Parker
Seals

FlexiSeal™
Spring Energized Polymer Seals

ISO 9001 / QS 9000 Certified

Catalog PPD-5315 USA

FlexiSeal™ Spring Energized Polymer Seals

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WARNING

Failure, improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury or property damage.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provides product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through his or her own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products describes herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

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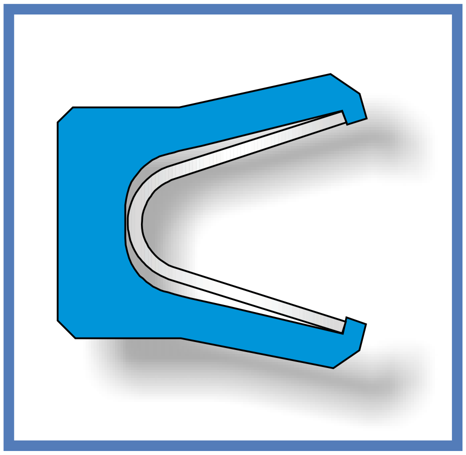

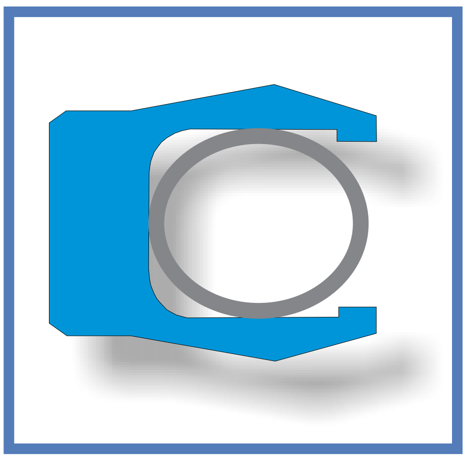

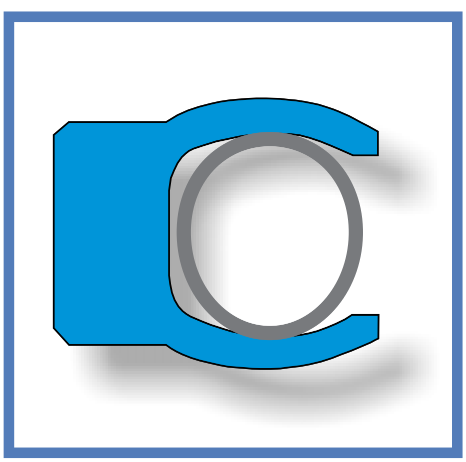

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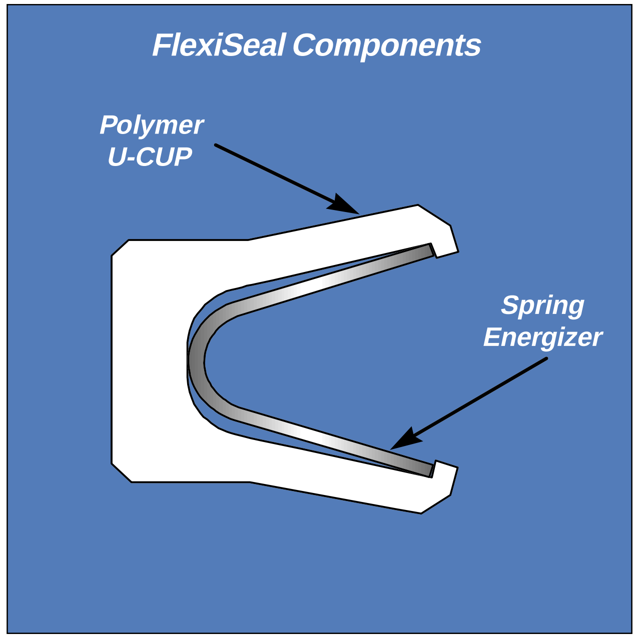
Parker Seals

What is a FlexiSeal ?

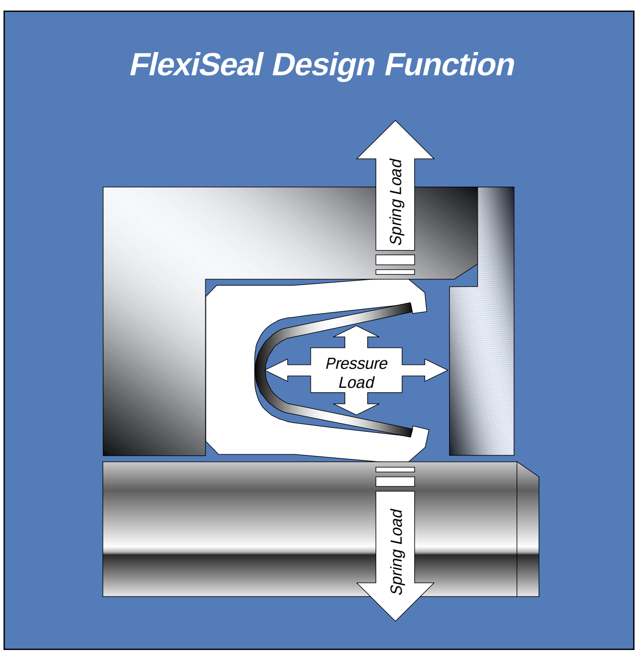
The Parker FlexiSeal is a U-Cup lip seal geometry energized by a metallic spring. The seal is made from PTFE, and PTFE composites or other high performance polymer plastics. Three different spring energizer designs are made from corrosion resistant metal alloys including Stainless Steel, Elgiloy® and Hastelloy® .

Standard FlexiSeals are precision machined to fit inch fractional MIL-G-5514 and AS4716 glands in radial rod, piston and axial face seal configurations. Custom sizes and geometries are available from 1/8" to 72" diameters without tooling charges.

FlexiSeals are used in dynamic and static applications where elastomer seals cannot meet the extreme operating conditions of harsh environments.



- *Virtually Chemically Inert*
- *Vacuum to 10,000 psi (specials to 30,000 psi)*
- *Immune to Aging and Embrittlement*
- *Surface Speeds to 1000 Feet Per Minute*
- *Temperature Range -450° F to 600° F.*
- *Low Breakaway & Running Friction*
- *Dry Running and Abrasive Media Capability*
- *Near-Zero Compression Set*



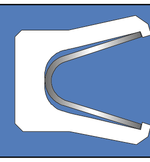
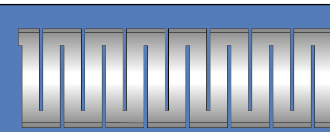
How The FlexiSeal Works

The FlexiSeal lips and spring energizer are compressed when installed into the seal gland. The resilient spring responds with constant force, pushing out the sealing lips, creating a gas tight seal. As pressure is introduced in the system, the seal expands increasing the sealing force.

In dynamic applications, the spring expands, compensating for seal wear while continuing to provide load. In conditions that see thermal cycling, the spring continues to energize the seal lips without taking a compression set or becoming to soft or hard.

The flexible spring provides a wide tolerance range that can help overcome hardware misalignment and eccentricity, without causing excess friction or the inability to seal. Three different FlexiSeal designs are available that provide individual attributes for each application.

V Series / Cantilever

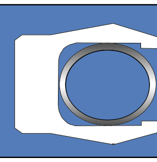
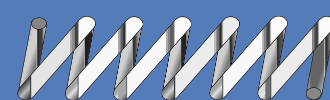
Features

- V-Shaped Spring with Moderate Load vs Deflection
- Standard Inch Fractional and MIL-G-5514 Sizes
- Standard 300 Series Stainless Steel Springs
- NACE Compliant Elgiloy® Springs Available
- Stock Sizes (VS-100 Series) From 1/8” to 3” Diameters
- Temperature Range from -100° to 600° F.
- Vacuum to 3000 psi Standard / 10,000 Extended
- Scraper Lip Designs for Abrasive Medias
- Available As External & Internal Pressure Face Seals

Recommended Applications

- Reciprocating Rod and Piston Seals
- Rotary Shafts < 300 Surface Feet Per Minute
- Wide Tolerance and Misaligned Glands (static)
- Abrasive Medias (when scraper lip is designated)
- Dynamic Applications above 450° F.

C Series / Canted Coil

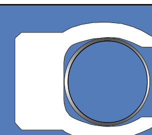
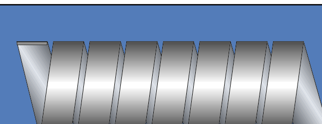
Features

- Canted Coil Spring with Flat Load vs Deflection
- Light, Medium and Heavy Load Springs Standard
- Standard Inch Fractional and MIL-G-5514 Sizes
- Standard 302 Series Stainless Steel Springs
- Hastelloy® Springs Available
- Temperature Range from -100° F to 450° F.
- Vacuum to 3000 psi Standard / 10,000 Extended
- Available as External & Internal Pressure Face Seals

Recommended Application

- Reciprocating Rod and Piston Seals
- Rotary Shafts < 300 Surface Feet Per Minute
- Wide Tolerance and Misaligned Glands
- Friction Critical Applications
- Dynamic Applications below 450° F.
- Diameters <1/2” and Cross-Sections <3/32”

H Series / Helical

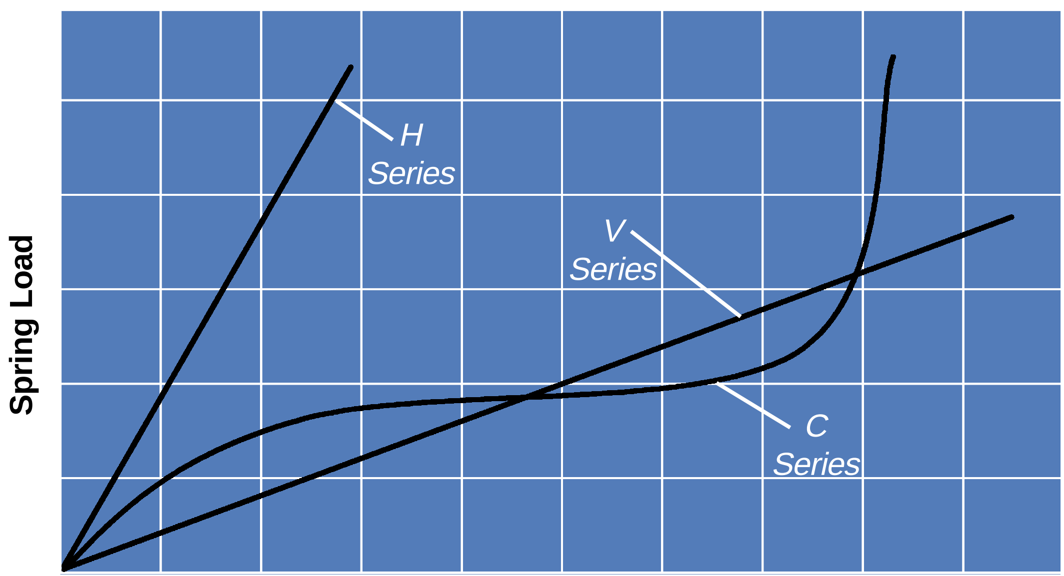
Features

- Helical Wound Ribbon Spring with High Load vs Deflection
- Standard Inch Fractional and MIL-G-5514 Sizes
- Standard 17-7 ph Stainless Steel Springs
- NACE Compliant Elgiloy® Springs Available
- Temperature Range from -360° F to 600° F.
- Vacuum to 3000 psi Standard / 10,000 Extended
- Available as External & Internal Pressure Face Seals

Recommended Applications

- Static Rod and Piston Seals
- Static Internal & External Pressure Face Seals
- Very Slow Dynamic Seals <10 sfpm
- Vacuum Sealing
- Applications below -100° F.

FlexiSeal Spring Energizers

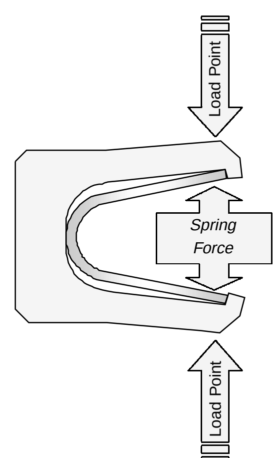


Cantilever Spring / V Series

The FlexiSeal Cantilever spring is made from flat metal strip stock of 300 Series stainless steel or Elgiloy as an option. The strip stock is punched or chemically etched into a serpentine pattern and formed into a rounded "V" shape. The finished spring produces a moderate load versus deflection range as depicted above, that is suitable in most applications.

The Cantilever spring is intended for dynamic applications involving rotary or reciprocating motion. It can also be used in static conditions when there is need for a higher deflection spring due to wide gland tolerance, excessive expansion and contraction or lift off due to high pressure.

The long beam leg design puts the spring load out at the leading edge of the seal, creating the best load location for the FlexiSeal to act as scraper or excluder seal when the optional scraper lip is selected.



Compressed

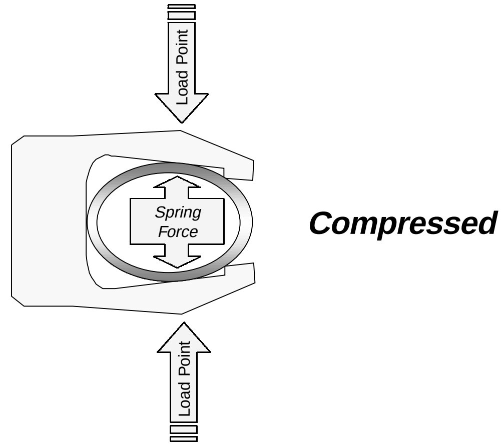
Nominal Cross Section	Minimum Diameters			
	Rod Shaft Dia.	Piston Bore Dia.	Int Press (Seal OD)	Ext Press (Seal ID)
1/16	.125	.250	.750	.500
3/32	.187	.375	1.250	.875
1/8	.375	.625	1.750	1.125
3/16	.875	1.250	2.250	2.000
1/4	1.625	2.125	3.500	3.000

The geometry of the Series V cantilever spring provides flexibility by utilizing individual tabs, separated by small gaps. This shape allows the spring to flex into radial and axial seal designs. The spring tabs can overlap on the ID and spread apart on the OD when the cross-section is too large for the diameter.

The chart on the left provides the minimum diameters for Series V springs for rod and piston seals, as well as internal and external pressure face seals. For diameters smaller than those listed, it is recommended to utilize Series C or Series H spring designs.

Canted Coil Spring / C Series

The FlexiSeal C Series spring is made from round wire that is coiled and formed into a canted or slanted shape. The result is a radial compression spring with a very flat load versus deflection curve as illustrated in the graph on the facing page. The standard material is 302 stainless steel with Hastelloy C-276 as an option, and is available in three different spring loads.



The canted-coil spring is intended for dynamic reciprocating and rotary applications. It is also used in static applications when wide gland tolerance or misalignment is present. The flat load curve of this design makes it an ideal choice for friction sensitive applications.

The C Series spring can be fit into small seal diameters without overlapping the individual spring coils. Because the ID coils tend to butt up to each other, the spring has very small gaps providing maximum spring contact. This geometry is well suited for dynamic rod seal applications that are less than 1/2” in diameter.

The C Series spring produces compression load near the center of the seal. The standard beveled-lip seal geometry puts the point contact slightly in front, forcing the spring back into the spring cavity. The lip design provides concentrated unit load at the sealing interface, and allows lubrication to the dynamic lip, increasing the wear life. Because of this geometry, the C Series is not the best choice for abrasive medias. For abrasive conditions the FlexiSeal V Series is recommended. See page 9 for details.

Individual coils provide the compression load to the sealing interface of the C Series spring. Because the rounded coils provide a point contact, the spring can imbed itself into the seal material at elevated temperatures. Applications above 450° F. should use the V Series for dynamic conditions or the H Series for static situations.

The C Series spring is available in three load ranges; Light, Medium and Heavy.

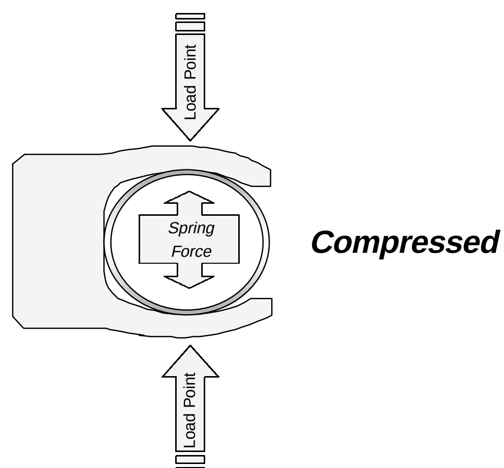
Light: Applications that require extremely low break-out and running friction when sealing ability is less important than friction.

Medium: General application. Low friction but reliable sealing capability. Normally the starting point for new applications. Balance functions of friction, sealing ability and dynamic wear.

Heavy: Generally static sealing applications only where optimum resilience is required due to hardware separation. Accelerated seal material wear in dynamic applications. Used when sealing is primary and friction and/or wear is second.

Helical / H Series

The H Series spring is made from flat ribbon metal strip stock that is formed into a helix shape. The standard material is 17-7 ph stainless steel, and Elgiloy is offered as an option. The finished spring produces a very high load versus deflection curve as shown on the facing page.



