



Parker O-Ring Material Offering Guide

ORD 5712

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.



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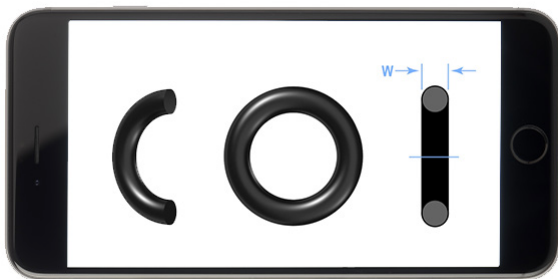
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O-Ring Material Offering Guide



THIS IS O-RING DESIGN EXPERTISE

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Operations

Engineers in every industry - from automotive to fluid power to semiconductor processing - choose O-rings made by Parker to keep their equipment running safely and reliably. That's because Parker's O-Ring & Engineered Seals Division develops, manufactures and supplies precision-engineered O-rings and custom seals by offering a unique combination of experience, innovation and support.

Quality Assurance

In our world-class facilities, skilled Parker technicians manufacture O-rings to exacting standards, closely monitoring each step of the process through a Controlled Batch Identification (CBI) program. From in-house mixing and tooling operations to the final non-contact inspection process, state-of-the-art technology is employed to provide unparalleled material consistency and dimensional control. Quality registrations (AS 9100, ISO 9001, TS 16949 and VDA 6.1) are maintained to ensure superior product performance and process repeatability.

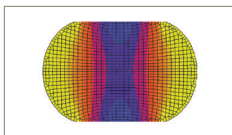
Research and Development

In its on-site research labs, Parker develops new O-ring material formulations and compounds to meet customer needs. These materials are subjected to a broad range of mechanical, physical and environmental conditions, and their performance is evaluated through a comprehensive testing process.



Finite Element Analysis

Through the use of powerful computers and Finite Element Analysis (FEA) software specifically designed for elastomeric evaluation, Parker engineers can predict a seal's performance in a variety of media, temperatures and pressures before a single part is made. This eliminates the need for costly tooling, speeds the production process and ensures the selection of the right material and geometry for a customer's application.



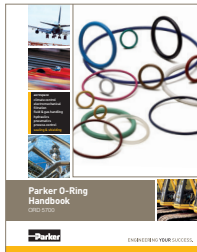
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Literature

Since its initial release, the Parker O-Ring Handbook (ORD 5700) has been a fixture on the reference shelves of engineers and seal specifiers worldwide.

This book contains extensive information about basic sealing elastomer properties, typical O-ring applications, static and dynamic seal design fundamentals, and O-ring failure modes.



To download a pdf copy of the O-Ring Handbook, go to www.parker.com/ORD5700

For fast, on the go access to this information, check out our abridged versions of the handbook, available as the O-Ring eHandbook (interactive online version), ORD 5712 (US) and 5705 (Europe).

Seal Design Software

Parker's Mobile inPHorm™ and O-Ring Selector (advanced users) are web-based mobile applications designed to assist with material selection, fluid compatibility, gland/seal calculations and overall design analysis. Scan the below QR codes to try them out today!



inPHorm



Selector



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Product Lines

O-Rings

- Manufactured to US and international standards: AS568, ISO 3601, DIN 3771, JIS and metric. Custom sizes of almost any dimension.
- Miniature O-rings, large special O-rings, continuously molded and spliced cord.
- Perfluorinated (FFKM) O-rings, custom molded products and die-cuts. Broadest chemical resistance, highest purity and temperature resistance of any elastomeric family - up to 320°C/608°F.

Parbak® Back-up Rings

Prevent extrusion in high-pressure applications and help retain lubricant, extending O-ring life.

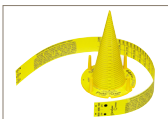


O-Ring Kits

Kits are conveniently arranged with various size O-rings for repair, assembly and workshop.

Accessories

Products to assist O-ring users include assembly greases and lubricants, sizing cones and extraction tools.



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Material Offering



Compounds

O-rings can be molded in a wide range of compounds in durometers ranging from 40 to 95 Shore A. These materials include:

- Acrylonitrile-Butadiene (NBR)
- Butyl (IIR)
- Chloroprene (CR)
- Ethylene Acrylic (AEM)
- Ethylene Propylene (EPDM)
- Fluorocarbon (FKM)
- Fluorosilicone (FVMQ)
- Hydrogenated Nitrile (HNBR)
- Perfluoroelastomer (FFKM)
- Polyacrylate (ACM)
- Silicone (VMQ)

Parker O-ring compounds are formulated to meet the most stringent industry standards, including NSF, Underwriters Laboratories (UL), Military (MIL-SPEC), Aerospace (AMS), NASA, FDA, USP, and many customer-specific requirements.

Wynn's Numbering System

Parker Hannifin acquired Wynn's International, parent company of Wynn's Precision and Goshen Rubber, in July 2000. As a result, some Wynn's products and materials were added to the Parker O-Ring & Engineered Seals Division's offering.

The Wynn's compound numbering system has been phased out; however, the old numbers are noted in parentheses (XXXXX) wherever applicable for reference purposes.

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Parker O-Ring Compound Numbering Systems

Note: There are two types of nomenclature used to reference Parker O-Ring products. See tables below for description of these types.

TYPE I		
N	0674	-70
Polymer Code (Single Letter)	Sequence Number (four digits)	Durometer Indicator (two digits)

TYPE II			
A	A	150	-70
Polymer Code (Single Letter)	Special Property Description (Single Letter)	Sequence Number (three digits)	Durometer Indicator (two digits)

Polymer Codes

A	Polyacrylate	N	Nitrile (Buna N) and HNBR
B	Butyl	P	Polyurethane
C	Chloroprene (Neoprene®)	S	Silicone
E	Ethylene Propylene	V	Fluorocarbon, AFLAS®, Hifluor™, ULTRA™
F	ULTRA™ FFKM	Y	Epichlorohydrin
H	Hifluor™	Z	Exotic Polymers
K	HNBR		
L	Fluorosilicone		

Special Property Descriptions

A	General Purpose
B	Low Compression Set
E	Ethylene Acrylate or (Vamac®)
F	Fuel Resistant or Fully Fluorinated
G	Higher Fluorine Content
J	NSF / FDA / WRAS Approvals
L	Internally Lubed
M	Mil/ AMS Specifications
P	Low Temperature Flexible or (AFLAS)
W	Non-Black Compound
X	Carboxylated

Durometer Indicators (Hardness)

-40	40 ±5	Shore A Durometer
-45	45 ±5	Shore A Durometer
-50	50 ±5	Shore A Durometer
-55	55 ±5	Shore A Durometer
-60	60 ±5	Shore A Durometer
-65	65 ±5	Shore A Durometer
-70	70 ±5	Shore A Durometer
-75	75 ±5	Shore A Durometer
-80	80 ±5	Shore A Durometer
-85	85 ±5	Shore A Durometer
-90	90 ±5	Shore A Durometer
-95	95 ±5	Shore A Durometer

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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
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POLYACRYLATE (ACM)

ACM (acrylic rubber) has good resistance to mineral oil, oxygen and ozone. The water compatibility and cold flexibility of ACM are considerably worse than with NBR.

AA150-70	Engines & Transmission Seals	-5 to 350	Black
AA451-70	Low Temperature	-40 to 325	Black

ETHYLENE ACRYLATE (AEM)

Ethylene acrylate is a mixed polymer of ethylene, methyl acrylate and a small amount of carboxylated cure-site monomer. Developed as a lower-temperature version of Polyacrylate, but swells slightly more. Polymer is sold under the tradename VAMAC®.

AE152-70	Transmission Applications	-40 to 325	Black
AE153-75	Transmission Applications, Internally Lubed	-40 to 325	Black

BUTYL RUBBER (IIR)

Butyl rubber (isobutylene-isoprene rubber or IIR) has a very low permeability rate and good electrical properties, but poor short-term rebound.

B0612-70	Vacuum, Low Compression Set	-75 to 250	Black
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POLYCHLOROPRENE RUBBER (CR)

Also known by the tradename Neoprene®, polychloroprene was the first synthetic rubber and exhibits generally good ozone, aging, and chemical resistance. It has good mechanical properties over a wide temperature range.

C0267-50	AMS 3208, Low Temperature	-60 to 250	Black
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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
C0557-70	Drive Belt Applications, General Purpose	-35 to 250	Black
C0873-70	Refrigerant Gases, Low Extractibles, Low Compression Set	-35 to 225	Black
C1124-70	AMS 3209, Low Temperature	-60 to 250	Black

ETHYLENE PROPYLENE RUBBER (EPM, EPR, EPDM)

EPM (EPR) is a copolymer of ethylene and propylene. EPDM is a terpolymer of ethylene, propylene, and a diene third monomer used for cross-linking.

EJ243-45	Internally lubricated, USP Class VI, USP <87>, ISO 10993	-70 to 250	Black
EA454-50	General Purpose	-70 to 250	Black
E1157-60	General Purpose	-70 to 250	Black
E1561-60	NSF 61	-70 to 250	Black
E0751-65	Drive Belt Applications	-70 to 250	Black
E0603-70	General Purpose (EPR)	-70 to 250	Black
E0803-70	General Purpose	-70 to 250	Black
E1244-70	NSF 61, Internally Lubed, USP Class VI	-70 to 250	Black
E1549-70	NSF 61	-70 to 250	Black
E1583-70	Internally Lubed, NSF 51	-70 to 250	Black
E3609-70	NSF 51, NSF 61, FDA, USP Class VI, ISO 10993	-70 to 250	Black

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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
EB152-70	UL Listed	-70 to 250	Black
EJ274-70	Internally lubed, NSF 61, Chloramine Resistant	-70 to 250	Black
E0740-75	Nuclear Applications, USP Class VI, USP <87>, 8243412	-70 to 250	Black
E0540-80	General Purpose (EPR)	-70 to 250	Black
E0893-80	General Purpose, Hydrogen	-70 to 250	Purple
EM163-80	NAS 1613 Rev 6 & NAS 1613 Rev 2	-80 to 250	Black
E0652-90	General Purpose, Back-Up Rings	-60 to 250	Black
E0962-90	Excellent Steam to 500° F, ISO 23936-2 RGD	-60 to 250	Black

FLUOROSILICONE (FVMQ)

Fluorosilicone is a silicone polymer chains with fluorinated side-chains for improved oil and fuel resistance. The mechanical and physical properties are very similar to those of silicone.

L1223-60	MIL-DTL-25988, TY 1, CL 1, GR 60, AMS 3325	-100 to 350	Blue
LM100-70	MIL-DTL-25988, TY I, CL I, GR 70, UL listed	-100 to 350	Blue
L1077-75	MIL-DTL-25988, TY I, CL III, GR 75	-90 to 350	Blue
L1218-80	MIL-DTL-25988, TY 1, CL 1, GR 80	-90 to 350	Blue



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ACRYLONITRILE-BUTADIENE (NBR)

Nitrile rubber (NBR) is the general term for acrylonitrile-butadiene terpolymer. The acrylonitrile content of nitrile sealing compounds varies considerably (18 to 50%.) Polymers with higher ACN content exhibit less swell in gasoline and aromatic solvents, while lower ACN polymers exhibit better compression set and low temperature flexibility. Polymer is also called Buna-N.

N0545-40	General Purpose	-45 to 225	Black
N0299-50	UL listed	-55 to 225	Black
N0525-60	AMS 3220	-25 to 250	Black
NM506-65	AMS 7271	-70 to 180	Black
N0103-70	Low Temp.	-55 to 225	Black
N0497-70	Low Swell, SAE 120R1 CL II, UL Listed	-35 to 212	Black
N0602-70	General Purpose, AMS-P-5315, Low Temp.	-70 to 180	Black
N0674-70	General Purpose, MIL-G-21569, Cl I, UL listed	-30 to 250	Black
N0757-70	NSF 61, UL Listed	-30 to 225	Black
N1220-70	NSF 51, FDA	-30 to 225	Black
N1470-70	General Purpose, X-rings	-40 to 250	Black
N1499-70	General Purpose, UL Listed	-30 to 250	Black
N1510-70	NSF 61	-30 to 225	Black

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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
NA151-70	UL Listed	-30 to 250	Black
NM072-70	AMS-R-7362	-60 to 180	Black
NM756-75	AMS-P-83461	-65 to 250	Black
N0756-75	Low Temperature, Low Set	-65 to 250	Black
N0951-75	High Temp, Low Compression Set	-25 to 275	Black
N1500-75	Low Swell, UL Listed, Fuel applications	-35 to 212	Black
N1090-85	Extra Low Friction (ELF) Pneumatic, Carboxylated, Internally Lubed	-25 to 225	Black
N0300-90	Back-Up Rings Only	-40 to 180	Black
N0507-90	AMS-P-5510, Low Temp.	-65 to 180	Black
N0552-90	General Purpose	-30 to 250	Black
N0702-90	Low Compression Set	-30 to 275	Black
N1059-90	Low Compression Set	-30 to 275	Black
N1444-90	Back-Up Rings Only	-30 to 250	Black
N1490-90	General Purpose	-30 to 250	Black

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HYDROGENATED NITRILE (HNBR, HSN)

Hydrogenated nitrile was developed as an air-resistant variant of nitrile rubber. In HNBR, the carbon-carbon double bonds in the main polymer chain are saturated with hydrogen atoms in a process called "hydrogenation" that improves the material's thermal stability and oxidation resistance.

