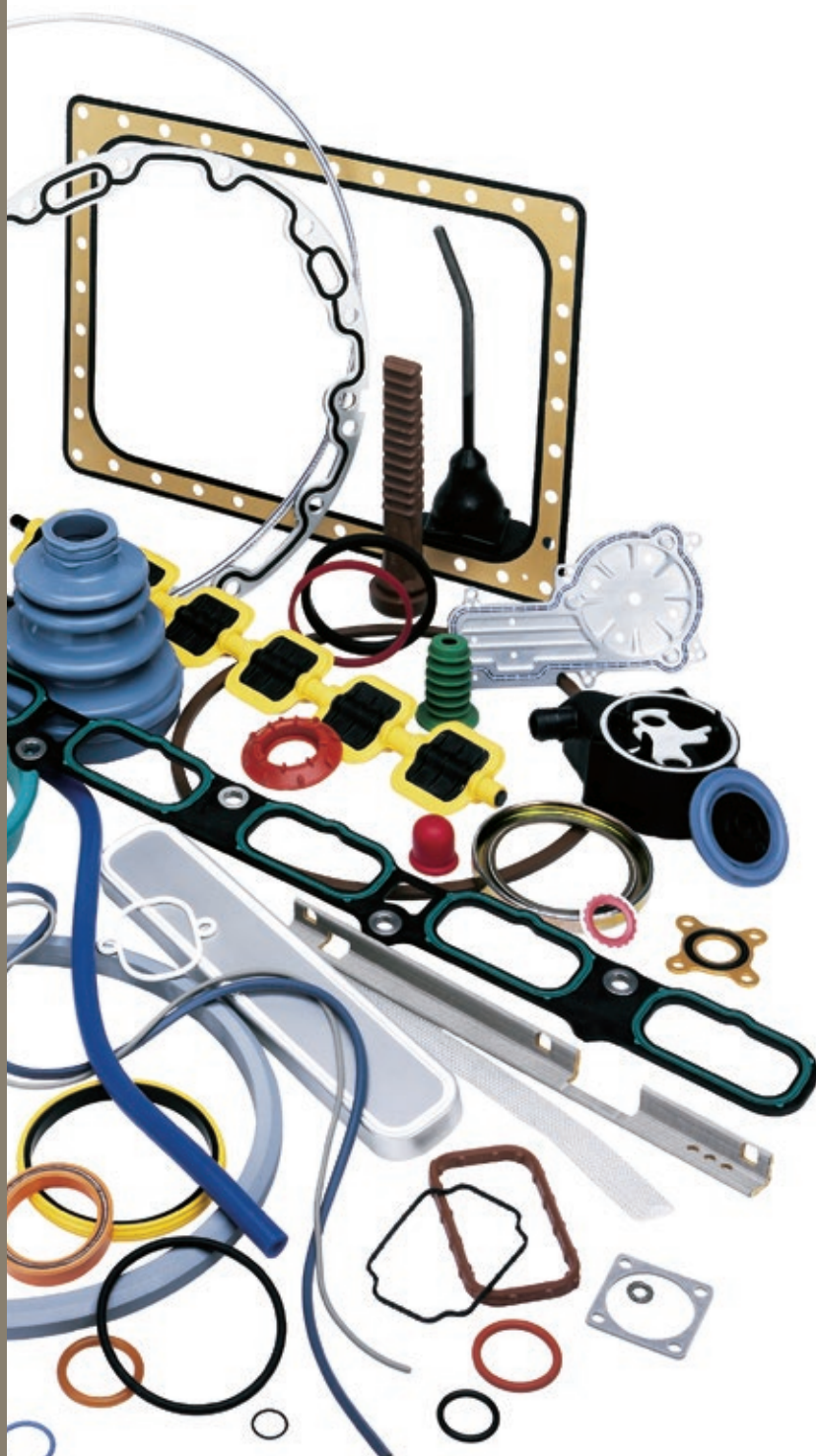




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Product Overview ..... 19

# Engineered Sealing Solutions

Our foundation is built on manufacturing and designing the highest quality sealing products and systems. The equipment that moves today's industry is more reliable and highly-engineered than ever before. Parker's engineered sealing solutions are technologically advanced sealing devices designed from materials that can keep pace with tighter tolerances, higher temperatures and more aggressive chemistries.

Our solutions have a unique combination of experience and innovation built right in, and we're able to supply them quickly and cost-effectively to fit virtually any application you can think of.

## Sealing & Shielding

We don't just manufacture a few standard seals for a handful of applications. Our seal products range from standard O-rings and extruded silicone profiles, custom molded shapes to highly complex composite seals, and metal seals for extreme application environments. Parker's shielding materials and thermal management products are used to shield sensitive electronic equipment from harmful effects of electromagnetic interference (EMI) and thermal energy. Our precision plastic and elastomeric components are used in a wide variety of medical devices.