The helical spring design is intended for static applications due to the high unit load. It can be used in very slow or infrequent dynamic conditions when friction and wear are secondary concerns to positive sealing.

The H Series spring produces evenly distributed load across each individual band, with very small gaps between the coils, This tight spacing provides near continuous load, reducing potential leak paths. This combined with the high unit load makes the H Series well suited for vacuum and cryogenic applications or when pressure is too low to energize the seal.

The load provided by the H Series spring is directly through it’s center line. The lip design of the seal is a full radius at the sealing interface, providing maximum load to the contact points to effect a tight seal. The spring is welded at the ends and is retained in the seal by parallel side cuts in the spring cavity. When the seal is compressed into the hardware, the spring cavity is designed to allow the axial growth of the spring.

The relatively small deflection range of the H Series spring prevents it from being used in applications having wide gland tolerances, eccentricity or misalignment. The V or C Series FlexiSeal should be considered for these conditions.

FlexiSeal Materials

Polon Material Code	Material Description & Application	Color	Temp. Range (°F)	Wear Resistance 1 = Low 10 = High	Chemical Compatability A = Excellent B = Fair C = Limited	Hardware Dynamic Surface Hardness Min. (Rc)	FDA / NSF Compliant
110	**Virgin PTFE :** Best for static applications requiring positive sealing. Good in vacuum with low gas permeability. Low particulate generation. Excellent in cryogenics. Can be used in slow, infrequent dynamics.	White	-450° to +425°	1	A	No Min.	Yes
102	**Mineral / PTFE :** Improved upper temperature and wear over virgin PTFE with very low abrasion to soft surfaces. Intended for light dynamic applications.* Ingredients are FDA / NSF compliant and can pass many requirements.	White	-360° to +550°	4	A	25	No*
08	**Carbon Fiber / PTFE :** Excellent all purpose material. Best for dynamic applications running on moderate to hard surfaces. High wear material with low abrasion.	Brown	-360° to +550°	8	A	45	No
106	**Polymer / PTFE :** A dynamic material for softer surfaces and a static material for high temperatures. Excellent wear resistance without abrasion. Not recommended in steam.	Tan	-360° to +600°	7	A	35	No
114	**UHMWPE :** Ultra High Molecular Weight Polyethylene. High wearing plastic for use in abrasive medias. Excellent in water based medias, but restricted chemical and heat resistance. Intended for reciprocating applications, or very slow rotary.	Trans-lucent	-360° to +180°	10	B	30	Yes
149	**Carbon / PPS / PTFE :** Abrasion resistant high wearing material for use on very hard surfaces. Intended for sever service dynamic applications involving high PV values and / or high temperature. Not recomended for use in Oxidizing agents, or Ethers above 200^0 F.	Black	-360° to +575°	10	A	65	No
299	**Thermoplastic Elastomer (TPE):** An abrasion resistant polyester elastomer with high wear properties. Recommended for reciprocating, very slow rotary and static applications that require extremely low leakage. Excellent in gases and most hydraulic fluids. Limited Chemical compatibility and temperature range.	Black	-80° to +275°	9	C	30	No

Parker processes over 100 material blends. See page 6 for a partial list of additional compounds available

Note: Material ratings on this page are intended only as a guide for the users initial selection. Actual values may be different based on application parameters including, pressure, temperature and media. Other factors including hardware surface finish, hardness, alignment and clearance gaps, also effect overall material performance. Actual testing in the specific application is the responsibility of the user to determine final material selection and approval. Please call Technical Services at Parker GNP with any questions regarding material selection at 1-800-774-2394.

Seal material selection is based on several factors including dynamics, temperature, speed and hardware. First determine if your application is static or dynamic. If it's dynamic you must ***1).*** Determine the surface hardness of the dynamic section of your hardware material (rod or bore). ***2).*** Determine the operating temperature range and. ***3).*** Calculate the dynamic speed in surface feet per minute. Use the *Dynamic Seal Material* matrix below to determine the recommended material. If the application is static, determine the operating temperature and use the *Static Seal Materials* chart. Make sure to consult the material chart on page 5 and the chemical compatibility guides on pages 25-27 as necessary for further details. Additional seal materials are listed in the chart below right, should you be looking for a specific blend. Parker GNP offers over 100 compounds in addition to these. If you are not sure of the proper material for your application, please consult GNP technical services at 1-800-774-2394.

Dynamic Seal Materials

(1) Dynamic Surface Hardness Min. Rc	(2) Temperature Range °F (low to high)	Material(s) Recommended	
		(3) Rotary < 10 sfpm / Reciprocating < 50 sfpm	(3) Rotary > 10 sfpm / Reciprocating > 50 sfpm
25	-450° to -250°	110	110
	-250° to +180°	102 114*	102
	+180° to +250°	102 299**	102
	+250° to +400°	102	102
35	-250° to +575°	106	106
45	-250° to +550°	08	08
65	-250° to +575°	149	149

*Suggested for applications involving abrasive media. Refer to the chemical compatibility charts on pages 25-27 to determine suitability in your specific application.

**Recommended for abrasive media, vacuum applications and when hardware surface finishes are greater than 32 Ra. Refer to the chemical compatibility charts on pages 25-27 to determine suitability in your specific application.

Static Seal Materials

Temperature Range °F (low to high)	Material
-450° to -65°	110
-65° to +275°	299** 110
+275° to +400°	110
+400° to +600°	106

Additional Seal Materials

Polon Material Code	Description
06	10% Carbon Fiber / PTFE
07	10% Carbon Graphite / PTFE
09	Red Pigmented UHMW PE
100	15% Glass / 5% Moly / PTFE
105	25%Carbon Graphite / PTFE
107	60% Bronze / 40% PTFE
117	5% Carbon / 5% PPS / PTFE
123	5% Moly / PTFE
132	Gold Pigmented PTFE
245	10% Graphite / PTFE
246	15% Graphite / PTFE
254	10% Carbon / PTFE
257	5%Glass 5% Moly / PTFE
309	72 Durometer TPE
314	15% Polyimid / PTFE
330	Turquoise Pigmented PTFE

Physical Properties

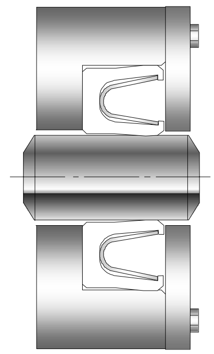
Polon Material Code	Tensile Strength (psi)	Elongation (%)	Specific Gravity	Hardness (Shore D)	Coefficient of Friction
110	4500	350	2.15	60	.06
102	3400	325	2.22	62	.08
08	3200	250	2.09	67	.10
106	3200	200	2.04	67	.10
114	6000	250	0.93	62	.20
149	2200	300	2.00	67	.12
299	5000	450	1.20	55	.45

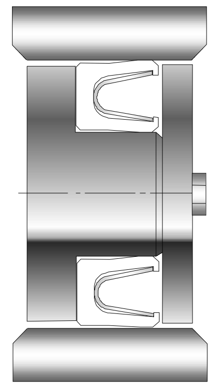
The physical properties listed at left are nominal values. Contact GNP for detailed Material Specification Test Reports listing all measured values and methods.

Rod & Piston Seals

Two-Piece Gland: Parker FlexiSeals are rigid in comparison to elastomer seals such as O-rings and u-cups. They can be damaged if stretched or compressed beyond their material limitations. It is recommended that a two-piece, split gland design be utilized when ever possible. This allows easy installation or removal of the FlexiSeal without the need for additional tools, and will greatly reduce the risk of damage to the seal.

Lead-in chamfers that are blended and very smooth are necessary to prevent damage to the seal during installation. Full dimensions details and surface finish recommendations are described on pages 8 and 13.

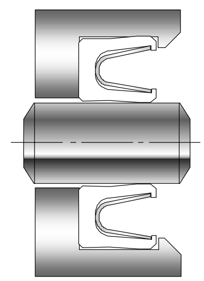


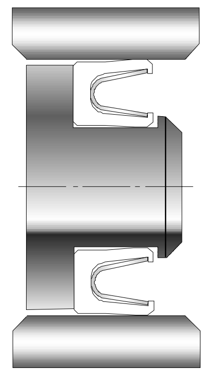


Step-Cut Gland: An alternative to the two-piece gland is the step-cut design. This solid one-piece configuration has a reduced wall on the pressure side of the groove. This allows the seal to snap into the groove without the need for a separate retainer or installation tools.

The step is designed to hold the seal in the groove during final assembly and under dynamic conditions such as low pressure return strokes in reciprocating applications. In pressurized conditions, the FlexiSeal is naturally held into the back of the groove.

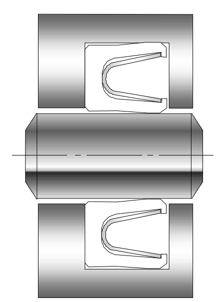
The step-cut gland can be utilized for both rod and piston seals Complete dimensions for this design are supplied on page 14.

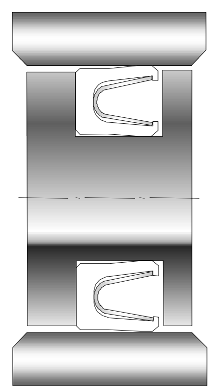




Closed-Gland: The least desirable gland design for the FlexiSeal is the closed-gland design. The seal cross-section, diameter and material are all factors which determine whether the FlexiSeal can be stretched into a solid piston groove or compressed into a rod seal housing. FlexiSeals are more easily stretched into piston grooves than compressed into rod seal housings.

The table below left is a guide for piston seal minimum diameters that can be used in solid grooves utilizing installation and re-sizing tools. The table on the lower right is for minimum rod seal diameters. Tools are not generally used to install rod seals into the gland housing. Tools to re-size the rod seals after installation into the housing are used. Contact GNP for information on seal installation tooling for your application at (800)774-2394.





Rod Seals

Dash Series	Nominal Cross Section	Minimum Rod Diameter		
		V Series	C Series	H Series
000	1/16	1.500	1.000	1.250
100	3/32	2.500	2.000	2.250
200	1/8	6.000	5.000	5.500
300	3/16	11.000	10.000	10.500
400	1/4	16.000	14.000	15.000

Piston Seals

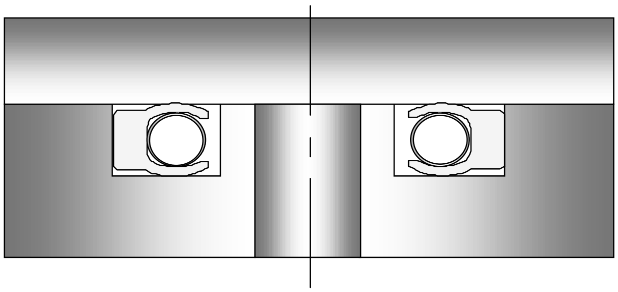
Dash Series	Nominal Cross Section	Minimum Bore Diameter		
		V Series	C Series	H Series
000	1/16	1.250	.750	1.000
100	3/32	1.750	1.000	1.500
200	1/8	2.500	2.000	2.250
300	3/16	4.000	3.000	3.500
400	1/4	6.000	5.000	5.500

Internal / External Pressure Face Seals

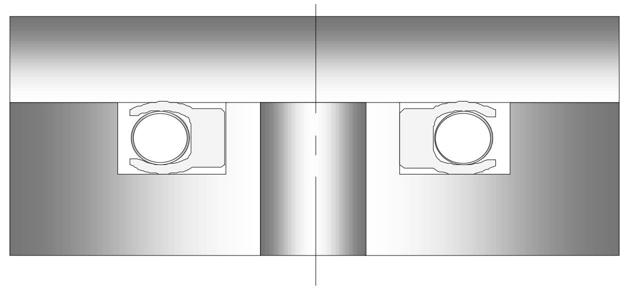
Face seal glands can be one-piece machined grooves because seal installation does not require excessive stretching or compressing. The FlexiSeal is designed to have a clearance of slight interference fit on the back of the seal (non-pressure side) so it will press easily into the groove.

The grooves for face seals can be an enclosed or open to the pressure side. Because the FlexiSeal is somewhat ridged, it will hold it's position in the gland and not normally drift out. If any back pressure is expected in the application, a closed groove should be used.

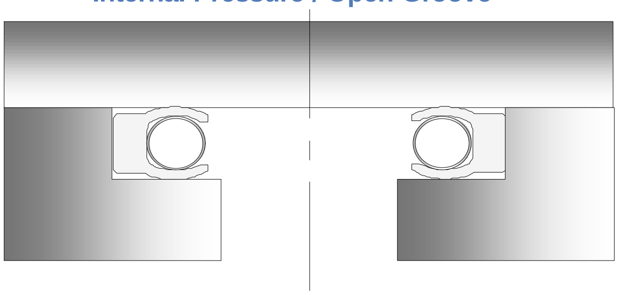
Internal Pressure / Closed Groove



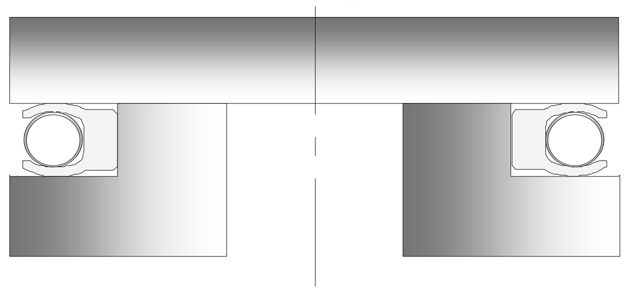
External Pressure / Closed Groove



Internal Pressure / Open Groove

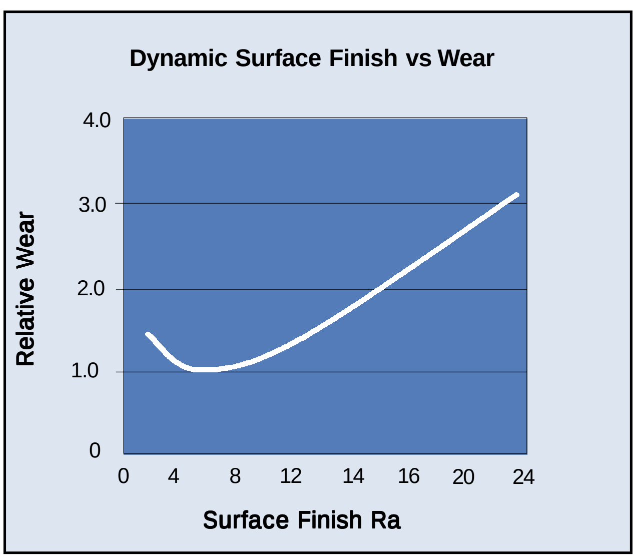


External Pressure / Open Groove



Surface Finish

Proper surface finish of the seal gland is critical to insure positive sealing, and achieve the longest seal life possible in dynamic applications. Mating surfaces that are too rough can create leak paths and can be very abrasive to the seal. Unlike elastomer contact seals, PTFE based FlexiSeals can run on very smooth surfaces with or without lubrication. The optimum surface finish for FlexiSeals is 32 Ra or better on the static side, and 4-8 Ra on dynamic areas.



Dynamic Surface Hardness

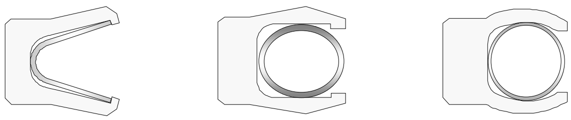
Most dynamic applications require a hard running surface on the dynamic portion of the hardware. The harder surface allows the use of higher reinforced seal materials that will increase the seal and hardware life. Softer running surfaces must use lower wear resistant materials that will not damage the hardware, and normally yield shorter seal life.

A balance between seal material and dynamic surface hardness must be met to insure that the seal remains the sacrificial component. The charts on pages 5-6 show minimum recommended surface hardness for Parker materials in dynamic applications, based on temperature, motion and speed.

When the dynamic surface hardness is below 45 Rc, most seal materials will polish the running surface of the hardware and the seal. This initial break in period will cause seal wear to taper off over a period of time depending on the seal material, surface finish and PV of the application. When hardness exceeds 45 Rc, the initial surface finish is very important since the surface is much harder to polish and the time to achieve break-in is much longer. Surface hardness above 65 Rc will generally not polish and therefore the initial surface finish is critical to seal life.

Lip Designs

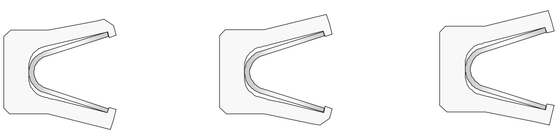
Chamfered Lips: The standard FlexiSeal lip is chamfered or back beveled on the ID and OD for Series V and C, and radiused on the Series H . This design allows for ease of installation and permits lubrication to nest under the lip and feed through in dynamic applications. The result is a microscopic thin film of lubrication that increases seal and mating surface hardware life.