N1173-70	General Purpose	-25 to 300	Black
KA158-70	Low Temp.	-40 to 300	Black
KA157-70	General Purpose	-30 to 300	Black
N1231-80	NACE TM0297 RGD	-25 to 300	Black
KA453-80	Chemical Resistant, ISO 23936-2 H ₂ S, NACE TM0297 RGD	-25 to 300	Black
KB162-80	High Temperature Hydraulics	-25 to 300	Black
KA183-85	Low Temperature, ISO 23936-2 RGD & H ₂ S, API 6A	-55 to 300	Black
KB163-90	Extrusion Resistant, ISO 23936-2 RGD & H₂S, API 6A	-25 to 300	Black
KB292-95	Extreme Extrusion Resistant, ISO23936-2 RGD, H ₂ S	-25 to 300	Black

SILICONE RUBBER (VMQ, PVMQ)

Silicones possess good insulating properties and tends to be physiologically neutral. However, silicone elastomers have relatively low tensile strength, poor tear and wear resistance.

S0469-40	USP Class VI, A-A-59588 CL 2a, 2b, GR 40	-75 to 400	Rust
S0595-50	AMS 3302	-70 to 400	Rust

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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
S0317-60	FDA, USP Class VI	-103 to 450	Rust
S0613-60	A-A-59588 Cl 2b, GR 60, AMS 3303	-60 to 450	Rust
SB739-60	UL 94 V-0	-65 to 400	Gray
S0383-70	A-A-59588 CL 1a, 1b, GR 70, AMS 3337	-175 to 400	Rust
S0455-70	High Temperature	-65 to 450	Rust
S0604-70	A-A-59588 Cl 2a, 2b, GR 70, AMS 3304, AMS 3357, MIL-G-21569 Class 2, UL	-65 to 450	Rust
S1138-70	FDA, USP Class VI, USP <87>	-75 to 450	Rust

FLUOROCARBON (FKM, FPM)

Fluorocarbon (FKM) has excellent resistance to high temperature and a broad range of chemicals. Permeation resistance and compression set are excellent.

V0986-50	General Purpose	-15 to 400	Brown
V0769-60	General Purpose	-15 to 400	Black
VG271-60	Automotive Fuel Applications	-40 to 400	Black
VW901-65	Low Swell	-15 to 400	Green
VA179-70	FKM for High Temp. Engines	-10 to 437	Black
VB185-70	Acid Resistant, Steam, B Type	-15 to 400	Black

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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
V0680-70	NSF 51, FDA	-15 to 400	Rust
V0747-75	UL Listed	-15 to 400	Black
V0848-75	PTFE Loaded	-15 to 400	Black
V1163-75	"GFLT" Type, UL listed	-35 to 400	Black
V1260-75	Very Chemically Resistant, "Viton™ Extreme" Type	-15 to 400	Black
V1263-75	Low Swell, Flex Fuel Blends, UL listed	-15 to 400	Black
V1436-75	General Purpose, UL Listed	-15 to 400	Black
V1475-75	General Purpose, X-rings	-15 to 400	Black
V1476-75	General Purpose	-15 to 400	Brown
VA075-75	General Purpose, UL Listed	-15 to 400	Black
VG130-75	General Purpose	-50 to 400	Black
VG323-75	Engine Coolant, Biodiesel Resistant, "GLT" Type, Hydrogen	-40 to 400	Black
VM125-75	"GLT" Type, AMS-R-83485, AMS 7287	-40 to 400	Black
VM330-75	AMS 7276, Low Compression Set	-15 to 400	Black
VW076-75	General Purpose, UL Listed	-15 to 400	Brown
VW173-75	Automotive Applications	-15 to 400	Green


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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
VW340-75	General Purpose	-15 to 400	Brown
VX065-75	Extreme Low Temperature FKM, Fuel Resistant, AMS7410	-65 to 400	Black
VG286-80	Low Temperature. Low Compression Set, ISO 23936-2 RGD, API 6A	-50 to 400	Black
VP309-82	Base & Amine Resistant, ISO 23936-2 RGD, NACE TM0817	-10 to 400	Black
V1411-90	General Purpose	-15 to 400	Black
V1412-90	General Purpose	-15 to 400	Brown
VA090-90	General Purpose	-15 to 400	Black
VA355-90	General Purpose, AMS 7259	-15 to -400	Black
VG109-90	Low Temperature, Low Compression Set, ISO 23936-2 RGD & H ₂ S, API 6A	-50 to 400	Black
VP316-90	Base & Amine Resistant, ISO 23936-2 RGD, NACE TM0817	-10 to 400	Black
VW894-90	General Purpose	-15 to 400	Brown
VX365-90	Extreme Low Temperature, ISO 23936-2 RGD & H ₂ S, API 6A	-65 to 400	Black
V1238-95	Extrusion Resistant, ISO 23936-2 RGD & H₂S, API 6A	-15 to 400	Black

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TETRAFLUOROETHYLENE - PROPYLENE (AFLAS)

This material is a copolymer of TFE and propylene. Its chemical resistance is excellent across a wide range of aggressive media. Polymer is sold under the tradename AFLAS®.

V1006-75	AMS 7255	25 to 450	Black
VP101-80	General Purpose	25 to 450	Black
V1041-85	ISO 23936-2 RGD & H ₂ S	15 to 450	Black
VP103-95	Extrusion Resistant, ISO 23936-2 RGD & H ₂ S	25 to 450	Black

PERFLUOROELASTOMER (ULTRA) (FFKM)

Perfluoroelastomer is a rubber version of PTFE. Available from Parker under the tradename ULTRA™.

FF364-65	Low Closure Force, Plasma Resistant	5 to 608	White
FF156-75	General Purpose, Broad Chemical Resistance, FDA, USP Class VI	5 to 525	Black
FF362-75	Plasma Resistant	5 to 608	White
FF580-75	Broad Chemical Resistance, Steam Resistant, Amine/Base Resistant, USP Class VI, ISO 23936-2 H ₂ S	5 to 525	Black
FF504-80	Broad Chemical Resistance	5 to 525	Green
V8545-75	AMS 7257, FDA	5 to 572	Black


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COMPOUND NUMBER	RECOMMENDED FOR	TEMP. RANGE (°F)	COLOR
FF400-85	Low Temperature, ISO 23936-2 RGD & H ₂ S, NACE TM0187 H ₂ S	-40 to 525	Black
FF582-90	Steam Resistant, Amine/Base Resistant, ISO 23936-2 RGD & H ₂ S	5 to 525	Black
V8581-90	Plasma Resistant, Low Stiction	5 to 550	White

Note: Compound numbers in [XXXXX] are the obsolete Wynn's Precision compound numbering system.

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Hifluor™ is a trademark of the Parker Hannifin Corporation

Neoprene® is a registered trademark of Denka Performance Elastomers LLC

ULTRA™ is a trademark of the Parker Hannifin Corporation

Vamac® is a registered trademark of E.I. du Pont de Nemours & Co.

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Underwriters Laboratories Approved Services*

SERVICE	Fire Extinguishing Agents	Gasoline	Gasoline/Alcohol Blends*	Naptha or Kerosene	MPS Gas	MFG or Natural Gas	Diesel Fuel, Fuel Oil, Lubricating Oil	Heated Fuel Oil	Anhydrous Ammonia	LP-Gas	Laundry Detergents	Dishwashing Detergents	UL 1081 Swimming Pool applicationA	Suitable for UL 25 gasket applications	UL50 E Enclosure Seals	UL 87A Gasoline/Ethanol Blends	UL 87B Diesel/Biodiesel Blends	UL 87C Diesel Exhaust Fluids	Gasoline Blends with up to 15% Methanol
	A	B	C	D	E	F	G	H	I	J	L	M							
EA454-50											✓	✓							
EA140-70											✓	✓							
EB152-70											✓	✓			✓				
LM100-70		✓		✓		✓	✓	✓		✓					✓	✓	✓	✓	
L1465-70		✓	✓	✓			✓								✓	✓	✓	✓	
N0299-50													✓						
NF162-65		✓	✓	✓		✓	✓	✓		✓									
NA151-70				✓		✓	✓	✓		✓									
N0497-70		✓	✓	✓		✓	✓			✓						✓			✓
N0674-70	✓			✓		✓	✓	✓	✓	✓					✓				
N1499-70	✓			✓		✓	✓			✓									
N1502-70		✓	✓	✓								✓							
N1585-70	✓																		
N1500-75		✓	✓	✓		✓	✓			✓						✓	✓		✓

* Contact factory for specific ratios of alcohol (methyl and/or ethyl) and gasoline.

Note: Material certifications are subject to change. Please contact Parker's O-Ring Division for more information.

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Underwriters Laboratories Approved Services*

SERVICE	Fire Extinguishing Agents																		
	A	B	C	D	E	F	G	H	I	J	L	M	UL 1081 Swimming Pool Applications	Suitable for UL 25 Gasket Application	UL50 E Enclosure Seals	UL 87A Gasoline/Ethanol Blends	UL 87B Diesel/Biodiesel Blends	UL 87C Diesel Exhaust Fluids	Gasoline Blends with up to 15% Methanol
Code																			
VA075-75		✓	✓	✓		✓	✓	✓		✓					✓				
VA151-75		✓		✓		✓	✓	✓		✓									
VW076-75		✓	✓	✓		✓	✓	✓		✓					✓				
V1163-75		✓	✓	✓		✓	✓			✓						✓	✓	✓	✓
V1263-75		✓	✓	✓		✓	✓	✓		✓						✓	✓	✓	✓
V1436-75	✓	✓		✓		✓	✓	✓		✓						✓	✓		
SM151-50											✓	✓				✓			
SM153-70											✓	✓				✓			

* Contact factory for specific ratios of alcohol (methyl and/or ethyl) and gasoline.

Note: Material certifications are subject to change. Please contact Parker's O-Ring Division for more information.



WARNING

This product contains a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

FDA, NSF 51, NSF 61 and USP Approved Compounds

The Food and Drug Administration (FDA) has established a list of rubber compounding ingredients which tests have indicated are neither toxic nor carcinogenic. Rubber compounds produced entirely from those ingredients and which also pass the FDA extraction tests are said to "meet the FDA requirements". The FDA does not approve rubber compounds. It is the responsibility of the manufacturer to compound food grade materials from the FDA list of ingredients and establish whether they pass the necessary extraction requirements.

Additional requirements have been imposed upon seal manufacturers regarding food and beverage service. Parker has developed several materials that are certified to NSF 51, Food and Beverage Standard. In critical medical applications, seals often must be made from an even "cleaner" list of ingredients. The U.S. Pharmacopoeia (USP) Class VI outlines requirements for system toxicity and intracutaneous toxicity for these "cleaner" compounds. The USP Class VI compounds must be made from ingredients with clear histories of biocompatibility that meet tighter requirements for leachates.

Typical applications for our FDA and NSF 51 materials are disposable medical devices, surgical instruments and medical fluid dispensing components, as well as a wide variety of food and beverage handling equipment. The type of approval/certification required generally rests with the end customer's regulatory expectations for the specific application.

NSF 61 Drinking Water System Components - is the nationally recognized health effects standard for all devices, components and materials which contact drinking water. Parker's O-Ring Division has developed several materials that are certified to NSF 61.

NSF International is an industry regulating agency that was established in 1944. Recognized by ANSI (American National Standards Institute), NSF maintains qualification standards and criteria for a wide range of products, including potable water components and delivery systems.

 **WARNING**

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FDA, NSF 51, NSF 61 and USP Approved Compounds

Parker Compound	Polymer	Service	Water Contact Temp.
E1028-70	EPDM	FDA	
E1244-70	EPDM	USP Class VI, USP <87>, NSF 61, Internally Lubed	Commercial Hot **
E1549-70	EPDM	NSF 61	Commercial Hot **
E1583-70	EPDM	NSF 51	
E3609-70	EPDM	NSF 51, FDA, USP Class VI, NSF 61, Excellent Compression Set Resistance	Commercial Hot **
E0740-75	EPDM	USP Class VI, USP <87>	
EA140-70	EPDM	NSF 61	Commercial Hot**
EJ274-70	EPDM	NSF 61, Internally Lubed, Chloramine Resistant	Commercial Hot**
N0757-70	NBR	NSF 61	Cold Water***
N1220-70	NBR	NSF 51, FDA	
N1510-70	NBR	NSF 61	Commercial Hot**
S0469-40	VMQ	USP Class VI	
S1538-55	VMQ	FDA, USP Class VI	
S0317-60	VMQ	FDA, USP Class VI	
S1138-70	VMQ	FDA, USP Class VI, USP <87>	
V0680-70	FKM	FDA, NSF 51	
V1274-80	FKM	FDA, USP Class VI	
FF156-75	FFKM	FDA*, USP Class VI, USP <87>	
FF580-75	FFKM	USP Class VI, USP <87>	

*Compounds comply with 21 CFR 177.2600 for ingredient guidelines, water, and hexane extraction limits listed in paragraph (e). However, the FDA has not addressed the use of perfluoroelastomer polymers in CFR 177.2600.