## Worldwide — Where You Need Us

Around the corner or around the globe, Parker is there with engineered solutions. Your local Parker market specialist provides a single point of contact for local sealing support. And our worldwide headquarters, located in Cleveland, Ohio, is the hub of an established worldwide network of distributor and service center locations. This network – and the global sales and engineering support it provides – means you can always get quality products when and where you need them. It also means that sound advice from a Parker sealing expert is never far away.

## Built for Speed and Service

Parker's local market specialists, authorized distributors and Parker Service Centers (PSCs) are your connection to Parker's engineered solutions. Over 65 years strong, this extensive network includes an elite group of Sealing Technology Centers (STCs) that are qualified by Parker to act as full-service sealing specialists in their local area. The STCs offer applications assistance, inventory management, kitting and assembly services to help you streamline operations and reduce costs.

## Product Innovation

Today's sealing challenges demand innovative solutions, and nobody knows innovation better than Parker. Drawing from over six decades of engineering, material formulation and manufacturing experience, we continually develop new products for your evolving sealing needs.

## Quality Initiatives

Quality isn't just a buzzword at Parker. It's a culture, based on employee empowerment and continuous improvement. Our manufacturing facilities are registered to ISO 9001, ISO 13485:2003, ISO/TS16949:2002, AS 9100, ISO 14001 and we're constantly striving to improve customer satisfaction and product quality through the implementation of:

- Six Sigma methodology
- Lean manufacturing
- TQM methodology
- Advanced product quality planning (APQP)
- Feasibility studies
- Kaizen events



# Material Science

## Compounds

The heart of any Parker elastomeric seal is the compound from which it is manufactured. Parker compounds are among the world's most effective seal materials.

A compound is a mixture of a base polymer and a specific blend of chemical ingredients tailored for particular required characteristics to optimize performance in an application. Our continuing material research at our divisions assures Parker customers that only the highest performance formulations are used.

Many Parker seals are composite products, fully utilizing the unique properties of elastomer, polymer, metal or ceramic materials, in resourceful and innovative combinations.

## Specialty Elastomers

Parker has developed a wide range of specialty elastomeric materials to satisfy the unique sealing needs of

customers. The many types of specialty elastomer formulations include;

- A-A-59588 qualified materials
- ASTM materials
- Carboxylated HSN (XHNBR)
- Carboxylated nitriles (XNBR)
- Engineered plastics
- FDA white list materials
- Fungus-resistant materials
- MIL-spec and AMS-spec materials
- NORSOK M-710 certified
- NSF Standard 61 and 51
- Perfluorinated materials
- Radiation-resistant materials
- SAE materials
- UHP materials
- UL approved base materials
- USP Class VI materials

## Metal Seal Base Materials – For Extreme Environments

- Temperatures > 1800°F
- Pressures > 100,000 psi
- Vacuum <  $1 \times 10^{-5}$  torr
- Harsh chemicals



Ultra-high purity processing keeps seal materials and products clean, from start to finish.

## Ultra-High Purity (UHP) Process

For semiconductor, healthcare, pharmaceutical and other applications that demand an extra level of cleanliness, we offer ultra-high purity, or UHP processing. Parker UHP processing employs totally enclosed and dedicated manufacturing areas where high purity products are mixed, tooled, molded, finished, inspected and packaged.

## In-House Mixing

A clean, precise mixing process is essential to the production of – as well as the resulting performance of – quality, engineered seals and sealing systems. Our in-house mixing capabilities, which employ the latest in advanced computer control technology, allow us to combine standard and custom compounds with unmatched speed and accuracy.

From powder to polymer, computer controlled mixing eliminates batch-to-batch material variations, keeping product quality consistently high.



