050	18-8 S/S	n/a	Fender	Round	Z0545-188	D-10
.390	3/8	.625	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0663R	D-16
.390	3/8	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8342	D-34
.390	3/8	.625	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C616L	D-15
.390	3/8	.625	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C616	D-15
.406	3/8	.687	.032	Teflon	n/a	Non-Metal	Round	WAS40626875032TEFLON	D-21
.406	3/8	.875	.125	Stl Cased	Nickel	Machined	Round	Z9097M	D-9
.406	3/8	.875	.125	18-8 S/S	n/a	Machined	Round	Z9097M-SS	D-9
.406	3/8	.875	.125	Steel	Plain	Component Thick	Round	Z9183	D-9
.406	3/8	1.000	.188	Steel	n/a	Flat Washer	Round	Z9202	D-3
.406	3/8	1.000	.188	Brass	n/a	Flat Washer	Round	Z9202BR	D-4
.406	3/8	1.000	.188	18-8 S/S	n/a	Flat Washer	Round	Z9202SS	D-2
.406	3/8	1.000	.188	17-4 S/S	n/a	Flat Washer	Round	Z9202-174	D-4
.406	3/8	2.375	.375	Steel Cased	Black Ox	C Washer	Round	Z9439	D-22
.406	3/8	2.500	.375	Steel Cased	Black Ox	C Washer	Round	Z9440	D-22
.406	3/8	1.250	.040 - .060	18-8 S/S	n/a	Fender	Round	Z0468-188	D-10
.406	3/8	1.250	.040 - .060	18-8 S/S	Black Ox	Fender	Round	Z0468-188-BOX	D-10
.406	3/8	1.250	.040 - .060	316 S/S	n/a	Fender	Round	Z0468-316	D-11
.406	3/8	1.250	.042 - .052	Steel	Zinc	Fender	Round	Z0468	D-12
.406	3/8	1.500	.042 - .052	Steel	Zinc	Fender	Round	Z0469	D-12
.406	3/8	1.625	.042 - .052	Steel	Zinc	Fender	Round	Z0470	D-12
.406	3/8	.812	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-814	D-16
.406	3/8	.812	.051 - .080	18-8 S/S	n/a	SAE Standard	Round	WAS40438	D-17
.406	3/8	.812	.051 - .080	316 S/S	n/a	SAE Standard	Round	WAS40538	D-17
.406	3/8	.812	.051 - .080	316 H5 S/S	n/a	SAE Standard	Round	WAS40738	D-17
.406	3/8	.812	.051 - .080	Titanium	n/a	SAE Standard	Round	WAS40638	D-17
.406	3/8	1.500	.051 - .080	Steel	Zinc	Fender	Round	Z0637	D-12
.406	3/8	2.000	.051 - .080	Steel	Zinc	Fender	Round	Z0638	D-12
.406	3/8	3.000	.051 - .080	Steel	Zinc	Fender	Round	Z0487	D-12
.406	3/8	1.500	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0469-188	D-10
.406	3/8	1.500	.052 - .072	18-8 S/S	Black Ox	Fender	Round	Z0469-188-BOX	D-10
.406	3/8	1.500	.052 - .072	316 S/S	n/a	Fender	Round	Z0469-316	D-11
.406	3/8	2.000	.052 - .072	Steel	Zinc	Fender	Round	Z0471	D-12
.406	3/8	2.000	.052 - .072	18-8 S/S	n/a	Fender	Round	Z0471-188	D-10
.406	3/8	2.000	.052 - .072	18-8 S/S	Black Ox	Fender	Round	Z0471-188-BOX	D-10
.406	3/8	2.000	.052 - .072	316 S/S	n/a	Fender	Round	Z0471-316	D-11
.406	3/8	.734	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB38NZ	D-19
.406	3/8	.734	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB38N316	D-19
.406	3/8	1.000	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB38RZ	D-20
.406	3/8	1.000	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB38R8	D-20
.406	3/8	1.000	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB38R316	D-20
.406	3/8	.734	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB38N8	D-19
.406	3/8	1.625	.056 - .070	18-8 S/S	n/a	Fender	Round	Z0470-188	D-10

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.406	3/8	1.625	.056-.070	316 S/S	n/a	Fender	Round	Z0470-316	D-11
.406	3/8	1.250	.090-.112	Steel	Zinc	ANSI Type B	Round	WASB38WZ	D-20
.406	3/8	1.250	.090-.112	316 S/S	n/a	ANSI Type B	Round	WASB38W316	D-20
.406	3/8	1.250	.090-.112	18-8 S/S	n/a	ANSI Type B	Round	WASB38W8	D-20
.406	3/8	.750	.094	18-8 S/S	n/a	Flat Washer	Round	Z9163	D-2
.406	3/8	.750	.094	Brass	n/a	Flat Washer	Round	Z9163BR	D-4
.406	3/8	.750	.094	Steel	n/a	Flat Washer	Round	Z9163STL	D-3
.406	3/8	.812	.125	316 H5 S/S	n/a	Flat Washer	Round	Z9272-316H5	D-4
.406	3/8	.812	.125	18-8 S/S	n/a	Flat Washer	Round	Z9131	D-2
.406	3/8	.812	.125	Steel	Zinc Yel	Flat Washer	Round	Z9272	D-3
.406	3/8	.812	.125	18-8 S/S	n/a	Flat Washer	Round	Z9272SS	D-2
.406	3/8	.875	.125	Steel	n/a	Flat Washer	Round	Z9097	D-3
.406	3/8	.875	.125	Brass	n/a	Flat Washer	Round	Z9097BR	D-4
.406	3/8	.875	.125	18-8 S/S	n/a	Flat Washer	Round	Z9097SS	D-2
.406	3/8	.875	.125	17-4 S/S	n/a	Flat Washer	Round	Z9097-174	D-4
.406	3/8	.875	.125	Soft Stl	Plain	Beveled FW	Round	Z9183-BEV	D-8
.406	3/8	.875	.125	Stl Cased	Plain	Beveled FW	Round	Z9183-BEV-H	D-8
.406	3/8	.875	.125	Stl Cased	Zinc	Beveled FW	Round	Z9183-BEV-HZN	D-8
.406	3/8	.875	.125	18-8 S/S	n/a	Beveled FW	Round	Z9183-BEV-SS	D-8
.406	3/8	1.000	.125	18-8 S/S	n/a	Flat Washer	Round	Z9217	D-2
.406	3/8	1.000	.125	18-8 S/S	Black Ox	Flat Washer	Round	Z9217-BOX	D-2
.406	3/8	1.000	.125	Brass	n/a	Flat Washer	Round	Z9217BR	D-4
.406	3/8	1.000	.125	Steel	n/a	Flat Washer	Round	Z9217STL	D-3
.406	3/8	2.000	.125	Steel	n/a	Fender-XT	Round	Z9684	D-13
.406	3/8	2.000	.125	18-8 S/S	n/a	Fender-XT	Round	Z9684SS	D-13
.406	5/16 & 3/8	.875	.130	Stl Cased	Black Ox	Spherical	Round	Z9454M	D-24
.406	5/16 & 3/8	.875	.130	316 S/S	n/a	Spherical	Round	Z9454M-316	D-24
.406	5/16 & 3/8	.875	.130	18-8 S/S	n/a	Spherical	Round	Z9454M-SS	D-23
.406	3/8	1.062	.188	Stl Cased	n/a	Component Thick	Round	Z9202U	D-7
.406	3/8	2.000	.250	Steel	n/a	Fender-XT	Round	Z9685	D-13
.406	5/16 & 3/8	1.250	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9424	D-22
.406	5/16 & 3/8	1.250	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9424SS	D-22
.406	5/16 & 3/8	1.500	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9425	D-22
.406	5/16 & 3/8	1.500	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9425SS	D-22
.406	5/16 & 3/8	1.750	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9426	D-22
.406	5/16 & 3/8	1.750	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9426SS	D-22
.406	3/8	1.000	.130-.150	Stl Cased	Black Ox	Fender	Round	Z9287	D-12
.425	3/8	1.250	.125	18-8 S/S	n/a	Countersunk	Round	Z9974SS	D-27
.438	3/8	.875	.188	Stl Cased	Zinc	Welding Thick	Round	Z9090	D-7
.438	3/8	.875	.188	18-8 S/S	n/a	Welding Thick	Round	Z9090-SS	D-7
.438	3/8	2.000	.250	18-8 S/S	n/a	Fender-XT	Round	Z9685SS	D-13
.438	3/8	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8952D	D-32
.438	3/8	2.000	.250	Soft Stl	Galv.	Square	Square	Z8952G	D-34
.438	3/8	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8952H	D-32
.438	3/8	2.000	.250	18-8 S/S	n/a	Square	Square	Z8952SS	D-31
.438	3/8	1.000	.064-.104	18-8 S/S	n/a	Mil Spec	Round	MS15795-815	D-16
.438	3/8	1.000	.064-.104	18-8 S/S	n/a	USS Standard	Round	WAS50438	D-18
.438	3/8	1.000	.064-.104	316 S/S	n/a	USS Standard	Round	WAS50538	D-18
.438	3/8	2.000	.112-.128	18-8 S/S	n/a	Square	Square	Z8927-188	D-31
.438	3/8	2.000	.112-.128	Steel	Black Ox	Square	Square	Z8927-BOX	D-32
.438	3/8	2.000	.112-.128	Steel	Zinc	Square	Square	Z8927-ZN	D-33
.438	3/8	2.000	.170-.200	18-8 S/S	n/a	Square	Square	Z8936-188	D-31
.438	3/8	2.000	.170-.200	Steel	Black Ox	Square	Square	Z8936-BOX	D-32
.453	5/16 or 3/8	.875	.156	Stl Cased	Black Ox	Spherical	Round	Z9454F	D-24

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.453	5/16 or 3/8	.875	.156	316 S/S	n/a	Spherical	Round	Z9454F-316	D-24
.453	5/16 or 3/8	.875	.156	18-8 S/S	n/a	Spherical	Round	Z9454F-SS	D-23
.453	7/16	.750	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C716L	D-15
.453	7/16	.750	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C716	D-15
.469	7/16	.750	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0763R	D-16
.469	7/16	.921	.125	18-8 S/S	n/a	Flat Washer	Round	Z9218	D-2
.469	7/16	.921	.125	Brass	n/a	Flat Washer	Round	Z9218BR	D-4
.469	7/16	1.000	.125	Steel	n/a	Flat Washer	Round	Z9098	D-3
.469	7/16	1.000	.125	Brass	n/a	Flat Washer	Round	Z9098BR	D-4
.469	7/16	1.000	.125	Stl Cased	Nickel	Machined	Round	Z9098M	D-9
.469	7/16	1.000	.125	18-8 S/S	n/a	Machined	Round	Z9098M-SS	D-9
.469	7/16	1.000	.125	18-8 S/S	n/a	Flat Washer	Round	Z9098SS	D-2
.469	7/16	1.000	.156	Soft Stl	Plain	Beveled FW	Round	Z9184-BEV	D-8
.469	7/16	1.000	.156	Stl Cased	Plain	Beveled FW	Round	Z9184-BEV-H	D-8
.469	7/16	1.000	.156	Stl Cased	Zinc	Beveled FW	Round	Z9184-BEV-HZN	D-8
.469	7/16	1.000	.156	18-8 S/S	n/a	Beveled FW	Round	Z9184-BEV-SS	D-8
.469	7/16	1.250	.188	Stl Cased	n/a	Component Thick	Round	Z9203U	D-7
.469	7/16	.937	.110 - .126	18-8 S/S	n/a	Flat Washer	Round	Z9273SS	D-2
.469	7/16	.750	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0732R	D-16
.469	7/16	.921	.125	Steel	n/a	Flat Washer	Round	Z9218STL	D-3
.469	7/16	.921	.125	Steel	Zinc Yel	Flat Washer	Round	Z9273	D-3
.469	7/16	1.000	.188	Steel	n/a	Flat Washer	Round	Z9203	D-3
.469	7/16	.922	.051 - .080	18-8 S/S	n/a	Mil Spec	Round	MS15795-816	D-16
.469	7/16	.922	.051 - .080	18-8 S/S	n/a	SAE Standard	Round	WAS40471	D-17
.469	7/16	.922	.051 - .080	316 S/S	n/a	SAE Standard	Round	WAS40571	D-17
.469	7/16	.875	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB71NZ	D-19
.469	7/16	.875	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB71N8	D-19
.469	7/16	.875	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB71N316	D-19
.469	7/16	1.125	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB71RZ	D-20
.469	7/16	1.125	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB71R8	D-20
.469	7/16	1.125	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB71R316	D-20
.469	7/16	1.469	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB71WZ	D-20
.469	7/16	1.469	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB71W8	D-20
.469	7/16	1.469	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB71W316	D-20
.473 - .484	5/8	.614 - .618	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9892-016	D-37
.473 - .484	5/8	.614 - .618	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9892-030	D-37
.473 - .484	7/16	1.000	.188	18-8 S/S	n/a	Flat Washer	Round	Z9203SS	D-2
.473 - .484	7/16	1.000	.188	17-4 S/S	n/a	Flat Washer	Round	Z9203-174	D-4
.475	7/16	.625	.032	Teflon	n/a	Non-Metal	Round	WAS475625032TEFLON	D-21
.500	1/2	1.125	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0565	D-44
.500	n/a	.875	.048	18-8 S/S	n/a	Wide Shim	Round	Z9940SS	D-35
.500	7/16	1.125	.062	316 S/S	n/a	Fender	Round	Z0546-316	D-11
.500	7/16	1.125	.062	18-8 S/S	n/a	Fender	Round	Z0546-188	D-10
.500	1/2	1.125	.063	18-8 S/S	n/a	Shims for D Shafts	Round	Z0566	D-44
.500	n/a	.875	.075	18-8 S/S	n/a	Wide Shim	Round	Z9954SS	D-35
.500	1/2	1.125	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0567	D-44
.500	1/2	2.438	.188	Steel	Galv.	Tapped Flange	Square	Z8887-STL-RC	D-46
.500	1/2	3.688	.188	Steel	Galv.	Tapped Flange	Square	Z8887-STL-SQ	D-46
.500	7/16	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8953H	D-32
.500	7/16	1.250	.064 - .104	18-8 S/S	n/a	Mil Spec	Round	MS15795-817	D-16
.500	7/16	1.250	.064 - .104	18-8 S/S	n/a	USS Standard	Round	WAS50471	D-18
.500	7/16	1.250	.064 - .104	316 S/S	n/a	USS Standard	Round	WAS50571	D-18
.500	7/16	2.000	.235 - .265	18-8 S/S	n/a	Square	Square	Z8953SS	D-31
.500 - .505	n/a	.745 - .755	.001	18-8 S/S	n/a	Shims for Shafts	Round	Z9841	D-41
.500 - .505	n/a	.745 - .755	.001	Brass	n/a	Shims for Shafts	Round	Z9841-BR	D-41