Note: NSF 61 listed materials given a commercial hot water rating are also certified for cold water

** Commercial Hot = Tested at 82° C (180° F)

*** Cold Water = Tested at 23° C (73.4° F)



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O-Ring compounds that can be quoted in other geometries

Parker Compound	O-Rings	Molded Shapes	Extruded Seals	Lathe Cut	Machined	Spliced Seals	Backup Rings
AA150-70	✓	✓					
AE152-70	✓						
AE153-75	✓				✓		
B0612-70	✓	✓					
C0267-50	✓						
C0557-70	✓						
C0873-70	✓				✓		
C1124-70	✓						
EA454-50	✓						
EB152-70	✓						
E1157-60	✓						
E1561-60	✓						
E0751-65	✓						
E0603-70	✓						
EB367-70	✓	✓			✓		
E0803-70	✓						
E1244-70	✓						
E1549-70	✓						
E1583-70	✓						
E3609-70	✓	✓					
EJ274-70	✓						
E0740-75	✓		✓	✓	✓	✓	
E0540-80	✓						


WARNING

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O-Ring compounds that can be quoted in other geometries

Parker Compound	O-Rings	Molded Shapes	Extruded Seals	Lathe Cut	Machined	Spliced Seals	Backup Rings
E0893-80	✓						
EM163-80	✓						
E0652-90	✓						
E0962-90	✓				✓		
LM158-60	✓	✓					
L1223-60		✓					
LM160-80	✓						
L1218-80		✓					
N0545-40	✓						
N0299-50	✓						
N0525-60	✓						
NM506-65	✓						
N0103-70	✓						
N0497-70	✓						
N0602-70	✓						
N0674-70	✓						
N0757-70	✓						
N1220-70	✓						
N1470-70	✓						
N1499-70	✓						
N1510-70	✓						
N1527-70	✓						
NA151-70	✓						


WARNING

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O-Ring compounds that can be quoted in other geometries

Parker Compound	O-Rings	Molded Shapes	Extruded Seals	Lathe Cut	Machined	Spliced Seals	Backup Rings
NM072-70	✓						
N0756-75	✓						
N0951-75	✓						
N1500-75	✓						
N1090-85	✓						
N0300-90	✓						✓
N0507-90	✓						
N0552-90	✓						
N0702-90	✓						✓
N1059-90	✓						
N1444-90							✓
N1490-90	✓						
N1173-70	✓						
KA158-70	✓						
KA157-70	✓						
N1231-80	✓						
KA453-80	✓						
KB162-80	✓	✓	✓			✓	
KA183-85	✓	✓	✓				
KB163-90	✓	✓	✓		✓		✓
S0469-40	✓	✓					
S0595-50	✓						
S0317-60	✓						


WARNING

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O-Ring compounds that can be quoted in other geometries

Parker Compound	O-Rings	Molded Shapes	Extruded Seals	Lathe Cut	Machined	Spliced Seals	Backup Rings
S0613-60	✓						
S0383-70	✓						
S0455-70	✓						
S0604-70	✓						
S1138-70	✓						
V0986-50	✓						
V0769-60	✓						
VW252-65	✓						
VA179-70	✓						
VB185-70	✓						
V1163-75	✓	✓					
V1260-75	✓						
V1263-75	✓						
VG130-75	✓						
V1436-75	✓						
V1475-75	✓						
V1476-75	✓						
VA075-75	✓						
VA151-75	✓	✓			✓		
VG292-75	✓						
VM125-75	✓						
VM128-75	✓	✓			✓		
VW076-75	✓						


WARNING

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O-Ring compounds that can be quoted in other geometries

Parker Compound	O-Rings	Molded Shapes	Extruded Seals	Lathe Cut	Machined	Spliced Seals	Backup Rings
VW173-75	✓						
VX065-75	✓	✓	✓			✓	
V1274-80	✓						
VG286-85	✓						
V0894-90	✓						✓
V1411-90	✓						✓
V1412-90	✓						
VA090-90	✓						
VA153-90	✓						
VW155-90	✓						
VG109-90	✓	✓			✓		
VX365-90	✓						
V1238-95	✓		✓				✓
V1006-75	✓						
VP101-80	✓						
V1041-85	✓						
VP103-90	✓						
FF156-75	✓		✓				
FF580-75	✓		✓			✓	
V8545-75	✓						
FF400-85	✓		✓				
FF582-90	✓						
V8581-90	✓						


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Engineering Tools

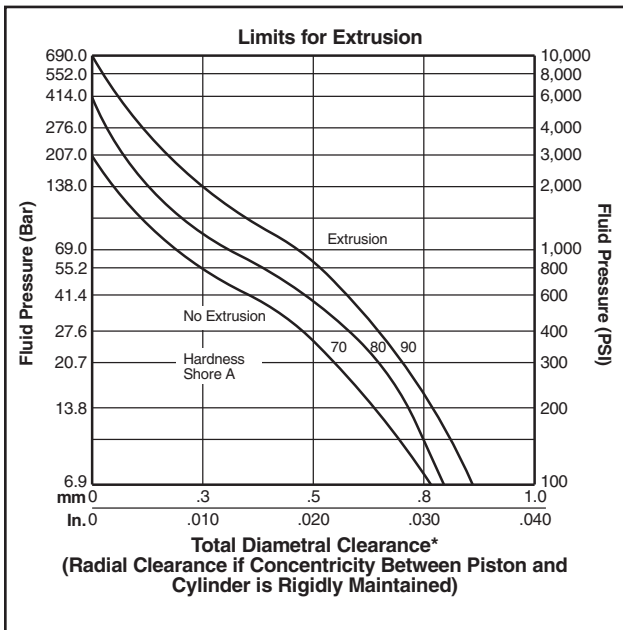


The following charts are included to facilitate engineering analysis. Additional information is available in the Parker O-Ring Handbook (ORD 5700) or online at www.parker.com/oes

WARNING

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Extrusion



* Reduce the clearance shown by 60% when using silicone or fluorosilicone elastomers.

Basis for Curves

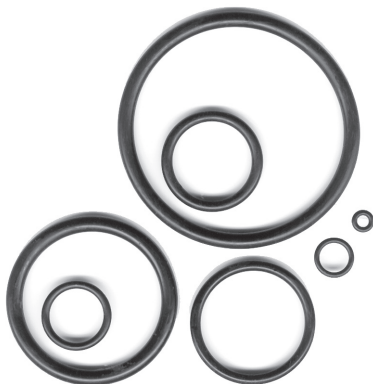
1. 100,000 pressure cycles at the rate of 60 per minute from zero to the indicated pressure.
2. Maximum temperature (i.e., test temperature) 71°C (160°F).
3. No back-up rings.
4. Total diametral clearance must include cylinder expansion due to pressure.
5. Apply a reasonable safety factor in practical applications to allow for excessively sharp edges and other imperfections and for higher temperatures.



WARNING

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Gland Designs



The following charts are included to facilitate engineering analysis. Additional information is available in the Parker O-Ring Handbook (ORD 5700) or online at www.parkerorings.com

Parker offers O-rings for use in static as well as dynamic sealing applications. Static seals are those where the mating parts of the gland do not have movement relative to each other. These seals include face, radial and dovetail. Examples of these seals and the corresponding design charts are found on pages 30-34. Dynamic seals include reciprocating, floating pneumatic, oscillating, and rotary applications. Dynamic seals are defined by one of the gland parts having movement relative to the other part. Gland design recommendations for a reciprocating seal are provided on pages 36 and 37.

For further design assistance and recommendations, access our solutions area of the website: Mobile inPHorm O-Ring Calculator, O-Ring Selector, or contact a Parker O-Ring & Engineered Seals Division Applications Engineer.

**WARNING**

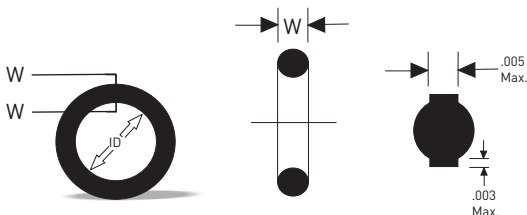
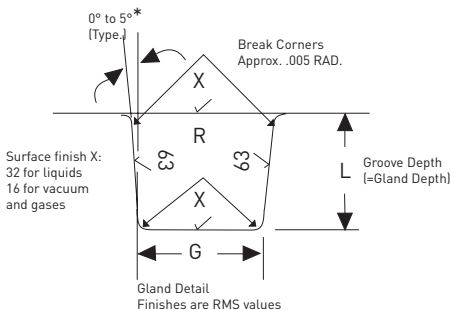
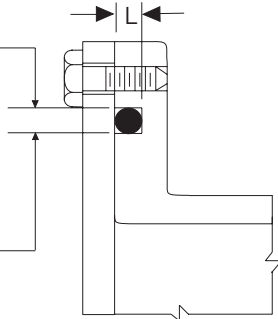
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For Internal Pressure
 (outward pressure direction) dimension
 the groove by its outside diameter (H_0)
 and width:

(H_0) = Mean O.D. of O-ring tolerance =
 Minus 1% of mean O.D., but not more
 than $-.060$

For External Pressure
 (inward pressure direction) dimension
 the groove by its inside diameter (H_i)
 and width:

(H_i) = Mean I.D. of O-ring tolerance =
 Plus 1% of mean I.D., but not more
 than $+.060$



* Mean OD = ID + (2X Cross Section)



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O-Ring Face Seal Glands

These dimensions are intended primarily for face type O-ring seals and low temperature applications.

O-Ring Size Parker No. 2-size AS568	W Cross Section		L		Squeeze		G Groove Width		R Groove Radius
	Nominal	Actual	Gland Depth		Actual	%	Liquids	Vacuum and Gases	
004 to 050	1/16	.070 ± .003	.050 to .054		.013 to .023	19 to 32	.101 to .107	.084 to .089	.005 to .015
102 to 178	3/32	.103 ± .003	.074 to .080		.020 to .032	20 to 30	.136 to .142	.120 to .125	.005 to .015
201 to 284	1/8	.139 ± .004	.101 to .107		.028 to .042	20 to 30	.177 to .187	.158 to .164	.010 to .025
309 to 395	3/16	.210 ± .005	.152 to .162		.043 to .063	21 to 30	.270 to .290	.239 to .244	.020 to .035
425 to 475	1/4	.275 ± .006	.201 to .211		.058 to .080	21 to 29	.342 to .362	.309 to .314	.020 to .035
Special	3/8	.375 ± .007	.276 to .286		.082 to .108	22 to 28	.475 to .485	.419 to .424	.030 to .035
Special	1/2	.500 ± .008	.370 to .380		.112 to .138	22 to 27	.638 to .645	.560 to .565	.030 to .045

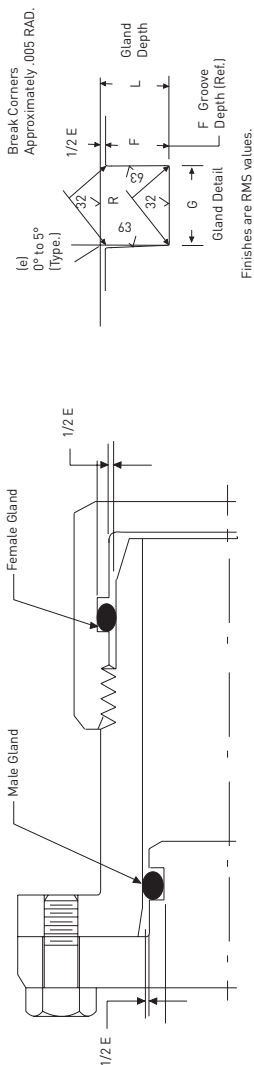
Note: These design recommendations assume metal-to-metal contact. In some hard vacuum applications, it may be necessary to increase compression on the seal to achieve proper sealing. Contact a Parker Applications Engineer for more information.



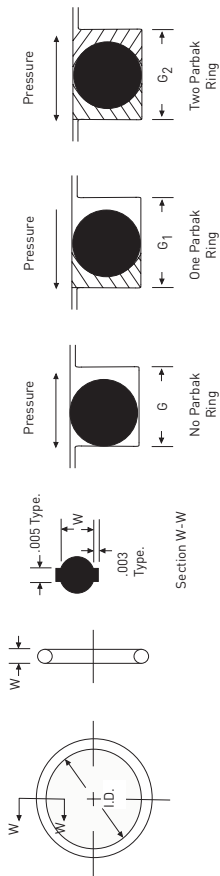
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Industrial O-Ring Static Seal Glands



Finishes are RMS va lues.