# Common Base Polymer Families

Chemical Name	Abbreviation	Temperature Range	Characteristics
Acrylonitrile-Butadiene (Nitrile, Buna-N)	NBR	-70°F to 275°F (-57°C to 135°C)	Most widely used polymer in the seal industry. Excellent resistance to petroleum-based fluids, good balance of physical properties and wide temperature range.
Isobutylene-Isoprene (Butyl)	IIR	-75°F to 250°F (-59°C to 121°C)	Low permeability rate and good electrical properties. Often used to seal low temperature vacuum system applications.
Chloroprene Rubber (Neoprene)	CR	-60°F to 250°F (-51°C to 121°C)	Good general purpose polymer. Exhibits good ozone, aging and chemical resistance—primarily used in refrigerants.
Ethylene Acrylate (Vamac®)	AEM	-40°F to 350°F (-40°C to 177°C)	Similar to polyacrylate with improved low temperature performance, swells more in oil than polyacrylate.
Ethylene Propylene Rubber	EPDM, EPM, EP, EPR	-65°F to 300°F (-54°C to 149°C)	Widely specified seal material—excellent resistance to alcohols, ketones, steam, brake fluid, Skydrol® and other phosphate ester based hydraulic fluids.
Fluorocarbon	FKM, FPM	-55°F to 400°F (-48°C to 204°C)	Second most popular seal material after nitrile. Wide-spectrum chemical resistance and broad temperature range. Some specialty FKM compounds have low temperature static sealing to -40°F (-40°C). Commonly used in fuels.
Fluorosilicone	FVMQ	-100°F to 350°F (-73°C to 177°C)	Combines temperature range of silicone with good resistance to petroleum-based fuels and lubricants. Applications with high heat that are combined with potential exposure to petroleum oils and/or hydrocarbon fuels.
Hifluor™	FKM	-15°F to 400°F (-26°C to 204°C)	Parker's trade name for a group of intermediate technology materials that bridge the gap between fluorocarbon and perfluoroelastomer.
Hydrogenated Nitrile	HNBR, HSN	-40°F to 300°F (-40°C to 149°C)	Similar to nitrile with improved high temperature capabilities and ozone resistance. Excellent resistance to petroleum-based fluids.
Liquid Silicone Rubber	LSR, LIM	-175°F to 450°F (-115°C to 232°C)	LSR is mixed as a two-part liquid and is pumped into an injection tool. The material's low viscosity prior to vulcanization requires a lower mold pressure and shorter vulcanization times compared to conventional injection molding.
Polyamide (Nylon 6, Nylon 6, 6)	PA 6	-65°F to 250°F (-54°C to 121°C)	Well known family of plastics used as anti-extrusion devices and retainers. Resistant to a variety of petroleum and phosphate ester hydraulic fluids.
Perfluoroelastomer	FFKM, FFKM	5°F to 608°F (-15°C to 320°C)	Parker's Parofluor™ and Parofluor ULTRA™ materials combine the chemical resistance of PTFE with the elastic properties of fluorocarbon.
Polyacrylate	ACM	-5°F to 350°F (-21°C to 177°C)	Outstanding resistance to petroleum-based fuels and oils. Good resistance to oxidation, ozone and sunlight—resists flex cracking.
Polyetheretherketone	PEEK	-80°F to 450°F (-62°C to 232°C)	High-temperature-resistant plastic used where extrusion resistance, high-temperature capability and a broad resistance to chemical environments is needed. Available in unmodified or glass-filled formulations.
Polytetrafluoroethylene	PTFE	-450°F to 550°F (-268°C to 288°C)	Stable polymer with extremely good resistance to almost all known chemicals. Parker's proprietary polytetrafluoroethylene material is called Polon®.
Polyurethane	AU, EU	-40°F to 200°F (-40°C to 93°C)	Tough, abrasion and wear-resistant material, well suited for hydraulic and pneumatic rod or piston applications. Parker's proprietary materials, Molythane®, Resilon® and Ultrathane® deliver the best overall sealing performance of all commercial polyurethane formulations. Ultra clean medical and optical grades are also available.
Silicone	VMQ, PVMQ, PMQ	-175°F to 450°F (-115°C to 232°C)	Exceptional heat and compression set resistance, good insulating properties, tends to be physiologically neutral and is useful in wide temperature extremes. Relatively poor tensile strength, tear and abrasion resistance.
Tetrafluoroethylene-Propylene (Aflas®)	TFE/P	15°F to 450°F (-9°C to 232°C)	High-temperature stability, resistance to broad range of chemicals, including bases, amines, sour gas, hydrocarbon blends and brake fluid. Its poor low temperature flexibility and compression set resistance has limited a more widespread use of the material.

Aflas® is a registered trademark of Asahi Glass Co., Ltd.

Skydrol® is a registered trademark of Solutia Inc.

Vamac® is a registered trademark of DuPont and brought to market by DuPont Performance Elastomers.