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.500 - .505	n/a	.745 - .755	.002	18-8 S/S	n/a	Shims for Shafts	Round	Z9842	D-41
.500 - .505	n/a	.745 - .755	.002	Brass	n/a	Shims for Shafts	Round	Z9842-BR	D-41
.500 - .505	n/a	.745 - .755	.003	18-8 S/S	n/a	Shims for Shafts	Round	Z9843	D-41
.500 - .505	n/a	.745 - .755	.003	Brass	n/a	Shims for Shafts	Round	Z9843-BR	D-41
.500 - .505	n/a	.745 - .755	.004	18-8 S/S	n/a	Shims for Shafts	Round	Z9844	D-41
.500 - .505	n/a	.745 - .755	.004	Brass	n/a	Shims for Shafts	Round	Z9844-BR	D-41
.500 - .505	n/a	.745 - .755	.005	18-8 S/S	n/a	Shims for Shafts	Round	Z9845	D-41
.500 - .505	n/a	.745 - .755	.005	316 S/S	n/a	Shims for Shafts	Round	Z9845-316	D-41
.500 - .505	n/a	.745 - .755	.005	Brass	n/a	Shims for Shafts	Round	Z9845-BR	D-41
.500 - .505	n/a	.745 - .755	.006	18-8 S/S	n/a	Shims for Shafts	Round	Z9846	D-41
.500 - .505	n/a	.745 - .755	.006	316 S/S	n/a	Shims for Shafts	Round	Z9846-316	D-41
.500 - .505	n/a	.745 - .755	.006	Brass	n/a	Shims for Shafts	Round	Z9846-BR	D-41
.500 - .505	n/a	.745 - .755	.008	18-8 S/S	n/a	Shims for Shafts	Round	Z9848	D-41
.500 - .505	n/a	.745 - .755	.008	316 S/S	n/a	Shims for Shafts	Round	Z9848-316	D-41
.500 - .505	n/a	.745 - .755	.008	Brass	n/a	Shims for Shafts	Round	Z9848-BR	D-41
.500 - .505	n/a	.745 - .755	.010	18-8 S/S	n/a	Shims for Shafts	Round	Z9850	D-41
.500 - .505	n/a	.745 - .755	.010	316 S/S	n/a	Shims for Shafts	Round	Z9850-316	D-41
.500 - .505	n/a	.745 - .755	.010	Brass	n/a	Shims for Shafts	Round	Z9850-BR	D-41
.500 - .505	n/a	.745 - .755	.012	18-8 S/S	n/a	Shims for Shafts	Round	Z9852	D-41
.500 - .505	n/a	.745 - .755	.012	316 S/S	n/a	Shims for Shafts	Round	Z9852-316	D-41
.500 - .505	n/a	.745 - .755	.012	Brass	n/a	Shims for Shafts	Round	Z9852-BR	D-41
.500 - .505	n/a	.745 - .755	.015	18-8 S/S	n/a	Shims for Shafts	Round	Z9854	D-41
.500 - .505	n/a	.745 - .755	.015	316 S/S	n/a	Shims for Shafts	Round	Z9854-316	D-41
.500 - .505	n/a	.745 - .755	.015	Brass	n/a	Shims for Shafts	Round	Z9854-BR	D-41
.500 - .505	n/a	.745 - .755	.016	18-8 S/S	n/a	Shims for Shafts	Round	Z9856	D-41
.501 - .512	1/2	.748 - .752	.005	18-8 S/S	n/a	Shims for Shoulders	Round	Z9898-005	D-37
.501 - .512	n/a	.745 - .755	.016	316 S/S	n/a	Shims for Shafts	Round	Z9856-316	D-41
.501 - .512	n/a	.745 - .755	.016	Brass	n/a	Shims for Shafts	Round	Z9856-BR	D-41
.503 - .508	1/4 x 5/8	.618 - .623	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9886-3	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.003	Brass	n/a	Shims for Bearing	Round	Z9886-3-BR	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9886-5	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.005	316 S/S	n/a	Shims for Bearing	Round	Z9886-5-316	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.005	Brass	n/a	Shims for Bearing	Round	Z9886-5-BR	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9886-7	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9886-10	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.010	316 S/S	n/a	Shims for Bearing	Round	Z9886-10-316	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.010	Brass	n/a	Shims for Bearing	Round	Z9886-10-BR	D-43
.503 - .508	1/2	.748 - .752	.016	18-8 S/S	n/a	Shims for Shoulders	Round	Z9898-016	D-37
.503 - .508	1/4 x 5/8	.618 - .623	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9886-20	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.020	316 S/S	n/a	Shims for Bearing	Round	Z9886-20-316	D-43
.503 - .508	1/4 x 5/8	.618 - .623	.020	Brass	n/a	Shims for Bearing	Round	Z9886-20-BR	D-43
.503 - .508	1/2	.748 - .752	.030	18-8 S/S	n/a	Shims for Shoulders	Round	Z9898-030	D-37
.505	1/4 x 5/8	.618 - .623	.007	316 S/S	n/a	Shims for Bearing	Round	Z9886-7-316	D-43
.515	1/4 x 5/8	.618 - .623	.007	Brass	n/a	Shims for Bearing	Round	Z9886-7-BR	D-43
.515	1/2	.875	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0832R	D-16
.515	1/2	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8344	D-34
.515	1/2	1.000	.187	4140 Stl	Black Ox	Machined	Round	Z0356	D-9
.515	1/2	.875	.022 - .042	18-8 S/S	n/a	Mil Spec	Round	AN960-C816L	D-15
.515	1/2	.875	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C816	D-15
.530	1/2	.875	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0863R	D-16
.531	1/2	.880	.031	Nylatron	n/a	Non-Metal	Round	Z8396	D-21
.531	1/2	.880	.062	Fiberglass	n/a	Non-Metal	Round	Z8328	D-21
.531	1/2	1.125	.125	18-8 S/S	Black Ox	Flat Washer	Round	Z9099SS-BOX	D-2
.531	1/2	1.125	.125	17-4 S/S	n/a	Flat Washer	Round	Z9099-174	D-4
.531	1/2	1.125	.125	Stl Cased	Nickel	Machined	Round	Z9099M	D-9

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.531	1/2	1.125	.125	18-8 S/S	n/a	Machined	Round	Z9099M-SS	D-9
.531	1/2	1.125	.188	Steel	n/a	Flat Washer	Round	Z9204	D-3
.531	1/2	1.125	.188	Brass	n/a	Flat Washer	Round	Z9204BR	D-4
.531	1/2	1.125	.188	17-4 S/S	n/a	Flat Washer	Round	Z9204-174	D-4
.531	1/2	1.125	.188	18-8 S/S	n/a	Flat Washer	Round	Z9204SS	D-2
.531	1/2	1.125	.188	18-8 S/S	Black Ox	Flat Washer	Round	Z9204SS-BOX	D-2
.531	1/2	1.000	.188	Steel	Plain	Component Thick	Round	Z9185	D-9
.531	1/2	1.500	.042 - .052	Steel	Zinc	Fender	Round	Z0472	D-12
.531	1/2	1.500	.042 - .052	18-8 S/S	n/a	Fender	Round	Z0472-188	D-10
.531	1/2	1.500	.042 - .052	316 S/S	n/a	Fender	Round	Z0472-316	D-11
.531	1/2	2.000	.042 - .052	Steel	Zinc	Fender	Round	Z0473	D-12
.531	1/2	2.000	.042 - .052	18-8 S/S	n/a	Fender	Round	Z0473-188	D-10
.531	1/2	2.000	.042 - .052	316 S/S	n/a	Fender	Round	Z0473-316	D-11
.531	1/2	1.500	.051- .080	Steel	Zinc	Fender	Round	Z0639	D-12
.531	1/2	2.000	.051- .080	Steel	Zinc	Fender	Round	Z0650	D-12
.531	1/2	1.000	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB12NZ	D-19
.531	1/2	1.000	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB12N8	D-19
.531	1/2	1.000	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB12N316	D-19
.531	1/2	1.062	.057 - .067	316 H5 S/S	n/a	SAE Standard	Round	WAS40712	D-17
.531	1/2	1.062	.057 - .067	Titanium	n/a	SAE Standard	Round	WAS40612	D-17
.531	1/2	1.062	.074 - .121	18-8 S/S	n/a	Mil Spec	Round	MS15795-818	D-16
.531	1/2	1.062	.074 - .121	18-8 S/S	n/a	SAE Standard	Round	WAS40412	D-17
.531	1/2	1.062	.074 - .121	316 S/S	n/a	SAE Standard	Round	WAS40512	D-17
.531	1/2	1.250	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB12RZ	D-20
.531	1/2	1.250	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB12R8	D-20
.531	1/2	1.250	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB12R316	D-20
.531	1/2	1.750	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB12W316	D-20
.531	1/2	1.750	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB12WZ	D-20
.531	1/2	1.750	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB12W8	D-20
.531	1/2	1.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0830-316	D-11
.531	1/2	2.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0833-316	D-11
.531	1/2	3.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0836-316	D-11
.531	1/2	1.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0831-316	D-11
.531	1/2	2.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0834-316	D-11
.531	1/2	3.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0837-316	D-11
.531	1/2	1.125	.125	Steel	n/a	Flat Washer	Round	Z9099	D-3
.531	1/2	1.125	.125	Brass	n/a	Flat Washer	Round	Z9099BR	D-4
.531	1/2	1.125	.125	18-8 S/S	n/a	Flat Washer	Round	Z9099SS	D-2
.531	1/2	2.000	.125	Steel	n/a	Fender-XT	Round	Z9688	D-13
.531	1/2	1.000	.188	Soft Stl	Plain	Beveled FW	Round	Z9185-BEV	D-8
.531	1/2	1.000	.188	Stl Cased	Plain	Beveled FW	Round	Z9185-BEV-H	D-8
.531	1/2	1.000	.188	Stl Cased	Zinc	Beveled FW	Round	Z9185-BEV-HZN	D-8
.531	1/2	1.000	.188	18-8 S/S	n/a	Beveled FW	Round	Z9185-BEV-SS	D-8
.531	1/2	1.062	.188	18-8 S/S	n/a	Flat Washer	Round	Z9219	D-2
.531	1/2	1.062	.188	Brass	n/a	Flat Washer	Round	Z9219BR	D-4
.531	1/2	1.062	.188	Steel	n/a	Flat Washer	Round	Z9219STL	D-3
.531	1/2	1.187	.188	Stl Cased	n/a	Component Thick	Round	Z9204U	D-7
.531	7/16 or 1/2	1.125	.188	Stl Cased	Black Ox	Spherical	Round	Z9458M	D-24
.531	7/16 or 1/2	1.125	.188	316 S/S	n/a	Spherical	Round	Z9458M-316	D-24
.531	7/16 or 1/2	1.125	.188	18-8 S/S	n/a	Spherical	Round	Z9458M-SS	D-23
.531	1/2	1.062	.203	Steel	Zinc Yel	Flat Washer	Round	Z9274	D-3
.531	1/2	1.062	.203	316 H5 S/S	n/a	Flat Washer	Round	Z9274-316H5	D-4
.531	1/2	1.062	.203	18-8 S/S	n/a	Flat Washer	Round	Z9274SS	D-2
.531	1/2	1.500	.219	Steel	n/a	Flat Washer	Round	Z9235	D-3
.531	7/16 & 1/2	1.875	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9428	D-22

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.531	7/16 & 1/2	1.875	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9428SS	D-22
.531	7/16 & 1/2	2.250	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9429	D-22
.531	7/16 & 1/2	2.250	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9429SS	D-22
.531	1/2	2.375	.375	Steel Cased	Black Ox	C Washer	Round	Z9441	D-22
.531	1/2	3.000	.051 - .080	Steel	Zinc	Fender	Round	Z0488	D-12
.531	1/2	1.375	.146 - .166	Stl Cased	Black Ox	Fender	Round	Z9289	D-12
.550	1/2	.850	.031	Teflon	n/a	Non-Metal	Round	WAS550850031TEFLON	D-21
.562	1/2	2.000	.125	18-8 S/S	n/a	Fender-XT	Round	Z9688SS	D-13
.562	1/2	2.000	.250	Steel	n/a	Fender-XT	Round	Z9689	D-13
.562	1/2	2.000	.250	18-8 S/S	n/a	Fender-XT	Round	Z9689SS	D-13
.562	1/2	3.000	0.25	Steel	Zinc	Dock	Round	Z9670	D-13
.562	1/2	1.375	.086 - .132	18-8 S/S	n/a	Mil Spec	Round	MS15795-819	D-16
.563	1/2	1.250	.063	316 S/S	n/a	Fender	Round	Z0547-316	D-11
.563	1/2	1.250	.063	18-8 S/S	n/a	Fender	Round	Z0547-188	D-10
.563	1/2	2.000	.125	Soft Stl	Galv.	Square	Square	Z8940G	D-34
.563	1/2	1.000	.188	Stl Cased	Zinc	Welding Thick	Round	Z9091	D-7
.563	1/2	1.000	.188	18-8 S/S	n/a	Welding Thick	Round	Z9091-SS	D-7
.563	1/2	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8954D	D-32
.563	1/2	2.000	.250	Soft Stl	Galv.	Square	Square	Z8954G	D-34
.563	1/2	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8954H	D-32
.563	1/2	2.000	.250	18-8 S/S	n/a	Square	Square	Z8954SS	D-31
.563	1/2	3.000	.250	Steel	Galv.	Square	Square	Z8880-HDG	D-32
.563	1/2	3.000	.250	18-8 S/S	n/a	Square	Square	Z8880SS	D-31
.563	1/2	1.375	.074 - .121	18-8 S/S	n/a	USS Standard	Round	WAS50412	D-18
.563	1/2	1.375	.074 - .121	316 S/S	n/a	USS Standard	Round	WAS50512	D-18
.563	1/2	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8928-188	D-31
.563	1/2	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8928-BOX	D-32
.563	1/2	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8940-BOX	D-32
.563	1/2	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8928-ZN	D-33
.563	1/2	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8940-ZN	D-33
.563	1/2	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8862-ZN	D-33
.563	1/2	3.000	.141 - .187	18-8 S/S	n/a	Square	Square	Z8955-188	D-31
.563	1/2	3.000	.141 - .187	18-8 S/S	n/a	Square	Square	Z8955-SLOT-188	D-31
.563	1/2	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8937-188	D-31
.563	1/2	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8937-BOX	D-32
.563	1/2	2.000	.170 - .200	Steel	Zinc	Square	Square	Z8937-ZN	D-33
.563	1/2	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8872-ZN	D-33
.563	1/2	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8954-ZN	D-33
.563	1/2	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8955-ZN	D-33
.563	1/2	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8880-ZN	D-33
.563	1/2	3 x 4.5	.230 - .250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8751-188	D-29
.563	1/2	3 x 4.5	.230 - .250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8751-SLOT-188	D-29
.563	1/2	3.000	.235 - .265	18-8 S/S	n/a	Square	Square	Z8880-SLOT-SS	D-31
.563	1/2	3.000	.235 - .265	Steel	Black Ox	Square	Square	Z8880H	D-32
.563	5/8	1.937 ^x 2.250	.360 - .390	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8787-188	D-29
.578	7/16 or 1/2	1.125	.188	Stl Cased	Black Ox	Spherical	Round	Z9458F	D-24
.578	7/16 or 1/2	1.125	.188	316 S/S	n/a	Spherical	Round	Z9458F-316	D-24
.578	7/16 or 1/2	1.125	.188	18-8 S/S	n/a	Spherical	Round	Z9458F-SS	D-23
.578	1/2	3.000	.250	Steel	Galv.	Dock	Round	Z9670G	D-13
.578	9/16	1.062	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C916	D-15
.589 - .609	9/16	1.469	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB91RZ	D-19
.589 - .609	9/16	1.469	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB91R8	D-19
.594	9/16	1.062	.032	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C0963R	D-16