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Industrial O-Ring Static Seal Glands

O-Ring 2-Size AS568B	W Cross Section		L Gland Depth	Squeeze		E (a) Diametral Clear- ance	G Groove Width			R Groove		Max. Eccentricity (b)
	Nominal	Actual		Actual	%		No Par- bak rings (G)	1 Parbak rings (G1)	2 Parbak rings (G2)	Radius		
004 - 050	1/16	.070 ± .003	.050 to .052	.015 to .023	22 to 32	.002 to .005	.093 to .098	.138 to .143	.205 to .210	.005 to .015		.002
105 - 178	3/32	.103 ± .003	.081 to .083	.017 to .025	17 to 24	.002 to .005	.140 to .145	.171 to .176	.238 to .243	.005 to .015		.002
201 - 284	1/8	.139 ± .004	.111 to .113	.022 to .032	16 to 23	.003 to .006	.187 to .192	.208 to .213	.275 to .280	.010 to .025		.003
309 - 395	3/16	.210 ± .005	.170 to .173	.032 to .045	15 to 21	.003 to .006	.281 to .286	.311 to .316	.410 to .415	.020 to .035		.004
425 - 475	1/4	.275 ± .006	.226 to .229	.040 to .055	15 to 20	.004 to .007	.375 to .380	.408 to .413	.538 to .543	.020 to .035		.005

(a) Clearance (extrusion gap) must be held to a minimum consistent with design requirements for temperature range variation.

(b) Total indicator reading between groove and adjacent bearing surface.

(c) Reduce maximum diametral clearance 50% when using silicone or fluorosilicone O-rings.

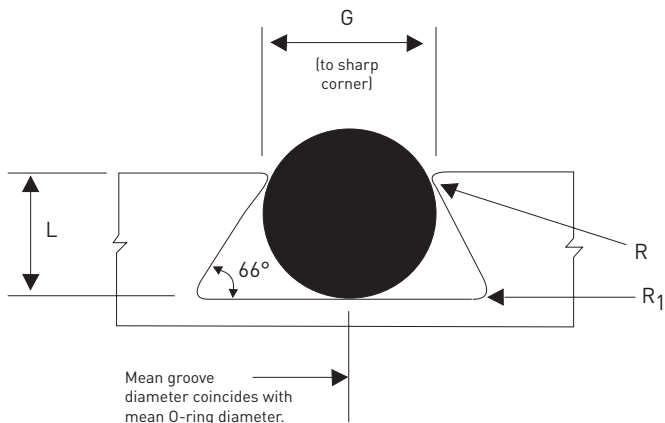
(d) For ease of assembly, when Parbaks are used, gland depth may be increased up to 5%.



WARNING

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O-Ring Dovetail Grooves



Finishes are RMS values

It is often necessary to provide some mechanical means for holding an O-ring in a face seal groove during assembly and maintenance of equipment. An undercut or dovetail groove has proven beneficial in many applications to keep the O-ring in place. This is an expensive groove to machine, however, and thus should be used only when absolutely necessary.

It should be noted that although this method has been used successfully, it is not generally recommended. The inherent characteristics of the groove design limit the amount of void area. Normally acceptable tolerance extremes, wide service temperature ranges and fluid media that cause high swell of the elastomer are conditions that cannot be tolerated in this type of groove design.

NOTE: If needed, Applications Engineering can recommend where to purchase dovetail cutters.

WARNING

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O-Ring Dovetail Grooves

Radius "R" is CRITICAL. Insufficient radius will potentially cause damage to the O-ring during installation, while excessive radius may contribute to extrusion.

O-Ring Size AS568B	W Cross Section		L Gland Depth	Squeeze %	G Gland Width (to sharp corner)	R	R1
	Nominal	Actual					
004 - 050	1/16	.070 ± .003	.050 to .052	27	.055 to .059	.005	1/64
102 - 178	3/32	.103 ± .003	.081 to .083	21	.083 to .087	.010	1/64
201 - 284	1/8	.139 ± .004	.111 to .113	20	.113 to .117	.010	1/32
309 - 395	3/16	.210 ± .005	.171 to .173	18	.171 to .175	.015	1/32
425 - 475	1/4	.275 ± .006	.231 to .234	16	.231 to .235	.015	1/16
Special	3/8	.375 ± .007	.315 to .319	16	.315 to .319	.020	3/32

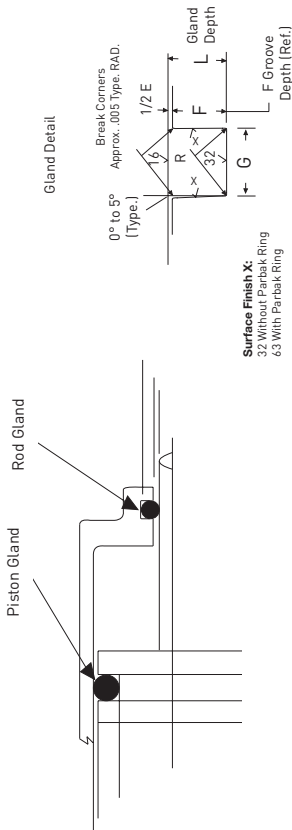
Note: These design recommendations assume metal-to-metal contact. In some hard vacuum applications, it may be necessary to increase compression on the seal to achieve proper sealing. Contact a Parker Applications Engineer for more information.



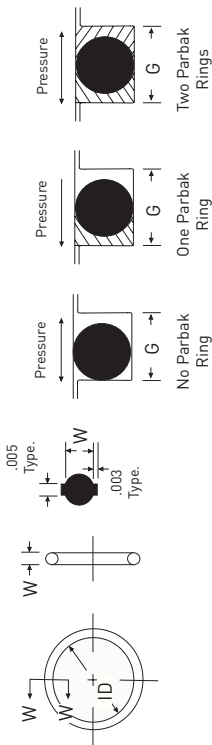
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Industrial Reciprocating O-Ring Packing Glands



Surface Finish X:
 32 Without Parbak Ring
 63 With Parbak Ring
 Finishes are RMS values



WARNING

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Industrial Reciprocating O-Ring Packing Glands

O-Ring 2-Size AS568B	W Cross-Section		L Gland		Squeeze		E (a) Diametral Clearance	G - Groove Width			R Groove		Max. Eccentricity (b)
	Nominal	Actual	Depth		Actual	%		No Parbak Ring (G)	1 Parbak Ring (G1)	2 Parbak Rings (G2)	Radius		
006 to 012	1/16	.070 ± .003	.055 to .057		.010 to .018	15 - 25	.002 to .005	.093 to .098	.138 to .143	.205 to .210	.005 to .015		.002
104 to 116	3/32	.103 ± .003	.088 to .090		.010 to .018	10 - 17	.002 to .005	.140 to .145	.171 to .176	.238 to .243	.005 to .015		.002
201 to 222	1/8	.139 ± .004	.121 to .123		.012 to .022	9 - 16	.003 to .006	.187 to .192	.208 to .213	.275 to .280	.010 to .025		.003
309 to 349	3/16	.210 ± .005	.185 to .188		.017 to .030	8 - 14	.003 to .006	.281 to .286	.311 to .316	.410 to .415	.020 to .035		.004
425 to 460	1/4	.275 ± .006	.237 to .240		.029 to .044	11 - 16	.004 to .007	.375 to .380	.408 to .413	.538 to .543	.020 to .035		.005

(a) Clearance (extrusion gap) must be held to a minimum consistent with design requirements for temperature range variation.

(b) Total indicator reading between groove and adjacent bearing surface.

(c) O-rings not listed are not recommended for reciprocating applications.



WARNING

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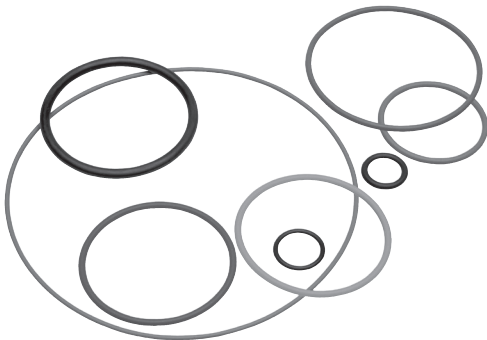
General Notes

A large rectangular area filled with a fine grid pattern, intended for taking notes or providing additional information.

 **WARNING**

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Sizing Charts



The following charts provide dimensions for standard shrinkage materials only. These correspond to AS568 dimensions. O-rings manufactured from compounds with different shrinkage rates will provide slightly different dimensions and tolerances when standard tooling is used. Custom tooling may be necessary for some compounds in order to meet AS568 dimensions and tolerances. For further information contact a Parker O-Ring Applications Engineer.

WARNING

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2-xxx Sizes, Cross-Section: .070 ± .003 in (1,78 ± 0,08mm)					2-xxx Sizes, Cross-Section: .070 ± .003 in (1,78 ± 0,08mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm	Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-001*	.029	.004	0,74	0,10	2-026	1.239	.011	31,47	0,28
2-002*	.042	.004	1,07	0,10	2-027	1.301	.011	33,05	0,28
2-003*	.056	.004	1,42	0,10	2-028	1.364	.013	34,65	0,33
2-004	.070	.005	1,78	0,13	2-029	1.489	.013	37,82	0,33
2-005	.101	.005	2,57	0,13	2-030	1.614	.013	41,00	0,33
2-006	.114	.005	2,90	0,13	2-031	1.739	.015	44,17	0,38
2-007	.145	.005	3,68	0,13	2-032	1.864	.015	47,35	0,38
2-008	.176	.005	4,47	0,13	2-033	1.989	.018	50,52	0,46
2-009	.208	.005	5,28	0,13	2-034	2.114	.018	53,70	0,46
2-010	.239	.005	6,07	0,13	2-035	2.239	.018	56,87	0,46
2-011	.301	.005	7,65	0,13	2-036	2.364	.018	60,05	0,46
2-012	.364	.005	9,25	0,13	2-037	2.489	.018	63,22	0,46
2-013	.426	.005	10,82	0,13	2-038	2.614	.020	66,40	0,51
2-014	.489	.005	12,42	0,13	2-039	2.739	.020	69,57	0,51
2-015	.551	.007	14,00	0,18	2-040	2.864	.020	72,75	0,51
2-016	.614	.009	15,60	0,23	2-041	2.989	.024	75,92	0,61
2-017	.676	.009	17,17	0,23	2-042	3.239	.024	82,27	0,61
2-018	.739	.009	18,77	0,23	2-043	3.489	.024	88,62	0,61
2-019	.801	.009	20,35	0,23	2-044	3.739	.027	94,97	0,69
2-020	.864	.009	21,95	0,23	2-045	3.989	.027	101,32	0,69
2-021	.926	.009	23,52	0,23	2-046	4.239	.030	107,67	0,76
2-022	.989	.010	25,12	0,25	2-047	4.489	.030	114,02	0,76
2-023	1.051	.010	26,70	0,25	2-048	4.739	.030	120,37	0,76
2-024	1.114	.010	28,30	0,25	2-049	4.989	.037	126,72	0,94
2-025	1.176	.011	29,87	0,28	2-050	5.239	.037	133,07	0,94

- (a) The rubber compound must be added when ordering by the 2-size number (i.e., N0674 2-007).
- (b) This chart provides dimensions for standard (AN) shrinkage materials ONLY. These correspond to AS568 dimensions. O-rings manufactured out of compounds with different shrinkage rates (other than AN) will produce slightly different dimensions and tolerances. For more information on shrinkage rates, see Parker O-Ring Handbook (ORD 5700).

* Please note: for 2-001 cross-section width = .040 in (1,02 mm)
 for 2-002 cross-section width = .050 in (1,27 mm)
 for 2-003 cross-section width = .060 in (1,52 mm)

WARNING

This product contains a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

2-xxx Sizes, Cross-Section: .103 ± .003 in (2,62 ± 0,08mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-102	.049	.005	1,24	0,13
2-103	.081	.005	2,06	0,13
2-104	.112	.005	2,84	0,13
2-105	.143	.005	3,63	0,13
2-106	.174	.005	4,42	0,13
2-107	.206	.005	5,23	0,13
2-108	.237	.005	6,02	0,13
2-109	.299	.005	7,59	0,13
2-110	.362	.005	9,19	0,13
2-111	.424	.005	10,77	0,13
2-112	.487	.005	12,37	0,13
2-113	.549	.007	13,94	0,18
2-114	.612	.009	15,54	0,23
2-115	.674	.009	17,12	0,23
2-116	.737	.009	18,72	0,23
2-117	.799	.010	20,30	0,25
2-118	.862	.010	21,89	0,25
2-119	.924	.010	23,47	0,25
2-120	.987	.010	25,07	0,25
2-121	1.049	.010	26,64	0,25
2-122	1.112	.010	28,24	0,25
2-123	1.174	.012	29,82	0,30
2-124	1.237	.012	31,42	0,30
2-125	1.299	.012	32,99	0,30
2-126	1.362	.012	34,59	0,30
2-127	1.424	.012	36,17	0,30
2-128	1.487	.012	37,77	0,30
2-129	1.549	.015	39,34	0,38
2-130	1.612	.015	40,94	0,38
2-131	1.674	.015	42,52	0,38
2-132	1.737	.015	44,12	0,38
2-133	1.799	.015	45,69	0,38
2-134	1.862	.015	47,29	0,38
2-135	1.925	.017	48,90	0,43
2-136	1.987	.017	50,47	0,43
2-137	2.050	.017	52,07	0,43
2-138	2.112	.017	53,64	0,43
2-139	2.175	.017	55,25	0,43
2-140	2.237	.017	56,82	0,43