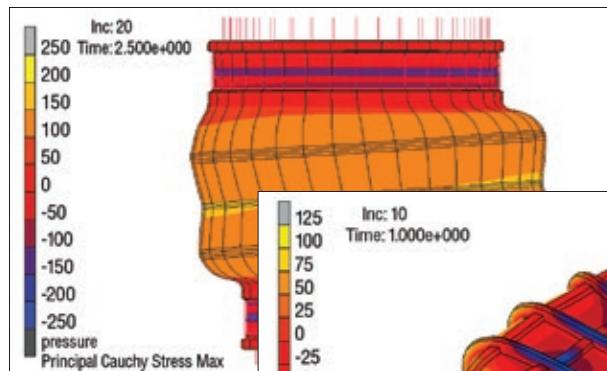
# Engineering and Innovation

## Innovative Solutions

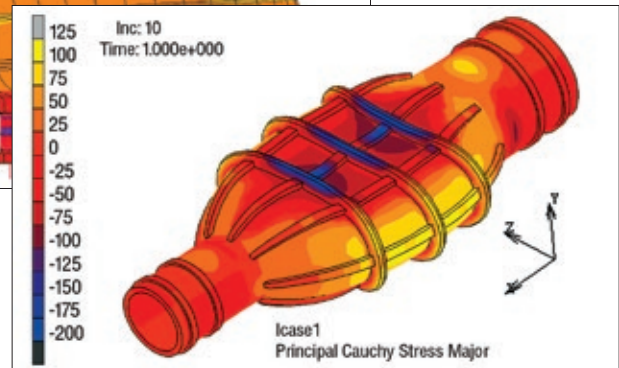
Parker is focused on advancing our market-driven product lines to present our customers with the best seal solutions. Our new product innovation process includes a number of stages, starting with brainstorming product ideas, and continues to the actual product launch. Our customers benefit from our lean thinking and the six sigma analysis tools that we're applying during the process – ensuring high quality, cost effectiveness and speed to market.

## Applications Engineering Assistance

Our team of application engineers can help you find the most reliable, cost-effective sealing solution for your application. These engineers are experts, combining decades of experience in real-world sealing with a full complement of technology-driven design tools, including AutoCAD®, Autodesk Inventor®, CATIA®, Solid Works® and others, working to produce the results you need.



Our FEA capabilities help customers save time and reduce costs.



## Advanced Computer Simulation

Utilizing advanced non-linear Finite Element Analysis (FEA) software our engineers can perform extremely accurate virtual simulations to determine optimum geometry based on specific compound test data. These simulations eliminate the need for multiple iterations of costly prototype tooling, and dramatically reduce development lead times. They also ensure first-time selection of the best material and geometry for your application.

FEA allows us to predict and analyze the following:

- Stress and strain distribution
- Pressure
- Load
- Stability
- Deformation/displacement
- Installation and removal forces





### Accredited Material Test Labs

All of our products are designed, developed and manufactured using the most advanced in-house compound, engineering, testing and process technology.

Testing the physical properties of our compounds is an integral part of seal compound development, as well quality assurance. Compound purity and identity are crucial prerequisites for product quality and reliability.



Parker chemists develop, analyze and carefully test our materials or modify our existing compounds to expand their application potential, in our ISO 17025 accredited material test labs. Gaining accurate and detailed information about an elastomeric compound involves the use of scientific analytical methods, such as infrared spectroscopy or thermogravimetry.

### Material Technology

Our team of skilled chemists, engineers and technicians can offer you assistance with material selection to print specifications and/or functional requirements. We also offer feasibility, process development and advanced product quality planning, or APQP support. Best of all, we can develop a material solution for you if one doesn't already exist.

### World-Class Testing

In our world-class testing labs, we can evaluate a seal's performance under a variety of physical and environmental conditions. And in our EMC test facilities, we can check your products for compliance with the latest U.S. and European standards.



Endurance test rig for hydraulic rod seals – measures friction, leakage and wear of a single seal or sealing system.

In-house fuel permeation testing paves the way for production of next-generation fuel system sealing components.



### Total inPHorm™

And for the day to day answers you need, we've developed Total inPHorm, a comprehensive software package that brings automated seal design and specification assistance right to your desktop.

The interactive software integrates material selection assistance with gland design recommendations to guide you through the design of application-specific glands and seals.

### On-line Design Assistance

Parker's website, [www.parker.com](http://www.parker.com) offers a host of tools to help you evaluate and select the best seal for your application.

# Value Added Services

At Parker, our commitment to customer satisfaction doesn't end with the manufacture and delivery of superior sealing products and materials. It extends to the development of valuable services and support tools that will help you simplify your design and specification experience.

## Fast Samples and Prototyping

Whether you're developing a new product, or looking for a solution to an existing sealing problem, it helps to have fast access to material and product choices. Our in-house prototyping and tooling capabilities enable us to turn out new solutions and samples quickly—within hours in some cases.

## Assemblies, Subsystems and Kitting

To help you reduce your vendor base and eliminate unnecessary labor costs, we can provide partial or complete assemblies of products for sealing, isolation and other applications. We can also create kits and subkits to your exact specifications, consolidating sealing products, other Parker components and related hardware into one convenient package.