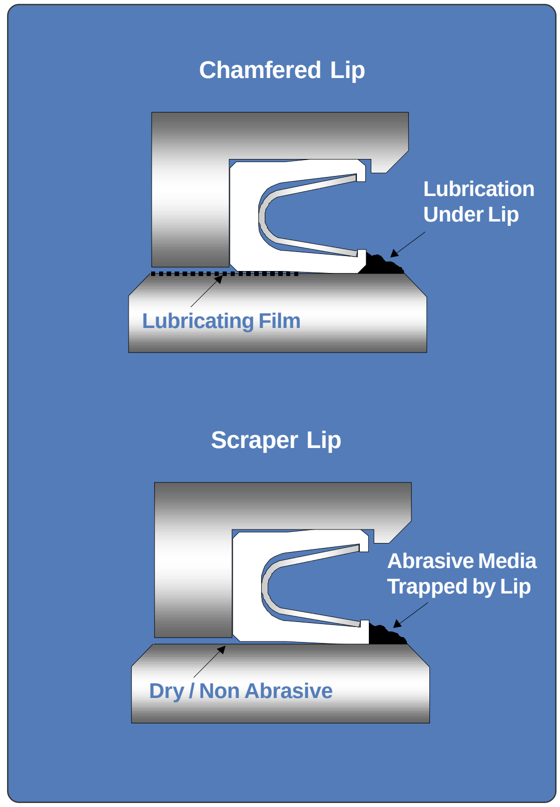
Series V Series C Series H

Scraper Lips: Applications often involve abrasive medias that can get between the seal lip and the mating hardware. This increases wear to both the seal and the dynamic mating surface. To prevent particles from accumulating, the V Series is offered with a scraper lip design in both standard and extended sizes.

The V Series spring geometry puts the load point out at the end of the beam, directly over the sharp sealing lip (see page 3). This position prevents contaminates from being trapped under the seal. The scraper lip is available in rod, piston and dual lip designs.



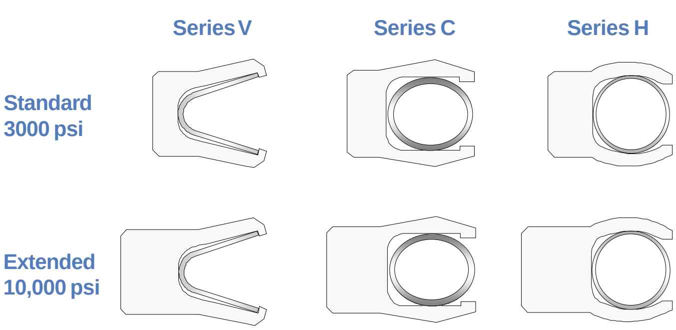
Rod Scraper Piston Scraper Dual Scraper

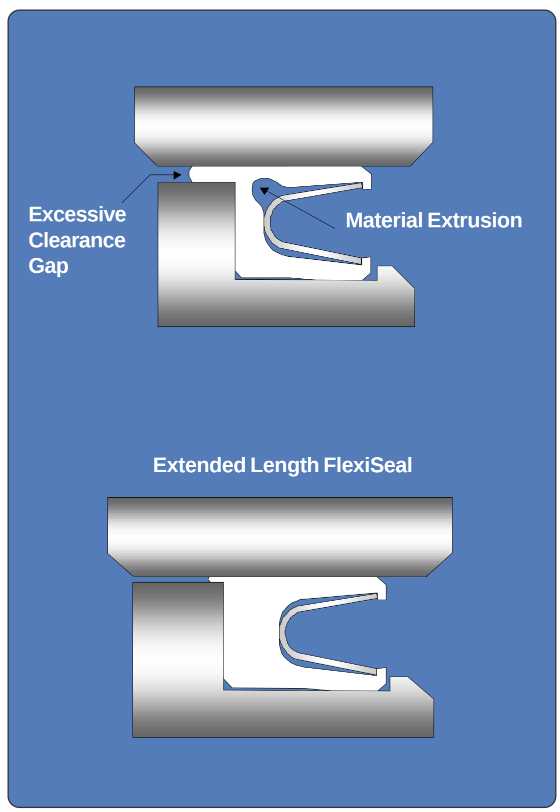


High Pressure Seals

Pressure capabilities are a function of temperature, seal material, extrusion or clearance gaps, and seal design. The standard FlexiSeal is rated to 3000 psi when used in glands conforming to the dimensions supplied in this guide, using materials that meet the temperature requirements of the application. An extended version is available for all radial FlexiSeals series that increases the pressure range to 10,000 psi under the same conditions.

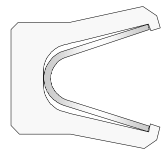
The extended FlexiSeal design prevents seal extrusion by increasing the material at the back of the seal. This extra material acts as a built-in back-up ring and fills the gap before damage is done to the rest of the seal. In applications that have excessive clearance gaps and / or pressures above 10,000 psi, it may be necessary to use seperate back-up device(s) or special seal designs to reduce the gap. Consult Parker GNP for more information.



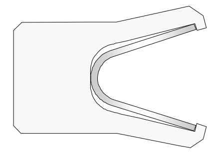


V Series Part Numbering

Rod & Piston Seals



Standard



Extended

Inch Fractional

VS - 10 0 - 210 - S - 102

Example	Series	Design	Lip Style	Dash Size	Spring Material	Seal Material
The example: VS-100-210-S-102 is a V Series cantilever-spring design, standard length, chamfered lips, 1/8" nominal cross-section, to fit a -210 (.750" x 1.000") gland. The spring material is 301 SS and the seal material is Mineral-filled PTFE.	Cantilever Spring (page 3)	10 = Standard 11 = Extended (page 9)	0 = Chamfered 1 = Scraper ID 2 = Scraper OD 3 = Dual Scraper (page 9)	Page 15-16	S = 301 SS E = Elgiloy	Page 5

Mil-G-5514F

VS - 21 1 - R - 121 - S - 106

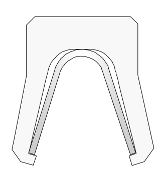
Example	Series	Design	Lip Style	Type	Dash Size	Spring Material	Seal Material
The example: VS-211-R-121-S-106 is for a V Series cantilever-spring design, extended length, scaper ID rod seal , 3/32" nominal cross-section, to fit a -121 (1.063" x 1.241") gland. The spring material is 301 SS and the seal material is Polymer-filled PTFE.	Cantilever Spring (page 3)	20 = Standard 21 = Extended (page 9)	0 = Chamfered 1 = Scraper ID 2 = Scraper OD 3 = Dual Scraper (page 9)	R = Rod P = Piston	Page 17-18	S = 301 SS E = Elgiloy	Page 5

AS4716

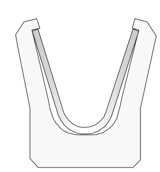
VS - 30 2 - P - 330 - S - 08

Example	Series	Design	Lip Style	Type	Dash Size	Spring Material	Seal Material
The example: VS-302-P-330-S-08 is for a V Series cantilever-spring design, standard length, scraper OD piston seal, 3/16" nominal cross-section, to fit a -330 (2.123" x 2.495") gland. The spring material is 301 SS and the seal material is Carbon Fiber-filled PTFE.	Cantilever Spring (page 3)	30 = Standard 31 = Extended (page 9)	0 = Chamfered 1 = Scraper ID 2 = Scraper OD 3 = Dual Scraper (page 9)	R = Rod P = Piston	Page 19-20	S = 301 SS E = Elgiloy	Page 5

Face Seals



Internal Pressure



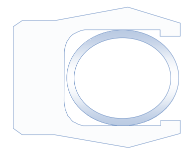
External Pressure

Standard

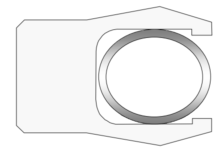
VS - 40 0 - I - 240 - E - 110

Example	Series	Design	Lip Style	Type	Dash Size	Spring Material	Seal Material
The example: VS-400-I-240-E-110 is for a V Series cantilever-spring, standard design, chamfered lips, internal pressure face seal, 1/8" nominal cross-section to fit a -240 (4.000" x 3.625") gland. The spring material is Elgiloy and the seal material is PTFE.	Cantilever Spring (page 3)	40 = Standard	0 = Chamfered 3 = Dual Scraper (page 9)	I = Internal E = External (page 8)	Page 21-22	S = 301 SS E = Elgiloy	Page 5

Rod & Piston Seals



Standard



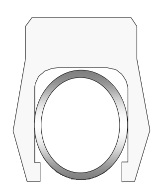
Extended

Inch Fractional	CS -	10 -	210 -	M	H -	102
The example: CS-10-210-MH-102 is for a C-Series canted-coil spring design, standard length with a 1/8" nominal cross-section, to fit a -210 (.750" x 1.000") gland. The spring is medium-load Hastelloy and the seal material is Mineral-filled PTFE.	**Series** Canted Coil Spring (page 4)	**Design** 10 = Standard 11 = Extended (page 9)	**Dash Size** Page 15-16	**Spring Load** L = Light M = Medium H = Heavy (page 4)	**Spring Material** S = 302 SS H = Hastelloy	**Seal Material** Page 5

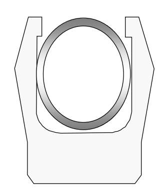
Mil-G-5514F	CS -	20 -	P -	121 -	L	S -	106
The example: CS-20-P-121-LS-106 is for a C-Series canted-coil spring design, standard-length piston seal with a 3/32" nominal cross-section, to fit a -121 (1.063" x 1.241") gland. The spring is light-load 302 SS and the seal material is Polymer-filled PTFE.	**Series** Canted Coil Spring (page 4)	**Design** 20 = Standard 21 = Extended (page 9)	**Type** R = Rod P = Piston	**Dash Size** Page 17-18	**Spring Load** L = Light M = Medium H = Heavy (page 4)	**Spring Material** S = 302 SS H = Hastelloy	**Seal Material** Page 5

AS4716	CS -	31 -	R -	330 -	M	H -	108
The example: CS-31-R-330-MH-108 is for a C Series canted-coil spring design, extended length rod seal with a 3/16" nominal cross-section, to fit a -330 (2.123" x 2.495") gland. The spring is medium- load Hastelloy and the seal material is Carbon Fiber-filled PTFE.	**Series** Canted Coil Spring (page 4)	**Design** 30 = Standard 31 = Extended (page 9)	**Type** R = Rod P = Piston	**Dash Size** Page 19-20	**Spring Load** L = Light M = Medium H = Heavy (page 4)	**Spring Material** S = 302 SS H = Hastelloy	**Seal Material** Page 5

Face Seals



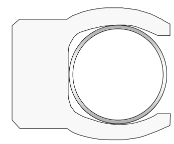
Internal Pressure



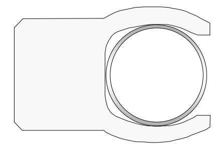
External Pressure

Standard	CS -	40 -	I -	240 -	H	S -	110
The example: CS-40-I-240-HS-110 is for a C Series canted-coil spring, standard design, internal pressure face seal, 1/8" nominal cross-section to fit a -240 (4.000" x 3.625") gland. The spring is heavy load 302SS and the seal material is PTFE.	**Series** Canted Coil Spring (page 4)	**Design** 40 = Standard	**Type** I = Internal E = External (page 8)	**Dash Size** Page 21-22	**Spring Load** L = Light M = Medium H = Heavy (page 4)	**Spring Material** S = 302 SS H = Hastelloy	**Seal Material** Page 5

Rod & Piston Seals



Standard



Extended

Inch Fractional HS - 10 - 210 - S - 110

The example: HS-10-210-S-110 is for an H Series helical-spring design, standard length, 1/8” nominal cross-section, to fit a -210 (.750” x 1.000”) gland. The spring material is 17-7 ph SS, and the seal material is PTFE.

HS	10	210	S	110
Series Helical Spring (page 4)	**Design** 10 = Standard 11 = Extended (page 9)	**Dash Size** Page 15-16	**Spring Material** S = 17-7 ph E = Elgiloy	**Seal Material** Page 5

Mil-G-5514F HS - 20 - P - 121 - S - 106

The example: HS-20-P-121-S-106 is for an H Series helical-spring design, standard length, piston seal, 3/32” nominal cross-section, to fit a -121 (1.063” x 1.241”) gland. The spring material is 17-7 ph SS and the seal material is Polymer-filled PTFE.

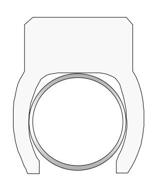
HS	20	P	121	S	106
Series Helical Spring (page 4)	**Design** 20 = Standard 21 = Extended (page 9)	**Type** R = Rod P = Piston	**Dash Size** Page 17-18	**Spring Material** S = 17-7 ph E = Elgiloy	**Seal Material** Page 5

AS4716 HS - 31 - R - 330 - E - 08

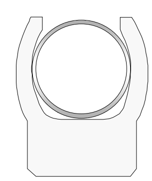
The example: HS-31-R-330-E-08 is for a H Series helical spring design, extended length, rod seal, 3/16” nominal cross-section, to fit a -330 (2.123” x 2.495”) gland. The spring material is Elgiloy and the seal material is Carbon Fiber-filled PTFE.

HS	31	R	330	E	08
Series Helical Spring (page 4)	**Design** 30 = Standard 31 = Extended (page 9)	**Type** R = Rod P = Piston	**Dash Size** Page 19-20	**Spring Material** S = 17-7 ph E = Elgiloy	**Seal Material** Page 5

Face Seals



Internal Pressure



External Pressure

Standard HS - 40 - I - 240 - E - 110

The example: HS-40-I-240-E-110 is for an H Series helical spring, standard design, internal pressure, 1/8” nominal cross-section to fit a -240 (4.000” x 3.625”) gland. The spring material is Elgiloy and the seal material is PTFE.

HS	40	I	240	E	110
Series Helical Spring (page 4)	**Design** 40 = Standard	**Type** I = Internal E = External (page 8)	**Dash Size** Page 21-22	**Spring Material** S = 17-7 ph E = Elgiloy	**Seal Material** Page 5

Gland Details

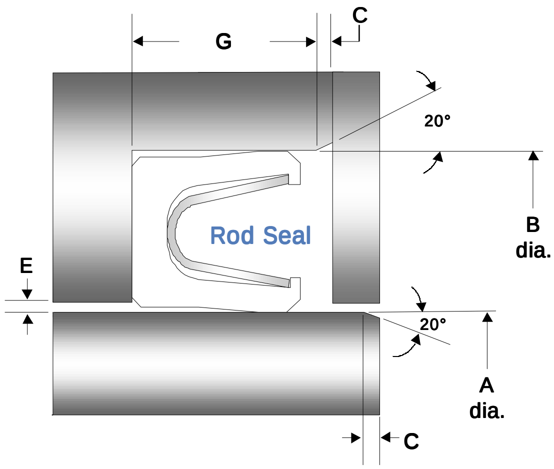
Two Piece Glands

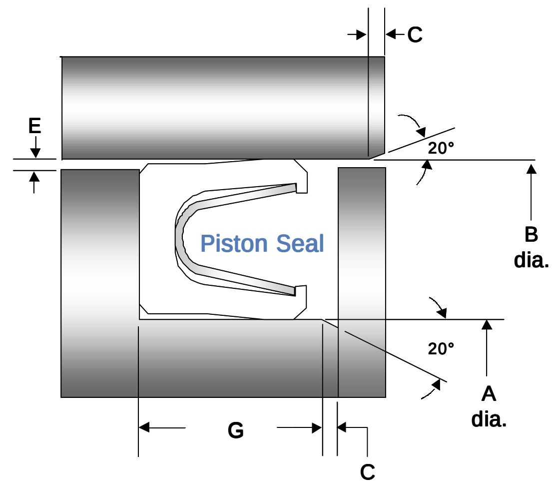
Heel-First Seal Installation: When installing the FlexiSeal with the heel or non-pressure side first, the lead-in chamfers can be smaller than when the seal must go in lips first. The FlexiSeal is designed with a slight clearance at the heel, and is also chamfered. If lead-in chamfer angles cannot be made, a full polished radius can also be used. Both designs must be very smooth and free from sharp edges that can damage the seal.

Note: Sometimes a combination of heel first and lip first installation is required. When this occurs, both gland designs must be utilized.

Dash Series	Nominal Cross Section	C Min.
000	1/16	.020
100	3/32	.030
200	1/8	.030
300	3/16	.040
400	1/4	.050

Note: See pages 15-20 for gland dimensions A, B, G and E.

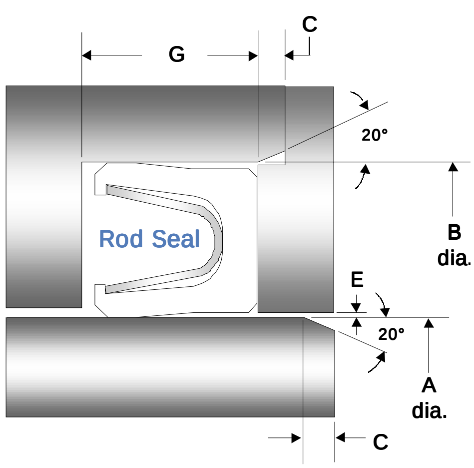


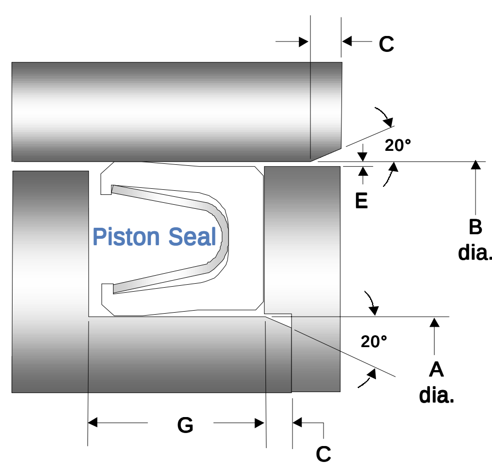


Lips-First Seal Installation: When installing the FlexiSeal with the lips or pressure-side first, the lead-in chamfers need to be longer than when the seal goes in heel first. The FlexiSeal is designed with pre-load interference on the lips that require additional clearance to prevent damage during installation. A stepped retention plate is required to provide a flat backed surface for the seal and to prevent extrusion into the lead in angles. All chamfers must be very smooth and free from sharp edges that can damage the seal. If the necessary angles and retention plate cannot be accomplished, installation tools will be required.