2-xxx Sizes, Cross-Section: .103 ± .003 in (2,62 ± 0,08mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-141	2.300	.020	58,42	0,51
2-142	2.362	.020	59,99	0,51
2-143	2.425	.020	61,60	0,51
2-144	2.487	.020	63,17	0,51
2-145	2.550	.020	64,77	0,51
2-146	2.612	.020	66,34	0,51
2-147	2.675	.022	67,95	0,56
2-148	2.737	.022	69,52	0,56
2-149	2.800	.022	71,12	0,56
2-150	2.862	.022	72,69	0,56
2-151	2.987	0.24	75,87	0,61
2-152	3.237	.024	82,22	0,61
2-153	3.487	.024	88,57	0,61
2-154	3.737	.028	94,92	0,71
2-155	3.987	.028	101,27	0,71
2-156	4.237	.030	107,62	0,76
2-157	4.487	.030	113,97	0,76
2-158	4.737	.030	120,32	0,76
2-159	4.987	.035	126,67	0,89
2-160	5.237	.035	133,02	0,89
2-161	5.487	.035	139,37	0,89
2-162	5.737	.035	145,72	0,89
2-163	5.987	.035	152,07	0,89
2-164	6.237	.040	158,42	1,02
2-165	6.487	.040	167,77	1,02
2-166	6.737	.040	171,12	1,02
2-167	6.987	.040	177,47	1,02
2-168	7.237	.045	183,82	1,14
2-169	7.487	.045	190,17	1,14
2-170	7.737	.045	196,52	1,14
2-171	7.987	.045	202,87	1,14
2-172	8.237	.050	209,22	1,27
2-173	8.487	.050	215,57	1,27
2-174	8.737	.050	221,92	1,27
2-175	8.987	.050	228,27	1,27
2-176	9.237	.055	234,62	1,40
2-177	9.487	.055	240,97	1,40
2-178	9.737	.055	247,32	1,40


WARNING

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2-xxx Sizes, Cross-Section: .139 ± .004 in (3,53 ± 0,10mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-201	.171	.055	4,34	0,13
2-202	.234	.005	5,94	0,13
2-203	.296	.005	7,52	0,13
2-204	.359	.005	9,12	0,13
2-205	.421	.005	10,69	0,13
2-206	.484	.005	12,29	0,13
2-207	.546	.007	13,87	0,18
2-208	.609	.009	15,47	0,23
2-209	.671	.009	17,04	0,23
2-210	.734	.010	18,64	0,25
2-211	.796	.010	20,22	0,25
2-212	.859	.010	21,82	0,25
2-213	.921	.010	23,39	0,25
2-214	.984	.010	24,99	0,25
2-215	1.046	.010	26,57	0,25
2-216	1.109	.012	28,17	0,30
2-217	1.171	.012	29,74	0,30
2-218	1.234	.012	31,34	0,30
2-219	1.296	.012	32,92	0,30
2-220	1.359	.012	34,52	0,30
2-221	1.421	.012	36,09	0,30
2-222	1.484	.015	37,69	0,38
2-223	1.609	.015	40,87	0,38
2-224	1.734	.015	44,04	0,38
2-225	1.859	.018	47,22	0,38
2-226	1.984	.018	50,39	0,46
2-227	2.109	.018	53,57	0,46
2-228	2.234	.020	56,74	0,51
2-229	2.359	.020	59,92	0,51
2-230	2.484	.020	63,09	0,51
2-231	2.609	.020	66,27	0,51
2-232	2.734	.024	69,44	0,60
2-233	2.859	.024	72,62	0,61
2-234	2.984	.024	75,79	0,61
2-235	3.109	.024	78,97	0,61
2-236	3.234	.024	82,14	0,61
2-237	3.359	.024	85,32	0,61
2-238	3.484	.024	88,49	0,61
2-239	3.609	.028	91,67	0,71
2-240	3.734	.028	94,84	0,71
2-241	3.859	.028	98,02	0,71
2-242	3.984	.028	101,19	0,71

2-xxx Sizes, Cross-Section: .139 ± .004 in (3,53 ± 0,10mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-243	4.109	.028	104,37	0,71
2-244	4.234	.030	107,54	0,76
2-245	4.359	.030	110,72	0,76
2-246	4.484	.030	113,89	0,76
2-247	4.609	.030	117,07	0,76
2-248	4.734	.030	120,24	0,76
2-249	4.859	.035	123,42	0,89
2-250	4.984	.035	126,59	0,89
2-251	5.109	.035	129,77	0,89
2-252	5.234	.035	132,94	0,89
2-253	5.359	.035	136,12	0,89
2-254	5.484	.035	139,29	0,89
2-255	5.609	.035	142,47	0,89
2-256	5.734	.035	145,64	0,89
2-257	5.859	.035	148,82	0,89
2-258	5.984	.035	151,99	0,89
2-259	6.234	.040	158,34	1,02
2-260	6.484	.040	164,69	1,02
2-261	6.734	.040	171,04	1,02
2-262	6.984	.040	177,39	1,02
2-263	7.234	.045	183,74	1,14
2-264	7.484	.045	190,09	1,14
2-265	7.734	.045	196,44	1,14
2-266	7.984	.045	202,79	1,14
2-267	8.234	.050	209,14	1,27
2-268	8.484	.050	215,49	1,27
2-269	8.734	.050	221,84	1,27
2-270	8.984	.050	228,19	1,27
2-271	9.234	.055	234,54	1,40
2-272	9.484	.055	240,89	1,40
2-273	9.734	.055	247,24	1,40
2-274	9.984	.055	253,59	1,40
2-275	10.484	.055	266,29	1,40
2-276	10.984	.065	278,99	1,65
2-277	11.484	.065	291,69	1,65
2-278	11.984	.065	304,39	1,65
2-279	12.984	.065	329,79	1,65
2-280	13.984	.065	355,19	1,65
2-281	14.984	.065	380,59	1,65
2-282	15.955	.075	405,26	1,91
2-283	16.955	.080	430,66	2,03
2-284	17.955	.085	456,06	2,16


WARNING

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2-xxx Sizes, Cross-Section: .210 ± .005 in (5,33 ± 0,13mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-309	.412	.005	10,46	0,13
2-310	.475	.005	12,07	0,13
2-311	.537	.007	13,64	0,18
2-312	.600	.009	15,24	0,23
2-313	.662	.009	16,81	0,23
2-314	.725	.010	18,42	0,25
2-315	.787	.010	19,99	0,25
2-316	.850	.010	21,59	0,25
2-317	.912	.010	23,16	0,25
2-318	.975	.010	24,77	0,25
2-319	1.037	.010	26,34	0,25
2-320	1.100	.012	27,94	0,30
2-321	1.162	.012	29,51	0,30
2-322	1.225	.012	31,12	0,30
2-323	1.287	.012	32,69	0,30
2-324	1.350	.012	34,29	0,30
2-325	1.475	.015	37,47	0,38
2-326	1.600	.015	40,64	0,38
2-327	1.725	.015	43,82	0,38
2-328	1.850	.015	46,99	0,38
2-329	1.975	.018	50,17	0,46
2-330	2.10	.018	53,34	0,46
2-331	2.225	.018	56,52	0,46
2-332	2.350	.018	59,69	0,46
2-333	2.475	.020	62,87	0,51
2-334	2.600	.020	66,04	0,51
2-335	2.725	.020	69,22	0,51
2-336	2.850	.020	72,39	0,51
2-337	2.975	.024	75,57	0,61
2-338	3.100	.024	78,74	0,61
2-339	3.225	.024	81,92	0,61
2-340	3.350	.024	85,09	0,61
2-341	3.475	.024	88,27	0,61
2-342	3.600	.028	91,44	0,71
2-343	3.725	.028	94,62	0,71
2-344	3.850	.028	97,79	0,71
2-345	3.975	.028	100,97	0,71
2-346	4.100	.028	104,14	0,71
2-347	4.225	.030	107,32	0,76
2-348	4.350	.030	110,49	0,76
2-349	4.475	.030	113,67	0,76
2-350	4.600	.030	116,84	0,76
2-351	4.725	.030	120,02	0,76
2-352	4.850	.030	123,19	0,76

2-xxx Sizes, Cross-Section: .210 ± .005 in (5,33 ± 0,13mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-353	4.975	.037	126,37	0,94
2-354	5.100	.037	129,54	0,94
2-355	5.225	.037	132,72	0,94
2-356	5.350	.037	135,89	0,94
2-357	5.475	.037	139,07	0,94
2-358	5.600	.037	142,24	0,94
2-359	5.725	.037	145,42	0,94
2-360	5.850	.037	148,59	0,94
2-361	5.975	.037	151,77	0,94
2-362	6.225	.040	158,12	1,02
2-363	6.475	.040	164,47	1,02
2-364	6.725	.040	170,82	1,02
2-365	6.975	.040	177,17	1,02
2-366	7.225	.045	183,52	1,14
2-367	7.475	.045	189,87	1,14
2-368	7.725	.045	196,22	1,14
2-369	7.975	.045	202,57	1,14
2-370	8.225	.050	208,92	1,27
2-371	8.475	.050	215,27	1,27
2-372	8.725	.050	221,62	1,27
2-373	8.975	.050	227,97	1,27
2-374	9.225	.055	234,32	1,40
2-375	9.475	.055	240,67	1,40
2-376	9.725	.055	247,02	1,40
2-377	9.975	.055	253,37	1,40
2-378	10.475	.060	266,07	1,52
2-379	10.975	.060	278,77	1,52
2-380	11.475	.065	291,47	1,65
2-381	11.975	.065	304,17	1,65
2-382	12.975	.065	329,57	1,65
2-383	13.975	.070	354,97	1,78
2-384	14.975	.070	380,37	1,78
2-385	15.955	.075	405,26	1,91
2-386	16.955	.080	430,66	2,03
2-387	17.955	.085	456,06	2,16
2-388	18.955	.090	481,41	2,29
2-389	19.955	.095	506,81	2,41
2-390	20.955	.095	532,21	2,41
2-391	21.955	.100	557,61	2,54
2-392	22.940	.105	582,68	2,67
2-393	23.940	.110	608,08	2,79
2-394	24.940	.115	633,48	2,92
2-395	25.940	.120	658,88	3,05


WARNING

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2-xxx Sizes, Cross-Section: .275 ± .006 in (6,99 ± 0,15mm)					2-xxx Sizes, Cross-Section: .275 ± .006 in (6,99 ± 0,15mm)				
Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm	Parker No.	Inside Dia. in.	Tol. ± in.	Inside Dia. mm	Tol. ± mm
2-425	4.475	.033	113,67	0,84	2-451	10.975	.060	278,77	1,52
2-426	4.600	.033	116,84	0,84	2-452	11.475	.060	291,47	1,52
2-427	4.725	.033	120,02	0,84	2-453	11.975	.060	304,17	1,52
2-428	4.850	.033	123,19	0,84	2-454	12.475	.060	316,87	1,52
2-429	4.975	.037	126,37	0,94	2-455	12.975	.060	329,57	1,52
2-430	5.100	.037	129,54	0,94	2-456	13.475	.070	342,27	1,78
2-431	5.225	.037	132,72	0,94	2-457	13.975	.070	354,97	1,78
2-432	5.350	.037	135,89	0,94	2-458	14.475	.070	367,67	1,78
2-433	5.475	.037	139,07	0,94	2-459	14.975	.070	380,37	1,78
2-434	5.600	.037	142,24	0,94	2-460	15.475	.070	393,07	1,78
2-435	5.725	.037	145,42	0,94	2-461	15.955	.075	405,26	1,91
2-436	5.850	.037	148,59	0,94	2-462	16.455	.075	417,96	1,91
2-437	5.975	.037	151,77	0,94	2-463	16.955	.080	430,66	2,03
2-438	6.225	.040	158,12	1,02	2-464	17.455	.085	443,36	2,16
2-439	6.475	.040	164,47	1,02	2-465	17.955	.085	456,06	2,16
2-440	6.725	.040	170,82	1,02	2-466	18.455	.085	468,76	2,16
2-441	6.975	.040	177,17	1,02	2-467	18.955	.090	481,46	2,29
2-442	7.225	.045	183,52	1,14	2-468	19.455	.090	494,16	2,29
2-443	7.475	.045	189,87	1,14	2-469	19.955	.095	506,86	2,41
2-444	7.725	.045	196,22	1,14	2-470	20.955	.095	532,26	2,41
2-445	7.975	.045	202,57	1,14	2-471	21.955	.100	557,66	2,54
2-446	8.475	.055	215,27	1,40	2-472	22.940	.105	582,68	2,67
2-447	8.975	.055	227,97	1,40	2-473	23.940	.110	608,08	2,79
2-448	9.475	.055	240,67	1,40	2-474	24.940	.115	633,48	2,92
2-449	9.975	.055	253,37	1,40	2-475	25.940	.120	658,88	3,05
2-450	10.475	.060	266,07	1,52					


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The following charts provide dimensions for standard shrinkage materials only. These correspond to AS568B dimensions. O-rings manufactured from compounds with different shrinkage rates will provide slightly different dimensions and tolerances when standard tooling is used. Custom tooling may be necessary for some compounds in order to meet AS568B dimensions and tolerances. Contact a Parker O-Ring Applications Engineer with any questions.