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.594	9/16	1.062	.062	316 S/S	n/a	Fender	Round	Z0548-316	D-11
.594	9/16	1.062	.062	18-8 S/S	n/a	Fender	Round	Z0548-188	D-10
.594	9/16	1.172	.172	Steel	Zinc Yel	Flat Washer	Round	Z9275	D-3
.594	9/16	1.187	.188	18-8 S/S	n/a	Flat Washer	Round	Z9220	D-2
.594	9/16	1.187	.188	Steel	Black Ox	Flat Washer	Round	Z9220STL	D-3
.594	9/16	1.125	.056 - .071	316 S/S	n/a	ANSI Type B	Round	WASB91N316	D-19
.594	9/16	1.125	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB91NZ	D-19
.594	9/16	1.250	.056 - .071	Steel	Zinc	ANSI Type B	Round	WASB91NZ	D-19
.594	9/16	1.250	.056 - .071	18-8 S/S	n/a	ANSI Type B	Round	WASB91N8	D-19
.594	9/16	1.469	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB91R316	D-20
.594	9/16	1.469	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB91RZ	D-20
.594	9/16	2.000	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB91W316	D-20
.594	9/16	1.161 -1.181	.168 - .191	18-8 S/S	n/a	Flat Washer	Round	Z9275SS	D-2
.625	5/8	1.250	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0570	D-44
.625	n/a	1.250	.048	18-8 S/S	n/a	Wide Shim	Round	Z9944SS	D-35
.625	5/8	1.250	.063	18-8 S/S	n/a	Shims for D Shafts	Round	Z0571	D-44
.625	n/a	1.250	.075	18-8 S/S	n/a	Wide Shim	Round	Z9956SS	D-35
.625	5/8	1.250	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0572	D-44
.625	5/8	2.438	.188	Steel	Galv.	Tapped Flange	Square	Z8888-STL-RC	D-46
.625	5/8	3.688	.188	Steel	Galv.	Tapped Flange	Square	Z8888-STL-SQ	D-46
.625	9/16	2.000	.090- .112	Steel	Zinc	ANSI Type B	Round	WASB91WZ	D-20
.625	9/16	2.000	.090- .112	18-8 S/S	n/a	ANSI Type B	Round	WASB91W8	D-20
.626 - .637	9/16	1.500	.086- .132	18-8 S/S	n/a	USS Standard	Round	WAS50491	D-18
.626 - .637	9/16	1.500	.086- .132	316 S/S	n/a	USS Standard	Round	WAS50591	D-18
.640	5/8	.750	.008	18-8 S/S	n/a	Shim	Round	Z9878	D-42
.640	5/8	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8346	D-34
.640	5/8	.873 - .877	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9899-016	D-37
.640	5/8	.873 - .877	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9899-030	D-37
.656	5/8	1.187	.063	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C1063R	D-16
.656	5/8	1.193	.093	Fiberglass	n/a	Non-Metal	Round	Z8330	D-21
.656	5/8	1.375	.125	Stl Cased	Nickel	Machined	Round	Z9100M	D-9
.656	5/8	1.375	.125	18-8 S/S	n/a	Machined	Round	Z9100M-SS	D-9
.656	5/8	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8366	D-34
.656	5/8	1.375	.188	Steel	n/a	Flat Washer	Round	Z9205	D-3
.656	5/8	1.375	.188	Brass	n/a	Flat Washer	Round	Z9205BR	D-4
.656	5/8	1.250	.250	Steel	Plain	Component Thick	Round	Z9186	D-9
.656	5/8	2.125	.375	Stl Cased	Black Ox	Easy On Slotted	Round	Z9431	D-22
.656	5/8	2.125	.375	18-8 S/S	n/a	Easy On Slotted	Round	Z9431SS	D-22
.656	5/8	1.187	.053 - .073	18-8 S/S	n/a	Mil Spec	Round	AN960-C1016	D-15
.656	5/8	1.312	.071 - .121	18-8 S/S	n/a	SAE Standard	Round	WAS40458	D-17
.656	5/8	1.312	.071 - .121	316 S/S	n/a	SAE Standard	Round	WAS40558	D-17
.656	5/8	1.312	.074 - .121	18-8 S/S	n/a	Mil Spec	Round	MS15795-820	D-16
.656	5/8	1.250	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB58N316	D-19
.656	5/8	1.250	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB58NZ	D-19
.656	5/8	1.250	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB58N8	D-19
.656	5/8	1.750	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB58R316	D-20
.656	5/8	1.750	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB58RZ	D-20
.656	5/8	1.750	.090- .112	Steel	Zinc	ANSI Type B	Round	WASB58RZ	D-20
.656	5/8	1.750	.090- .112	18-8 S/S	n/a	ANSI Type B	Round	WASB58R8	D-20
.656	5/8	2.250	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB58W316	D-20
.656	5/8	2.250	.146- .174	Steel	Zinc	ANSI Type B	Round	WASB58WZ	D-20
.656	5/8	2.250	.146- .174	18-8 S/S	n/a	ANSI Type B	Round	WASB58W8	D-20
.656	5/8	1.375	.125	Steel	n/a	Flat Washer	Round	Z9100	D-3

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.656	5/8	1.375	.125	Brass	n/a	Flat Washer	Round	Z9100BR	D-4
.656	5/8	1.375	.125	18-8 S/S	n/a	Flat Washer	Round	Z9100SS	D-2
.656	5/8	1.375	.125	18-8 S/S	Black Ox	Flat Washer	Round	Z9100SS-BOX	D-2
.656	5/8	1.375	.125	17-4 S/S	n/a	Flat Washer	Round	Z9100-174	D-4
.656	5/8	1.375	.188	18-8 S/S	n/a	Flat Washer	Round	Z9205SS	D-2
.656	5/8	1.375	.188	17-4 S/S	n/a	Flat Washer	Round	Z9205-174	D-4
.656	5/8	1.437	.188	Stl Cased	n/a	Component Thick	Round	Z9205U	D-7
.656	5/8	1.312	.219	18-8 S/S	n/a	Flat Washer	Round	Z9221	D-2
.656	5/8	1.312	.219	Brass	n/a	Flat Washer	Round	Z9221BR	D-4
.656	5/8	1.312	.219	Steel	Zinc Yel	Flat Washer	Round	Z9276	D-3
.656	5/8	1.312	.219	18-8 S/S	n/a	Flat Washer	Round	Z9276SS	D-2
.656	5/8	1.500	.219	Steel	n/a	Flat Washer	Round	Z9236	D-3
.656	5/8	1.312	.219	Steel Cased	Black Ox	Flat Washer	Round	Z9221STL	D-3
.656	5/8	1.250	.250	Soft Stl	Plain	Beveled FW	Round	Z9186-BEV	D-8
.656	5/8	1.250	.250	Stl Cased	Plain	Beveled FW	Round	Z9186-BEV-H	D-8
.656	5/8	1.250	.250	Stl Cased	Zinc	Beveled FW	Round	Z9186-BEV-HZN	D-8
.656	5/8	1.250	.250	18-8 S/S	n/a	Beveled FW	Round	Z9186-BEV-SS	D-8
.656	5/8	1.750	.146-.166	Stl Cased	Black Ox	Fender	Round	Z9290	D-12
.687 - .692	3/8 x 7/8	.868 - .873	.003	18-8 S/S	n/a	Shims for Bearing	Round	Z9887-3	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.003	Brass	n/a	Shims for Bearing	Round	Z9887-3-BR	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.005	18-8 S/S	n/a	Shims for Bearing	Round	Z9887-5	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.010	18-8 S/S	n/a	Shims for Bearing	Round	Z9887-10	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.010	316 S/S	n/a	Shims for Bearing	Round	Z9887-10-316	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.010	Brass	n/a	Shims for Bearing	Round	Z9887-10-BR	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.020	18-8 S/S	n/a	Shims for Bearing	Round	Z9887-20	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.020	316 S/S	n/a	Shims for Bearing	Round	Z9887-20-316	D-43
.687 - .692	3/8 x 7/8	.868 - .873	.020	Brass	n/a	Shims for Bearing	Round	Z9887-20-BR	D-43
.687 - .692	5/8	1.500	.078	316 S/S	n/a	Fender	Round	Z0549-316	D-11
.687 - .692	5/8	1.500	.078	18-8 S/S	n/a	Fender	Round	Z0549-188	D-10
.687 - .692	5/8	1.375	.188	Stl Cased	Black Ox	Spherical	Round	Z9462M	D-24
.687 - .692	5/8	1.375	.188	316 S/S	n/a	Spherical	Round	Z9462M-316	D-24
.687 - .692	5/8	1.375	.188	18-8 S/S	n/a	Spherical	Round	Z9462M-SS	D-23
.688	5/8	3.000	0.25	Steel	Zinc	Dock	Round	Z9671	D-13
.688	3/8 x 7/8	.868 - .873	.005	316 S/S	n/a	Shims for Bearing	Round	Z9887-5-316	D-43
.688	3/8 x 7/8	.868 - .873	.005	Brass	n/a	Shims for Bearing	Round	Z9887-5-BR	D-43
.688	3/8 x 7/8	.868 - .873	.007	18-8 S/S	n/a	Shims for Bearing	Round	Z9887-7	D-43
.688	3/8 x 7/8	.868 - .873	.007	316 S/S	n/a	Shims for Bearing	Round	Z9887-7-316	D-43
.688	3/8 x 7/8	.868 - .873	.007	Brass	n/a	Shims for Bearing	Round	Z9887-7-BR	D-43
.688	5/8	2.000	.125	Soft Stl	Galv.	Square	Square	Z8942G	D-34
.688	5/8	2.250	.188	Soft Stl	Galv.	Square	Square	Z8944G	D-34
.688	5/8	1.375	.219	Stl Cased	Black Ox	Spherical	Round	Z9462F	D-24
.688	5/8	1.375	.219	316 S/S	n/a	Spherical	Round	Z9462F-316	D-24
.688	5/8	1.375	.219	18-8 S/S	n/a	Spherical	Round	Z9462F-SS	D-23
.688	5/8	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8956D	D-32
.688	5/8	2.000	.250	Soft Stl	Galv.	Square	Square	Z8956G	D-34
.688	5/8	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8956H	D-32
.688	5/8	2.000	.250	18-8 S/S	n/a	Square	Square	Z8956SS	D-31
.688	5/8	3.000	.250	Steel	Galv.	Square	Square	Z8881-HDG	D-32
.688	5/8	3.000	.250	18-8 S/S	n/a	Square	Square	Z8881SS	D-31
.688	5/8	4.000	.250	Steel	Galv.	Square	Square	Z8892-HDG	D-32
.688	5/8	4.000	.250	18-8 S/S	n/a	Square	Square	Z8892SS	D-31

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.688	5/8	1.750	.108-.160	18-8 S/S	n/a	Mil Spec	Round	MS15795-821	D-16
.688	5/8	1.750	.108-.160	18-8 S/S	n/a	USS Standard	Round	WAS50458	D-18
.688	5/8	1.750	.108-.160	316 S/S	n/a	USS Standard	Round	WAS50558	D-18
.688	5/8	2.000	.112-.128	18-8 S/S	n/a	Square	Square	Z8929-188	D-31
.688	5/8	2.000	.112-.128	Steel	Black Ox	Square	Square	Z8929-BOX	D-32
.688	5/8	2.000	.112-.128	Steel	Black Ox	Square	Square	Z8942-BOX	D-32
.688	5/8	2.000	.112-.128	Steel	Zinc	Square	Square	Z8929-ZN	D-33
.688	5/8	2.000	.112-.128	Steel	Zinc	Square	Square	Z8942-ZN	D-33
.688	5/8	3.000	.112-.128	Steel	Zinc	Square	Square	Z8863-ZN	D-33
.688	5/8	4.000	.112-.128	Steel	Zinc	Square	Square	Z8727-ZN	D-33
.688	5/8	3.000	.141-.187	18-8 S/S	n/a	Square	Square	Z8758-SLOT-188	D-31
.688	5/8	2.000	.170-.200	18-8 S/S	n/a	Square	Square	Z8938-188	D-31
.688	5/8	2.000	.170-.200	Steel	Black Ox	Square	Square	Z8938-BOX	D-32
.688	5/8	2.000	.170-.200	Steel	Zinc	Square	Square	Z8938-ZN	D-33
.688	5/8	3.000	.170-.200	Steel	Zinc	Square	Square	Z8873-ZN	D-33
.688	5/8	4.000	.170-.200	Steel	Zinc	Square	Square	Z8735-ZN	D-33
.688	5/8	4 x 1.250	.170-.200	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8773-188	D-29
.688	5/8	4 x 1.5	.170-.200	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8774-188	D-29
.688	5/8	4 x 1.687	.170-.200	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8775-188	D-29
.688	5/8	2.000	.220-.280	Steel	Zinc	Square	Square	Z8957-ZN	D-33
.688	5/8	3.000	.220-.280	Steel	Zinc	Square	Square	Z8881-ZN	D-33
.688	5/8	4.000	.220-.280	Steel	Zinc	Square	Square	Z8892-ZN	D-33
.688	5/8	2 x 1.5	.230-.250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8770-188	D-29
.688	5/8	3 x 4.5	.230-.250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8752-188	D-29
.688	5/8	3 x 4.5	.230-.250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8771-SLOT-188	D-29
.688	5/8	4 x 2	.230-.250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8753-188	D-29
.688	5/8	2.000	.235-.265	Steel	Zinc	Square	Square	Z8956-ZN	D-33
.688	5/8	2.500	.235-.265	18-8 S/S	n/a	Square	Square	Z8956-188	D-31
.688	5/8	3.000	.235-.265	18-8 S/S	n/a	Square	Square	Z8759-SLOT-188	D-31
.688	5/8	4.000	.235-.265	Steel	Black Ox	Square	Square	Z8892H	D-32
.688	5/8	3.000	.235-.265	Steel	Black Ox	Square	Square	Z8881H	D-32
.688	5/8	1.500	.240-.260	316 S/S	n/a	Fender	Round	Z0838-316	D-11
.688	5/8	2.000	.240-.260	316 S/S	n/a	Fender	Round	Z0840-316	D-11
.688	5/8	3.000	.240-.260	316 S/S	n/a	Fender	Round	Z0842-316	D-11
.688	5/8	1.500	.365-.385	316 S/S	n/a	Fender	Round	Z0839-316	D-11
.688	5/8	2.000	.365-.385	316 S/S	n/a	Fender	Round	Z0841-316	D-11
.688	5/8	3.000	.365-.385	316 S/S	n/a	Fender	Round	Z0843-316	D-11
.688	5/8	3.000	.485-.515	18-8 S/S	n/a	Square	Square	Z8778-188	D-31
.688	5/8	4.000	.485-.515	18-8 S/S	n/a	Square	Square	Z8777-188	D-31
.719	5/8	3.000	.250	Steel	Galv.	Dock	Round	Z9671G	D-13
.719	5/8	1.250	.250	Stl Cased	Zinc	Welding Thick	Round	Z9092	D-7
.719	5/8	1.250	.250	18-8 S/S	n/a	Welding Thick	Round	Z9092-SS	D-7
.750	3/4	1.625	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0575	D-44
.750	n/a	1.250	.048	18-8 S/S	n/a	Wide Shim	Round	Z9946SS	D-35
.750	n/a	1.500	.048	18-8 S/S	n/a	Wide Shim	Round	Z9948SS	D-35
.750	3/4	1.625	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0577	D-44
.750	5/8	2.500	.125	Steel	n/a	Fender-XT	Round	Z9690	D-13
.750	5/8	2.500	.125	18-8 S/S	n/a	Fender-XT	Round	Z9690SS	D-13
.750	5/8	2.500	.250	Steel	n/a	Fender-XT	Round	Z9691	D-13
.750	5/8	2.500	.250	18-8 S/S	n/a	Fender-XT	Round	Z9691SS	D-13
.750	3/4	1.625	.63	18-8 S/S	n/a	Shims for D Shafts	Round	Z0576	D-44
.765	n/a	1.250	.075	18-8 S/S	n/a	Wide Shim	Round	Z9958SS	D-35
.765	n/a	1.500	.075	18-8 S/S	n/a	Wide Shim	Round	Z9960SS	D-35