Sealing kits can reduce labor costs and speed production.

## Part Marking

Our part marking capabilities include both permanent and non-permanent part identification from part numbers to customer logos, part identification helps to ensure the correct part is used in today's fast paced, integrated production lines.



## Electronic Ordering

To manage your supply chain efficiently, you need up-to-the-minute information on stock levels and an ordering system that minimizes paperwork. Parker offers state-of-the-art ordering systems like ANSI X12 EDI, PHconnect and PHast, all designed to improve efficiency. We also utilize a system which combines powerful inventory management software with a convenient hand-held scanner, allowing you to place orders directly to your local distributor or Parker Service Center. And our Internet-based EDI capabilities allow you to track your orders in real-time from anywhere in the world.





# Strategic Market Focus

Sealing and Shielding is a focused technology platform of the Parker Hannifin Corporation, the world's leading diversified manufacturer of motion and control technologies and systems.

Our products play an important role in the safe and reliable operation of critical equipment in hospitals, laboratories, and in everything from semiconductor processing fabs to

airplanes and heavy-duty trucks. And, our precision plastic and elastomeric components are used in a variety of medical devices.

In addition, our shielding and grounding products protect critical electronics from the harmful effects of electromagnetic interference, or EMI. And our thermal interface materials cool hot microprocessors and power supplies.

**We are strategically focused on providing engineered solutions to the following key markets:**



## **Aerospace**

Vehicles moving through air and space.



## **Life Sciences**

Medical devices, diagnostic & lab equipment and pharmaceutical manufacturing.



## **Automotive**

Vehicles and components associated with propelling and stopping vehicles.



## **Military**

Government weapons, vehicles, surveillance and security.



## **Chemical Industry**

Chemical processing producing a wide variety of solid, liquid and gaseous materials.



## **Oil & Gas**

Oil and natural gas exploration, drilling, extraction and conveyance.



## **Consumer**

Appliances, consumer electronics, water systems and food & beverage equipment.



## **Other Transportation**

Railways, subways and marine.



## **Fluid Power**

Hydraulic and pneumatic systems or components.



## **Power Generation**

Electrical power generation facilities.



## **General Industrial**

Manufacturing or processing of products or components.



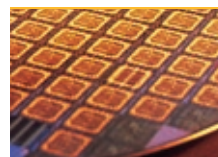
## **Renewable Energy**

Naturally replenished energy from sunlight, wind, rain, tides and geothermal services.



## **Heavy Duty Mobile**

Construction, agriculture and heavy trucks.



## **Semiconductor**

Design and fabrication of semiconductor devices.



## **Information Technology**

Computer systems, peripherals and components.



## **Telecommunications**

Transmission of signals over a distance for the purpose of communications.

# Worldwide Manufacturing Locations

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## North America

### United States of America

Anaheim, California  
Fontana, California  
Riverside, California  
San Diego, California  
Ventura, California  
North Haven, Connecticut  
Elgin, Illinois  
Woodridge, Illinois  
Goshen, Indiana  
Ligonier, Indiana  
Merrillville, Indiana  
Syracuse, Indiana  
Lexington, Kentucky  
Woburn, Massachusetts  
Gothenburg, Nebraska  
Hudson, New Hampshire  
Cranford, New Jersey  
Millville, New Jersey  
Fairport, New York  
Marion, New York  
Creedmoor, North Carolina  
Wilson, North Carolina  
Spartanburg, South Carolina  
Lebanon, Tennessee  
Livingston, Tennessee  
Houston, Texas  
Nacogdoches, Texas  
Salt Lake City, Utah  
Lynchburg, Virginia

### Canada

Edmonton

### Mexico

Apodaca, Monterrey  
Matamoros, Tamaulipas  
Mexico City, Federal District  
Tijuana, Baja California  
Zapopan, Jalisco



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## South America

### Brazil

Sao Paulo

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## Europe

### Belgium

Boom

### Czech Republic

Sadska

### Denmark

Helsingør

### France

Saint-Ouen l'Aumône

### Germany

Bietigheim-Bissingen  
Pleidelsheim

### Italy

Adro

### Scotland

Glasgow

### United Kingdom

Grantham  
High Wycombe



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## Asia

### **China**

Dongguan-Guangdong  
Shanghai  
Shenzhen  
Wuxi

### **Korea**

Seoul

### **Southeast Asia**

Ho Chi Minh, Vietnam  
Kuala Lumpur, Malaysia  
Singapore

### **India**

Bangalore  
Chennai, Tamil Nadu

### **Around the Corner and Around the Globe**

Parker's full line of seals and sealing systems are manufactured in Parker facilities around the globe.

In addition to our manufacturing facilities, local sales and distributor locations provide you with seals when and where you need them.