Dash Series	Nominal Cross Section	C Min.
000	1/16	.050
100	3/32	.070
200	1/8	.090
300	3/16	.110
400	1/4	.140

Note: See pages 15-20 for gland dimensions A, B, G and E.





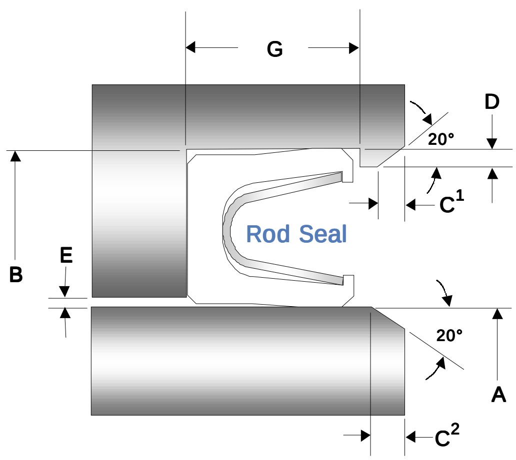
Step-Cut Glands

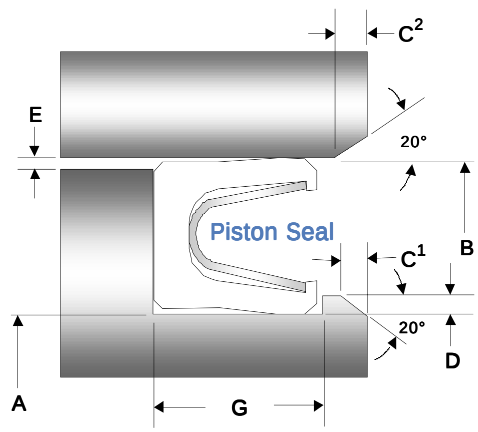
The step-cut gland can ***only*** be used when the seal sees pressure from the open or spring side of the seal. This requires the seal to be installed heel or non-pressure side first, snapping the seal lips behind the retention step. See page 7 for more details. After installing the seal into the groove, the assembly can be pushed into a piston bore, or over a rod.

*Dimensions for lead in chamfer C2 are supplied for both heel-first or lips-first ***final assembly*** into the bore or over the rod. See page 13 for further description.

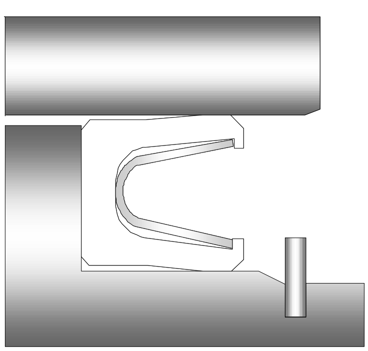
Note: See pages 15-20 for gland dimensions A, B, G and E.

Dash Series	Nominal Cross Section	C^1 Min.	C^2 Min. Heel First*	C^2 Min. Lips First*	D
000	1/16	.035	.020	.050	.007 / .010
100	3/32	.050	.030	.070	.010 / .015
200	1/8	.065	.030	.090	.015 / .020
300	3/16	.080	.040	.110	.020 / .025
400	1/4	.095	.050	.140	.025 / .030

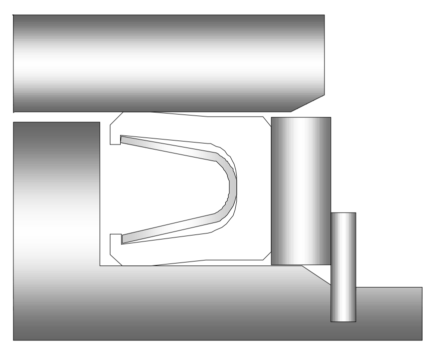




Alternative Gland Designs

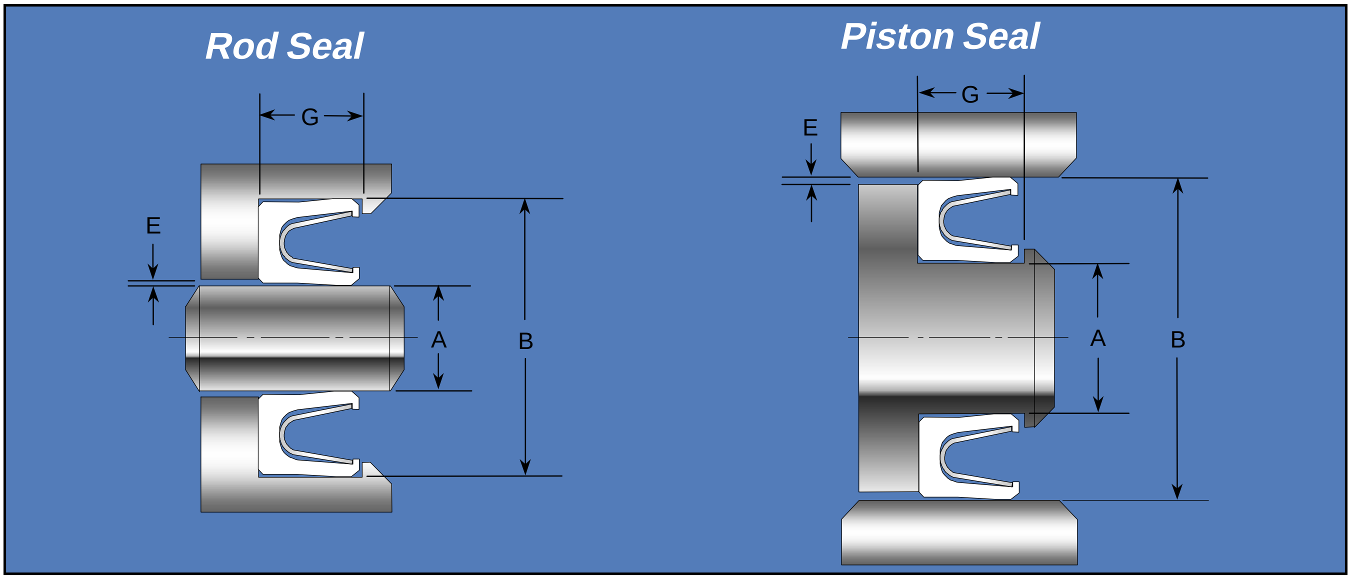


Heel-first installation with a snap-ring retainer. Note that the snap-ring groove is set into a reduced diameter to insure that the seal does not pass over the edges. This design can be used for both rod and piston seals.



Lips-first installation with a support ring and snap-ring retainer. The snap-ring groove is at a reduced diameter to prevent damage to the seal. The support ring must meet clearance gap recommendations as outlined in this guide. Load ratings for snap-rings must be considered to prevent fatigue or failure.

Caution: It is the responsibility of the designer to test any alternate gland designs and / or components used to insure that they meet all required operating conditions of their specific application.



Note: ***Shaded Areas Indicate Stock Sizes for VS-100-XXX-S-08 Seals Available at Participating Authorized Parker Distributors***

000 Series

1/16" Cross Section
G = .094 / .104 Standard
.149 / .159 Extended
E = .002 Max

Dash Size #	A +.000 -.002	B +.002 -.000
-006	.125	.250
-007	.156	.281
-008	.187	.312
-009	.218	.343
-010	.250	.375
-011	.312	.437
-012	.375	.500
-013	.437	.562
-014	.500	.625
-015	.562	.687
-016	.625	.750
-017	.687	.812
-018	.750	.875
-019	.812	.937
-020	.875	1.000
-021	.937	1.062
-022	1.000	1.125
-023	1.062	1.187
-024	1.125	1.250
-025	1.187	1.312
-026	1.250	1.375
-027	1.312	1.437
-028	1.375	1.500
-029	1.500	1.625

100 Series

3/32" Cross Section
G = .141 / .151 Standard
.183 / .193 Extended
E = .002 Max

Dash Size #	A +.000 -.002	B +.002 -.000
-106	.187	.375
-107	.219	.406
-108	.250	.437
-109	.312	.500
-110	.375	.562
-111	.437	.625
-112	.500	.687
-113	.562	.750
-114	.625	.812
-115	.687	.875
-116	.750	.937
-117	.812	1.000
-118	.875	1.062
-119	.937	1.125
-120	1.000	1.187
-121	1.062	1.250
-122	1.125	1.312
-123	1.187	1.375
-124	1.250	1.437
-125	1.312	1.500
-126	1.375	1.562
-127	1.437	1.625
-128	1.500	1.687
-129	1.562	1.750

Dash Size #	A +.000 -.002	B +.002 -.000
-130	1.625	1.812
-131	1.687	1.875
-132	1.750	1.937
-133	1.812	2.000
-134	1.875	2.062
-135	1.937	2.125
-136	2.000	2.187
-137	2.062	2.250
-138	2.125	2.312
-139	2.187	2.375
-140	2.250	2.437
-141	2.312	2.500
-142	2.375	2.562
-143	2.437	2.625
-144	2.500	2.687
-145	2.562	2.750
-146	2.625	2.812
-147	2.687	2.875
-148	2.750	2.937
-149	2.812	3.000
-150	2.875	3.062
-151	3.000	3.187
-152	3.250	3.437
-153	3.500	3.687
-154	3.750	3.937
-155	4.000	4.187
-156	4.250	4.437
-157	4.500	4.687
-158	4.750	4.937
-159	5.000	5.187

200 Series

1/8" Cross Section
G = .188 / .198 Standard
.235 / .245 Extended
E = .002 Max

Dash Size #	A +.000 -.002	B +.002 -.000
-202	.250	.500
-203	.312	.562
-204	.375	.625
-205	.437	.687
-206	.500	.750
-207	.562	.812
-208	.625	.875
-209	.687	.937
-210	.750	1.000
-211	.812	1.062
-212	.875	1.125
-213	.937	1.187
-214	1.000	1.250
-215	1.062	1.312
-216	1.125	1.375
-217	1.187	1.437
-218	1.250	1.500
-219	1.312	1.562
-220	1.375	1.625
-221	1.437	1.687
-222	1.500	1.750
-223	1.625	1.875
-224	1.750	2.000
-225	1.875	2.125

Dash Size #	A +.000 -.002	B +.002 -.000
-224	1.750	2.000
-225	1.875	2.125
-226	2.000	2.250
-227	2.125	2.375
-228	2.250	2.500
-229	2.375	2.625
-230	2.500	2.750
-231	2.625	2.875
-232	2.750	3.000
-233	2.875	3.125
-234	3.000	3.250
-235	3.125	3.375
-236	3.250	3.500
-237	3.375	3.625
-238	3.500	3.750
-239	3.625	3.875
-240	3.750	4.000
-241	3.875	4.125
-242	4.000	4.250
-243	4.125	4.375
-244	4.250	4.500
-245	4.375	4.625
-246	4.500	4.750
-247	4.625	4.875
-248	4.750	5.000
-249	4.875	5.125
-250	5.000	5.250
-251	5.125	5.375
-252	5.250	5.500
-253	5.375	5.625
-254	5.500	5.750
-255	5.625	5.875
-256	5.750	6.000
-257	5.875	6.125
-258	6.000	6.250
-259	6.250	6.500
-260	6.500	6.750
-261	6.750	7.000
-262	7.000	7.250
-263	7.250	7.500
-264	7.500	7.750
-265	7.750	8.000
-266	8.000	8.250
-267	8.250	8.500
-268	8.500	8.750
-269	8.750	9.000
-270	9.000	9.250
-271	9.250	9.500
-272	9.500	9.750
-273	9.750	10.000

300 Series

3/16" Cross Section

G = .281 / .291 Standard
.334 / .344 Extended
E = .003 Max

Dash Size #	A +.000 -.002	B +.002 -.000
-316	.875	1.250
-317	.937	1.312
-318	1.000	1.375
-319	1.062	1.437
-320	1.125	1.500
-321	1.187	1.562
-322	1.250	1.625
-323	1.312	1.687
-324	1.375	1.750
-325	1.500	1.875
-326	1.625	2.000
-327	1.750	2.125
-328	1.875	2.250
-329	2.000	2.375
-330	2.125	2.500
-331	2.250	2.625
-332	2.375	2.750
-333	2.500	2.875
-334	2.625	3.000
-335	2.750	3.125
-336	2.875	3.250
-337	3.000	3.375
-338	3.125	3.500
-339	3.250	3.625
-340	3.375	3.750
-341	3.500	3.875
-342	3.625	4.000
-343	3.750	4.125
-344	3.875	4.250
-345	4.000	4.375
-346	4.125	4.500
-347	4.250	4.625
-348	4.375	4.750
-349	4.500	4.875
-350	4.625	5.000
-351	4.750	5.125
-352	4.875	5.250
-353	5.000	5.375
-354	5.125	5.500
-355	5.250	5.625
-356	5.375	5.750
-357	5.500	5.875
-358	5.625	6.000
-359	5.750	6.125
-360	5.875	6.250

Dash Size #	A +.000 -.002	B +.002 -.000
-361	6.000	6.375
-362	6.250	6.625
-363	6.500	6.875
-364	6.750	7.125
-365	7.000	7.375
-366	7.250	7.625
-367	7.500	7.875
-368	7.750	8.125
-369	8.000	8.375
-370	8.250	8.625
-371	8.500	8.875
-372	8.750	9.125
-373	9.000	9.375
-374	9.250	9.625
-375	9.500	9.875
-376	9.750	10.125
-377	10.000	10.375
-378	10.500	10.875
-379	11.000	11.375
-380	11.500	11.875
-381	12.000	12.375

400 Series

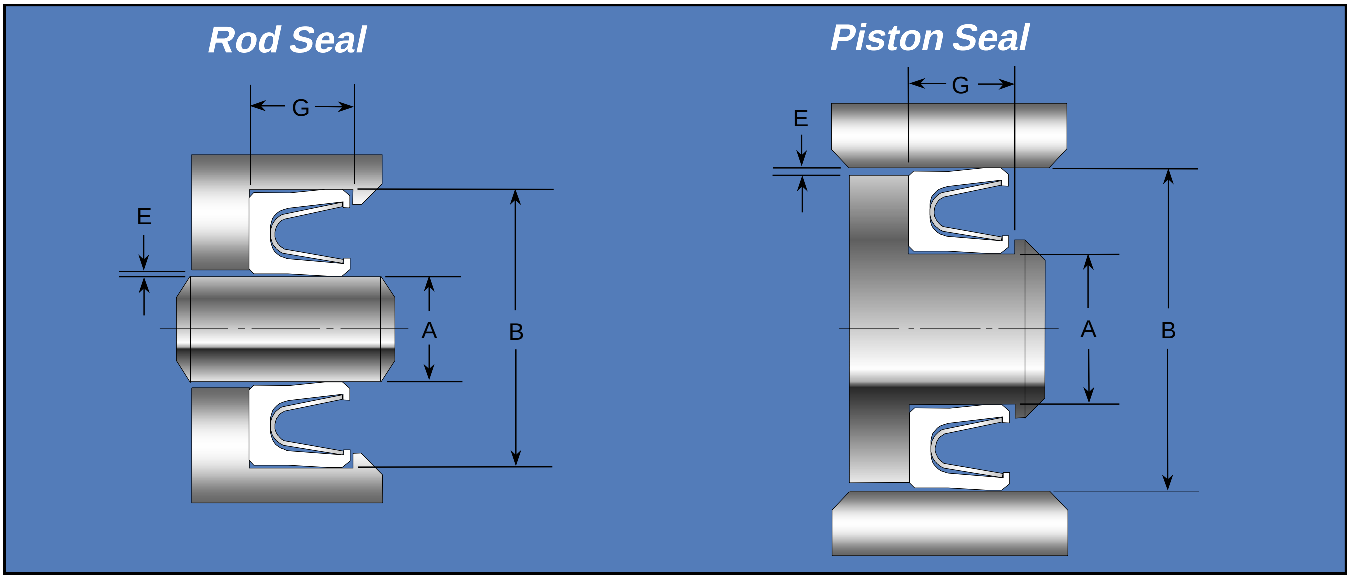
1/4" Cross Section

G = .375 / .385 Standard
.475 / .485 Extended
E = .003 Max

Dash Size #	A +.000 -.003	B +.003 -.000
-402	1.625	2.125
-403	1.750	2.250
-404	1.875	2.375
-405	2.000	2.500
-406	2.125	2.625
-407	2.250	2.750
-408	2.375	2.875
-409	2.500	3.000
-410	2.625	3.125
-411	2.750	3.250
-412	2.875	3.375
-413	3.000	3.500
-414	3.125	3.625
-415	3.250	3.750
-416	3.375	3.875
-417	3.500	4.000
-418	3.625	4.125
-419	3.750	4.250