3-9xx Sizes								
Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	W mm	Tol. ± mm
3-901	.185	.005	.056	.003	4,70	0,13	1,42	0,08
3-902	.239	.005	.064	.003	6,07	0,13	1,63	0,08
3-903	.301	.005	.064	.003	7,65	0,13	1,63	0,08
3-904	.351	.005	.072	.003	8,92	0,13	1,83	0,08
3-905	.414	.005	.072	.003	10,52	0,13	1,83	0,08
3-906	.468	.005	.078	.003	11,89	0,13	1,98	0,08
3-907	.530	.007	.082	.003	13,46	0,18	2,08	0,08
3-908	.644	.009	.087	.003	16,36	0,23	2,21	0,08
3-909	.706	.009	.097	.003	17,93	0,23	2,46	0,08
3-910	.755	.009	.097	.003	19,18	0,23	2,46	0,08
3-911	.863	.009	.116	.004	21,92	0,23	2,95	0,10
3-912	.924	.009	.116	.004	23,47	0,23	2,95	0,10
3-913	.986	.010	.116	.004	25,04	0,26	2,95	0,10
3-914	1.047	.010	.116	.004	26,59	0,26	2,95	0,10
3-916	1.171	.010	.116	.004	29,74	0,26	2,95	0,10
3-918	1.355	.012	.116	.004	34,42	0,30	2,95	0,10
3-920	1.475	.014	.118	.004	37,47	0,36	3,00	0,10
3-924	1.720	.014	.118	.004	43,69	0,36	3,00	0,10
3-928	2.090	.018	.118	.004	53,09	0,46	3,00	0,10
3-932	2.337	.018	.118	.004	59,36	0,46	3,00	0,10

- (a) The rubber compound must be added when ordering by the 3-size number (i.e., N0552 3-910).
 (b) Material with unusual shrinkage during molding will give slightly different dimensions.

O-Rings for Metric Tube Fittings (ISO 6149) (Similar to SAE J2244)

Parker O-Ring Division is tooled in these sizes for Nitrile and Fluorocarbon rubber only. Contact the division for availability.

Port Thread	O-Ring Name	Parker Part No.	ID mm	Tol. ± mm	W mm	Tol. ± mm
M8x1	M8 ISO O-Ring	0024-0063	6,10	0,13	1,60	0,08
M10x1	M10 ISO O-Ring	0031-9063	8,10	0,13	1,60	0,08
M12x1.5	M12 ISO O-Ring	0036-6087	9,30	0,13	2,20	0,08
M14x1.5	M14 ISO O-Ring	0044-5087	11,30	0,13	2,20	0,08
M16x1.5	M16 ISO O-Ring	0052-4087	13,30	0,15	2,20	0,08
M18x1.5	M18 ISO O-Ring	0060-2087	15,30	0,18	2,20	0,08
M22x1.5	M22 ISO O-Ring	0076-0087	19,30	0,20	2,20	0,08
M27x2	M27 ISO O-Ring	0092-9114	23,60	0,23	2,90	0,10
M33x2	M33 ISO O-Ring	0116-5114	29,60	0,30	2,90	0,10
M42x2	M42 ISO O-Ring	0152-0114	38,60	0,36	2,90	0,10
M48x2	M48 ISO O-Ring	0175-6114	44,60	0,41	2,90	0,10
M60x2	M60 ISO O-Ring	0222-8114	56,60	0,46	2,90	0,10



WARNING

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Parker Series 5-XXX O-Ring Sizes

The following 5-XXX sizes are O-rings of non-standard dimensions for which Parker tooling was available as of April 1, 2004. This tooling will be maintained while volume demand continues. A mold scrapped as defective will not be replaced unless demand justifies the expense. Please note 5-XXX tooling does not exist for ULTRA Family compounds.

Note: These molds are cut to allow for standard "AN" shrinkage and in materials having standard shrinkage they will normally produce rings to the dimensions listed. Materials with other than standard shrinkage will give different dimensions and tolerances. Please consult the factory or your local Parker Distributor for the availability of special sizes not included in this list.

5-xxx Sizes								
Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-118	0.059	0.004	0.040	0.003	1.50	0.10	1.02	0.08
5-101	0.100	0.005	0.038	0.003	2.54	0.13	0.97	0.08
5-578	0.102	0.005	0.074	0.003	2.59	0.13	1.88	0.08
5-632	0.110	0.005	0.040	0.003	2.79	0.13	1.02	0.08
5-102	0.116	0.005	0.038	0.003	2.95	0.13	0.97	0.08
5-178	0.120	0.005	0.040	0.003	3.05	0.13	1.02	0.08
5-646	0.126	0.005	0.040	0.003	3.20	0.13	1.02	0.08
5-103	0.128	0.005	0.050	0.003	3.25	0.13	1.27	0.08
5-190	0.132	0.005	0.070	0.003	3.35	0.13	1.78	0.08
5-579	0.133	0.005	0.074	0.003	3.39	0.13	1.88	0.08
5-669	0.146	0.005	0.040	0.003	3.71	0.13	1.02	0.08
5-148	0.154	0.005	0.038	0.003	3.91	0.13	0.97	0.08
5-106	0.154	0.005	0.066	0.003	3.91	0.13	1.68	0.08
5-580	0.165	0.005	0.074	0.003	4.19	0.13	1.88	0.08
5-193	0.176	0.005	0.040	0.003	4.47	0.13	1.02	0.08
5-108	0.176	0.005	0.050	0.003	4.47	0.13	1.27	0.08
5-124	0.176	0.005	0.056	0.003	4.47	0.13	1.42	0.08
5-107	0.176	0.005	0.066	0.003	4.47	0.13	1.68	0.08
5-125	0.180	0.005	0.040	0.003	4.57	0.13	1.02	0.08
5-581	0.192	0.005	0.074	0.003	4.88	0.13	1.88	0.08
5-685	0.208	0.005	0.094	0.003	5.28	0.13	2.39	0.08
5-582	0.224	0.005	0.074	0.003	5.69	0.13	1.88	0.08
5-194	0.228	0.005	0.040	0.003	5.79	0.13	1.02	0.08
5-638	0.233	0.005	0.076	0.003	5.92	0.13	1.93	0.08
5-179	0.239	0.005	0.040	0.003	6.07	0.13	1.02	0.08



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5-xxx Sizes								
Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-151	0.239	0.005	0.051	0.003	6.07	0.13	1.30	0.08
5-127	0.239	0.005	0.074	0.003	6.07	0.13	1.88	0.08
5-180	0.248	0.005	0.048	0.003	6.30	0.13	1.22	0.08
5-686	0.248	0.005	0.094	0.003	6.30	0.13	2.39	0.08
5-583	0.251	0.005	0.074	0.003	6.38	0.13	1.88	0.08
5-052	0.270	0.005	0.070	0.003	6.86	0.13	1.78	0.08
5-202	0.278	0.005	0.046	0.003	7.06	0.13	1.17	0.08
5-698	0.283	0.005	0.040	0.003	7.19	0.13	1.02	0.08
5-584	0.283	0.005	0.074	0.003	7.19	0.13	1.88	0.08
5-687	0.287	0.005	0.094	0.003	7.29	0.13	2.39	0.08
5-1004	0.290	0.005	0.045	0.003	7.39	0.13	1.14	0.08
5-056	0.301	0.005	0.038	0.003	7.65	0.13	0.97	0.08
5-710	0.301	0.005	0.054	0.003	7.65	0.13	1.37	0.08
5-673	0.305	0.005	0.074	0.003	7.75	0.13	1.88	0.08
5-204	0.312	0.005	0.036	0.003	7.92	0.13	0.91	0.08
5-160	0.312	0.005	0.103	0.003	7.92	0.13	2.62	0.08
5-712	0.313	0.005	0.051	0.003	7.95	0.13	1.30	0.08
5-585	0.314	0.005	0.074	0.003	7.98	0.13	1.88	0.08
5-1006	0.322	0.005	0.070	0.003	8.18	0.13	1.78	0.08
5-206	0.326	0.005	0.103	0.003	8.28	0.13	2.62	0.08
5-1007	0.330	0.005	0.050	0.003	8.38	0.13	1.27	0.08
5-133	0.332	0.005	0.031	0.003	8.43	0.13	0.79	0.08
5-612	0.344	0.005	0.070	0.003	8.74	0.13	1.78	0.08
5-586	0.350	0.005	0.074	0.003	8.89	0.13	1.88	0.08
5-587	0.350	0.005	0.106	0.004	8.89	0.13	2.69	0.10
5-699	0.353	0.005	0.094	0.003	8.97	0.13	2.39	0.08
5-716	0.362	0.005	0.118	0.004	9.19	0.13	3.00	0.10
5-057	0.364	0.005	0.045	0.003	9.25	0.13	1.14	0.08
5-209	0.370	0.005	0.040	0.003	9.40	0.13	1.02	0.08
5-211	0.375	0.005	0.187	0.005	9.53	0.13	4.75	0.13
5-212	0.384	0.005	0.070	0.003	9.75	0.13	1.78	0.08
5-614	0.391	0.005	0.103	0.003	9.93	0.13	2.62	0.08
5-718	0.395	0.005	0.040	0.003	10.03	0.13	1.02	0.08
5-134	0.410	0.005	0.031	0.003	10.41	0.13	0.79	0.08


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5-xxx Sizes

Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-588	0.413	0.005	0.106	0.004	10.49	0.13	2.69	0.10
5-002	0.416	0.005	0.059	0.003	10.57	0.13	1.50	0.08
5-215	0.418	0.005	0.094	0.003	10.62	0.13	2.39	0.08
5-218	0.425	0.005	0.025	0.003	10.80	0.13	0.64	0.08
5-682	0.426	0.005	0.040	0.003	10.82	0.13	1.02	0.08
5-613	0.437	0.005	0.070	0.003	11.10	0.13	1.78	0.08
5-1011	0.447	0.005	0.103	0.003	11.35	0.13	2.62	0.08
5-223	0.458	0.005	0.053	0.003	11.63	0.13	1.35	0.08
5-225	0.469	0.006	0.094	0.003	11.91	0.15	2.39	0.08
5-615	0.469	0.006	0.103	0.003	11.91	0.15	2.62	0.15
5-652	0.473	0.006	0.071	0.003	12.01	0.15	1.80	0.08
5-566	0.489	0.006	0.055	0.003	12.42	0.15	1.40	0.08
5-675	0.508	0.006	0.049	0.003	12.90	0.15	1.24	0.08
5-616	0.516	0.006	0.103	0.003	13.11	0.15	2.62	0.08
5-1014	0.525	0.007	0.071	0.003	13.34	0.18	1.80	0.08
5-135	0.526	0.007	0.031	0.003	13.36	0.18	0.79	0.08
5-239	0.570	0.007	0.106	0.004	14.48	0.18	2.69	0.10
5-156	0.575	0.007	0.060	0.003	14.61	0.18	1.52	0.08
5-563	0.583	0.007	0.040	0.003	14.81	0.18	1.02	0.08
5-735	0.583	0.007	0.103	0.003	14.81	0.18	2.62	0.08
5-591	0.594	0.007	0.106	0.004	15.09	0.18	2.69	0.10
5-609	0.600	0.007	0.094	0.003	15.24	0.18	2.39	0.08
5-243	0.604	0.007	0.103	0.003	15.34	0.18	2.62	0.08
5-676	0.610	0.007	0.058	0.003	15.49	0.18	1.47	0.08
5-247	0.623	0.007	0.125	0.004	15.82	0.18	3.18	0.10
5-248	0.625	0.007	0.050	0.003	15.88	0.18	1.27	0.08
5-617	0.625	0.007	0.103	0.003	15.88	0.18	2.62	0.08
5-251	0.631	0.007	0.062	0.003	16.03	0.18	1.57	0.08
5-005	0.640	0.007	0.080	0.003	16.26	0.18	2.03	0.08
5-136	0.643	0.007	0.031	0.003	16.33	0.18	0.79	0.08
5-643	0.650	0.007	0.045	0.003	16.51	0.18	1.14	0.08
5-252	0.652	0.007	0.070	0.003	16.56	0.18	1.78	0.08
5-254	0.660	0.007	0.064	0.003	16.76	0.18	1.63	0.08
5-592	0.665	0.007	0.106	0.004	16.89	0.18	2.69	0.10