# Parker Engineered Materials Group Divisions

## Chomerics Division

The Chomerics Division is a global leader in the design and manufacture of components, integrated assemblies and service for electronics, used in a variety of market applications. Chomerics has developed highly engineered materials; filled, coated and custom formulations, including electrically and thermally conductive dispersions for shielding electromagnetic interference (EMI) and thermal management.



### Manufacturing Capabilities/Technologies

Compression and injection molded conductive elastomers; highly-engineered, electrically conductive or non-conductive injection molded plastic solutions; conductive silicone-to-metal & conductive silicone-to-plastic overmolding; conductive elastomeric extruding and splicing; automated form-in-place gasket dispensing and painting, laminating, coating, single-knife slitting, rotary die-cutting, male/female and steel rule die cutting, wrapped foam gasketing, metallic conformal coating, in-house tooling, glass and laminating, cutting, optical bonding and assembly.

### Products

#### EMI Shielding

- CHOFORM® and ParPHorm™ form-in-place elastomer gaskets
- CHO-BOND® and CHO-SHIELD® conductive adhesives, coatings and sealants
- CHO-FLEX™ conductive coatings
- CHO-MUTE® microwave absorbers
- CHO-SEAL® and CHO-SIL® conductive elastomer gaskets
- PREMIER® conductive plastic shielding solutions
- SOFT-SHIELD® low closure force EMI gaskets
- Wire mesh gaskets
- STREAMSHIELD™ shielded vents
- SPRING-LINE® BeCu fingerstock, CHO-SORB® ferrites

#### Integrated System Solutions

- Integrated solutions plastic/metal housings or optical display with companion products and supply chain components

#### Custom Molded Plastics

- Injection molded plastics

#### Optical Display Products

- Glass, polycarbonate, acrylic, cast (allyl diglycol carbonate) and specialty viewing substrates, optical bonding
- Shielded windows

#### Thermal Management

- T-WING® and C-WING™ heat spreaders
- THERMFLOW® phase-change thermal interface materials
- THERMATTACH® thermally conductive adhesive tapes
- THERM-A-GAP™ thermally conductive gap fillers and insulation pads
- CHO-THERM® thermally conductive insulating pads
- THERM-A-FORM™ thermally conductive silicone adhesives and caulks
- Thermally conductive dispensable gels

## Composite Sealing Systems Division

The Composite Sealing Systems Division designs and manufactures engineered seals and sealing systems consisting of metal and composite retained elastomeric combinations for static face seal applications and metal seals for extreme sealing environments.



### Manufacturing Capabilities/Technologies

Machining, stamping, compression, transfer and injection molding, rubber-to-metal and composite bonding, vacuum heat-treatment, electroplating, roll-forming, welding and lapping, class 10,000 clean-room, mechanical, chemical and functional testing.

### Products

#### Composite Seals

- Gask-O-Seal® volume/void seals
- Integral Seal™ edge molded seals
- Stat-O-Seal® fastener and fitting seals
- ThredSeal™ fastener and fitting seals
- Lock-O-Seal® fastener and fitting seals

#### Metal Seals

- EnerRing® resilient metal seals (O, C, E, U and V cross-sections)
- Metal jacketed gaskets
- Corrugated gaskets
- Flat metal gaskets

#### Sealing Systems

- Composite sealing systems including seal, sealing interface and system design and manufacture

# Parker Engineered Materials Group Divisions

## Engineered Polymer Systems Division & Packing Division Europe

The Engineered Polymer Systems Division and the Packing Division Europe design and manufacture engineered elastomeric, polymeric and plastic seals and sealing systems for dynamic applications.



### Manufacturing Capabilities/Technologies

Plastics injection molding, urethane reactive extrusion, plastics compounding; rubber compression, transfer, and injection-compression molding; in-house elastomeric mixing, rubber to metal bonding; PTFE blending, molding and sintering; CNC precision machining and milling, in-house prototyping and tooling; in-house material and validation labs; class 1,000 and class 100,000 cleanrooms.