Dash Size #	A +.000 -.003	B +.003 -.000
-420	3.875	4.375
-421	4.000	4.500
-422	4.125	4.625
-423	4.250	4.750
-424	4.375	4.875
-425	4.500	5.000
-426	4.625	5.125
-427	4.750	5.250
-428	4.875	5.375
-429	5.000	5.500
-430	5.125	5.625
-431	5.250	5.750
-432	5.375	5.875
-433	5.500	6.000
-434	5.625	6.125
-435	5.750	6.250
-436	5.875	6.375
-437	6.000	6.500
-438	6.250	6.750
-439	6.500	7.000
-440	6.750	7.250
-441	7.000	7.500
-442	7.250	7.750
-443	7.500	8.000
-444	7.750	8.250
-445	8.000	8.500
-446	8.500	9.000
-447	9.000	9.500
-448	9.500	10.000
-449	10.000	10.500
-450	10.500	11.000
-451	11.000	11.500
-452	11.500	12.000
-453	12.000	12.500
-454	12.500	13.000
-455	13.000	13.500
-456	13.500	14.000
-457	14.000	14.500
-458	14.500	15.000
-459	15.000	15.500
-460	15.500	16.000
-461	16.000	16.500
-462	16.500	17.000
-463	17.000	17.500
-464	17.500	18.000
-465	18.000	18.500
-466	18.500	19.000
-467	19.000	19.500
-468	19.500	20.000
-469	20.000	20.500

*Gland Dimensions / MIL-G-5514F**



000 Series

1/16" Nominal Cross Section

G = .094 / .104 Standard
.149 / .159 Extended
E = .002 Max

Dash Size No.	Piston A +.000 -.001	Piston B +.001 -.000	Rod A +.000 -.001	Rod B +.001 -.000
-006	.123	.235	.123	.235
-007	.154	.266	.154	.266
-008	.185	.297	.185	.297
-009	.217	.329	.217	.329
-010	.248	.360	.248	.360
-011	.310	.422	.310	.422
-012	.373	.485	.373	.485
	+.000 -.002	+.002 -.000	+.000 -.002	+.002 -.000
-013	.438	.550	.435	.547
-014	.501	.613	.498	.610
-015	.563	.675	.560	.672
-016	.626	.738	.623	.735
-017	.688	.800	.685	.797
-018	.751	.863	.748	.860
-019	.813	.925	.810	.922
-020	.879	.991	.873	.985
-021	.941	1.053	.935	1.047
-022	1.004	1.116	.998	1.110
-023	1.066	1.178	1.060	1.172
-024	1.129	1.241	1.123	1.235
-025	1.191	1.303	1.185	1.297
-026	1.254	1.366	1.248	1.360
-027	1.316	1.428	1.310	1.422
-028	1.379	1.491	1.373	1.485

100 Series

3/32" Nominal Cross Section

G = .141 / .151 Standard
.183 / .193 Extended
E = .002 Max

Dash Size No.	Piston A +.000 -.001	Piston B +.001 -.000	Rod A +.000 -.001	Rod B +.001 -.000
-110	.372	.550	.373	0.551
-111	.435	.613	.435	0.613
-112	.497	.675	.498	0.676
-113	.560	.738	.560	0.738
-114	.622	.800	.623	0.801
-115	.685	.863	.685	0.863
-116	.747	.925	.748	0.926
-117	.813	.991	.810	0.988
-118	.875	1.053	.873	1.051
-119	.938	1.116	.935	1.113
-120	1.000	1.178	.998	1.176
-121	1.063	1.241	1.060	1.238
-122	1.125	1.303	1.123	1.301
-123	1.188	1.366	1.185	1.363
-124	1.250	1.428	1.248	1.426
-125	1.313	1.491	1.310	1.488
-126	1.375	1.553	1.373	1.551
-127	1.438	1.616	1.435	1.613
-128	1.500	1.678	1.498	1.676
-129	1.563	1.741	1.560	1.738
-130	1.627	1.805	1.623	1.801
-131	1.689	1.867	1.685	1.863
-132	1.752	1.930	1.748	1.926
-133	1.814	1.992	1.810	1.988
-134	1.877	2.055	1.873	2.051

100 Series

3/32" Nominal Cross Section

G = .141 / .151 Standard
.183 / .193 Extended
E = .002 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-135	1.940	2.118	1.936	2.114
-136	2.002	2.180	1.998	2.176
-137	2.065	2.243	2.061	2.239
-138	2.127	2.305	2.123	2.301
-139	2.190	2.368	2.186	2.364
-140	2.252	2.430	2.248	2.426
-141	2.315	2.493	2.311	2.489
-142	2.377	2.555	2.373	2.551
-143	2.440	2.618	2.436	2.614
-144	2.502	2.680	2.498	2.676
-145	2.565	2.743	2.561	2.739
-146	2.627	2.805	2.623	2.801
-147	2.690	2.868	2.686	2.864
-148	2.752	2.930	2.748	2.926
-149	2.815	2.993	2.811	2.989

***Note:** Mil-G-5514F gland specifications are intended for elastomer O-ring applications. They are closed one-piece grooves that will not provide necessary access for most FlexiSeals. Information supplied on these pages follow the specification for dimensioning purposes only. Necessary gland design information for FlexiSeal applications can be found on pages 13-14 of this guide.

*Gland Dimensions / MIL-G-5514F**

200 Series

1/8" Nominal Cross Section

G = .188 / .198 Standard
.235 / .245 Extended
E = .003 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-210	.748	.991	.748	.991
-211	.810	1.053	.810	1.053
-212	.873	1.116	.873	1.116
-213	.935	1.178	.935	1.178
-214	.998	1.241	.998	1.241
-215	1.060	1.303	1.060	1.303
-216	1.123	1.366	1.123	1.366
-217	1.185	1.428	1.185	1.428
-218	1.248	1.491	1.248	1.491
-219	1.310	1.553	1.310	1.553
-220	1.373	1.616	1.373	1.616
-221	1.435	1.678	1.435	1.678
-222	1.498	1.741	1.498	1.741
-223	1.624	1.867	1.623	1.866
-224	1.749	1.992	1.748	1.991
-225	1.875	2.118	1.873	2.116
-226	2.000	2.243	1.998	2.241
-227	2.125	2.368	2.123	2.366
-228	2.250	2.493	2.248	2.491
-229	2.375	2.618	2.373	2.616
-230	2.500	2.743	2.498	2.741
-231	2.625	2.868	2.623	2.866
-232	2.750	2.993	2.748	2.991
-233	2.875	3.118	2.873	3.116
-234	3.000	3.243	2.997	3.240
-235	3.125	3.368	3.122	3.365
-236	3.250	3.493	3.247	3.490
-237	3.375	3.618	3.372	3.615
-238	3.500	3.743	3.497	3.740
-239	3.625	3.868	3.622	3.865
-240	3.750	3.993	3.747	3.990
-241	3.875	4.118	3.872	4.115
-242	4.000	4.243	3.997	4.240
-243	4.125	4.368	4.122	4.365
-244	4.250	4.493	4.247	4.490
-245	4.375	4.618	4.372	4.615
-246	4.500	4.743	4.497	4.740
-247	4.625	4.868	4.622	4.865

300 Series

3/16" Nominal Cross Section

G = .281 / .291 Standard
.334 / .344 Extended
E = .003 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-325	1.495	1.867	1.498	1.870
-326	1.620	1.992	1.623	1.995
-327	1.746	2.118	1.748	2.120
-328	1.871	2.243	1.873	2.245
-329	1.996	2.368	1.998	2.370
-330	2.121	2.493	2.123	2.495
-331	2.246	2.618	2.248	2.620
-332	2.371	2.743	2.373	2.745
-333	2.496	2.868	2.498	2.870
-334	2.621	2.993	2.623	2.995
-335	2.746	3.118	2.748	3.120
-336	2.871	3.243	2.873	3.245
-337	2.996	3.368	2.997	3.369
-338	3.121	3.493	3.122	3.494
-339	3.246	3.618	3.247	3.619
-340	3.371	3.743	3.372	3.744
-341	3.496	3.868	3.497	3.869
-342	3.621	3.993	3.622	3.994
-343	3.746	4.118	3.747	4.119
-344	3.871	4.243	3.872	4.244
-345	3.996	4.368	3.997	4.369
-346	4.121	4.493	4.122	4.494
-347	4.246	4.618	4.247	4.619
-348	4.371	4.743	4.372	4.744
-349	4.496	4.868	4.497	4.869

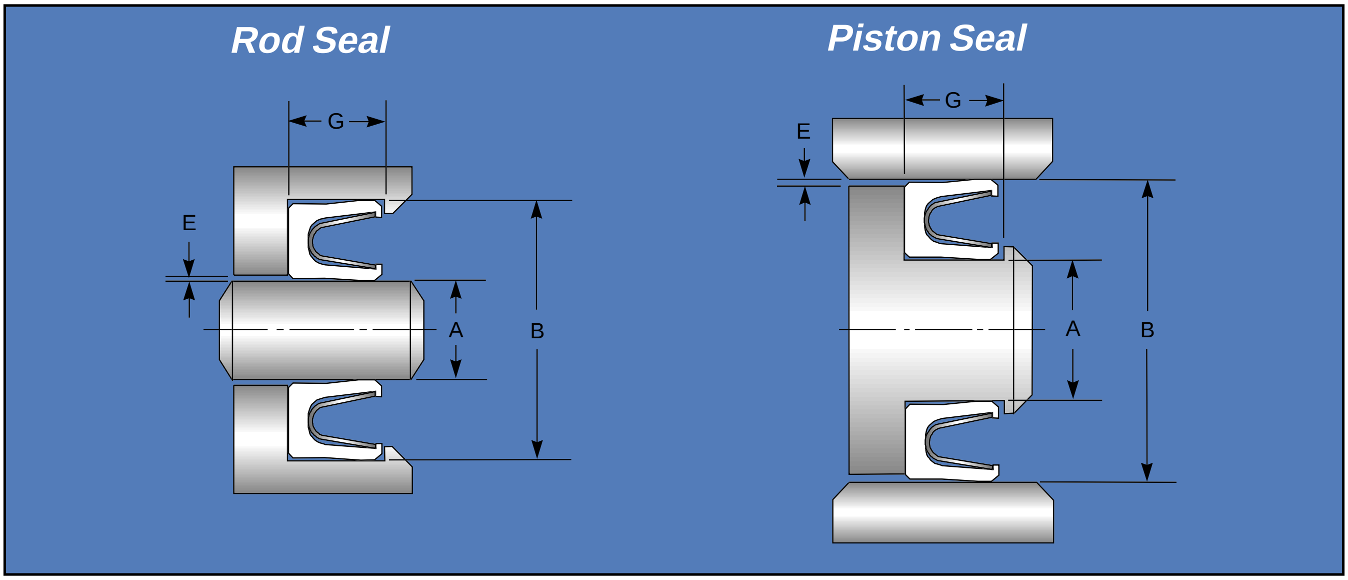
400 Series

1/4" Nominal Cross Section

G = .375 / .385 Standard
.475 / .485 Extended
E = .004 Max

Dash Size No.	Piston A	Piston B	Rod A	Rod B
	+.000 -.003	+.003 -.000	+.000 -.003	+.003 -.000
-425	4.497	4.974	4.497	4.974
-426	4.622	5.099	4.622	5.099
-427	4.747	5.224	4.747	5.224
-428	4.872	5.349	4.872	5.349
-429	4.997	5.474	4.997	5.474
-430	5.122	5.599	5.122	5.599
-431	5.247	5.724	5.247	5.724
-432	5.372	5.849	5.372	5.849
-433	5.497	5.974	5.497	5.974
-434	5.622	6.099	5.622	6.099
-435	5.747	6.224	5.747	6.224
-436	5.872	6.349	5.872	6.349
-437	5.997	6.474	5.997	6.474
-438	6.247	6.724	6.247	6.724
-439	6.497	6.974	6.497	6.974
-440	6.747	7.224	6.747	7.224
-441	6.997	7.474	6.997	7.474
-442	7.247	7.724	7.247	7.724
-443	7.497	7.974	7.497	7.974
-444	7.747	8.224	7.747	8.224
-445	7.997	8.474	7.997	8.474
-446	8.497	8.974	8.497	8.974
	+.000 -.003	+.004 -.000	+.000 -.003	+.004 -.000
-447	8.997	9.474	8.997	9.474
-448	9.497	9.974	9.497	9.974
-449	9.997	10.474	9.997	10.474
-450	10.497	10.974	10.497	10.974
-451	10.997	11.474	10.997	11.474
-452	11.497	11.974	11.497	11.974
-453	11.997	12.474	11.997	12.474
-454	12.497	12.974	12.497	12.974
-455	12.997	13.474	12.997	13.474
-456	13.497	13.974	13.497	13.974
-457	13.997	14.474	13.997	14.474
-458	14.497	14.974	14.497	14.974
-459	14.997	14.474	14.997	14.474
-460	15.497	15.974	15.497	15.974

Gland Dimensions / AS4716*



000 Series

1/16" Nominal Cross Section

G = .094 / .099 Standard
.150 / .160 Extended

E = .002 Max

Dash Size No.	Piston A +.000 -.001	Piston B +.001 -.000	Rod A +.000 -.001	Rod B +.001 -.000
-006	.123	.235	.123	.235
-007	.154	.266	.154	.266
-008	.189	.297	.185	.294
-009	.220	.329	.217	.327
-010	.250	.360	.248	.359
-011	.312	.422	.310	.421
-012	.375	.485	.373	.484
	+.000 -.002	+.002 -.000	+.000 -.002	+.002 -.000
-013	.441	.550	.435	.545
-014	.504	.613	.498	.608
-015	.566	.675	.560	.670
-016	.629	.738	.623	.733
-017	.691	.800	.685	.795
-018	.753	.863	.748	.858
-019	.815	.925	.810	.920
-020	.881	.991	.873	.983
-021	.943	1.053	.935	1.045
-022	1.006	1.116	.998	1.108
-023	1.068	1.178	1.060	1.170
-024	1.131	1.241	1.123	1.233
-025	1.193	1.303	1.185	1.295
-026	1.256	1.366	1.248	1.358
-027	1.318	1.428	1.310	1.420
-028	1.381	1.491	1.373	1.483

100 Series

3/32" Nominal Cross Section

G = .141 / .151 Standard
.183 / .193 Extended

E = .0025 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-110	.379	.550	.373	.546
-111	.441	.613	.435	.609
-112	.502	.675	.498	.672
-113	.565	.738	.560	.734
-114	.627	.800	.623	.797
-115	.689	.863	.685	.859
-116	.751	.925	.748	.923
-117	.817	.991	.810	.985
-118	.879	1.053	.873	1.048
-119	.942	1.116	.935	1.110
-120	1.003	1.178	.998	1.173
-121	1.066	1.241	1.060	1.235
-122	1.128	1.303	1.123	1.298
-123	1.191	1.366	1.185	1.360
-124	1.253	1.428	1.248	1.423
-125	1.316	1.491	1.310	1.485
-126	1.378	1.553	1.373	1.548
-127	1.441	1.616	1.435	1.610
-128	1.503	1.678	1.498	1.673
-129	1.566	1.741	1.560	1.735
-130	1.631	1.805	1.623	1.798
-131	1.693	1.867	1.685	1.860
-132	1.756	1.930	1.748	1.923
-133	1.818	1.992	1.810	1.984
-134	1.881	2.055	1.873	2.047

100 Series

3/32" Nominal Cross Section

G = .141 / .151 Standard
.183 / .193 Extended

E = .0025 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-135	1.944	2.118	1.936	2.110
-136	2.006	2.180	1.998	2.172
-137	2.069	2.243	2.061	2.235
-138	2.131	2.305	2.123	2.297
-139	2.194	2.368	2.186	2.360
-140	2.256	2.430	2.248	2.422
-141	2.319	2.493	2.311	2.485
-142	2.381	2.555	2.373	2.547
-143	2.444	2.618	2.436	2.610
-144	2.506	2.680	2.498	2.672
-145	2.569	2.743	2.561	2.735
-146	2.631	2.805	2.623	2.797
-147	2.694	2.868	2.686	2.860
-148	2.756	2.930	2.748	2.922
-149	2.819	2.993	2.811	2.985

***Note:** AS4716 gland specifications are intended for elastomer O-ring application. They are closed one-piece grooves that will not provide necessary access for most FlexiSeals. Information supplied on these pages follows the specification for dimensioning purposes only. Necessary gland design information for FlexiSeal applications can be found on Pages 13-14 of this guide.