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.765	3/4	2.438	.188	Steel	Galv.	Tapped Flange	Square	Z8889-STL-RC	D-46
.765	3/4	3.688	.188	Steel	Galv.	Tapped Flange	Square	Z8889-STL-SQ	D-46
.765	3/4	$\frac{998}{1002}$	.014 - .018	18-8 S/S	n/a	Shims for Shoulders	Round	Z9899-116	D-37
.781	3/4	1.312	.090	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C1290R	D-16
.781	3/4	1.317	.093	Fiberglass	n/a	Non-Metal	Round	Z8332	D-21
.781	3/4	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8348	D-34
.781	3/4	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8368	D-34
.781	3/4	1.625	.156	Stl Cased	Nickel	Machined	Round	Z9101M	
.781	3/4	1.625	.156	18-8 S/S	n/a	Machined	Round	Z9101M-SS	D-9
.781	3/4	$\frac{998}{1002}$	.027 - .033	18-8 S/S	n/a	Shims for Shoulders	Round	Z9899-130	D-37
.781	3/4	1.312	.080 - .100	18-8 S/S	n/a	Mil Spec	Round	AN960-C1216	D-15
.781	3/4	1.625	.125	18-8 S/S	n/a	Flat Washer	Round	Z9101SSL	D-2
.781	3/4	1.625	.156	Steel	n/a	Flat Washer	Round	Z9101	D-3
.781	3/4	1.625	.156	Brass	n/a	Flat Washer	Round	Z9101BR	D-4
.781	3/4	1.625	.156	18-8 S/S	n/a	Flat Washer	Round	Z9101SS	D-2
.781	3/4	1.625	.156	17-4 S/S	n/a	Flat Washer	Round	Z9101-174	D-4
.781	3/4	1.500	.250	Steel	Plain	Component Thick	Round	Z9187	D-9
.781	3/4	1.500	.250	Soft Stl	Plain	Beveled FW	Round	Z9187-BEV	D-8
.781	3/4	1.500	.250	Stl Cased	Plain	Beveled FW	Round	Z9187-BEV-H	D-8
.781	3/4	1.625	.250	Steel	n/a	Flat Washer	Round	Z9206	D-3
.781	3/4	1.625	.250	Brass	n/a	Flat Washer	Round	Z9206BR	D-4
.781	3/4	1.625	.250	18-8 S/S	n/a	Flat Washer	Round	Z9206SS	D-2
.781	3/4	1.625	.250	17-4 S/S	n/a	Flat Washer	Round	Z9206-174	D-4
.781	3/4	1.875	.260	Steel	n/a	Flat Washer	Round	Z9237	D-3
.812	3/4	2.000	.125	Steel	Galv.	Square	Square	Z8945G	D-34
.812	3/4	1.625	.219	Stl Cased	Black Ox	Spherical	Round	Z9466M	D-24
.812	3/4	1.625	.219	316 S/S	n/a	Spherical	Round	Z9466M-316	D-24
.812	3/4	1.625	.219	18-8 S/S	n/a	Spherical	Round	Z9466M-SS	D-23
.812	3/4	1.500	.250	Stl Cased	Zinc	Beveled FW	Round	Z9187-BEV-HZN	D-8
.812	3/4	1.500	.250	18-8 S/S	n/a	Beveled FW	Round	Z9187-BEV-SS	D-8
.812	3/4	1.687	.250	Stl Cased	n/a	Component Thick	Round	Z9206U	D-7
.812	3/4	3.000	.250	Steel	Zinc	Dock	Round	Z9693	D-13
.812	3/4	2.500	.438	Stl Cased	Black Ox	Easy On Slotted	Round	Z9433	D-22
.812	3/4	2.500	.438	18-8 S/S	n/a	Easy On Slotted	Round	Z9433SS	D-22
.812	3/4	1.375	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB34NZ	D-19
.812	3/4	1.375	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB34N8	D-19
.812	3/4	1.375	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB34N316	D-19
.812	3/4	2.000	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB34R316	D-20
.812	3/4	1.469	.108 - .160	18-8 S/S	n/a	Mil Spec	Round	MS15795-822	D-16
.812	3/4	1.500	.108 - .160	18-8 S/S	n/a	SAE Standard	Round	WAS40434	D-17
.812	3/4	1.500	.108 - .160	316 S/S	n/a	SAE Standard	Round	WAS40534	D-17
.812	3/4	2.000	.122 - .177	18-8 S/S	n/a	Mil Spec	Round	MS15795-823	D-16
.812	3/4	2.000	.122 - .177	18-8 S/S	n/a	USS Standard	Round	WAS50434	D-18
.812	3/4	2.000	.122 - .177	316 S/S	n/a	USS Standard	Round	WAS50534	D-18
.812	3/4	2.500	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB34W316	D-20
.813	3/4	1.750	.110	316 S/S	n/a	Fender	Round	Z0621-316	D-11
.813	3/4	1.750	.110	18-8 S/S	n/a	Fender	Round	Z0621-188	D-10
.813	3/4	2.250	.188	Soft Stl	Galv.	Square	Square	Z8946G	D-34
.813	3/4	3.000	.188	Soft Stl	Galv.	Square	Square	Z8947G	D-34
.813	3/4	1.437	.219	Steel	Zinc Yel	Flat Washer	Round	Z9277	D-3
.813	3/4	1.437	.219	18-8 S/S	n/a	Flat Washer	Round	Z9277SS	D-2
.813	3/4	1.500	.219	18-8 S/S	n/a	Flat Washer	Round	Z9222	D-2

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.813	3/4	1.500	.219	Brass	n/a	Flat Washer	Round	Z9222BR	D-4
.813	3/4	1.500	.219	Steel Cased	Black Ox	Flat Washer	Round	Z9222STL	D-3
.813	3/4	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8958H	D-32
.813	3/4	2.000	.250	18-8 S/S	n/a	Square	Square	Z8958SS	D-31
.813	3/4	3.000	.250	Soft Stl	Galv.	Square	Square	Z8948G	D-34
.813	3/4	3.000	.250	18-8 S/S	n/a	Square	Square	Z8948SS	D-31
.813	3/4	3.000	.250	Steel	Galv.	Square	Square	Z8882-HDG	D-32
.813	3/4	4.000	.250	Steel	Galv.	Square	Square	Z8893-HDG	D-32
.813	3/4	4.000	.250	18-8 S/S	n/a	Square	Square	Z8893SS	D-31
.813	3/4	2.000	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB34RZ	D-20
.813	3/4	2.000	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB34R8	D-20
.813	3/4	2.000	.122 - .177	18-8 S/S	n/a	Fender-XT	Round	WAS812X2X.187T188	D-13
.813	3/4	2.500	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB34WZ	D-20
.813	3/4	2.500	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB34W8	D-20
.813	3/4	3.000	.125	Steel	n/a	Fender-XT	Round	Z9692	D-13
.813	3/4	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8958D	D-32
.813	3/4	2.000	.250	Soft Stl	Galv.	Square	Square	Z8958G	D-34
.813	3/4	1.625	.265	316 S/S	n/a	Spherical	Round	Z9466F-316	D-24
.813	3/4	1.625	.265	18-8 S/S	n/a	Spherical	Round	Z9466F-SS	D-23
.813	3/4	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8931-188	D-31
.813	3/4	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8931-BOX	D-32
.813	3/4	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8945-BOX	D-32
.813	3/4	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8945-ZN	D-33
.813	3/4	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8865-ZN	D-33
.813	3/4	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8728-ZN	D-33
.813	3/4	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8939-188	D-31
.813	3/4	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8939-BOX	D-32
.813	3/4	2.000	.170 - .200	Steel	Zinc	Square	Square	Z8939-ZN	D-33
.813	3/4	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8874-ZN	D-33
.813	3/4	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8736-ZN	D-33
.813	3/4	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8958-ZN	D-33
.813	3/4	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8882-ZN	D-33
.813	3/4	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8893-ZN	D-33
.813	3/4	3 x 4.5	.230 - .250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8754-188	D-29
.813	3/4	3 x 4.5	.230 - .250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8754-SLOT-188	D-29
.813	3/4	6 x 5.75	.230 - .250	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8755-188	D-29
.813	3/4	2.500	.235 - .265	18-8 S/S	n/a	Square	Square	Z8757-188	D-31
.813	3/4	3.000	.235 - .265	18-8 S/S	n/a	Square	Square	Z8948-SLOT-SS	D-31
.813	3/4	3.000	.235 - .265	Steel	Black Ox	Square	Square	Z8948H	D-32
.813	3/4	4.000	.235 - .265	Steel	Black Ox	Square	Square	Z8893H	D-32
.813	5/8	1.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0845-316	D-11
.813	3/4	1.750	.240 - .260	316 S/S	n/a	Fender	Round	Z0848-316	D-11
.813	3/4	2.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0851-316	D-11
.813	3/4	6 x 5.75	.360 - .390	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8776-188	D-29
.813	3/4	1.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0846-316	D-11
.813	3/4	1.750	.365 - .385	316 S/S	n/a	Fender	Round	Z0849-316	D-11
.813	3/4	2.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0852-316	D-11
.813	3/4	3.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8780-188	D-31
.813	3/4	4.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8779-188	D-31
.844	3/4	1.625	.265	Stl Cased	Black Ox	Spherical	Round	Z9466F	D-24
.844	3/4	2.000	.240 - .260	Stl Cased	Black Ox	Fender	Round	Z9293	D-12
.890	3/4	3.000	.250	Steel	Galv.	Dock	Round	Z9693G	D-13

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.906	7/8	1.500	.090	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C1490R	D-16
.906	7/8	1.750	.156	Steel	n/a	Flat Washer	Round	Z9102	D-3
.906	7/8	1.750	.156	Brass	n/a	Flat Washer	Round	Z9102BR	D-4
.906	7/8	1.750	.156	18-8 S/S	n/a	Flat Washer	Round	Z9102SS	D-2
.906	7/8	1.750	.156	17-4 S/S	n/a	Flat Washer	Round	Z9102-174	D-4
.906	7/8	2.438	.188	Steel	Galv.	Tapped Flange	Square	Z8890-STL-RC	D-46
.906	7/8	3.688	.188	Steel	Galv.	Tapped Flange	Square	Z8890-STL-SQ	D-46
.906	7/8	1.500	.080 - .100	18-8 S/S	n/a	Mil Spec	Round	AN960-C1416	D-15
.906	7/8	1.750	.156	Stl Cased	Nickel	Machined	Round	Z9102M	D-9
.906	7/8	1.750	.156	18-8 S/S	n/a	Machined	Round	Z9102M-SS	D-9
.906	3/4	1.500	.250	Stl Cased	Zinc	Welding Thick	Round	Z9093	D-7
.906	3/4	1.500	.250	18-8 S/S	n/a	Welding Thick	Round	Z9093-SS	D-7
.906	7/8	1.750	.250	Steel	Plain	Machined	Round	Z9188	D-9
.906	7/8	1.750	.250	Steel	n/a	Flat Washer	Round	Z9207	D-3
.906	7/8	1.750	.250	Brass	n/a	Flat Washer	Round	Z9207BR	D-4
.906	3/4	3.000	.250	18-8 S/S	n/a	Fender-XT	Round	Z9693SS	D-13
.906	3/4	3.000	.375	Steel	n/a	Fender-XT	Round	Z9698	D-13
.906	7/8	2.125	.298 - .328	Steel	n/a	Flat Washer	Round	Z9238	D-3
.938	7/8	1.750	.250	18-8 S/S	n/a	Flat Washer	Round	Z9207SS	D-2
.938	7/8	1.750	.250	17-4 S/S	n/a	Flat Washer	Round	Z9207-174	D-4
.938	7/8	1.750	.250	Soft Stl	Plain	Beveled FW	Round	Z9188-BEV	D-8
.938	7/8	1.750	.250	Stl Cased	Plain	Beveled FW	Round	Z9188-BEV-H	D-8
.938	7/8	1.750	.250	Stl Cased	Zinc	Beveled FW	Round	Z9188-BEV-HZN	D-8
.938	7/8	1.750	.250	18-8 S/S	n/a	Beveled FW	Round	Z9188-BEV-SS	D-8
.938	7/8	1.750	.250	Steel	Zinc Yel	Flat Washer	Round	Z9278	D-3
.938	7/8	1.828	.250	Stl Cased	n/a	Component Thick	Round	Z9207U	D-7
.938	7/8	2.000	.250	Soft Stl	Galv.	Square	Square	Z8960G	D-34
.938	7/8	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8960H	D-32
.938	7/8	2.000	.250	18-8 S/S	n/a	Square	Square	Z8960SS	D-31
.938	7/8	3.000	0.25	Steel	Zinc	Dock	Round	Z9673	D-13
.938	7/8	3.000	.250	Steel	Galv.	Square	Square	Z8883-HDG	D-32
.938	7/8	3.000	.250	18-8 S/S	n/a	Square	Square	Z8883SS	D-31
.938	7/8	4.000	.250	Steel	Galv.	Square	Square	Z8894-HDG	D-32
.938	7/8	4.000	.250	18-8 S/S	n/a	Square	Square	Z8894SS	D-31
.938	7/8	1.750	.108 - .160	18-8 S/S	n/a	Mil Spec	Round	MS15795-824	D-16
.938	7/8	2.250	.136 - .192	18-8 S/S	n/a	Mil Spec	Round	MS15795-825	D-16
.938	7/8	2.250	.136 - .192	18-8 S/S	n/a	USS Standard	Round	WAS50478	D-18
.938	7/8	2.250	.136 - .192	316 S/S	n/a	USS Standard	Round	WAS50578	D-18
.938	7/8	3.250	.125	Steel	n/a	Fender-XT	Round	Z9694	D-13
.938	7/8	1.750	.240	Stl Cased	Black Ox	Spherical	Round	Z9470M	D-24
.938	7/8	1.750	.240	316 S/S	n/a	Spherical	Round	Z9470M-316	D-24
.938	7/8	1.750	.240	18-8 S/S	n/a	Spherical	Round	Z9470M-SS	D-23
.938	7/8	1.750	.250	18-8 S/S	n/a	Flat Washer	Round	Z9278SS	D-2
.938	7/8	3.000	.250	Steel	Galv.	Dock	Round	Z9673G	D-13
.938	7/8	3.250	.250	Steel	n/a	Fender-XT	Round	Z9695	D-13
.938	7/8	3.250	.250	18-8 S/S	n/a	Fender-XT	Round	Z9695SS	D-13
.938	7/8	1.469	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB78N316	D-19
.938	7/8	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8932-188	D-31
.938	7/8	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8932-BOX	D-32
.938	7/8	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8932-ZN	D-33
.938	7/8	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8866-ZN	D-33
.938	7/8	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8729-ZN	D-33
.938	7/8	2.250	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB78R316	D-20