### Engineered Polymer Systems Division Products

#### *Packings*

- PolyPak® rod and piston seals
- Resilon® polyurethane seals
- WearGard, MolyGard® & PTFE wear rings and bearings
- Wipers and scrapers
- U-Cup packings
- T-Seals
- V-Packing
- Integrated Pistons

#### *Rotary Shaft Seals*

- Clipper® and Parker oil seals
- FlexiLip PTFE rotary seals
- FlexiCase canned PTFE seals
- ProTech™ & MILLENNIUM® bearing isolators

#### *PTFE Seals*

- FlexiSeal® spring energized lip seals
- Custom PTFE seals

#### *Oilfield Products*

- Gimbal bearings
- Riser clamps
- End protectors
- Crown bumpers
- Large metal/elastomer elements
- Flex elements

#### *Custom Products*

- RM® Dynex expansion joints
- Thermoplastic tubing for medical applications

### Packing Division Europe Products

- Rod and piston seals
- Rotary seals
- Flange seals
- Cushioning seals for pneumatic cylinders
- Polon® PTFE seals
- FlexiSeal® spring energized lip seals
- Ultrathane® polyurethane seals
- Sealing systems for high-pressure water pumps
- Guiding elements
- Wiper rings

- Diaphragms
- Special profiles, precision molded shapes
- Anti-vibration elements
- Bonded rubber-metal seals
- Bearings
- Plastic/rubber composite seals
- Bonded piston seals
- Stat-O-Seal® fastener and fitting seals
- EnerRing® resilient metal seals and shapes
- Isolation mounts and grommets



## Engineered Seals Division

The Engineered Seals Division designs and manufactures engineered elastomeric shapes (both homogeneous and inserted), for sealing systems and isolation applications.



### Manufacturing Capabilities/Technologies

In-house mixing; homogeneous molding and over-molding expertise; injection, compression, transfer and liquid injection; specialty machining operations; system, sub-system and assembly; cleanroom manufacturing area; functional testing.

### Products

#### *Composite Seals*

- Fluid transfer seals
- Pipe seals
- Cluster seals
- Bearing seals
- Custom seals and isolators
- Hay rake tines and other agricultural equipment components

#### *Custom Molded Seals*

- Turbine shaft seals
- Machined lip seals
- Isolation mounts
- Grommets

- Connector seals
- Diaphragms
- Bellows
- Poultry picking fingers
- Filter seals
- Fuel management seals
- Wire connector boots
- Aerosol valve seals
- D-rings
- Packer elements
- Press-in-place diamond seal and H-seal
- Dovetail retrofit EZ-Lok™ and WEAR-Lok™

Integrated Sealing Systems Division

A collection of various engine components including a black valve cover, a green gasket, a yellow timing chain, a blue water pump, and several belts and hoses.

- ChemCast piston seals and wear rings

## Medical Systems Division

The Medical Systems Division's extensive in-house prototype and production tooling capabilities offer medical and pharmaceutical original equipment manufacturers a wide range of medical grade molding solutions and services.



### **Manufacturing Capabilities/Technologies**

Liquid silicone injection molding (LIM/LSR), silicone injection & flashless molding, organic rubber injection & flashless molding, compression molding as well as thermoplastic and TPE injection molding, class 10,000 and class 100,000 cleanrooms.

### **Products**

#### *Medical Component Manufacturing*

- Flashless organic and silicone molding
- Insert & over-molding
- Liquid silicone molding
- Organic rubber injection molding
- Thermoplastic & TPE molding

#### *Medical Device & Instrument Assembly*

- Class I, II and III medical devices
  - In-vitro diagnostic assembly, testing, packaging, sterilization and distribution
  - Non-sterile reusable devices
  - Single use devices
- Silicone medical device assembly

#### *Medical Grade Silicone Extrusions*

- Color coded tubing & rods
- Profiled tubing & rods
- Single and multi lumen tubing
- Wire-reinforced tubing
- X-ray striped & X-ray opaque tubing

#### *Medical Instrumentation*

#### *Packing, Printing & Sterilization*



# Parker Engineered Materials Group Divisions

## O-Ring Division & O-Ring Division Europe

The O-Ring Division designs and manufactures engineered elastomeric O-ring seals – including high-performance materials for nearly every sealing application.



### Manufacturing Capabilities/Technologies

In-house elastomeric mixing and tooling, computer-controlled compression and injection molding, liquid injection molding (LIM), automated vision inspection, co-injection molding.

### O-Ring Division Products

#### O-Rings

- O-ring seals in fluorocarbon, fluorosilicone, silicone, ethylene propylene, nitrile, HNBR, neoprene, butyl, polyacrylate, polyurethane and many other formulations
- O-ring seals in Hifluor™ and specialty perfluorinated elastomer formulations, such as Parofluor™ and Parofluor ULTRA™
- UL, NSF, FDA, USDA, USP, AMS, NAS and MIL-spec approved O-ring materials