Gland Dimensions / AS4716*

200 Series

1/8" Nominal Cross Section

G = .188 / .198 Standard
.235 / .245 Extended
E = .0035 Max

Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-210	.750	.991	.748	.989
-211	.812	1.053	.810	1.051
-212	.874	1.116	.873	1.115
-213	.936	1.178	.935	1.177
-214	.999	1.241	.998	1.240
-215	1.064	1.303	1.060	1.302
-216	1.124	1.366	1.123	1.365
-217	1.186	1.428	1.185	1.427
-218	1.249	1.491	1.248	1.490
-219	1.311	1.553	1.310	1.552
-220	1.374	1.616	1.373	1.615
-221	1.436	1.678	1.435	1.677
-222	1.499	1.741	1.498	1.740
-223	1.625	1.867	1.623	1.865
-224	1.750	1.992	1.748	1.990
-225	1.876	2.118	1.873	2.115
-226	2.001	2.243	1.998	2.240
-227	2.126	2.368	2.123	2.365
-228	2.251	2.493	2.248	2.490
-229	2.376	2.618	2.373	2.615
-230	2.501	2.743	2.498	2.740
-231	2.626	2.868	2.623	2.865
-232	2.751	2.993	2.748	2.990
-233	2.876	3.118	2.873	3.115
-234	3.001	3.243	2.997	3.239
-235	3.126	3.368	3.122	3.364
-236	3.251	3.493	3.247	3.489
-237	3.376	3.618	3.372	3.614
-238	3.501	3.743	3.497	3.739
-239	3.626	3.868	3.622	3.864
-240	3.751	3.993	3.747	3.989
-241	3.876	4.118	3.872	4.114
-242	4.001	4.243	3.997	4.239
-243	4.126	4.368	4.122	4.364
-244	4.251	4.493	4.247	4.489
-245	4.376	4.618	4.372	4.614
-246	4.501	4.743	4.497	4.739
-247	4.626	4.868	4.622	4.864

300 Series

3/16" Nominal Cross Section

G = .281 / .291 Standard
.334 / .344 Extended
E = .0035 Max

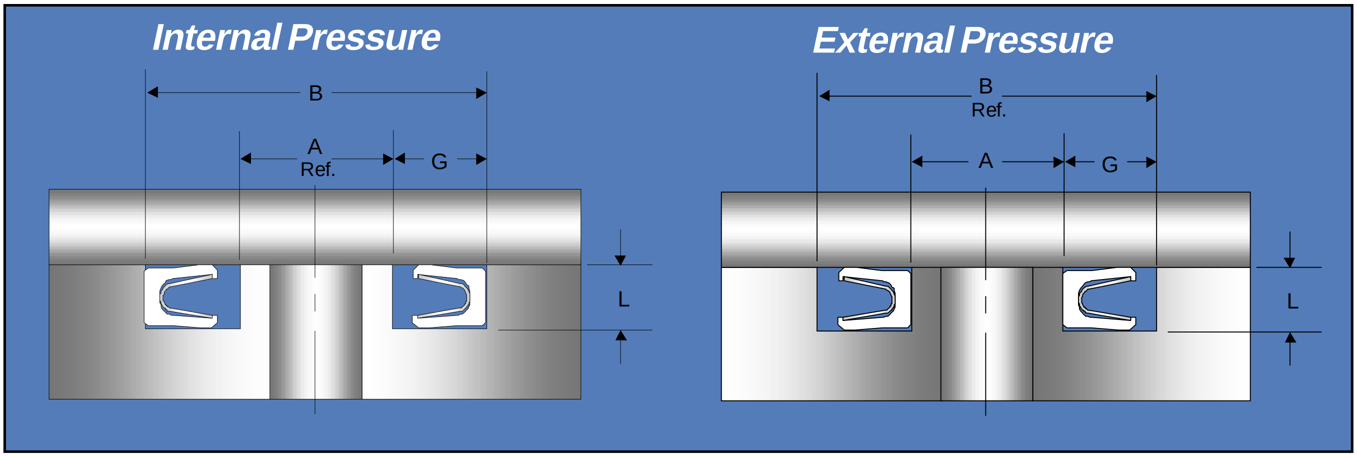
Dash Size No.	Piston A +.000 -.002	Piston B +.002 -.000	Rod A +.000 -.002	Rod B +.002 -.000
-325	1.495	1.867	1.498	1.870
-326	1.620	1.992	1.623	1.995
-327	1.746	2.118	1.748	2.120
-328	1.871	2.243	1.873	2.245
-329	1.996	2.368	1.998	2.370
-330	2.121	2.493	2.123	2.495
-331	2.246	2.618	2.248	2.620
-332	2.371	2.743	2.373	2.745
-333	2.496	2.868	2.498	2.870
-334	2.621	2.993	2.623	2.995
-335	2.746	3.118	2.748	3.120
-336	2.871	3.243	2.873	3.245
-337	2.996	3.368	2.997	3.369
-338	3.121	3.493	3.122	3.494
-339	3.246	3.618	3.247	3.619
-340	3.371	3.743	3.372	3.744
-341	3.496	3.868	3.497	3.869
-342	3.621	3.993	3.622	3.994
-343	3.746	4.118	3.747	4.119
-344	3.871	4.243	3.872	4.244
-345	3.996	4.368	3.997	4.369
-346	4.121	4.493	4.122	4.494
-347	4.246	4.618	4.247	4.619
-348	4.371	4.743	4.372	4.744
-349	4.496	4.868	4.497	4.869

400 Series

1/4" Nominal Cross Section

G = .375 / .385 Standard
.475 / .485 Extended
E = .005 Max

Dash Size No.	Piston A	Piston B	Rod A	Rod B
	+.000 -.003	+.003 -.000	+.000 -.003	+.003 -.000
-425	4.497	4.974	4.497	4.974
-426	4.622	5.099	4.622	5.099
-427	4.747	5.224	4.747	5.224
-428	4.872	5.349	4.872	5.349
-429	4.997	5.474	4.997	5.474
-430	5.122	5.599	5.122	5.599
-431	5.247	5.724	5.247	5.724
-432	5.372	5.849	5.372	5.849
-433	5.497	5.974	5.497	5.974
-434	5.622	6.099	5.622	6.099
-435	5.747	6.224	5.747	6.224
-436	5.872	6.349	5.872	6.349
-437	5.997	6.474	5.997	6.474
-438	6.247	6.724	6.247	6.724
-439	6.497	6.974	6.497	6.974
-440	6.747	7.224	6.747	7.224
-441	6.997	7.474	6.997	7.474
-442	7.247	7.724	7.247	7.724
-443	7.497	7.974	7.497	7.974
-444	7.747	8.224	7.747	8.224
-445	7.997	8.474	7.997	8.474
-446	8.497	8.974	8.497	8.974
	+.000 -.003	+.004 -.000	+.000 -.003	+.004 -.000
-447	8.997	9.474	8.997	9.474
-448	9.497	9.974	9.497	9.974
-449	9.997	10.474	9.997	10.474
-450	10.497	10.974	10.497	10.974
-451	10.997	11.474	10.997	11.474
-452	11.497	11.974	11.497	11.974
-453	11.997	12.474	11.997	12.474
-454	12.497	12.974	12.497	12.974
-455	12.997	13.474	12.997	13.474
-456	13.497	13.974	13.497	13.974
-457	13.997	14.474	13.997	14.474
-458	14.497	14.974	14.497	14.974
-459	14.997	14.474	14.997	14.474
-460	15.497	15.974	15.497	15.974



000 Series

1/16" Nominal Cross Section

G = .094 Min. L = .056 / .058

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-008	—	—	.187	.375
-009	—	—	.218	.406
-010	—	—	.250	.437
-011	—	—	.312	.500
-012	.312	.500	.375	.562
-013	.375	.562	.437	.625
-014	.437	.625	.500	.687
-015	.500	.687	.562	.750
-016	.562	.750	.625	.812
-017	.625	.812	.687	.875
-018	.687	.875	.750	.937
-019	.750	.937	.812	1.000
-020	.812	1.000	.875	1.062
-021	.875	1.062	.937	1.125
-022	.937	1.125	1.000	1.187
-023	1.000	1.187	1.062	1.250
-024	1.062	1.250	1.125	1.312
-025	1.125	1.312	1.187	1.375
-026	1.187	1.375	1.250	1.437
-027	1.250	1.437	1.312	1.500
-028	1.312	1.500	1.375	1.562
-029	1.437	1.625	1.500	1.687
-030	1.562	1.750	1.625	1.812
-031	1.687	1.875	1.750	1.937
-032	1.812	2.000	1.875	2.062
-033	1.937	2.125	2.000	2.187
-034	2.062	2.250	2.125	2.312
-035	2.187	2.375	2.250	2.437
-036	2.312	2.500	2.375	2.562
-037	2.437	2.625	2.500	2.687
-038	2.562	2.750	2.625	2.812
-039	2.687	2.875	2.750	2.937
-040	2.812	3.000	2.875	3.062
-041	2.937	3.125	3.000	3.187
-042	3.187	3.375	3.250	3.437
-043	3.437	3.625	3.500	3.687
-044	3.687	3.875	3.750	3.937
-045	3.937	4.125	4.000	4.187

100 Series

3/32 Nominal Cross Section

G = .141 Min. L = .089 / .091

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-110	—	—	.375	.657
-111	—	—	.437	.719
-112	.405	.687	.500	.782
-113	.468	.750	.562	.844
-114	.530	.812	.625	.907
-115	.593	.875	.687	.969
-116	.655	.937	.750	1.032
-117	.718	1.000	.812	1.094
-118	.780	1.062	.875	1.157
-119	.843	1.125	.937	1.219
-120	.905	1.187	1.000	1.282
-121	.968	1.250	1.062	1.344
-122	1.030	1.312	1.125	1.407
-123	1.093	1.375	1.187	1.469
-124	1.155	1.437	1.250	1.532
-125	1.218	1.500	1.312	1.594
-126	1.280	1.562	1.375	1.657
-127	1.343	1.625	1.437	1.719
-128	1.405	1.687	1.500	1.782
-129	1.468	1.750	1.562	1.844
-130	1.530	1.812	1.625	1.907
-131	1.593	1.875	1.687	1.969
-132	1.655	1.937	1.750	2.032
-133	1.718	2.000	1.812	2.094
-134	1.780	2.062	1.875	2.157
-135	1.843	2.125	1.937	2.219
-136	1.905	2.187	2.000	2.282
-137	1.968	2.250	2.062	2.344
-138	2.030	2.312	2.125	2.407
-139	2.093	2.375	2.187	2.469
-140	2.155	2.437	2.250	2.532
-141	2.218	2.500	2.312	2.594
-142	2.280	2.562	2.375	2.657
-143	2.343	2.625	2.437	2.719
-144	2.405	2.687	2.500	2.782
-145	2.468	2.750	2.562	2.844
-146	2.530	2.812	2.625	2.907
-147	2.593	2.875	2.687	2.969

100 Series

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-148	2.655	2.937	2.750	3.032
-149	2.718	3.000	2.812	3.094
-150	2.780	3.062	2.875	3.157
-151	2.905	3.187	3.000	3.282
-152	3.155	3.437	3.250	3.532
-153	3.405	3.687	3.500	3.782
-154	3.655	3.937	3.750	4.032
-155	3.905	4.187	4.000	4.282
-156	4.155	4.437	4.250	4.532
-157	4.405	4.687	4.500	4.872
-158	4.655	4.937	4.750	5.032
-159	4.905	5.187	5.000	5.282
-160	5.155	5.437	5.250	5.532
-161	5.405	5.687	5.500	5.782
-162	5.655	5.937	5.750	6.032
-163	5.905	6.187	6.000	6.282
-164	6.155	6.437	6.250	6.532

200 Series

1/8" Nominal Cross Section

G = .188 Min. L = .121 / .123

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-208	—	—	.625	1.000
-209	—	—	.687	1.062
-210	.625	1.000	.750	1.125
-211	.687	1.062	.812	1.187
-212	.750	1.125	.875	1.250
-213	.812	1.187	.937	1.312
-214	.875	1.250	1.000	1.375
-215	.937	1.312	1.062	1.437
-216	1.000	1.375	1.125	1.500
-217	1.062	1.437	1.187	1.562
-218	1.125	1.500	1.250	1.625
-219	1.187	1.562	1.312	1.687

200 Series

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-220	1.250	1.625	1.375	1.750
-221	1.312	1.687	1.437	1.812
-222	1.375	1.750	1.500	1.875
-223	1.500	1.875	1.625	2.000
-224	1.625	2.000	1.750	2.125
-225	1.750	2.125	1.875	2.250
-226	1.875	2.250	2.000	2.375
-227	2.000	2.375	2.125	2.500
-228	2.125	2.500	2.250	2.625
-229	2.250	2.625	2.375	2.750
-230	2.375	2.750	2.500	2.875
-231	2.500	2.875	2.625	3.000
-232	2.625	3.000	2.750	3.125
-233	2.750	3.125	2.875	3.250
-234	2.875	3.250	3.000	3.375
-235	3.000	3.375	3.125	3.500
-236	3.125	3.500	3.250	3.625
-237	3.250	3.625	3.375	3.750
-238	3.375	3.750	3.500	3.875
-239	3.500	3.875	3.625	4.000
-240	3.625	4.000	3.750	4.125
-241	3.750	4.125	3.875	4.250
-242	3.875	4.250	4.000	4.375
-243	4.000	4.375	4.125	4.500
-244	4.125	4.500	4.250	4.625
-245	4.250	4.625	4.375	4.750
-246	4.375	4.750	4.500	4.875
-247	4.500	4.875	4.625	5.000
-248	4.625	5.000	4.750	5.125
-249	4.750	5.125	4.875	5.250
-250	4.875	5.250	5.000	5.375
-251	5.000	5.375	5.125	5.500
-252	5.125	5.500	5.250	5.625
-253	5.250	5.625	5.375	5.750
-254	5.375	5.750	5.500	5.875
-255	5.500	5.875	5.625	6.000
-256	5.625	6.000	5.750	6.125
-257	5.750	6.125	5.875	6.250
-258	5.875	6.250	6.000	6.375
-259	6.125	6.500	6.250	6.625
-260	6.375	6.750	6.500	6.875
-261	6.625	7.000	6.750	7.125
-262	6.875	7.250	7.000	7.375
-263	7.125	7.500	7.250	7.625
-264	7.375	7.750	7.500	7.875
-265	7.625	8.000	7.750	8.125
-266	7.875	8.250	8.000	8.375
-267	8.125	8.500	8.250	8.625
-268	8.375	8.750	8.500	8.875
-269	8.625	9.000	8.750	9.125
-270	8.875	9.250	9.000	9.375
-271	9.125	9.500	9.250	9.625
-272	9.375	9.750	9.500	9.875
-273	9.625	10.000	9.750	10.125

300 Series

3/16" Nominal Cross Section

G = .281 Min. L = .186 / .188

Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-325	1.312	1.875	1.500	2.062
-326	1.437	2.000	1.625	2.187
-327	1.562	2.125	1.750	2.312
-328	1.687	2.250	1.875	2.437
-329	1.812	2.375	2.000	2.562
-330	1.937	2.500	2.125	2.687
-331	2.062	2.625	2.250	2.812
-332	2.187	2.750	2.375	2.937
-333	2.312	2.875	2.500	3.062
-334	2.437	3.000	2.625	3.187
-335	2.562	3.125	2.750	3.312
-336	2.687	3.250	2.875	3.437
-337	2.812	3.375	3.000	3.562
-338	2.937	3.500	3.125	3.687
-339	3.062	3.625	3.250	3.812
-340	3.187	3.750	3.375	3.937
-341	3.312	3.875	3.500	4.062
-342	3.437	4.000	3.625	4.187
-343	3.562	4.125	3.750	4.312
-344	3.687	4.250	3.875	4.437
-345	3.812	4.375	4.000	4.562
-346	3.937	4.500	4.125	4.687
-347	4.062	4.625	4.250	4.812
-348	4.187	4.750	4.375	4.937
-349	4.312	4.875	4.500	5.062
-350	4.437	5.000	4.625	5.187
-351	4.562	5.125	4.750	5.312
-352	4.687	5.250	4.875	5.437
-353	4.812	5.375	5.000	5.562
-354	4.937	5.500	5.125	5.687
-355	5.062	5.625	5.250	5.812
-356	5.187	5.750	5.375	5.937
-357	5.312	5.875	5.500	6.062
-358	5.437	6.000	5.625	6.187
-359	5.562	6.125	5.750	6.312
-360	5.687	6.250	5.875	6.437
-361	5.812	6.375	6.000	6.562
-362	6.062	6.625	6.250	6.812
-363	6.312	6.875	6.500	7.062
-364	6.562	7.125	6.750	7.312
-365	6.812	7.375	7.000	7.562
-366	7.062	7.625	7.250	7.812
-367	7.312	7.875	7.500	8.062
-368	7.562	8.125	7.750	8.312
-369	7.812	8.375	8.000	8.562
-370	8.062	8.625	8.250	8.812
-371	8.312	8.875	8.500	9.062
-372	8.562	9.125	8.750	9.312
-373	8.812	9.375	9.000	9.562
-374	9.062	9.625	9.250	9.812
-375	9.312	9.875	9.500	10.062
-376	9.562	10.125	9.750	10.312
-377	9.812	10.375	10.000	10.562
-378	10.312	10.875	10.500	11.062
-379	10.812	11.375	11.000	11.562