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
.938	7/8	2.750	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB78W316	D-20
.938	7/8	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8941-188	D-31
.938	7/8	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8941-BOX	D-32
.938	7/8	2.000	.170 - .200	Steel	Zinc	Square	Square	Z8941-ZN	D-33
.938	7/8	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8875-ZN	D-33
.938	7/8	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8737-ZN	D-33
.938	7/8	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8960-ZN	D-33
.938	7/8	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8883-ZN	D-33
.938	7/8	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8894-ZN	D-33
.938	7/8	2.000	.235 - .265	18-8 S/S	n/a	Square	Square	Z8960-188	D-31
.938	7/8	4.000	.235 - .265	Steel	Black Ox	Square	Square	Z8894H	D-32
.938	7/8	3.000	.235 - .265	Steel	Black Ox	Square	Square	Z8883H	D-32
.938	7/8	3.000	.298 - .328	18-8 S/S	n/a	Square	Square	Z8761-188	D-31
.938	7/8	$\frac{1.937}{2.25} \times$	.360 - .390	18-8 S/S	n/a	Bearing Plate	Rectangle	Z8756-188	D-29
1.000	1	1.750	.031	18-8 S/S	n/a	Shims for D Shafts	Round	Z0580	D-44
1.000	n/a	2.000	.048	18-8 S/S	n/a	Wide Shim	Round	Z9950SS	D-35
1.000	1	1.750	.063	18-8 S/S	n/a	Shims for D Shafts	Round	Z0581	D-44
1.000	n/a	2.000	.075	18-8 S/S	n/a	Wide Shim	Round	Z9962SS	D-35
1.000	1	1.750	.125	18-8 S/S	n/a	Shims for D Shafts	Round	Z0582	D-44
1.000	7/8	3.250	.375	Steel	n/a	Fender-XT	Round	Z9699	D-13
1.000	7/8	1.469	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB78NZ	D-19
1.000	7/8	1.469	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB78N8	D-19
1.015	7/8	2.000	.110	316 S/S	n/a	Fender	Round	Z0622-316	D-11
1.015	7/8	2.000	.110	18-8 S/S	n/a	Fender	Round	Z0622-188	D-10
1.015	7/8	2.250	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB78RZ	D-20
1.015	7/8	2.250	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB78R8	D-20
1.015	7/8	2.750	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB78WZ	D-20
1.031	1	2.000	.188	17-4 S/S	n/a	Flat Washer	Round	Z9103-174	D-4
1.031	7/8	1.750	.240	Stl Cased	Black Ox	Spherical	Round	Z9470F	D-24
1.031	7/8	1.750	.240	316 S/S	n/a	Spherical	Round	Z9470F-316	D-24
1.031	7/8	1.750	.240	18-8 S/S	n/a	Spherical	Round	Z9470F-SS	D-23
1.031	1	2.000	.313	Soft Stl	Plain	Beveled FW	Round	Z9189-BEV	D-8
1.031	7/8	2.750	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB78W8	D-20
1.031	1	1.750	.090	18-8 S/S	n/a	Mil Spec	Round	NAS1149-C1690R	D-16
1.031	1	1.755	.093	Fiberglass	n/a	Non-Metal	Round	Z8334	D-21
1.031	1	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8350	D-34
1.031	1	2.000	.125	Fiberglass	n/a	Non-Metal	Square	Z8370	D-34
1.031	1	2.000	.188	Steel	n/a	Flat Washer	Round	Z9103	D-3
1.031	1	2.000	.188	Brass	n/a	Flat Washer	Round	Z9103BR	D-4
1.031	1	2.000	.188	18-8 S/S	n/a	Flat Washer	Round	Z9103SS	D-2
1.031	1	2.000	.219	Steel	n/a	Flat Washer	Round	Z9208	D-3
1.031	1	2.000	.219	Brass	n/a	Flat Washer	Round	Z9208BR	D-4
1.031	1	2.000	.219	18-8 S/S	n/a	Flat Washer	Round	Z9208SS	D-2
1.031	1	2.000	.219	17-4 S/S	n/a	Flat Washer	Round	Z9208-174	D-4
1.031	1	1.750	.080 - .100	18-8 S/S	n/a	Mil Spec	Round	AN960-C1616	D-15
1.032	1	2.000	.313	Stl Cased	Plain	Beveled FW	Round	Z9189-BEV-H	D-8
1.032	1	2.000	.313	Stl Cased	Zinc	Beveled FW	Round	Z9189-BEV-HZN	D-8
1.062	1	2.000	0.110	316 S/S	n/a	Fender	Round	Z0623-316	D-11
1.062	1	2.000	0.110	18-8 S/S	n/a	Fender	Round	Z0623-188	D-10
1.062	1	2.500	0.125	316 S/S	n/a	Fender	Round	WAS1.062X2.5X.125T316	D-11
1.062	1	2.000	.187	Stl Cased	Nickel	Machined	Round	Z9103M	D-9
1.062	1	2.000	.187	18-8 S/S	n/a	Machined	Round	Z9103M-SS	D-9

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
1.062	1	2.000	.250	18-8 S/S	n/a	Flat Washer	Round	Z9209SS	D-2
1.062	1	2.000	.250	Steel	n/a	Flat Washer	Round	Z9209STL	D-3
1.062	1	2.000	.250	Steel	Zinc Yel	Flat Washer	Round	Z9279	D-3
1.062	1	2.000	.250	18-8 S/S	n/a	Flat Washer	Round	Z9279SS	D-2
1.062	1	2.000	.250	Steel	Galv.	Square	Square	Z8962G	D-34
1.062	1	2.000	.250	Diamond Stl	Galv.	Square	Square	Z8962D	D-32
1.062	1	2.000	.250	Stl Cased	Black Ox	Square	Square	Z8962H	D-32
1.062	1	2.000	.250	18-8 S/S	n/a	Square	Square	Z8962SS	D-31
1.062	1	3.000	.250	Steel	Galv.	Square	Square	Z8884-HDG	D-32
1.062	1	3.250	0.25	Steel	Zinc	Dock	Round	Z9674	D-13
1.062	1	2.062	.281	Stl Cased	n/a	Component Thick	Round	Z9208U	D-7
1.062	1	2.000	.312	Steel	Plain	Component Thick	Round	Z9189	D-9
1.062	1	2.000	.313	18-8 S/S	n/a	Beveled FW	Round	Z9189-BEV-SS	D-8
1.062	1	2.500	.313	Steel	n/a	Flat Washer	Round	Z9239	D-3
1.062	1	2.000	.330	Stl Cased	Black Ox	Spherical	Round	Z9474M	D-24
1.062	1	2.000	.330	316 S/S	n/a	Spherical	Round	Z9474M-316	D-24
1.062	1	2.000	.330	18-8 S/S	n/a	Spherical	Round	Z9474M-SS	D-23
1.062	7/8 & 1	2.500	.438	Stl Cased	Black Ox	Easy On Slotted	Round	Z9434	D-22
1.062	7/8 & 1	2.500	.438	18-8 S/S	n/a	Easy On Slotted	Round	Z9434SS	D-22
1.062	1	3.000	.562	Steel Cased	Black Ox	C Washer	Round	Z9442	D-22
1.062	1	1.750	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB80N316	D-19
1.062	1	1.750	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB80NZ	D-19
1.062	1	1.750	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB80N8	D-19
1.062	1	2.000	.108 - .160	18-8 S/S	n/a	Mil Spec	Round	MS15795-826	D-16
1.062	1	2.000	.108 - .160	18-8 S/S	n/a	SAE Standard	Round	WAS40401	D-17
1.062	1	2.000	.108 - .160	316 S/S	n/a	SAE Standard	Round	WAS40501	D-17
1.062	1	2.250	.110 - .140	316 S/S	n/a	Fender	Round	WAS1.062X2.25X.125T316	D-11
1.062	1	2.850	.110 - .140	316 S/S	n/a	Fender	Round	WAS1.062X2.85X.125-316	D-11
1.062	1	2.500	.136 - .192	18-8 S/S	n/a	Mil Spec	Round	MS15795-827	D-16
1.062	1	2.500	.136 - .192	18-8 S/S	n/a	USS Standard	Round	WAS50401	D-18
1.062	1	2.500	.136 - .192	316 S/S	n/a	USS Standard	Round	WAS50501	D-18
1.062	1	2.500	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB80R316	D-20
1.062	1	3.000	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB80W316	D-20
1.062	1	2.500	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB80RZ	D-20
1.062	1	2.500	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB80R8	D-20
1.062	1	3.000	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB80WZ	D-20
1.062	1	3.000	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB80W8	D-20
1.062	1	2.500	.240 - .260	Stl Cased	Black Ox	Fender	Round	Z9294	D-12
1.063	1	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8933-188	D-31
1.063	1	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8933-BOX	D-32
1.063	1	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8933-ZN	D-33
1.063	1	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8867-ZN	D-33
1.063	1	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8730-ZN	D-33
1.063	1	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8949-188	D-31
1.063	1	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8949-BOX	D-32
1.063	1	2.000	.170 - .200	Steel	Zinc	Square	Square	Z8949-ZN	D-33
1.063	1	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8877-ZN	D-33
1.063	1	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8738-ZN	D-33
1.063	1	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8962-ZN	D-33
1.063	1	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8884-ZN	D-33
1.063	1	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8895-ZN	D-33
1.063	1	4.000	.235 - .265	Steel	Black Ox	Square	Square	Z8895H	D-32

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
1.063	1	3.000	.235 - .265	Steel	Black Ox	Square	Square	Z8884H	D-32
1.063	1	2.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0854-316	D-11
1.063	1	3.500	.360 - .390	18-8 S/S	n/a	Square	Square	Z8762-188	D-31
1.063	1	2.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0855-316	D-11
1.063	1	3.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8782-188	D-31
1.063	1	4.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8781-188	D-31
1.125	1	3.000	.250	18-8 S/S	n/a	Square	Square	Z8884SS	D-31
1.156	1	3.250	.250	Steel	Galv.	Dock	Round	Z9674G	D-13
1.156	1	3.500	.125	Steel	n/a	Fender-XT	Round	Z9696	D-13
1.156	1	3.500	.125	18-8 S/S	n/a	Fender-XT	Round	Z9696SS	D-13
1.156	1	3.250	.250	18-8 S/S	n/a	Fender-XT	Round	Z9674SS	D-13
1.156	1	3.250	.250	Steel	n/a	Fender-XT	Round	Z9674GU	D-13
1.156	1	3.500	.250	Steel	n/a	Fender-XT	Round	Z9697	D-13
1.156	1	3.500	.375	Steel	n/a	Fender-XT	Round	Z9677	D-13
1.187	1-1/8	2.000	.090 - .112	316 S/S	n/a	ANSI Type B	Round	WASB81N316	D-19
1.187	1-1/8	2.750	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB81R316	D-20
1.187	1-1/8	3.250	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB81W316	D-20
1.188	1	2.000	.290	Stl Cased	Black Ox	Spherical	Round	Z9474F	D-24
1.188	1	2.000	.290	316 S/S	n/a	Spherical	Round	Z9474F-316	D-24
1.188	1	2.000	.290	18-8 S/S	n/a	Spherical	Round	Z9474F-SS	D-23
1.188	1 1/8	2.250	.219	Steel	n/a	Flat Washer	Round	Z9104	D-3
1.188	1 1/8	2.250	.219	18-8 S/S	n/a	Flat Washer	Round	Z9104SS	D-2
1.188	1 1/8	2.250	.219	17-4 S/S	n/a	Flat Washer	Round	Z9104-174	D-4
1.188	1	4.000	.250	Steel	Galv.	Square	Square	Z8895-HDG	D-32
1.188	1	4.000	.250	18-8 S/S	n/a	Square	Square	Z8895SS	D-31
1.188	1-1/8	2.250	.312	Steel	Plain	Component Thick	Round	Z9190	D-9
1.188	1-1/8	2.250	.313	Soft Stl	Plain	Beveled FW	Round	Z9190-BEV	D-8
1.188	1-1/8	2.250	.313	Stl Cased	Plain	Beveled FW	Round	Z9190-BEV-H	D-8
1.250	n/a	1.875	.075	18-8 S/S	n/a	Wide Shim	Round	Z9964SS	D-35
1.250	1-1/8	2.250	.125	18-8 S/S	n/a	Fender-XT	Round	WAS1.25X2.25X.125T188	D-13
1.250	1-1/8	2.250	.313	Stl Cased	Zinc	Beveled FW	Round	Z9190-BEV-HZN	D-8
1.250	1-1/8	2.250	.313	18-8 S/S	n/a	Beveled FW	Round	Z9190-BEV-SS	D-8
1.250	1-1/8	2.000	.090 - .112	Steel	Zinc	ANSI Type B	Round	WASB81NZ	D-19
1.281	1-1/8	3.250	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB81WZ	D-20
1.281	1-1/8	2.750	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB81R8	D-20
1.281	1-1/8	2.500	.125	316 S/S	n/a	Fender	Round	Z0624-316	D-11
1.281	1-1/8	2.500	.125	18-8 S/S	n/a	Fender	Round	Z0624-188	D-10
1.281	1-1/8	2.250	.250	Steel	Zinc Yel	Flat Washer	Round	Z9280	D-3
1.281	1-1/8	2.250	.281	Stl Cased	Black Ox	Spherical	Round	Z9478M	D-24
1.281	1-1/8	2.250	.281	316 S/S	n/a	Spherical	Round	Z9478M-316	D-24
1.281	1-1/8	2.250	.281	18-8 S/S	n/a	Spherical	Round	Z9478M-SS	D-23
1.281	1-1/8	2.000	.090 - .112	18-8 S/S	n/a	ANSI Type B	Round	WASB81N8	D-19
1.281	1-1/8	2.750	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB81RZ	D-20
1.312	1-1/4	2.500	.281	Steel	n/a	Flat Washer	Round	Z9105	D-3
1.312	1-1/4	2.500	.281	18-8 S/S	n/a	Flat Washer	Round	Z9105SS	D-2
1.312	1-1/4	2.500	.281	17-4 S/S	n/a	Flat Washer	Round	Z9105-174	D-4
1.312	1-1/4	2.250	.312	Steel	Plain	Component Thick	Round	Z9191	D-9
1.312	1-1/4	2.250	.313	Soft Stl	Plain	Beveled FW	Round	Z9191-BEV	D-8
1.312	1-1/4	2.250	.313	Stl Cased	Plain	Beveled FW	Round	Z9191-BEV-H	D-8
1.312	1-1/4	2.250	.313	Stl Cased	Zinc	Beveled FW	Round	Z9191-BEV-HZN	D-8
1.312	1-1/4	2.250	.313	18-8 S/S	n/a	Beveled FW	Round	Z9191-BEV-SS	D-8
1.312	1-1/8	2.250	.350	Stl Cased	Black Ox	Spherical	Round	Z9478F	D-24
1.312	1-1/8	2.250	.350	316 S/S	n/a	Spherical	Round	Z9478F-316	D-24