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5-xxx Sizes								
Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-256	0.707	0.008	0.103	0.003	17.96	0.20	2.62	0.08
5-594	0.720	0.008	0.141	0.004	18.29	0.20	3.58	0.10
5-257	0.722	0.008	0.113	0.004	18.34	0.20	2.87	0.10
5-593	0.724	0.008	0.106	0.004	18.39	0.20	2.69	0.10
5-181	0.725	0.008	0.040	0.003	18.42	0.20	1.02	0.08
5-263	0.750	0.008	0.061	0.003	19.05	0.20	1.55	0.08
5-266	0.766	0.008	0.080	0.003	19.46	0.20	2.03	0.08
5-137	0.775	0.008	0.031	0.003	19.69	0.20	0.79	0.08
5-595	0.779	0.008	0.141	0.004	19.79	0.20	3.58	0.10
5-006	0.796	0.008	0.080	0.003	20.22	0.20	2.03	0.08
5-751	0.820	0.009	0.150	0.005	20.83	0.23	3.81	0.13
5-003	0.836	0.009	0.059	0.003	21.23	0.23	1.50	0.08
5-596	0.838	0.009	0.141	0.004	21.29	0.23	3.58	0.10
5-708	0.850	0.009	0.045	0.003	21.59	0.23	1.14	0.08
5-753	0.857	0.009	0.123	0.004	21.77	0.23	3.12	0.10
5-273	0.879	0.009	0.040	0.003	22.33	0.23	1.02	0.08
5-597	0.905	0.009	0.141	0.004	22.99	0.23	3.58	0.10
5-598	0.968	0.010	0.141	0.004	24.59	0.25	3.58	0.10
5-139	0.987	0.010	0.031	0.003	25.07	0.25	0.79	0.08
5-677	1.004	0.010	0.081	0.003	25.50	0.25	2.06	0.08
5-618	1.016	0.010	0.139	0.004	25.81	0.25	3.53	0.10
5-763	1.080	0.010	0.050	0.003	27.43	0.25	1.27	0.08
5-600	1.094	0.010	0.141	0.004	27.79	0.25	3.58	0.10
5-140	1.112	0.010	0.031	0.003	28.24	0.25	0.79	0.08
5-601	1.153	0.012	0.141	0.004	29.29	0.30	3.58	0.10
5-602	1.212	0.012	0.141	0.004	30.78	0.30	3.58	0.10
5-294	1.213	0.012	0.149	0.004	30.81	0.30	3.78	0.10
5-141	1.226	0.012	0.031	0.003	31.14	0.30	0.79	0.08
5-296	1.229	0.012	0.070	0.003	31.22	0.30	1.78	0.08
5-157	1.338	0.012	0.092	0.003	33.99	0.30	2.34	0.08
5-780	1.412	0.014	0.073	0.003	35.86	0.36	1.85	0.08
5-008	1.421	0.014	0.080	0.003	36.09	0.36	2.03	0.08
5-670	1.437	0.014	0.070	0.003	36.40	0.36	1.78	0.08
5-142	1.450	0.014	0.047	0.003	36.83	0.36	1.19	0.08


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5-xxx Sizes

Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-657	1.465	0.014	0.103	0.003	37.21	0.36	2.62	0.08
5-606	1.468	0.014	0.141	0.004	37.29	0.36	3.58	0.10
5-321	1.559	0.015	0.139	0.004	39.60	0.38	3.53	0.10
5-327	1.640	0.015	0.139	0.004	41.66	0.38	3.53	0.10
5-143	1.670	0.015	0.047	0.003	42.42	0.38	1.19	0.08
5-329	1.670	0.015	0.070	0.003	42.42	0.38	1.78	0.08
5-1018	1.671	0.015	0.139	0.004	42.44	0.38	3.53	0.10
5-025	1.765	0.016	0.125	0.004	44.83	0.41	3.18	0.10
5-1023	1.788	0.016	0.070	0.003	45.42	0.41	1.78	0.08
5-795	1.850	0.016	0.070	0.003	46.99	0.41	1.78	0.08
5-981	1.850	0.016	0.275	0.006	46.99	0.41	6.99	0.15
5-1043	1.882	0.017	0.118	0.004	47.80	0.43	3.00	0.10
5-144	1.891	0.017	0.047	0.003	48.03	0.43	1.19	0.08
5-037	2.036	0.018	0.139	0.004	51.71	0.46	3.53	0.10
5-1044	2.060	0.018	0.139	0.004	52.32	0.46	3.53	0.10
5-027	2.140	0.018	0.125	0.004	54.36	0.46	3.18	0.10
5-1046	2.140	0.018	0.315	0.010	54.36	0.46	8.00	0.25
5-800	2.225	0.018	0.275	0.006	56.52	0.46	6.99	0.15
5-702	2.312	0.020	0.139	0.004	58.72	0.51	3.53	0.10
5-039	2.411	0.020	0.139	0.004	61.24	0.51	3.53	0.10
5-703	2.563	0.020	0.139	0.004	65.10	0.51	3.53	0.10
5-982	2.725	0.022	0.275	0.006	69.22	0.56	6.99	0.15
5-367	2.924	0.022	0.103	0.003	74.27	0.56	2.62	0.08
5-369	3.037	0.024	0.103	0.003	77.14	0.61	2.62	0.08
5-374	3.112	0.024	0.070	0.003	79.04	0.61	1.78	0.08
5-557	3.125	0.024	0.103	0.003	79.38	0.61	2.62	0.08
5-815	3.156	0.024	0.060	0.003	80.16	0.61	1.52	0.08
5-816	3.162	0.024	0.070	0.003	80.31	0.61	1.78	0.08
5-984	3.225	0.024	0.275	0.006	81.92	0.61	6.99	0.15
5-821	3.300	0.026	0.070	0.003	83.82	0.66	1.78	0.08
5-825	3.350	0.026	0.275	0.006	85.09	0.66	6.99	0.15
5-1053	3.354	0.026	0.070	0.003	85.19	0.66	1.78	0.08
5-979	3.443	0.026	0.275	0.006	87.45	0.66	6.99	0.15
5-381	3.475	0.026	0.275	0.006	88.27	0.66	6.99	0.15


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5-xxx Sizes

Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-985	3.600	0.026	0.275	0.006	91.44	0.66	6.99	0.15
5-031	3.640	0.028	0.125	0.004	92.46	0.71	3.18	0.10
5-986	3.725	0.028	0.275	0.006	94.62	0.71	6.99	0.15
5-390	3.957	0.028	0.147	0.004	100.51	0.71	3.73	0.10
5-987	3.975	0.028	0.275	0.006	100.97	0.71	6.99	0.15
5-833	4.085	0.030	0.103	0.003	103.76	0.76	2.62	0.08
5-989	4.225	0.030	0.275	0.006	107.32	0.76	6.99	0.15
5-402	4.750	0.035	0.188	0.005	120.65	0.89	4.78	0.13
5-850	4.925	0.035	0.260	0.006	125.10	0.89	6.60	0.15
5-403	4.930	0.035	0.103	0.003	125.22	0.89	2.62	0.08
5-852	5.030	0.035	0.210	0.005	127.76	0.89	5.33	0.13
5-853	5.057	0.035	0.233	0.006	128.45	0.89	5.92	0.15
5-407	5.249	0.035	0.123	0.004	133.32	0.89	3.12	0.10
5-413	5.475	0.035	0.164	0.005	139.07	0.89	4.17	0.13
5-567	5.985	0.040	0.070	0.003	152.02	1.02	1.78	0.08
5-428	6.361	0.040	0.108	0.004	161.57	1.02	2.74	0.10
5-666	6.520	0.040	0.070	0.003	165.61	1.02	1.78	0.08
5-869	6.609	0.045	0.139	0.004	167.87	1.14	3.53	0.10
5-696	7.110	0.045	0.103	0.003	180.59	1.14	2.62	0.08
5-691	7.139	0.045	0.072	0.003	181.33	1.14	1.83	0.08
5-975	7.425	0.045	0.260	0.006	188.60	1.14	6.60	0.15
5-445	8.277	0.050	0.275	0.006	210.24	1.27	6.99	0.15
5-575	8.875	0.055	0.070	0.003	225.42	1.40	1.78	0.08
5-883	9.820	0.060	0.103	0.003	249.43	1.52	2.62	0.08
5-884	9.984	0.060	0.070	0.003	253.59	1.52	1.78	0.08
5-885	10.171	0.060	0.139	0.004	258.34	1.52	3.53	0.10
5-457	10.232	0.060	0.139	0.004	259.89	1.52	3.53	0.10
5-458	10.340	0.060	0.139	0.004	262.64	1.52	3.53	0.10
5-887	10.343	0.060	0.275	0.006	262.71	1.52	6.99	0.15
5-165	10.359	0.060	0.139	0.004	263.12	1.52	3.53	0.10
5-889	10.372	0.060	0.104	0.003	263.45	1.52	2.64	0.08
5-976	10.425	0.060	0.260	0.006	264.80	1.52	6.60	0.15
5-890	10.606	0.060	0.103	0.003	269.39	1.52	2.62	0.08
5-891	10.734	0.060	0.139	0.004	272.64	1.52	3.53	0.10


WARNING

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5-xxx Sizes

Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-466	10.749	0.060	0.210	0.005	273.03	1.52	5.33	0.10
5-894	10.996	0.060	0.103	0.003	279.30	1.52	2.62	0.10
5-474	11.331	0.060	0.275	0.006	287.81	1.52	6.99	0.15
5-898	11.335	0.060	0.103	0.003	287.91	1.52	2.62	0.08
5-482	12.109	0.070	0.139	0.004	307.57	1.78	3.53	0.10
5-164	12.160	0.070	0.210	0.005	308.86	1.78	5.33	0.13
5-901	12.234	0.070	0.139	0.004	310.74	1.78	3.53	0.10
5-902	12.360	0.070	0.210	0.005	313.94	1.78	5.33	0.13
5-487	12.380	0.070	0.139	0.004	314.45	1.78	3.53	0.10
5-488	12.463	0.070	0.103	0.003	316.56	1.78	2.62	0.08
5-569	12.475	0.070	0.139	0.004	316.87	1.78	3.53	0.10
5-905	12.623	0.070	0.140	0.004	320.62	1.78	3.56	0.10
5-907	12.725	0.070	0.275	0.006	323.22	1.78	6.99	0.15
5-908	12.840	0.070	0.139	0.004	326.14	1.78	3.53	0.10
5-619	12.915	0.070	0.139	0.004	328.04	1.78	3.53	0.10
5-910	13.375	0.070	0.210	0.005	339.73	1.78	5.33	0.13
5-071	13.410	0.070	0.139	0.004	340.61	1.78	3.53	0.10
5-493	13.490	0.070	0.139	0.004	342.65	1.78	3.53	0.10
5-494	13.541	0.070	0.210	0.005	343.94	1.78	5.33	0.13
5-498	13.650	0.070	0.139	0.004	346.71	1.78	3.53	0.10
5-912	13.734	0.070	0.139	0.004	348.84	1.78	3.53	0.10
5-1097	13.750	0.070	0.103	0.003	349.25	1.78	2.62	0.08
5-073	13.820	0.080	0.139	0.004	351.03	2.03	3.53	0.10
5-502	14.088	0.080	0.210	0.005	357.84	2.03	5.33	0.13
5-624	14.111	0.080	0.139	0.004	358.42	2.03	3.53	0.10
5-074	14.234	0.080	0.139	0.004	361.54	2.03	3.53	0.10
5-505	14.470	0.080	0.139	0.004	367.54	2.03	3.53	0.10
5-507	14.600	0.080	0.210	0.005	370.84	2.03	5.33	0.13
5-508	14.674	0.080	0.139	0.004	372.72	2.03	3.53	0.10
5-166	14.722	0.080	0.139	0.004	373.94	2.03	3.53	0.10
5-921	14.795	0.080	0.071	0.003	375.79	2.03	1.80	0.08
5-924	15.410	0.080	0.210	0.005	391.41	2.03	5.33	0.13
5-079	15.540	0.080	0.139	0.004	394.72	2.03	3.53	0.10
5-515	15.548	0.080	0.210	0.005	394.92	2.03	5.33	0.13

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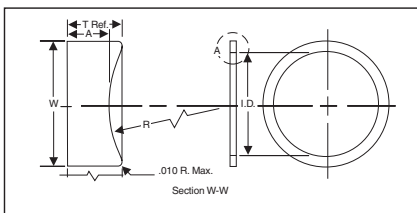
5-xxx Sizes								
Parker No.	ID in.	Tol. ± in.	Width in.	Tol. ± in.	ID mm	Tol. ± mm	Width mm	Tol. ± mm
5-516	15.740	0.080	0.139	0.004	399.80	2.03	3.53	0.10
5-517	15.750	0.080	0.275	0.006	400.05	2.03	6.99	0.15
5-518	16.031	0.080	0.256	0.006	407.19	2.03	6.50	0.15
5-571	16.234	0.090	0.139	0.004	412.34	2.29	3.53	0.10
5-930	16.285	0.090	0.250	0.006	413.64	2.29	6.35	0.15
5-520	16.435	0.090	0.139	0.004	417.45	2.29	3.53	0.10
5-524	16.640	0.090	0.210	0.005	422.66	2.29	5.33	0.13
5-622	16.750	0.090	0.275	0.006	425.45	2.29	6.99	0.15
5-935	17.100	0.090	0.275	0.006	434.34	2.29	6.99	0.15
5-526	17.250	0.090	0.187	0.005	438.15	2.29	4.75	0.13
5-937	17.390	0.090	0.139	0.004	441.71	2.29	3.53	0.10
5-533	18.169	0.090	0.096	0.003	461.49	2.29	2.44	0.08
5-085	18.350	0.090	0.210	0.005	466.09	2.29	5.33	0.13
5-1104	18.500	0.090	0.188	0.005	469.90	2.29	4.78	0.13
5-1105	18.635	0.090	0.139	0.004	473.33	2.29	3.53	0.10
5-944	18.880	0.100	0.139	0.004	479.55	2.54	3.53	0.10
5-947	19.380	0.100	0.139	0.004	492.25	2.54	3.53	0.10
5-950	19.960	0.100	0.139	0.004	506.98	2.54	3.53	0.10
5-1010	20.609	0.100	0.139	0.004	523.47	2.54	3.53	0.10
5-547	21.564	0.100	0.139	0.004	547.73	2.54	3.53	0.10
5-090	23.576	0.120	0.139	0.004	598.83	3.05	3.53	0.10
5-167	23.780	0.120	0.375	0.007	604.01	3.05	9.52	0.18
5-170	25.500	0.120	0.275	0.006	647.70	3.05	6.99	0.15
5-171	26.125	0.120	0.275	0.006	663.58	3.05	6.99	0.15
5-173	26.188	0.120	0.210	0.005	665.18	3.05	5.33	0.13
5-172	27.485	0.120	0.275	0.006	698.12	3.05	6.99	0.15
5-092	27.625	0.120	0.275	0.006	701.68	3.05	6.99	0.15
5-955	28.801	0.140	0.275	0.006	731.55	3.56	6.99	0.15


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Parker Series 8-XXX Compounds Sizes

Developed primarily for service in petroleum based hydraulic fluids at -40°C to 121°C (-40°F to 250°F), Parker's standard Parbak N0300-90 and N1444-90 compounds provide the maximum benefits in back-up ring service. Compounds for use in other fluids and for temperatures up to 204°C (400°F) are available on request. Parbaks will stretch up to 50%, and are quickly and easily installed. Advantages of the contour design are obtained regardless of how Parbaks are installed — they may be installed with the concave face in either direction, toward or away from the O-ring.



