

# Parker O-Rings: Building With The Best

Engineers in every industry - from automotive to fluid power to semiconductor processing - choose o-rings made by Parker Hannifin to keep their equipment running safely and reliably. That's because Parker's O-Ring Division, a developer, manufacturer and supplier of precision-engineered o-rings for over 50 years, offers a unique combination of experience, innovation and support.



## Quality assurance

In the O-Ring Division's world-class facilities, skilled Parker technicians manufacture o-rings to exacting standards, closely monitoring each step of the process through an innovative 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 certifications (AS 9000, ISO 9001, QS 9000 and VDA 6.1) are maintained to ensure superior product performance and process repeatability.

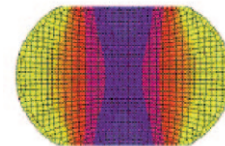
## Research and development

In its on-site research labs, Parker is constantly developing new o-ring material formulations and compounds

to meet customers' needs. These materials are subjected to a broad range of mechanical, physical and environmental tests, and their performance is evaluated through a comprehensive Failure Mode Analysis 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. As an added benefit, FEA can also be used to predict service life.



## Desktop seal design

Parker's Total inPHorm™ software brings seal design and material specification right to the engineer's desktop. The software, which consists of stand-alone packages for o-ring, hydraulic and pneumatic, static face and standard composite seal products (as well as EMI shielding and thermal management), uses a simple interface to guide users through the design of application-specific glands and seals. It automatically cross-references thou-



sands of part numbers, and recommends materials based on the requirements of SAE, MIL and other standards. Total inPHorm also contains a complete array of online reference material, including test reports, technical bulletins and seal maintenance instructions. It is available on CD-ROM in English, German and French versions.

## Literature

Since their initial release decades ago, the Parker O-Ring Handbook (ORD 5700 USA) and the Precision O-Ring Handbook (published in Europe in various languages) have become fixtures on the reference shelves of engineers and seal specifiers worldwide.

These books contain extensive information about the properties of basic sealing elastomers, as well as examples of typical o-ring applications, fundamentals of static and dynamic seal design and o-ring failure modes.



They also provide an overview of international sizes and standards, and contain compatibility data for fluids, gases and solids. Abridged versions of these books, available as ORD 5703 (US) and 5705 (Europe), provide engineers with fast access to information on standard sizes and materials.

# Product lines



## O-Rings

- To national and international standards: AS 568A, ISO 3601, DIN 3771, JIS and metric. Custom sizes of almost any dimension
- Miniature O-rings and large special O-rings continuously molded from spliced cord
- Perfluorinated (FFKM) O-rings. Broadest chemical resistance, highest purity and temperature resistance of any elastomeric family - up to 320°C/608°F



O-rings made with Parker's Parofluor ULTRA™ Series of perfluorinated elastomers help keep semiconductor processing equipment productive.

## Compounds

O-rings can be molded in a wide range of compounds in hardnesses from 30 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)
- Polytetrafluoroethylene (PTFE)
- 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, USDA, USP, and many customer-specific requirements.



For applications that demand an extra level of cleanliness, Parker's O-Ring Division offers ultra-high purity (UHP) processing.

## Parbak® Back-up Rings

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



## O-Ring Kits

With conveniently arranged O-rings for repair, assembly and workshop.



## Accessories

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

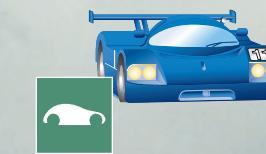
*The O-ring is the part most commonly used for static and dynamic seals, with world production amounting to billions per year.*

*In 1937, Niels A. Christensen, a Danish emigrant to the USA, was awarded a patent for this ring with the perfect geometrical shape.*

*In 1949, Parker O-ring materials led to the aeronautical specification MIL-P-5515 B and to the dimensional standards MS 29512 and 513, which were based on Parker O-rings. Since then, the O-ring has become a vital sealing element in all kinds of fluid power equipment.*

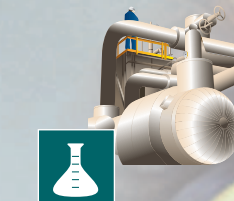
# Applications

Parker O-rings are used in many applications and industries, including:



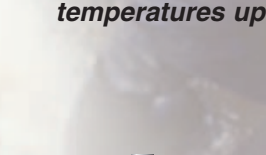
## Transportation

- Brakes/ABS
- Cooling/air conditioning
- Fuel and diesel injection, spark plugs
- Quick connects, couplings, gear units
- Shock absorbers
- Steering systems
- Transmissions and radiator seals



## Chemical Processing Industry (CPI)

- Equipment and components requiring extremely high chemical inertness at temperatures up to +320°C



## Aerospace

- Aircraft engines, wheels and brakes
- Control and actuation systems
- Fuel systems
- Space shuttle launch vehicles



## Medical

- Dyalizers
- Syringes, infusions
- USP Class VI and FDA "White Listed" formulations are available



## Energy/Oil Field

- Drilling
- Exploration
- Production
- Transportation



## Semiconductor Processing

- For wet, dry and thermal processes
- Parker UHP Processing: Parker uses totally enclosed and dedicated manufacturing areas for compounding, preparation, molding, cleaning and final packaging of o-rings in critical compounds for semiconductor processing applications



## Fluid Power

- Accumulators
- Cylinders, valves
- Filters
- Fittings
- Pumps
- Rotary actuators



## Consumer Products

- Appliances
- Compounds meeting the requirements/recommendations: FDA, NSF, WRC, DVGW, BGA, KTW
- Heating/plumbing
- Sanitary equipment



# Serving Industry Worldwide

Around the corner or around the globe, Parker's O-Ring Division is there to provide engineered solutions to tough sealing problems.

The division's North American headquarters, located in Lexington KY, is

the hub of an established worldwide network of 13 o-ring manufacturing locations and over 200 distributor and service center locations in nine countries.

This network - and the global sales and engineering support it provides - means that customers can always get quality products when and where they need them. It also means that sound advice from Parker sealing experts is never far away.



● Parker O-Ring division's manufacturing facilities span 4 continents and 9 countries. Some of these facilities include:



Sao Paulo (Brazil)



Orillia, ONT (Canada)



Shanghai (China)



Pleidelsheim (Germany)



Adro (Italy)



Matamoros (Mexico)




Lexington, KY (USA)



Lebanon, TN (USA)

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### Continental Headquarters

Manufacturing plants 



1/02-2.5M-CE



# Engineered O-Rings

Catalog ORD 5710 USA



Simple solutions  
for complex sealing problems