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
1.312	1-1/8	2.250	.350	18-8 S/S	n/a	Spherical	Round	Z9478F-SS	D-23
1.312	1-1/4	2.250	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB82N316	D-19
1.312	1-1/4	3.000	.146 - .174	316 S/S	n/a	ANSI Type B	Round	WASB82R316	D-20
1.312	1 1/8	3.250	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB81W8	D-20
1.312	1-1/4	3.500	.234 - .266	316 S/S	n/a	ANSI Type B	Round	WASB82W316	D-20
1.313	1-1/4	2.000	.250	18-8 S/S	n/a	Square	Square	Z8963SS	D-31
1.313	1-1/4	3.000	.250	Steel	Galv.	Square	Square	Z8885G	D-34
1.313	1-1/4	3.000	.250	Steel	Black Ox	Square	Square	Z8885H	D-32
1.313	1-1/4	3.000	.625	Steel Cased	Black Ox	C Washer	Round	Z9443	D-22
1.313	1-1/4	2.000	.250	Steel	Galv.	Square	Square	Z8963G	D-34
1.313	1-1/4	2.000	.250	Steel	Black Ox	Square	Square	Z8963H	D-32
1.313	1-1/4	2.000	.112 - .128	18-8 S/S	n/a	Square	Square	Z8934-188	D-31
1.313	1-1/4	2.000	.112 - .128	Steel	Black Ox	Square	Square	Z8934-BOX	D-32
1.313	1-1/4	2.000	.112 - .128	Steel	Zinc	Square	Square	Z8934-ZN	D-33
1.313	1-1/4	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8868-ZN	D-33
1.313	1-1/4	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8731-ZN	D-33
1.313	1-1/4	2.000	.170 - .200	18-8 S/S	n/a	Square	Square	Z8951-188	D-31
1.313	1-1/4	2.000	.170 - .200	Steel	Black Ox	Square	Square	Z8951-BOX	D-32
1.313	1-1/4	2.000	.170 - .200	Steel	Zinc	Square	Square	Z8951-ZN	D-33
1.313	1-1/4	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8878-ZN	D-33
1.313	1-1/4	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8739-ZN	D-33
1.313	1-1/4	2.000	.220 - .280	Steel	Zinc	Square	Square	Z8963-ZN	D-33
1.313	1-1/4	3.000	.220 - .280	18-8 S/S	n/a	Square	Square	Z8885SS	D-31
1.313	1-1/4	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8885-ZN	D-33
1.313	1-1/4	4.000	.220 - .280	Steel	Black Ox	Square	Square	Z8896H	D-32
1.313	1-1/4	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8896-ZN	D-33
1.313	1-1/4	3.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0857-316	D-11
1.313	1-1/4	4.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0859-316	D-11
1.313	1-1/4	3.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0858-316	D-11
1.313	1-1/4	4.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0860-316	D-11
1.313	1-1/4	3.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8784-188	D-31
1.313	1-1/4	4.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8783-188	D-31
1.375	1-1/4	4.000	.250	Steel	Galv.	Square	Square	Z8896G	D-34
1.375	1-1/4	4.000	0.25	Steel	Zinc	Dock	Round	Z9675	D-13
1.375	1-1/4	2.500	0.312	316 S/S	n/a	Spherical	Round	Z9484M-316	D-24
1.375	1-1/4	2.500	0.312	18-8 S/S	n/a	Spherical	Round	Z9484M-SS	D-23
1.375	1 1/8	2.250	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB82NZ	D-19
1.375	1 1/8	2.250	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB82N8	D-19
1.375	1 1/8	3.000	.146 - .174	Steel	Zinc	ANSI Type B	Round	WASB82RZ	D-20
1.375	1 1/8	3.000	.146 - .174	18-8 S/S	n/a	ANSI Type B	Round	WASB82R8	D-20
1.375	1 1/8	3.500	.234 - .266	Steel	Zinc	ANSI Type B	Round	WASB82WZ	D-20
1.438	1 1/8	3.500	.234 - .266	18-8 S/S	n/a	ANSI Type B	Round	WASB82W8	D-20
1.500	n/a	2.250	.075	18-8 S/S	n/a	Wide Shim	Round	Z9968SS	D-35
1.500	1-1/4	2.750	.125	316 S/S	n/a	Fender	Round	Z0625-316	D-11
1.500	1-1/4	2.750	.125	18-8 S/S	n/a	Fender	Round	Z0625-188	D-10
1.500	1 1/4	2.500	.344	Steel	n/a	Flat Washer	Round	Z9240	D-3
1.500	1-1/4	3.000	.438	Stl Cased	Black Ox	Easy On Slotted	Round	Z9437	D-22
1.500	1-1/4	3.000	.438	18-8 S/S	n/a	Easy On Slotted	Round	Z9437SS	D-22
1.562	1-1/4	2.500	.250	Steel	Zinc Yel	Flat Washer	Round	Z9281	D-3
1.562	1-1/4	2.500	.312	Stl Cased	Black Ox	Spherical	Round	Z9484M	D-24
1.562	1-1/4	2.500	.350	Stl Cased	Black Ox	Spherical	Round	Z9484F	D-24
1.563	1-1/4	2.500	.350	316 S/S	n/a	Spherical	Round	Z9484F-316	D-24

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
1.563	1-1/4	2.500	.350	18-8 S/S	n/a	Spherical	Round	Z9484F-SS	D-23
1.563	1-1/4	4.000	.500	18-8 S/S	n/a	Fender-XT	Round	Z9675SS	D-13
1.563	1-1/4	2.500	.136 - .192	316 S/S	n/a	Fender	Round	WAS1375X2.5X156T316	D-11
1.563	1-1/4	3.000	.136 - .192	316 S/S	n/a	Fender	Round	WAS1.375X3X.187T316	D-11
1.563	1-1/4	4.000	.500	Steel	Galv.	Dock	Round	Z9675G	D-13
1.563	1-1/2	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8869-ZN	D-33
1.563	1-1/2	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8732-ZN	D-33
1.563	1-1/2	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8891-ZN	D-33
1.563	1-1/2	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8740-ZN	D-33
1.563	1-1/2	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8886-ZN	D-33
1.563	1-1/2	4.000	.220 - .280	Steel	Black Ox	Square	Square	Z8897H	D-32
1.563	1-1/2	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8897-ZN	D-33
1.563	1-1/2	3.250	.240 - .260	316 S/S	n/a	Fender	Round	Z0862-316	D-11
1.563	1-1/2	3.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0864-316	D-11
1.563	1-1/2	4.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0866-316	D-11
1.563	1-1/2	3.250	.365 - .385	316 S/S	n/a	Fender	Round	Z0863-316	D-11
1.563	1-1/2	3.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0865-316	D-11
1.563	1-1/2	4.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0867-316	D-11
1.563	1-1/2	3.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8786-188	D-31
1.563	1-1/2	4.000	.485 - .515	18-8 S/S	n/a	Square	Square	Z8785-188	D-31
1.625	1-3/8	2.750	.250	Steel	Zinc Yel	Flat Washer	Round	Z9282	D-3
1.625	1-3/8	2.750	.250	Alloy Stl	n/a	Extra Large OD	Round	Z9250	D-14
1.625	1-3/8	2.750	.250	18-8 S/S	n/a	Extra Large OD	Round	Z9250SS	D-14
1.625	1-3/8	2.750	.250	Steel	Black Ox	Extra Large OD	Round	Z9250LC	D-14
1.625	1-3/8	2.750	.100 - .180	316 S/S	n/a	Fender	Round	WAS1.5X2.75X.125T316	D-11
1.750	1-1/2	3.000	.250	Steel	Galv.	Square	Square	Z8886G	D-34
1.750	1-1/2	3.000	.250	Steel	Black Ox	Square	Square	Z8886H	D-32
1.750	1-1/2	4.000	.313	Steel	Galv.	Extra Large OD	Round	Z9253-HDG	D-14
1.750	1-1/2	4.000	.313	Steel	Galv.	Extra Large OD	Round	Z9265LCG	D-14
1.750	1-5/8	3.750	.153 - .213	18-8 S/S	n/a	Fender-XT	Round	WAS1.75X3.75X187T303	D-13
1.812	1-3/4	3.875	.170 - .200	18-8 S/S	n/a	Fender-XT	Round	WAS1.812X3.875X.187T188	D-13
1.813	1-3/4	3.000	.112 - .128	Steel	Zinc	Square	Square	Z8871-ZN	D-33
1.813	1-3/4	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8733-ZN	D-33
1.813	1-3/4	3.000	.170 - .200	Steel	Zinc	Square	Square	Z8702-ZN	D-33
1.813	1-3/4	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8741-ZN	D-33
1.813	1-3/4	3.000	.220 - .280	Steel	Zinc	Square	Square	Z8879-ZN	D-33
1.813	1-3/4	4.000	.220 - .280	Steel	Black Ox	Square	Square	Z8898H	D-32
1.813	1-3/4	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8898-ZN	D-33
1.875	1-1/2	3.250	.125	316 S/S	n/a	Fender	Round	Z0626-316	D-11
1.875	1-1/2	3.000	.250	Steel	Zinc Yel	Flat Washer	Round	Z9283	D-3
1.875	1-1/2	4.000	.250	Steel	Galv.	Square	Square	Z8897G	D-34
1.875	1-1/2	2.750	.375	Steel	n/a	Flat Washer	Round	Z9241	D-3
1.875	1-1/2	2.750	.375	17-4 S/S	n/a	Flat Washer	Round	Z9241-174	D-4
1.937	1-1/2	3.250	.125	18-8 S/S	n/a	Fender	Round	Z0626-188	D-10
1.937	1-1/2	2.875	.350	Stl Cased	Black Ox	Spherical	Round	Z9488M	D-24
1.937	1-1/2	2.875	.350	316 S/S	n/a	Spherical	Round	Z9488M-316	D-24
1.937	1-1/2	2.875	.350	18-8 S/S	n/a	Spherical	Round	Z9488M-SS	D-23
2.000	1-1/2	3.000	.125	18-8 S/S	n/a	Extra Large OD	Round	Z9251SS	D-14
2.000	2	3.750	.250	Steel	Black Ox	Extra Large OD	Round	Z9256LC	D-14
2.000	1-3/4	4.000	.312	Steel	Galv.	Extra Large OD	Round	Z9266LCG	D-14
2.000	1-3/4	4.000	.313	Steel	Galv.	Extra Large OD	Round	Z9255-HDG	D-14
2.063	1-1/2	3.000	.250	Alloy Stl	n/a	Extra Large OD	Round	Z9252	D-14
2.063	1-1/2	3.000	.250	18-8 S/S	n/a	Extra Large OD	Round	Z9252SS	D-14