400 Series

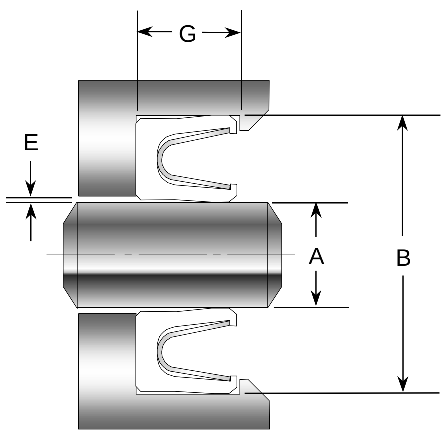
1/4" Nominal Cross Section

G = .375 Min. L = .238 / .241

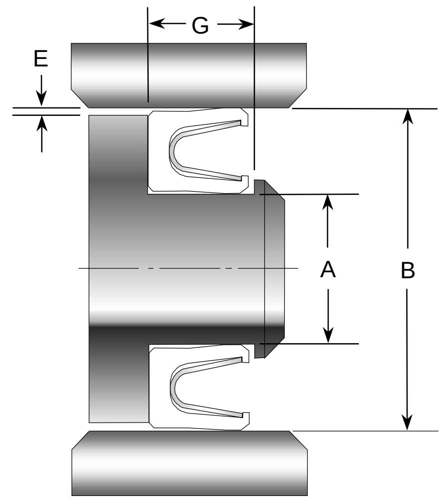
Dash Size No.	Internal A Ref. Dia.	Internal B +.005 -.000	External A +.000 -.005	External B Ref. Dia.
-425	4.250	5.000	4.500	5.250
-426	4.375	5.125	4.625	5.375
-427	4.500	5.250	4.750	5.500
-428	4.625	5.375	4.875	5.625
-429	4.750	5.500	5.000	5.750
-430	4.875	5.625	5.125	5.875
-431	5.000	5.750	5.250	6.000
-432	5.125	5.875	5.375	6.125
-433	5.250	6.000	5.500	6.250
-434	5.375	6.125	5.625	6.375
-435	5.500	6.250	5.750	6.500
-436	5.625	6.375	5.875	6.625
-437	5.750	6.500	6.000	6.750
-438	6.000	6.750	6.250	7.000
-439	6.250	7.000	6.500	7.250
-440	6.500	7.250	6.750	7.500
-441	6.750	7.500	7.000	7.750
-442	7.000	7.750	7.250	8.000
-443	7.250	8.000	7.500	8.250
-444	7.500	8.250	7.750	8.500
-445	7.750	8.500	8.000	8.750
-446	8.250	9.000	8.500	9.250
-447	8.750	9.500	9.000	9.750
-448	9.250	10.000	9.500	10.250
-449	9.750	10.500	10.000	10.750
-450	10.250	11.000	10.500	11.250
-451	10.750	11.500	11.000	11.750
-452	11.250	12.000	11.500	12.250
-453	11.750	12.500	12.000	12.750
-454	12.250	13.000	12.500	13.250
-455	12.750	13.500	13.000	13.750
-456	13.250	14.000	13.500	14.250
-457	13.750	14.500	14.000	14.750
-458	14.250	15.000	14.500	15.250
-459	14.750	15.500	15.000	15.750
-460	15.250	16.000	15.500	16.250
-461	15.750	16.500	16.000	16.750
-462	16.250	17.000	16.500	17.250
-463	16.750	17.500	17.000	17.750
-464	17.250	18.000	17.500	18.250
-465	17.750	18.500	18.000	18.750
-466	18.250	19.000	18.500	19.250
-467	18.750	19.500	19.000	19.750
-468	19.250	20.000	19.500	20.250

Need Help? If you are not sure of which seal is the best choice for your application, please run a copy of the facing page, fill out the required information and fax it to GNP 0perations at (847)-464-5287. Utilize the hardware information below and other information in this guide to determine the dimensions needed. We will contact you to discuss your specific application and make recomendations. If required, we will custom design a seal or sealing system that meets your conditions. If you need help filling out the form, please call GNP Technical Services at (800)-774-2394.

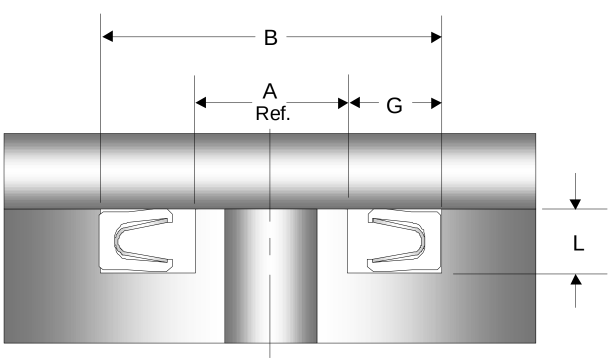
Rod / Shaft Seal



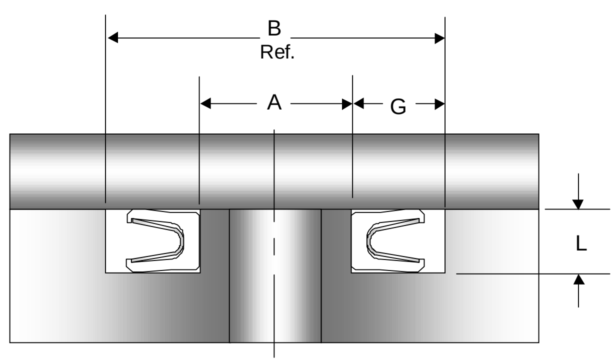
Piston Seal



Internal Pressure



External Pressure



Parker Hannifin Corporation
Packing Division / GNP Operations
Hampshire, Illinois

Parker Seals

Design Action Request

Parker Packing / GNP Operations
41W195 Railroad Street
Hampshire, Illinois 60140-2394
Toll Free 1-800-774-2394
Phone (847) 464-5202
FAX (847) 464-4051

COMPANY: ____________ FAX NUMBER: ____________
ADDRESS: ____________ P.O. BOX: ________ MAILSTOP: ________
CITY: ____________ STATE: ________ ZIP: ________
CONTACT: ________ TITLE: ________ PHONE: ________ EXT: ________
ALT. CONTACT: ________ TITLE: ________ PHONE: ________ EXT: ________
E-MAIL:

EQUIPMENT: ____________ MODEL: ____________
COMPONENTS: ____________ PROBLEM: ____________
EXISTING SEAL: ____________ PROBLEM PARTS INCLUDED: ___ YES ___ NO
PRICE: $ ______ @ ______ pcs USAGE / YEAR: ______ CUSTOMER P/N: ______
TARGET: $ ______ @ ______ pcs QUOTE QTY: ______ PROTO QTY: ______
DATE PROTO' REQ'D: ______

SEAL TYPE
___ ROD / SHAFT ___ INTERNAL PRESSURE OTHER: ____________
___ PISTON ___ EXTERNAL PRESSURE ____________

OPERATING PARAMETERS	UNIT (CIRCLE ONE)	MINIMUM	OPERATING	MAXIMUM
TEMPERATURE:	°K °F °C			
PRESSURE:	PSI BAR MPA			
STROKE LENGTH:	INCH MM			
CYCLE RATE:	/MIN. /HR. HZ			
ROTATION:	DEG. RAD.			
RPM:				
VELOCITY:	FT/MIN. MM/MIN.			
VACUUM:	IN. HG TORR			

DIRECTION OF ROTATION: _____ CLOCKWISE _____ COUNTER CLOCKWISE

MOTION
___ STATIC
___ RECIPROCATING
___ ROTARY
___ OSCILLATORY

PRESSURE DIRECTION
___ UNIDIRECTIONAL
___ BI-DIRECTIONAL

MEDIA(S) SEALED: ____________

HARDWARE SPECIFICATIONS HARDWARE DRAWINGS INCLUDED WITH DAR _____ YES _____ NO

A: DIAMETER MIN. ______ MAX. ______ HARDNESS ______ FINISH ______ MAT'L ______
B: DIAMETER MIN. ______ MAX. ______ HARDNESS ______ FINISH ______ MAT'L ______

G: DIMENSION MIN. ______ MAX. ______
E: DIMENSION MIN. ______ MAX. ______ CAN HARDWARE BE CHANGED? ____ YES ____ NO
L: DIMENSION MIN. ______ MAX. ______ HOW? ____________

PERFORMANCE REQUIREMENTS
(CIRCLE ONE)

RUNOUT (TIR) MIN. ______ MAX. ______
FRICTION: LBS OZ GMS BREAKOUT ____ DYNAMIC ____
TORQUE: FT/LB IN/OZ GM/CM BREAKOUT ____ DYNAMIC ____

SIDE LOAD (LBS NEWTON'S): ____________ EXPECTED LIFE: CYC HRS YRS ______
MIL-G-5514 O-RING DASH # ____ BACK-UP WIDTH ___ MAX. LEAKAGE: DROPS CC/MIN ______
AS4716 O-RING DASH # ____ BACK-UP WIDTH ___ MOST CRITICAL ASPECT: ______

GLAND TYPE
___ SPLIT ___ OPEN
___ CLOSED ___ STEPPED

METRIC
___ YES
___ NO

CONTAMINATION ____________

NOTES:

Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Acetaldehyde	A	C	—	A	A	A
Acetamide	A	A	—	B	—	—
Acetate Solvent	A	A	—	A	A	A
Acetic acid	A	A[2]	A	D	A	A
Acetic acid, 20%	A	A	A	B	A	A
Acetic acid, 80%	A	A	—	D	A	A
Acetic acid, Glacial	A	D	—	C	A	A
Acetic anhydride	A	D	B	B	A	A
Acetone	A	B	B	A	A	A
Acetyl chloride (dry)	A	D	—	A	A	A
Acetylene	A	D	A	A	—	A
Acrylonitrile	A	A	—	A[1]	B	—
Adipic acid	A	A	—	A[1]	—	—
Alcohols:						
Amyl	A	B[2]	A	A	A	A
Benzyl	A	D	—	A	A	A
Butyl	A	A	—	A	A	A
Discertone	A	B[1]	—	A	A	A
Ethyl	A	B	A	A	A	A
Hexyl	A	A	—	A	A	A
Isobutyl	A[2]	A[2]	—	A	A	A
Isopropyl	A[2]	A[2]	A	B	A	A
Methyl	A	A[1]	B	A	A	A
Octyl	—	A	—	A	C	A
Propyl	A	A[2]	—	A	A	A
Aluminum chloride	A	B[2]	C	B	A	B
Aluminum chloride, 20%	A	B[2]	—	D	A	C
Aluminum fluoride	A	A[2]	—	D	B	C
Aluminum hydroxide	A	A[2]	—	A[1]	B	—
Aluminum nitrate	A	A[2]	—	A	—	—
Alum. Potassium sulfate	A	A[2]	—	D	C	—
Aluminum sulfate	A	A[2]	B[1]	B	B	—
Alums	A	A	D	—	B	—
Amines	A[2]	C[1]	A[1]	A	B	A
Ammonia 10%	A	C[1]	—	A	A	A
Ammonia nitrate	A	A	—	A	—	A
Ammonia, anhydrous	A	B[2]	D	A	B	A
Ammonia, liquid	A	C[1]	—	B[2]	B	B
Ammonium acetate	A	A	-	B	—	—
Ammonium bifluoride	A	A[2]	—	D	B	C
Ammonium carbonate	A	B[2]	—	B	B	—
Ammonium chloride	A	A[2]	A[1]	C	D	A
Ammonium hydroxide	A	A[1]	C	A[1]	B	A
Ammonium nitrate	A	A[1]	B[1]	A[1]	B	—
Ammonium persulfate	A[1]	A[2]	—	A	B	—
Ammonium phosphate:						
Dibasic	A[2]	A[2]	—	B	B	—
Monobasic	A	A	B[1]	B	B	—
Tribasic	A	C	—	B	B	—
Ammonium sulfate	A	A[1]	B[1]	B	B	A
Amyl acetate	A	C[1]	C[1]	A	A	—
Amyl alcohol	A	B[2]	A[1]	A	A	A
Amyl chloride	A	D	—	A[2]	A[1]	—
Aniline	A	C	D	A	B	—
Aniline hydrochloride	A	D	—	D	D	—
Antimony trichloride	A	B[2]	—	B	A[2]	B[1]
Aqua regia	A	B[1]	C[1]	D	C	D
Arochlor 1248	A	C[1]	C[1]	B	A	—
Aromatic hydrocarbons	—	C	C[1]	—	—	—
Arsenic acid	A	B[2]	—	A[2]	B	—
Asphalt	A[1]	A[1]	B[1]	B	—	—
Barium carbonate	A	B[2]	—	B[1]	B	—
Barium chloride	A	A[1]	B[1]	A[1]	B	—
Barium cyanide	A[1]	B	—	A[1]	A	—
Barium hydroxide	A	B[2]	B[1]	B	B	—
Barium nitrate	A[1]	B[2]	—	B	—	—
Barium sulfate	A	B[2]	D	B	A	—
Barium sulfide	A	B[2]	—	B	—	—
Benzaldehyde	A[1]	A[1]	B	B	A	—
Benzene	A	C[1]	C	B	B	—
Benzene sulfonic acid	A	A[1]	B	B	B	—
Benzoic acid	A[2]	A[1]	D	B	B[1]	—
Benzol	A	C[1]	C	A[1]	B	—
Boric acid	A	A[2]	A[1]	B[2]	A	—
Bromine	A	D	D	D	A	C
Butadiene	A[2]	D	—	A	C	—

Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Butane	A	C[1]	—	A[2]	A	A
Butylacetate	A	C[1]	B	B	A	—
Butylene	A	B[1]	—	A	—	—
Butyric acid	A[2]	D	B[1]	B[2]	A[1]	—
Calcium bisulfide	A	B[1]	B[1]	B	A	—
Calcium carbonate	A	B[1]	—	A[1]	B	—
Calcium chloride	A	B[2]	A[1]	C[2]	A	C
Calcium hydroxide	A	A[2]	B[1]	B[1]	A	A
Calcium hypochlorite	A	A[1]	C[1]	C[1]	B	C
Calcium oxide	A	B[1]	A	A	A	A
Calcium sulfate	A	B[1]	—	B	B	—
Carbon bisulfide	—	—	C[1]	A	—	—
Carbon dioxide	A	A[1]	A	A	A	A
Carbon dioxide (Dry)	A	A[1]	A[1]	A	A	A
Carbon dioxide (Wet)	A	A[1]	—	A	A	A
Carbon disulfide	A	C[1]	—	A[1]	B	—
Carbon monoxide	A	A[2]	A	A	B	A
Carbon tetrachloride	A	D	D	B	A[1]	A
Carbonic acid	A	B[2]	D	A[1]	A[2]	—
Catsup	—	—	—	A	—	A
Chlorinated glue	—	—	—	—	—	—
Chlorine water	A	B[1]	—	C	A[2]	A
Chlorine, anhydrous liquid	A	D	—	C[1]	D	—
Chlorine, dry	A	D	D	A[1]	A[2]	A
Chlorobenzene (Mono)	B	C[1]	D	A	A	—
Chloroform	A[1]	C[1]	D	A	A[1]	A
Chlorosulfonic acid	A	D	D	D	A[1]	—
Chromic acid 5%	A	D	D	B	B	B
Chromic acid 10%	A	D	D	B	A	B
Chromic acid 30%	A	D	D	B[2]	D	B
Chromic acid 50%	A	D	D	C	B	C
Cider	—	B	B[1]	A	—	A
Citric acid	A	D	A[1]	B[1]	A	A
Clorox (bleach)	A	—	—	A	A	A
Coffee	—	—	—	A	A	A
Copper chloride	A	—	A[1]	D	—	—
Copper cyanide	A	B[2]	—	B	A[1]	—
Copper fluoborate	—	—	—	D	B	—
Copper nitrate	A	A[2]	—	A	B[2]	—
Copper sulfate 5%	A	A[2]	A[1]	B	A	—
Copper sulfate >5%	A	A[2]	A[1]	B	A	—
Cream	A	—	—	A	—	A
Cresola	—	C[1]	D	A[2]	B[2]	—
Cresylic acid	A	B[1]	—	A[1]	B[1]	—
Cyclohexane	A	B[1]	A[1]	A[1]	B	—
Cyclohexanone	A	D	—	A[1]	A[1]	—
Detergents	A	D	—	A[2]	B	A
Diacetone alcohol	A	A	—	B[1]	—	—
Dichloroethane	A[1]	C[1]	—	C[1]	A	—
Diesel fuel	A	C[1]	—	A[1]	B	A
Diethyl ether	A	—	C	B1	B1	A
Disthylamine	D	D	—	A	A	A
Diethylene glycol	A[2]	B[2]	—	A[1]	B[1]	A
Dimethyl formamide	D	A	—	A	—	—
Diphenyl oxide	A[1]	—	—	B[1]	B[1]	—
Epsom salts	A	A[2]	—	A	B	A
Ethane	A	—	—	A	—	A
Ethanol	A	B	—	A	A	A
Ethanolamine	A[1]	—	—	A	B	—
Ether	A	D	—	A	B[1]	A
Ethyl acetate	A	D	B	B	A	A
Ethyl benzoate	A	C[2]	—	—	—	—
Ethyl chloride	A	C[1]	C	A	B[1]	—
Ethylene bromide	A	D	—	A	B	—
Ethylene chloride	A	D	—	B	—	—
Ethylene chlorohydrin	A	D	—	B	B	—
Ethylene diamine	A	A[1]	—	B[1]	C	—
Ethylene dichloride	A	D	C	B	B	—
Ethylene glycol	A	D	A	B	B[1]	A
Ethylene oxide	A	A	A	B	A	A
Patty acids	A	D	—	B	A	A
Ferric chloride	A	A[1]	C	D	B[2]	C
Ferric nitrate	A	A[2]	—	B	B[1]	B
Ferric sulfate	A	A[2]	—	B[1]	A[1]	B
Ferrous chloride	A	A[2]	—	D	B[1]	C
Ferrous sulfate	A	A[2]	—	B	B	B