Parbak sizes are designed to correspond with the Parker 2-xxx, 3-xxx and AS568B series O-ring with which they are used.

Complete call-out consists of the digit 8, the dash number for the size wanted and the rubber material.

Example: N0300 8-009



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8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.087	.049	.045	.003	.053	.003
Parker No.	ID in.	ToL. ±			
8-004	.096	.005			
8-005	.127				
8-006	.140				
8-007	.171				
8-008	.202				
8-009	.234				
8-010	.265				
8-011	.327				
8-012	.390				
8-013	.455				
8-014	.518				
8-015	.580				
8-016	.643				
8-017	.705	.009			
8-018	.768				
8-019	.830				
8-020	.893				
8-021	.955				
8-022	1.018				
8-023	1.080	.010			
8-024	1.143				
8-025	1.205				
8-026	1.268	.011			
8-027	1.330				
8-028	1.393	.013			
8-029	1.518				
8-030	1.643	.015			
8-031	1.768				
8-032	1.893				
8-033	2.018	.018			
8-034	2.143				
8-035	2.268				
8-036	2.393				
8-037	2.518				

8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.087	.049	.045	.003	.053	.003
Parker No.	ID in.	ToL. ±			
8-038	2.643	.020			
8-039	2.768				
8-040	2.893				
8-041	3.018	.024			
8-042	3.268				
8-043	3.518	.027			
8-044	3.768				
8-045	4.018	.030			
8-046	4.268				
8-047	4.518	.037			
8-048	4.768				
8-049	5.018				
8-050	5.268				


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8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.129	.053	.045	.003	.086	.003
Parker No.	ID in.	ToL. ±			
8-102	.077	.005			
8-103	.109				
8-104	.140				
8-105	.171				
8-106	.202				
8-107	.234				
8-108	.265				
8-109	.327				
8-110	.390				
8-111	.452				
8-112	.515				
8-113	.577				
8-114	.640				
8-115	.702				
8-116	.765				
8-117	.831				
8-118	.893				
8-119	.956				
8-120	1.018	.010			
8-121	1.081				
8-122	1.143				
8-123	1.206				
8-124	1.268				
8-125	1.331				
8-126	1.393				
8-127	1.456				
8-128	1.518				
8-129	1.581				
8-130	1.643				
8-131	1.706				
8-132	1.768				
8-133	1.831				
8-134	1.893				

8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.129	.053	.045	.003	.086	.003
Parker No.	ID in.	ToL. ±			
8-135	1.956	.017			
8-136	2.018				
8-137	2.081				
8-138	2.143				
8-139	2.206				
8-140	2.268				
8-141	2.331				
8-142	2.393				
8-143	2.456				
8-144	2.518				
8-145	2.581				
8-146	2.643				
8-147	2.706				
8-148	2.768				
8-149	2.831				
8-150	2.893				
8-151	3.018				
8-152	3.268				
8-153	3.518	.022			
8-154	3.768				
8-155	4.018				
8-156	4.268				
8-157	4.518				
8-158	4.768				
8-159	5.018				
8-160	5.268				
8-161	5.518				
8-162	5.768				
8-163	6.018				
8-164	6.268				
8-165	6.518				
8-166	6.768				
8-167	7.018				


WARNING

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8-XXX Sizes

R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.129	.053	.045	.003	.086	.003

Parker No.	ID in.	ToL. ±
8-168	7.268	.045
8-169	7.518	
8-170	7.768	
8-171	8.018	
8-172	8.268	.050
8-173	8.518	
8-174	8.768	
8-175	9.018	
8-176	9.238	.055
8-177	9.518	
8-178	9.768	


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8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.174	.050	.040	.003	.118	.004

Parker No.	ID in.	ToL. ±
8-201	.202	.005
8-202	.265	
8-203	.327	
8-204	.390	
8-205	.455	
8-206	.518	
8-207	.580	.007
8-208	.643	.009
8-209	.705	
8-210	.766	
8-211	.828	.010
8-212	.891	
8-213	.953	
8-214	1.016	
8-215	1.078	.012
8-216	1.141	
8-217	1.203	
8-218	1.266	
8-219	1.334	
8-220	1.397	
8-221	1.459	
8-222	1.522	.015
8-223	1.647	
8-224	1.772	
8-225	1.897	.018
8-226	2.022	
8-227	2.147	
8-228	2.272	.020
8-229	2.397	
8-230	2.522	
8-231	2.631	

8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.174	.050	.040	.003	.118	.004

Parker No.	ID in.	ToL. ±
8-232	2.756	.024
8-233	2.881	
8-234	3.006	
8-235	3.131	
8-236	3.256	
8-237	3.381	
8-238	3.506	
8-239	3.631	.028
8-240	3.756	
8-241	3.881	
8-242	4.006	
8-243	4.131	.030
8-244	4.256	
8-245	4.381	
8-246	4.506	
8-247	4.631	
8-248	4.768	
8-249	4.893	.035
8-250	5.018	
8-251	5.143	
8-252	5.268	
8-253	5.393	
8-254	5.518	.040
8-255	5.643	
8-256	5.768	
8-257	5.893	
8-258	6.018	
8-259	6.268	
8-260	6.518	
8-261	6.768	
8-262	7.018	


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8-XXX Sizes

R ± .010	Tol. Ref.	A in.	Tol. ±	Width in.	Tol. ±
.174	.050	.040	.003	.118	.004

Parker No.	ID in.	Tol. ±
8-263	7.268	.045
8-264	7.518	
8-265	7.768	
8-266	8.018	.050
8-267	8.268	
8-268	8.518	
8-269	8.768	
8-270	9.018	.055
8-271	9.268	
8-272	9.518	
8-273	9.768	
8-274	10.018	
8-275	10.518	.065
8-276	11.018	
8-277	11.518	
8-278	12.018	
8-279	13.018	
8-280	14.018	
8-281	15.018	.075
8-282	15.989	
8-283	16.989	
8-284	17.989	


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8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.262	.076	.060	.004	.183	.005
Parker No.	ID in.	ToL. ±			
8-309	.450	.005			
8-310	.513				
8-311	.575	.007			
8-312	.638	.009			
8-313	.700				
8-314	.763	.010			
8-315	.825				
8-316	.888				
8-317	.950				
8-318	1.013				
8-319	1.075				
8-320	1.138	.012			
8-321	1.200				
8-322	1.263				
8-323	1.316				
8-324	1.388	.015			
8-325	1.513				
8-326	1.638				
8-327	1.763				
8-328	1.888				
8-329	2.013	.018			
8-330	2.138				
8-331	2.268				
8-332	2.393	.020			
8-333	2.518				
8-334	2.643				
8-335	2.768				
8-336	2.893	.024			
8-337	3.018				
8-338	3.143				
8-339	3.273				
8-340	3.398				
8-341	3.523				

8-XXX Sizes					
R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.262	.076	.060	.004	.183	.005
Parker No.	ID in.	ToL. ±			
8-342	3.648	.028			
8-343	3.773				
8-344	3.989				
8-345	4.028	.030			
8-346	4.153				
8-347	4.278				
8-348	4.403				
8-349	4.528				
8-350	4.653	.037			
8-351	4.778				
8-352	4.903				
8-353	5.028				
5-354	5.153				
8-355	5.278				
8-356	5.403	.040			
8-357	5.528				
8-358	5.653				
8-359	5.778				
8-360	5.903	.045			
8-361	6.028				
8-362	6.278				
8-363	6.528	.050			
8-364	6.778				
8-365	7.028	.050			
8-366	7.278				
8-367	7.528				
8-368	7.778				
8-369	8.028				
8-370	8.278				
8-371	8.528				
8-372	8.778				
8-373	9.028				


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8-XXX Sizes

R ± .010	ToL. Ref.	A in.	ToL. ±	Width in.	ToL. ±
.262	.076	.060	.004	.183	.005

Parker No.	ID in.	ToL. ±
8-374	9.278	.055
8-375	9.528	
8-376	9.778	
8-377	10.028	
8-378	10.528	.060
8-379	11.028	
8-380	11.528	.065
8-381	12.028	
8-382	13.028	
8-383	14.028	.070
8-384	15.028	
8-385	16.008	.075
8-386	17.008	.080
8-387	18.008	.085
8-388	19.006	.090
8-389	20.006	.095
8-390	21.006	
8-391	22.006	.100
8-392	22.993	.105
8-393	23.993	.110
8-394	24.993	.115
8-395	25.993	.120

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8-XXX Sizes					
R ± .010	Tol. Ref.	A in.	Tol. ±	Width in.	Tol. ±
.344	.117	.096	.005	.236	.006

Parker No.	ID in.	Tol. ±	
8-425	4.551	.003	
8-426	4.676		
8-427	4.801		
8-428	4.926		
8-429	5.051		
8-430	5.176	.037	
8-431	5.301		
8-432	5.426		
8-433	5.551		
8-434	5.676		
8-435	5.801		
8-436	5.926		
8-437	6.051		
8-438	6.274		.040
8-439	6.524		
8-440	6.774		
8-441	7.024		
8-442	7.274	.045	
8-443	7.524		
8-444	7.774		
8-445	8.024		
8-446	8.524	.055	
8-447	9.024		
8-448	9.524		
8-449	10.024		
8-450	10.524		
8-451	11.024	.060	
8-452	11.524		
8-453	12.024		
8-454	12.524		
8-455	13.024		
8-456	13.524	.070	
8-457	14.024		
8-458	14.524		
8-459	15.024		
8-460	15.524		

8-XXX Sizes					
R ± .010	Tol. Ref.	A in.	Tol. ±	Width in.	Tol. ±
.344	.117	.096	.005	.236	.006

Parker No.	ID in.	Tol. ±
8-461	16.004	.075
8-462	16.504	
8-463	17.004	.080
8-464	17.504	.085
8-465	18.004	
8-466	18.504	
8-467	19.004	.090
8-468	19.504	
8-469	20.004	.095
8-470	21.004	
8-471	22.004	.100
8-472	23.004	.105
8-473	24.004	.110
8-474	25.004	.115
8-475	26.004	.120


WARNING

This product contains a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

General Notes

**WARNING**

This product contains a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



Scan this QR code or type in www.parker.com/parkerorings/mobileinphorm to open in your browser. Then save to your smartphone homepage.

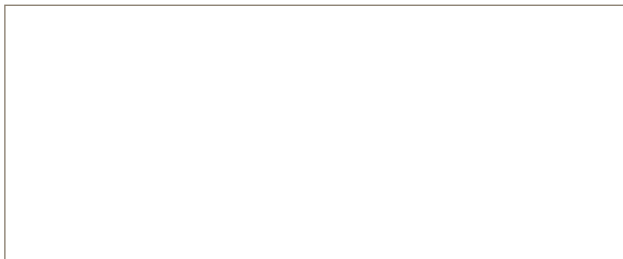
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- Fluid compatibility supports up to 5 blends at a time
- User flexibility to adjust hardware dimensions
- Design analysis includes psi and back-up ring suggestions
- Material listing offered by certifications
- Material test reports can be viewed and e-mailed
- Metric or English units
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2/2024 POD TMR

Parker Hannifin Corporation
O-Ring & Engineered Seals
2360 Palumbo Drive
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Ph: 859-269-2351
www.parker.com/oes
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