Size of Flat Washers by Inner Diameter— Inch

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
2.063	2	4.000	.112 - .128	Steel	Zinc	Square	Square	Z8734-ZN	D-33
2.063	2	4.000	.170 - .200	Steel	Zinc	Square	Square	Z8742-ZN	D-33
2.063	2	4.000	.220 - .280	Steel	Zinc	Square	Square	Z8899-ZN	D-33
2.125	1-1/2	3.000	.250	Steel	Black Ox	Extra Large OD	Round	Z9252LC	D-14
2.125	2	3.750	.250	18-8 S/S	n/a	Extra Large OD	Round	Z9256SS	D-14
2.125	1-1/2	2.875	.390	18-8 S/S	n/a	Spherical	Round	Z9488F-SS	D-23
2.125	1-1/2	2.875	.390	316 S/S	n/a	Spherical	Round	Z9488F-316	D-24
2.125	1-1/2	2.875	.390	Stl Cased	Black Ox	Spherical	Round	Z9488F	D-24
2.125	1-1/2	3.500	.153 - .213	316 S/S	n/a	Fender	Round	WAS1.625X3.5X.187T316	D-11
2.125	2	3.000	.240 - .260	316 S/S	n/a	Fender	Round	Z0869-316	D-11
2.125	2	3.000	.365 - .385	316 S/S	n/a	Fender	Round	Z0870-316	D-11
2.250	2	4.000	.312	Steel	Galv.	Extra Large OD	Round	Z9267LCG	D-14
2.250	2	4.000	.313	Steel	Galv.	Extra Large OD	Round	Z9257-HDG	D-14
2.375	2-1/4	4.500	.210 - .280	316 S/S	n/a	Fender-XT	Round	WAS2.375X4.5X.25T316	D-11
2.625	2-1/2	4.500	.313	Alloy Stl	n/a	Extra Large OD	Round	Z9258	D-14
2.625	2-1/2	4.500	.313	18-8 S/S	n/a	Extra Large OD	Round	Z9258SS	D-14
2.625	1-3/4	4.000	.153 - .213	316 S/S	n/a	Fender-XT	Round	WAS1.875X4X.187T316	D-11
2.625	2-1/2	4.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0871-316	D-11
2.625	2-1/2	4.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0872-316	D-11
2.750	1-3/4	3.375	.250	Alloy Stl	n/a	Extra Large OD	Round	Z9254	D-14
2.750	1-3/4	3.375	.250	18-8 S/S	n/a	Extra Large OD	Round	Z9254SS	D-14
2.750	2-1/2	4.500	.312	Steel	Galv.	Extra Large OD	Round	Z9268LCG	D-14
2.750	2-1/2	4.500	.313	Steel	Galv.	Extra Large OD	Round	Z9259-HDG	D-14
3.125	1-3/4	3.000	.250	Steel	Galv.	Square	Square	Z8879G	D-34
3.125	1-3/4	3.000	.250	Steel	Black Ox	Square	Square	Z8879H	D-32
3.125	1-3/4	3.375	.250	Steel	Black Ox	Extra Large OD	Round	Z9254LC	D-14
3.125	3	5.500	.313	Alloy Stl	n/a	Extra Large OD	Round	Z9260	D-14
3.125	3	5.500	.313	18-8 S/S	n/a	Extra Large OD	Round	Z9260SS	D-14
3.125	3	5.000	.228 - .310	316 S/S	n/a	Fender-XT	Round	WAS3.125X5X.250T316	D-11
3.125	3	5.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0873-316	D-11
3.125	3	5.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0874-316	D-11
3.250	1-3/4	4.000	.250	Steel	Galv.	Square	Square	Z8898G	D-34
3.250	3	5.500	.312	Steel	Galv.	Extra Large OD	Round	Z9269LCG	D-14
3.250	3	5.500	.313	Steel	Galv.	Extra Large OD	Round	Z9261-HDG	D-14
3.625	2	4.000	.250	Steel	Galv.	Square	Square	Z8899G	D-34
3.625	3-1/2	6.500	.313	Alloy Stl	n/a	Extra Large OD	Round	Z9262	D-14
3.625	3-1/2	6.500	.313	18-8 S/S	n/a	Extra Large OD	Round	Z9262SS	D-14
3.625	3-1/2	6.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0875-316	D-11
3.625	3-1/2	6.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0876-316	D-11
4.125	2	3.750	.250	Alloy Stl	n/a	Extra Large OD	Round	Z9256	D-14
4.125	2	4.000	.250	Steel	Black Ox	Square	Square	Z8899H	D-32
4.125	4	7.500	.313	Alloy Stl	n/a	Extra Large OD	Round	Z9264	D-14
4.125	4	7.500	.313	18-8 S/S	n/a	Extra Large OD	Round	Z9264SS	D-14
4.125	4	7.500	.240 - .260	316 S/S	n/a	Fender	Round	Z0877-316	D-11
4.125	4	7.500	.365 - .385	316 S/S	n/a	Fender	Round	Z0878-316	D-11

Size of Flat Washers by Inner Diameter— Metric

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
2.20 mm	M2	5.00 mm	.20 - .40	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M2	D-18
2.70 mm	M2.5	6.00 mm	.40 - .60	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M2.5	D-18
3.20 mm	M3	7.00 mm	.40 - .60 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M3	D-18
3.20 mm	M3	12.00 mm	2.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8840SS	D-5
3.20 mm	M3	12.00 mm	2.00 mm	316 S/S	n/a	Flat Washer	Round	Z8840-316	D-5
3.20 mm	M3	8.00 mm	2.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8803SS	D-5
3.20 mm	M3	8.00 mm	2.00 mm	316 S/S	n/a	Flat Washer	Round	Z8803-316	D-5
3.20 mm	M3	8.00 mm	2.00 mm	Steel	Black Ox	Flat Washer	Round	Z8803	D-5
3.20 mm	M3	12.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9972MSS	D-28
3.20 mm	M3	12.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9972M-316	D-28
3.20 mm	M3	12.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9972M	D-28
3.20 mm	M3	12.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9972ME-SS	D-28
3.20 mm	M3	12.00 mm	2.50 mm	316 S/S	n/a	Countersunk	Round	Z9972ME-316	D-28
3.20 mm	M3	12.00 mm	2.50 mm	Steel	Black Ox	Countersunk	Round	Z9972ME	D-28
3.20 mm	M3	12.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8840	D-5
3.70 mm	M3.5	8.00 mm	.40 - .60 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M3.5	D-18
3.70 mm	M3.5	14.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9979MSS	D-28
3.70 mm	M3.5	14.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9979M-316	D-28
3.70 mm	M3.5	14.00 mm	2.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9979M	D-28
4.30 mm	M4	9.00 mm	.70 - .90 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M4	D-18
4.30 mm	M4	10.00 mm	2.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8804SS	D-5
4.30 mm	M4	10.00 mm	2.00 mm	316 S/S	n/a	Flat Washer	Round	Z8804-316	D-5
4.30 mm	M4	10.00 mm	2.00 mm	Steel	Black Ox	Flat Washer	Round	Z8804	D-5
4.30 mm	M4	14.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8842SS	D-5
4.30 mm	M4	14.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8842-316	D-5
4.30 mm	M4	14.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8842	D-5
4.30 mm	M4	16.00 mm	3.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9920SS	D-28
4.30 mm	M4	16.00 mm	3.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9920-316	D-28
4.30 mm	M4	16.00 mm	3.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9920	D-28
4.30 mm	M4	16.00 mm	3.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9920E-SS	D-28
4.30 mm	M4	16.00 mm	3.00 mm	316 S/S	n/a	Countersunk	Round	Z9920E-316	D-28
4.30 mm	M4	16.00 mm	3.00 mm	Steel	Black Ox	Countersunk	Round	Z9920E	D-28
4.30 mm	M4	2.00 mm	3.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9921	D-28
5.30 mm	M5	10.00 mm	.90 - 1.10 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M5	D-18
5.30 mm	M5	10.00 mm	.90 - 1.10 mm	316 H5 S/S	n/a	DIN Washer	Round	WAS407M5	D-18
5.30 mm	M5	11.00 mm	2 mm	18-8 S/S	n/a	Flat Washer	Round	Z8805SS	D-5
5.30 mm	M5	11.00 mm	2 mm	316 S/S	n/a	Flat Washer	Round	Z8805-316	D-5
5.30 mm	M5	11.00 mm	2 mm	Steel	Black Ox	Flat Washer	Round	Z8805	D-5
5.30 mm	M5	15.00 mm	2 mm	18-8 S/S	n/a	Flat Washer	Round	Z8844SS	D-5
5.30 mm	M5	15.00 mm	2 mm	316 S/S	n/a	Flat Washer	Round	Z8844-316	D-5
5.30 mm	M5	15.00 mm	2 mm	Steel	Black Ox	Flat Washer	Round	Z8844	D-5
5.30 mm	M5	12.00 mm	3 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M05-174	D-5
5.30 mm	M5	22.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9922SS	D-28
5.30 mm	M5	22.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9922-316	D-28
5.30 mm	M5	22.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9922	D-28
5.30 mm	M5	22.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9922E-SS	D-28
5.30 mm	M5	22.00 mm	3.50 mm	316 S/S	n/a	Countersunk	Round	Z9922E-316	D-28
5.30 mm	M5	22.00 mm	3.50 mm	Steel	Black Ox	Countersunk	Round	Z9922E	D-28
5.30 mm	M5	25.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9923SS	D-28
5.30 mm	M5	25.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9923	D-28
5.30 mm	M5	28.00 mm	3.50 mm	18-8 S/S	n/a	Countersunk	Round	Z9924	D-28

Size of Flat Washers by Inner Diameter— Metric

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
6.40 mm	M6	12.00 mm	1.40 - 1.80 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M6	D-18
6.40 mm	M6	12.00 mm	1.40 - 1.80 mm	316 H5 S/S	n/a	DIN Washer	Round	WAS407M6	D-18
6.40 mm	M6	12.00 mm	2.30 mm	18-8 S/S	n/a	Spherical	Round	Z9521M	D-4
6.40 mm	M6	12.00 mm	2.30 mm	Steel	Black Ox	Spherical	Round	Z9520M	D-4
6.40 mm	M6	13.00 mm	2.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8806SS	D-5
6.40 mm	M6	13.00 mm	2.50 mm	316 S/S	n/a	Flat Washer	Round	Z8806-316	D-5
6.40 mm	M6	13.00 mm	2.50 mm	Steel	Black Ox	Flat Washer	Round	Z8806	D-5
6.40 mm	M6	18.00 mm	4.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8846SS	D-5
6.40 mm	M6	18.00 mm	4.50 mm	316 S/S	n/a	Flat Washer	Round	Z8846-316	D-5
6.40 mm	M6	18.00 mm	4.50 mm	Steel	Black Ox	Flat Washer	Round	Z8846	D-5
6.40 mm	M6	32.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9925SS	D-28
6.40 mm	M6	32.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9925-316	D-28
6.40 mm	M6	32.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9925	D-28
6.40 mm	M6	32.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9925E-SS	D-28
6.40 mm	M6	32.00 mm	4.00 mm	316 S/S	n/a	Countersunk	Round	Z9925E-316	D-28
6.40 mm	M6	32.00 mm	4.00 mm	Steel	Black Ox	Countersunk	Round	Z9925E	D-28
6.40 mm	M6	36.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9926	D-28
6.40 mm	M6	4.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9927SS	D-28
6.40 mm	M6	4.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9927	D-28
6.40 mm	M6	45.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9928	D-28
6.40 mm	M6	52.00 mm	4.00 mm	18-8 S/S	n/a	Countersunk	Round	Z9929	D-28
7.10 mm	M6	12.00 mm	2.80 mm	18-8 S/S	n/a	Spherical	Round	Z9521F	D-4
7.10 mm	M6	12.00 mm	2.80 mm	Steel	Black Ox	Spherical	Round	Z9520F	D-4
8.40 mm	M8	16.00 mm	1.40 - 1.80 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M8	D-18
8.40 mm	M8	16.00 mm	1.40 - 1.80 mm	316 H5 S/S	n/a	DIN Washer	Round	WAS407M8	D-18
8.40 mm	M8	16.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8808SS	D-5
8.40 mm	M8	16.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8808-316	D-5
8.40 mm	M8	16.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8808	D-5
8.40 mm	M8	19.00 mm	3.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M08-174	D-5
8.40 mm	M8	22.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8848SS	D-5
8.40 mm	M8	22.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8848-316	D-5
8.40 mm	M8	22.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8848	D-5
8.40 mm	M8	17.00 mm	3.20 mm	18-8 S/S	n/a	Spherical	Round	Z9523M	D-4
8.40 mm	M8	17.00 mm	3.20 mm	Steel	Black Ox	Spherical	Round	Z9522M	D-4
8.40 mm	M8	32.00 mm	4.80 mm	18-8 S/S	n/a	Countersunk	Round	Z9973MSS	D-28
8.40 mm	M8	32.00 mm	4.80 mm	18-8 S/S	n/a	Countersunk	Round	Z9973M-316	D-28
8.40 mm	M8	32.00 mm	4.80 mm	18-8 S/S	n/a	Countersunk	Round	Z9973M	D-28
9.00 mm	M6	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8906SS	D-34
9.00 mm	M6	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8908	D-34
9.00 mm	M6	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8908-G	D-34
9.60 mm	M8	17.00 mm	3.50 mm	18-8 S/S	n/a	Spherical	Round	Z9523F	D-4
9.60 mm	M8	17.00 mm	3.50 mm	Steel	Black Ox	Spherical	Round	Z9522F	D-4
10.50 mm	M10	20.00 mm	1.80 - 2.20 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M10	D-18
10.50 mm	M10	20.00 mm	1.80 - 2.20 mm	316 H5 S/S	n/a	DIN Washer	Round	WAS407M10	D-18
10.50 mm	M10	19.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8810SS	D-5
10.50 mm	M10	19.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8810-316	D-5
10.50 mm	M10	19.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8810	D-5
10.50 mm	M10	22.00 mm	3.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M10-174	D-5
10.50 mm	M10	23.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8850SS	D-5
10.50 mm	M10	23.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8850-316	D-5
10.50 mm	M10	23.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8850	D-5
10.50 mm	M10	21.00 mm	4.00 mm	18-8 S/S	n/a	Spherical	Round	Z9525M	D-4
10.50 mm	M10	21.00 mm	4.00 mm	Steel	Black Ox	Spherical	Round	Z9524M	D-4