A = No Effect / Excellent B = Minor Effect / Good C = Moderate Effect / Fair D = Severe Effect / Poor [1] Maximum 72° F (22°C) [2] Maximum 120°F (48°C)

Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Fluboric acid	A	A[2]	—	B	A[1]	—
Fluorine	D	D	—	C	B[1]	C
Fluosilcic acid	A	A[2]	—	C	B	—
Formaldehyde 40%	A	D	B	A[1]	B	A
Formaldehyde 100%	A	B	—	C	A	A
Formic acid	A	D	B	B[1]	A	A
Freon 11	A	C	A	A	A	A
Freon 12	A	A[1]	A	B[1]	A	A
Freon 22	A	—	—	A	A	A
Freon 113	A	—	A	—	A	A
Freon TF	A	—	A	A	A	A
Fruit juice	A	A	—	A	A	A
Fuel oils	B	B	—	A	A[1]	A
Furan resin	A	D	—	A[1]	B	—
Furfural	A	D	—	A	B	—
Galic acid	B	A	—	A	B[1]	—
Gasoline	B	A	A	A	A	A
Gelatin	A	A[2]	—	A[2]	A	A
Glucose	A	A[2]	—	A[1]	A	A
Glue, PVA	A	A[2]	A	A[1]	A	A
Glycerin	A	A[1]	A	A[2]	A	A
Glycolic acid	A	A[2]	—	A	A	A
Grape juice	A	B	—	A	—	A
Grease	A	—	—	—	A	A
Heptane	A	B[1]	—	A	A	A
Hexane	A	D	A	A	A	A
Honey	A	B	—	A	A	A
Hydraulic oil (Petro)	A	C	—	A	A	A
Hydraulic oil (Synthetic)	A	A	—	A	A	A
Hydrazine	C	—	C	A	—	—
Hydrobromic acid 20%	-	B[2]	—	D	A	C
Hydrobromic acid 100%	A	B[1]	—	D	C	D
Hydrochloric acid 20%	A	A[2]	B	D	A[1]	B
Hydrochloric acid 37%	A	B[2]	C	D	B	C
Hydrochloric acid 100%	A	—	—	D	A	B
Hydrocyanic acid	A	A[2]	C	B[1]	A	—
Hydrocyanic acid gas 10%	A	—	—	—	—	—
Hydrofluoric acid 20%	A	A[2]	—	D	B	C
Hydrofluoric acid 50%	A	A[1]	D	D	B	C
Hydrofluoric acid 75%	A	C[1]	D	D	B	C
Hydrofluoric acid 100%	A	—	D	B[1]	B	C
Hydrofluosilicic acid 20%	A	B[2]	—	C[2]	B	C
Hydrofluosilicic acid 100%	A	B[1]	—	D	B	C
Hydrogen gas	A	A[2]	A	A	A	A
Hydrogen peroxide 10%	A	A	—	B[2]	A	D
Hydrogen peroxide 30%	A	C[2]	—	B[2]	A	D
Hydrogen peroxide 50%	A	C[2]	—	B[2]	A	D
Hydrogen peroxide 100%	A	C[2]	—	B[2]	A	D
Hydrogen sulfide (aqua)	A	A	—	C	A	A
Hydrogen sulfide (dry)	A	A	A	C[1]	A	A
Hydroquinone	A	A	—	B	B	—
Hydroxyacetic acid 70%	A	A	—	—	—	—
Iodine	A	A[1]	B	D	A	D
Isopropyl acetate	A	B[2]	C	C	B	—
Isopropyl ether	A[1]	B	—	A	A	A
Jet fuel (JP3,4,5,6,8)	A	D	—	A	A	A
Jet fuel (JP9, 10)	A	D	—	A	A	A
Kerosene	A	C[1]	C	A	B	A
Ketones	A	C[1]	—	A	A	A
Lacquer thinners	A	A[2]	D	A[1]	A	A
Lacquers	A	A[2]	—	A[1]	A	A
Lactic acid	A	A[1]	D	B[1]	B[1]	—
Lard	A	A	—	A	A	A
Latex	A	—	—	A[2]	A	A
Lead acetate	A	A[2]	—	B[1]	B[1]	—
Lead Sulfamate	B	A[1]	—	C	—	—
Ligroin	A	A	—	—	—	—
Lime	A[1]	A	—	A	—	A
Lubricants	A	D	A	A[2]	A	A
Magnesium carbonate	A[1]	B	—	B[1]	B[1]	—
Magnesium Chloride	A	A[1]	C	D	A[2]	—
Magnesium hydroxide	A	A[2]	C	B[1]	A	A
Magnesium nitrate	A	A[2]	—	B[1]	A	A
Magnesium sulfate	A	A[2]	—	A	B	—
Maleic acid	A	B[2]	—	A	B	—
Malic acid	A	B[2]	—	A	B	—

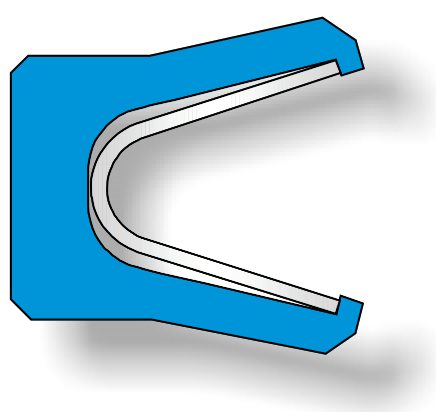
Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Mayonnaise	A	D	—	C	A	A
Melamine	A	—	—	—	—	—
Mercuric chloride (dilute)	A	A	B	C	C	D
Mercuric cyanide	B	A	—	A	A	—
Mercury	A	A	B	A	A[2]	A
Methane	A	—	—	A	A	A
Methanol	A	A[1]	B	A	A	A
Methyl acetate	A	B[1]	—	A	A	A
Methyl acrylate	—	—	—	A	—	—
Methyl alcohol 10%	A	A[1]	B	A	A	A
Methyl bromide	A	C[1]	—	B[1]	—	—
Methyl cellosoive	A	—	—	A	—	—
Methyl chloride	A	C[1]	—	—	B	B
Methyl dichloride	—	—	—	B[1]	—	—
Methyl ethyl ketone (MEK)	A	B[2]	B	A	A	A
Methyl isobutyl ketone	A	C	B	A	A	A
Methyl isopropyl ketone	A	D	—	B[1]	—	A
Methylamine	A	A[1]	—	A	—	—
Methylene chloride	A	C	D	A	B	—
MIL-H-5606	A	—	—	A	—	—
MIL-L-7808	A	—	—	A	—	—
MIL-L-23699	A	—	—	A	—	—
MIL-H-46170	A	—	—	A	—	—
Milk	A	A	—	A	A	A
Mineral spirits	A	B	—	A	B	A
Molasses	A	A	—	A	A	A
Monoethanolamine	A	C	—	A	—	A
Mustard	A	A	—	A	A	A
Naphtha	B	A[1]	B	A	B	A
Nephthanlene	A	C	B	A	A	A
Nickel chloride	A	A	—	D	B	C
Nickel sulfate	A[2]	A	—	B[1]	B	—
Nitric acid (5-10%)	A	B	C	A	A[1]	A
Nitric acid (20%)	A	C	D	A	A[1]	A
Nitric acid (50%)	A	B[1]	D	A[2]	A[1]	A
Nitric acid (concentrated)	A	C[1]	D	A[1]	B[1]	A
Nitrobenzene	A	C[1]	D	B	D	—
Nitrous acid	A	—	—	B	D	—
Nitrous oxide	A	C	—	B	B	—
OILS:						
Aniline	A	—	D	A	B	A
Castor	A	—	B[1]	A	—	A
Cocoa nut	A	A	—	A	A	A
Cod Liver	A	—	—	A	A	A
Corn	A	A	A	A	A	A
Cotton Seed	A	A	A[1]	A	A	A
Creosote	A	C	D	B	B	A
Diesel fuel	A	A	A[1]	A	B	A
Fuel	A	B	A	A	A[1]	A
Ginger	A	—	—	D	—	A
Lemon	A	—	—	A	—	A
Linseed	A	A	B[1]	A	B	A
Mineral	A	B[1]	A	A	A	A
Olive	A[1]	A[1]	—	A	A	A
Orange	—	C[1]	—	A	A	A
Palm	A	A	—	A	—	A
Peanut	A	A	—	A	—	A
Peppermint	A	—	—	A	—	A
Pine	A	D	—	A	—	A
Rapeseed	A	D	—	S	—	A
Rosin	A	B[2]	—	A[1]	A	A
Sesame Seed	A	—	—	A	—	A
Silicone	A	A	A	A	A	A
Soybean	A	A[1]	B	A	A	A
Tanning	—	—	—	A	—	A
Transformer	A	C[1]	—	A	—	A
Turbine	A	C	—	A	—	A
Oleic acid	A	C[2]	A	A	A[2]	A
Oleum 25%	A	D	C	B[2]	A	—
Oleum 100%	A	D	—	A	D	—
Oxalic acid (cold)	A[1]	A[2]	D	B	B	B
Ozone	A	A	C	B	—	A
Paraffin	A	B	—	A	B	A
Pentane	A	D	—	C	A	A
Perchloric acid	A	B	—	C	B	—
Perchloroethylene	A	D	C	B	B	—

A = No Effect / Excellent B = Minor Effect / Good C = Moderate Effect / Fair D = Severe Effect / Poor [1] Maximum 72° F (22°C) [2] Maximum 120°F (48°C)

Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Petroletum	**C**	**B**	**—**	**A**	**A**	**—**
Phenol (10%)	**A**	**B**	**—**	**B**	**B**	**—**
Phosphoric acid (<40%)	**A**	**A**	**—**	**D**	**A[2]**	C
Phosphoric acid (>40%)	A	B[1]	—	D	A[2]	C
Phosphoric acid (crude)	A	B[1]	—	D	A[2]	—
Photographic developer	A	A	—	A	B	—
Phthalic anhydride	A	—	—	A	A	—
Picric acid	A	A	—	B	B	—
Potash	—	A[1]	D	B	B	A
Potassium bicarbonate	A	A	—	B	B	—
Potassium bromide	A	A	—	B	B	—
Potassium chlorate	A	A[1]	—	B[1]	B	—
Potassium chloride	A	A[1]	B	B[1]	A	B
Potassium chromate	A[1]	A	—	B[1]	A	—
Potassium cyanide sols.	A	A	B	B[1]	B	—
Potassium dichromate	A	A	C	B	B	B
Potassium ferrocyanide	A	A[1]	—	B	B	—
Potassium hydroxide	A	A	D	B	B[1]	B
Potassium nitrate	A	B	B	B	B[1]	—
Potassium permanganate	A	A	D	B[1]	A[1]	—
Potassium sulfate	A	A[2]	B	B[1]	B[1]	—
Potassium sulfide	A	A[2]	—	B	—	—
Propane (liquefied)	A	C[1]	A	A	A	A
Propylene glycor	A	B[2]	—	B	B	B
Pyridine	A	C	—	B	B	—
Pyrogallic acid	A	B[1]	C	A	B	—
Rosins	A	B[1]	—	A[1]	—	A
Rum	—	—	—	A	—	A
Rust inhibitors	—	—	—	A[2]	A[1]	—
Salad dressings	—	—	—	A	—	A
Sea water	A	A[2]	A	C	A	A
Shellac (bleached)	A	A[1]	—	A	—	A
Silicone	A	—	A	A	—	A
Silver bromide	A	A	—	D	A	—
Silver nitrate	A	A	A	—	B	A
Skydrol 500B	A	—	D	A	—	—
Soap solutions	A	D	A	A	A	A
Sodium acetate	A	A	—	B	A	A
Sodium aluminate	A	—	—	A	B	—
Sodium bicarbonate	A	A[2]	—	A	B[1]	—
Sodium bisulfate	A	A[2]	C	D	B[2]	—
Sodium bisulfide	A	A[2]	B	B[1]	B	—
Sodium borate	A	A[2]	B	B[2]	A	—
Sodium carbonate	A	B[2]	—	A	A	—
Sodium chlorate	A	B[2]	—	A	B[1]	—
Sodium chloride	A	A[2]	A	B	A	A
Sodium chromate	A	—	—	B[1]	A	—
Sodium cyanide	A	A[2]	B	A[1]	A	A
Sodium fluoride	A[1]	A[2]	—	D	A	B
Sodium hydroxide (20%)	A	D	B	B	B	B
Sodium hydroxide (50%)	A	D	C	B	C	B
Sodium hydroxide (80%)	A[1]	D	—	C	A[1]	B
" Hypochlorite (100%)	A	B[2]	D	D	B	C
" Hypochlorite (<20%)	A	A	A	C	A	B
Sodium hyposulfate	A	—	—	A	—	—
Sodium metaphosphate	A	A[1]	—	A	—	—
Sodium metaslicate	A	—	—	A	A	—
Sodium nitrate	A	A[2]	—	B[1]	B	—
Sodium perborate	A	A[1]	—	B	B	B
Sodium peroxide	A	A	—	A	B	A
Sodium polyphosphate	A	A	—	B	A	—
Sodium silicate	A	A[2]	—	A	B	—
Sodium sulfate	A	A[2]	—	B	B	—
Sodium sulfite	A	B[1]	—	B	B[1]	—
Sodium tetraborate	A	A[2]	—	B	B	—
Sodium thiosulfate (hypo)	A	A[1]	—	A[2]	—	—
Stannic chloride	A	A[2]	—	D	B	C
Stannous chloride	A	B[2]	C	C[2]	B	B
Starch	A	B	—	A	—	A
Stearic acid	A	B[1]	C	B	B	—
Stoddard solvent	A	C[1]	—	A	A	—
Styrene	A	—	D	A	D	—
Sugar (liquids)	A	—	—	A	A	A
Sulfate (liquors)	A	A[2]	—	B	B	B
Sulfur chloride	A	C[1]	—	D	A	A
Sulfur dioxide	A	B[1]	C	D	C	—

Media	PTFE	UHMW PE	TPE	301 SS	Hast C-276	Elgiloy
Sulfur dioxide (dry)	**A**	**A[1]**	C	D	B	B
Sulfur hexaflouride	—	B	—	—	—	A
Sulfur trioxide	A	—	—	A	—	—
Sulfur trioxide (dry)	A	C[1]	—	D	B	—
Sulfuric acid (10-75%)	A	A[1]	—	D	B[1]	D
Sulfuric acid (75-100%)	A	B[1]	C	C	B[1]	C
Sulfuric acid (<10%)	A	A[1]	A	D	B[1]	D
Sulfuric acid (cold conc)	A	C	B	C	A[1]	C
Sulfuric acid (hot conc)	A	D	—	B[1]	A	A
Sulfurous acid	A	B[2]	—	B[2]	B	—
Tallow	A	C	—	A	—	A
Tannic acid	A	B[2]	A	B[1]	B[1]	—
Tanning liquors	A	A[1]	—	A[2]	B	B
Tartaric acid	A	A[1]	C	C[2]	B	—
Tetrschloroethane	A	—	—	B	A	A
Tetrachloroethylene	A	B	—	—	—	A
Tetrahydrofuran	A	C[1]	B	A	A	A
Tin Salts	A	—	—	—	C	—
Toluene (toluol)	A	C[1]	B	A	A	A
Trichloroacetic acid	A	A	—	D	B	—
Trichloroethane	A	—	—	B	A	A
Trichloroethylene	A	D	—	B	A	A
Trichloropropane	A[1]	—	—	A	A	A
Tricresylphosphate	A	B[1]	—	B	A	—
Triethylamine	A	—	—	A	—	A
Trisodium phospate	A	A	A	B	A	—
Turpentine	A	D	—	A	B	A
Urea	A	A	—	B	B	B
Uric acid	A	B	—	B	B	—
Varnish	A	A	—	A	A	A
Vegetable juice	A	—	—	A	—	A
Vinegar	A	A	—	A	A	A
Water acid, mine	A	A[2]	—	B	A	A
Water, distilled	A	A[2]	—	A	A	A
Water, fresh	A[1]	A[2]	A	A	A	A
Water, salt	A	A[2]	A	B	A	A
Whiskey & wines	A	C	—	A	—	A
White liquor (pulp mill)	A	A[2]	—	A	A	A
Xylene	A	B	B	B	A	A
Zinc chloride	A	A[1]	A	B	B	—

Note: Chemical compatability ratings on this and preceding pages are intended only as a guide for the users initial selection. Actual compatability may be different based on application parameters including, pressure, temperature and specific media contents and percentages. Actual testing in the specific application media and operating parameters is the responsibility of the user to determine final material selection and approval. Please call Technical Services at Parker GNP with any questions regarding material selection at 1-800-774-2394.



A = No Effect / Excellent B = Minor Effect / Good C = Moderate Effect / Fair D = Severe Effect / Poor [1] Maximum 72° F (22°C) [2] Maximum 120°F (48°C)

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