Size of Flat Washers by Inner Diameter— Metric

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
11.00 mm	M8	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8908SS	D-34
11.00 mm	M8	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8910	D-34
11.00 mm	M8	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8910-G	D-34
12.00 mm	M10	21.00 mm	4.20 mm	18-8 S/S	n/a	Spherical	Round	Z9525F	D-4
12.00 mm	M10	21.00 mm	4.20 mm	Steel	Black Ox	Spherical	Round	Z9524F	D-4
13.00 mm	M12	24.00 mm	2.30 - 2.70 mm	Gr 2 Titanium	n/a	DIN Washer	Round	WAS406M12	D-18
13.00 mm	M12	24.00 mm	2.30 - 2.70 mm	316 H5 S/S	n/a	DIN Washer	Round	WAS407M12	D-18
13.00 mm	M12	22.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8812SS	D-5
13.00 mm	M12	22.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8812-316	D-5
13.00 mm	M12	22.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8812	D-5
13.00 mm	M12	26.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8852SS	D-5
13.00 mm	M12	26.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8852-316	D-5
13.00 mm	M12	26.00 mm	3.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M12-174	D-5
13.00 mm	M12	26.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8852	D-5
13.00 mm	M12	24.00 mm	4.60 mm	18-8 S/S	n/a	Spherical	Round	Z9527M	D-4
13.00 mm	M12	24.00 mm	4.60 mm	Steel	Black Ox	Spherical	Round	Z9526M	D-4
13.00 mm	M12	35.00 mm	5.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z92M12-174	D-5
13.00 mm	M10	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8910SS	D-34
13.00 mm	M10	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8912	D-34
13.00 mm	M10	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8912-G	D-34
13.00 mm	M12	38.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8851SS	D-5
13.00 mm	M12	50.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8853SS	D-5
13.00 mm	M12	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8855SS	D-5
14.20 mm	M12	24.00 mm	5.00 mm	18-8 S/S	n/a	Spherical	Round	Z9527F	D-4
14.20 mm	M12	24.00 mm	5.00 mm	Steel	Black Ox	Spherical	Round	Z9526F	D-4
15.00 mm	M14	25.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8814SS	D-5
15.00 mm	M14	25.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8814-316	D-5
15.00 mm	M14	25.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8814	D-5
15.00 mm	M14	26.00 mm	3.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M14-174	D-5
15.00 mm	M14	27.00 mm	3.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8854SS	D-5
15.00 mm	M14	27.00 mm	3.00 mm	316 S/S	n/a	Flat Washer	Round	Z8854-316	D-5
15.00 mm	M14	27.00 mm	3.00 mm	Steel	Black Ox	Flat Washer	Round	Z8854	D-5
15.00 mm	M14	35.00 mm	5.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z92M14-174	D-5
15.00 mm	M14	28.00 mm	5.00 mm	Steel	Black Ox	Spherical	Round	Z9528M	D-4
16.00 mm	M12	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8912SS	D-34
16.00 mm	M12	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8914	D-34
16.00 mm	M12	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8914-G	D-34
16.50 mm	M14	28.00 mm	5.60 mm	Steel	Black Ox	Spherical	Round	Z9528F	D-4
17.00 mm	M16	35.00 mm	3.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M16-174	D-6
17.00 mm	M16	28.00 mm	3.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8816SS	D-6
17.00 mm	M16	28.00 mm	3.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8818SS	D-6
17.00 mm	M16	28.00 mm	3.50 mm	316 S/S	n/a	Flat Washer	Round	Z8816-316	D-6
17.00 mm	M16	28.00 mm	3.50 mm	316 S/S	n/a	Flat Washer	Round	Z8818-316	D-6
17.00 mm	M16	28.00 mm	3.50 mm	Steel	Black Ox	Flat Washer	Round	Z8816	D-6
17.00 mm	M16	32.00 mm	3.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8856SS	D-6
17.00 mm	M16	32.00 mm	3.50 mm	316 S/S	n/a	Flat Washer	Round	Z8856-316	D-6
17.00 mm	M16	32.00 mm	3.50 mm	Steel	Black Ox	Flat Washer	Round	Z8856	D-6
17.00 mm	M16	35.00 mm	5.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z92M16-174	D-6
17.00 mm	M16	3.00 mm	5.30 mm	18-8 S/S	n/a	Spherical	Round	Z9531M	D-4
18.00 mm	M14	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8914SS	D-34
18.00 mm	M14	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8916	D-34
18.00 mm	M14	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8916-G	D-34
19.00 mm	M16	3.00 mm	6.20 mm	18-8 S/S	n/a	Spherical	Round	Z9531F	D-4

Size of Flat Washers by Inner Diameter— Metric

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
19.00 mm	M16	3.00 mm	6.20 mm	Steel	Black Ox	Spherical	Round	Z9530F	D-4
20.00 mm	M18	32.00 mm	3.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8819SS	D-6
20.00 mm	M18	42.00 mm	4.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M18-174	D-6
20.00 mm	M18	38.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8857SS	D-6
20.00 mm	M18	42.00 mm	6.30 mm	17-4 S/S	n/a	Flat Washer	Round	Z92M18-174	D-6
20.00 mm	M18	50.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8858SS	D-6
20.00 mm	M18	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8859SS	D-6
21.00 mm	M20	35.00 mm	3.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8820SS	D-6
21.00 mm	M20	35.00 mm	3.50 mm	316 S/S	n/a	Flat Washer	Round	Z8820-316	D-6
21.00 mm	M20	35.00 mm	3.50 mm	Steel	Black Ox	Flat Washer	Round	Z8820	D-6
21.00 mm	M20	35.00 mm	5.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8860SS	D-6
21.00 mm	M20	35.00 mm	5.00 mm	316 S/S	n/a	Flat Washer	Round	Z8860-316	D-6
21.00 mm	M20	35.00 mm	5.00 mm	Steel	Black Ox	Flat Washer	Round	Z8860	D-6
21.00 mm	M20	36.00 mm	6.30 mm	18-8 S/S	n/a	Spherical	Round	Z9533M	D-4
21.00 mm	M20	36.00 mm	6.30 mm	Steel	Black Ox	Spherical	Round	Z9530M	D-4
22.00 mm	M20	45.00 mm	4.00 mm	17-4 S/S	n/a	Flat Washer	Round	Z90M20-174	D-6
22.00 mm	M16	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8916SS	D-34
22.00 mm	M16	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8920	D-34
22.00 mm	M16	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8920-G	D-34
22.00 mm	M20	38.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8861SS	D-6
22.00 mm	M20	45.00 mm	6.30 mm	17-4 S/S	n/a	Flat Washer	Round	Z92M20-174	D-6
22.00 mm	M20	50.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8862SS	D-6
22.00 mm	M20	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8863SS	D-6
23.20 mm	M20	36.00 mm	7.50 mm	18-8 S/S	n/a	Spherical	Round	Z9533F	D-4
23.20 mm	M20	36.00 mm	7.50 mm	Steel	Black Ox	Spherical	Round	Z9532F	D-4
25.00 mm	M24	4.00 mm	4.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8824SS	D-6
25.00 mm	M24	4.00 mm	4.00 mm	316 S/S	n/a	Flat Washer	Round	Z8824-316	D-6
25.00 mm	M24	4.00 mm	4.00 mm	Steel	Black Ox	Flat Washer	Round	Z8824	D-6
25.00 mm	M24	43.00 mm	4.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8864SS	D-6
25.00 mm	M24	43.00 mm	4.00 mm	316 S/S	n/a	Flat Washer	Round	Z8864-316	D-6
25.00 mm	M24	43.00 mm	4.00 mm	Steel	Black Ox	Flat Washer	Round	Z8864	D-6
25.00 mm	M24	44.00 mm	8.20 mm	18-8 S/S	n/a	Spherical	Round	Z9535M	D-4
25.00 mm	M24	44.00 mm	8.20 mm	Steel	Black Ox	Spherical	Round	Z9532M	D-4
26.00 mm	M20	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8920SS	D-34
26.00 mm	M20	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8922	D-34
26.00 mm	M20	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8922-G	D-34
26.00 mm	M24	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8825SS	D-6
26.00 mm	M24	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8826SS	D-6
28.00 mm	M22	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8922SS	D-34
28.00 mm	M22	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8924	D-34
28.00 mm	M22	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8924-G	D-34
28.00 mm	M24	44.00 mm	9.50 mm	Steel	Black Ox	Spherical	Round	Z9534F	D-4
28.00 mm	M24	44.00 mm	9.50 mm	18-8 S/S	n/a	Spherical	Round	Z9535F	D-4
31.00 mm	M30	56.00 mm	11.20 mm	18-8 S/S	n/a	Spherical	Round	Z9537M	D-4
31.00 mm	M30	56.00 mm	11.20 mm	Steel	Black Ox	Spherical	Round	Z9536M	D-4
31.00 mm	M30	44.00 mm	4.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8830SS	D-6
31.00 mm	M30	44.00 mm	4.00 mm	316 S/S	n/a	Flat Washer	Round	Z8830-316	D-6
31.00 mm	M30	44.00 mm	4.00 mm	Steel	Black Ox	Flat Washer	Round	Z8830	D-6
31.00 mm	M30	48.00 mm	4.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8870SS	D-6
31.00 mm	M30	48.00 mm	4.00 mm	316 S/S	n/a	Flat Washer	Round	Z8870-316	D-6
31.00 mm	M30	48.00 mm	4.00 mm	Steel	Black Ox	Flat Washer	Round	Z8870	D-6
31.00 mm	M24	44.00 mm	8.20 mm	Steel	Black Ox	Spherical	Round	Z9534M	D-4
32.00 mm	M24	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8924SS	D-34

Size of Flat Washers by Inner Diameter— Metric

ID	Bolt Size	OD	Thickness	Material	Finish	Type	Shape	Part Number	Page #
32.00 mm	M24	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8930	D-34
32.00 mm	M24	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8930-G	D-34
32.00 mm	M30	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8871SS	D-6
32.00 mm	M30	76.00 mm	9.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8872SS	D-6
35.00 mm	M30	56.00 mm	12.00 mm	18-8 S/S	n/a	Spherical	Round	Z9537F	D-4
35.00 mm	M30	56.00 mm	12.00 mm	Steel	Black Ox	Spherical	Round	Z9536F	D-4
37.00 mm	M36	50.00 mm	5.00 mm	18-8 S/S	n/a	Flat Washer	Round	Z8836SS	D-6
37.00 mm	M36	50.00 mm	5.00 mm	316 S/S	n/a	Flat Washer	Round	Z8836-316	D-6
37.00 mm	M36	50.00 mm	5.00 mm	Steel	Black Ox	Flat Washer	Round	Z8836	D-6
37.00 mm	M36	50.00 mm	7.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8876SS	D-6
37.00 mm	M36	50.00 mm	7.50 mm	316 S/S	n/a	Flat Washer	Round	Z8876-316	D-6
37.00 mm	M36	50.00 mm	7.50 mm	Steel	Black Ox	Flat Washer	Round	Z8876	D-6
38.00 mm	M30	50.00 mm	6.00 mm	18-8 S/S	n/a	Square	Square	Z8930SS	D-34
38.00 mm	M30	50.00 mm	6.00 mm	Steel	Black Ox	Square	Square	Z8906	D-34
38.00 mm	M30	50.00 mm	6.00 mm	Steel	Galv.	Square	Square	Z8906-G	D-34
38.50 mm	M36	76.00 mm	6.30 mm	18-8 S/S	n/a	Flat Washer	Round	Z8877SS	D-6
38.50 mm	M36	76.00 mm	9.50 mm	18-8 S/S	n/a	Flat Washer	Round	Z8878SS	D-6
	M6	n/a	4.20 mm	18-8 S/S	n/a	Spherical	Round	Z9521SET	D-4
	M6	n/a	4.20 mm	Steel	Black Ox	Spherical	Round	Z9520SET	D-4
	M8	n/a	5.60 mm	18-8 S/S	n/a	Spherical	Round	Z9523SET	D-4
	M8	n/a	5.60 mm	Steel	Black Ox	Spherical	Round	Z9522SET	D-4
	M10	n/a	6.50 mm	18-8 S/S	n/a	Spherical	Round	Z9525SET	D-4
	M10	n/a	6.50 mm	Steel	Black Ox	Spherical	Round	Z9524SET	D-4
	M12	n/a	8.00 mm	18-8 S/S	n/a	Spherical	Round	Z9527SET	D-4
	M12	n/a	8.00 mm	Steel	Black Ox	Spherical	Round	Z9526SET	D-4
	M14	n/a	9.00 mm	Steel	Black Ox	Spherical	Round	Z9528SET	D-4
	M16	n/a	9.60 mm	18-8 S/S	n/a	Spherical	Round	Z9531SET	D-4
	M16	n/a	9.60 mm	Steel	Black Ox	Spherical	Round	Z9530SET	D-4
	M20	n/a	11.70 mm	18-8 S/S	n/a	Spherical	Round	Z9533SET	D-4
	M20	n/a	11.70 mm	Steel	Black Ox	Spherical	Round	Z9532SET	D-4
	M24	n/a	15.20 mm	18-8 S/S	n/a	Spherical	Round	Z9535SET	D-4
	M24	n/a	15.20 mm	Steel	Black Ox	Spherical	Round	Z9534SET	D-4
	M30	n/a	19.20 mm	18-8 S/S	n/a	Spherical	Round	Z9537SET	D-4
	M30	n/a	19.20 mm	Steel	Black Ox	Spherical	Round	Z9536SET	D-4



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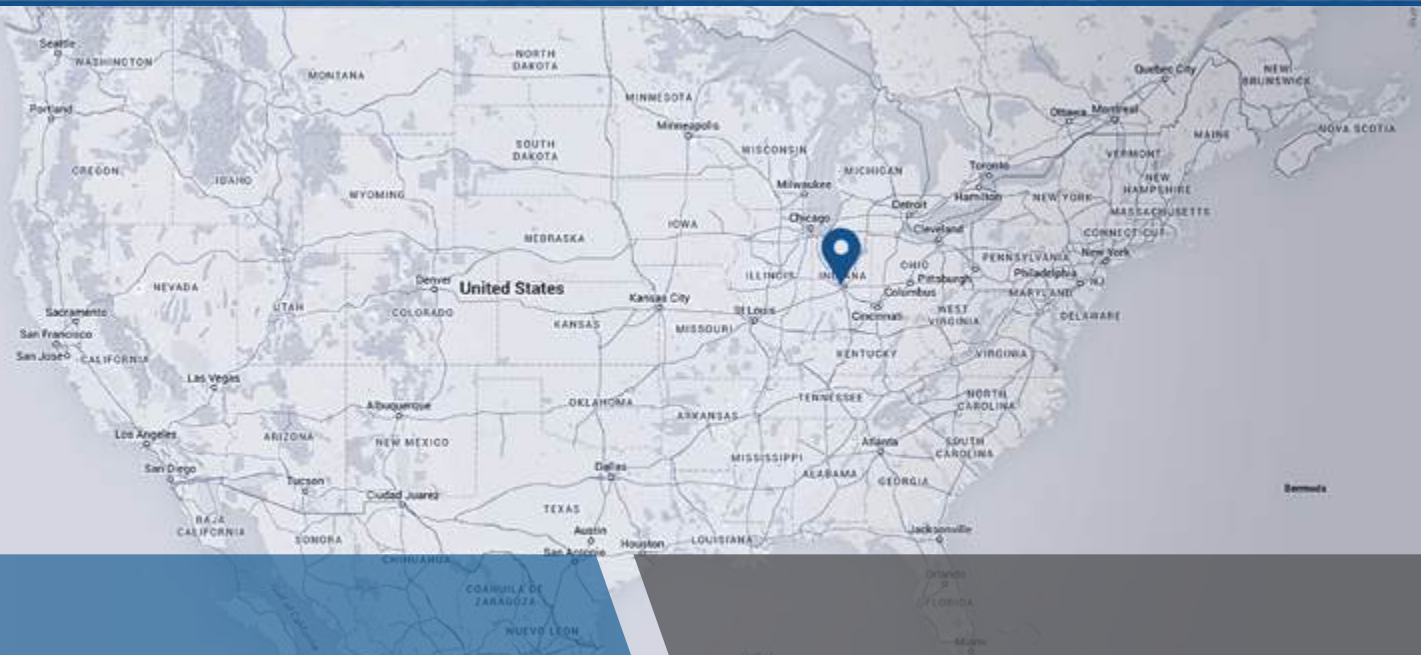
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