- Large-diameter continuous molded O-rings
- Parbak® Back-up rings
- Drive belts

#### O-Ring Accessories

- Standard and custom O-ring kits
- O-ring installation lubricants and tools

### O-Ring Division Europe Products

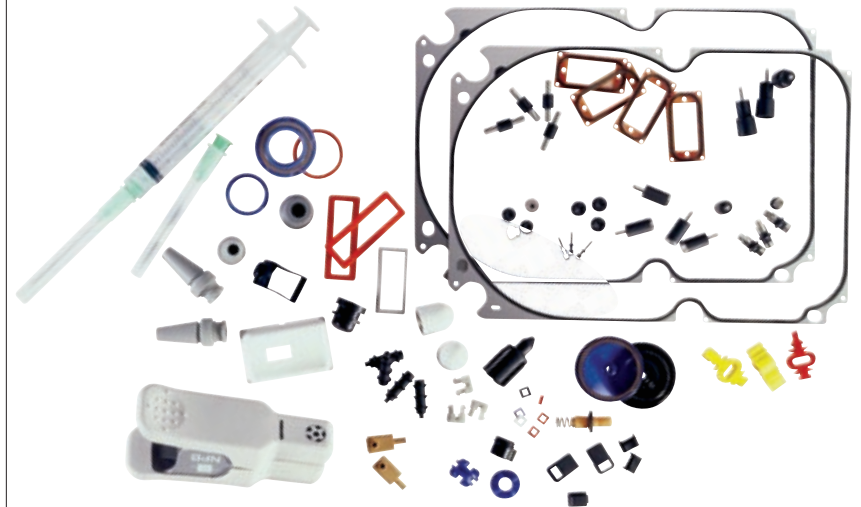
- O-ring seals in fluorocarbon, fluorosilicone, silicone, ethylene propylene, nitrile, HNBR, neoprene, butyl, polyacrylate, polyurethane and many other formulations
- O-ring seals in Hifluor™ and specialty perfluorinated elastomer formulations, such as Parofluor™ and Parofluor ULTRA™
- Large diameter continuous molded O-rings
- Parbak® back-up rings
- Standard and custom O-ring kits
- O-ring installation lubricants and tools

*In addition to O-rings, the following products are available from the O-Ring Division Europe:*

- Custom molded shapes
- Extruded profiles
- Filter seals
- Special lathe cut profiles
- Plastic/rubber composite seals for static automotive powertrain applications
- Aerosol valve seals
- Custom seals for HVAC systems

## Sealing Technology Division Asia

The Sealing Technology Division creates a wide variety of customized precision elastomeric components, materials and processes. Supported by fully integrated in-house tool design and fabrication, dedicated manufacturing cells and accredited chemical and mechanical testing services.



### Manufacturing Capabilities/Technologies

Micro molding; compression, transfer and over molding; liquid injection molding (LIM); class 100,000 cleanroom manufacturing; high speed CNC machining center; in-house capabilities, chemical and mechanical testing.

### Products

- Custom precision elastomeric components
- Miniature elastomer seals
- Sensor & control components, seals and gaskets
- Crash stops, gaskets & dampers
- Ultra clean O-rings
- Oil & gas sensors and controls, optic plugs
- Variety of custom molded elastomeric parts for medical devices and other industries, including:
  - Infusion pump gaskets
  - Oximeter sensor pads
  - Rubber parts for hearing aids
  - Stoppers for syringes
  - Vial caps
- Rod and Piston Seals
- Wipers and Scrapers
- Flange Seals
- Polon PTFE Seals
- Guiding elements
- Press-in-place seals
- O-Rings
- Lip Seals
- Stat-O-Seals sealing washers
- Rubber-metal bonded seals

# Parker Engineered Materials Group Divisions

## TechSeal Division

The TechSeal Division designs and manufactures engineered elastomeric extruded profiles, lathe cuts and spliced/fabricated gaskets.



### Manufacturing Capabilities/Technologies

Compression and liquid injection molding, precision cutting, splicing and fabricating, close tolerance custom extruded profiles, USP Class VI and FDA white-listed, UL and NSF 61 certified materials.

### Products

#### *Extruded Products*

- Small-diameter precision cut seals
- Large-diameter lathe cut seals
- ParFab™ extruded profiles
- ParFab spliced/fabricated gaskets (hollow and solid rings/gaskets, 4-corner “picture frame” gaskets, compression limited gaskets)
- TetraSeal® circular lathe cut seals

- Spin-on oil filter seals
- Industrial drive belts
- Special lathe cut profiles (D-rings, V-seals, L-seals, double chamfers, short lip seals, etc.)
- Long-length extruded seals
- Anti-drain back seals
- Sweeper belts
- Oilfield packer elements



## Product Overview

Composite.....	20
Custom Molded Seals.....	22
Extruded Products .....	23
Metal Seals.....	24
O-Rings .....	25
Packings.....	26
PTFE Seals.....	28
Rotary Shaft Seals .....	29
Medical Component Manufacturing .....	30
Medical Device & Instrument Assembly .....	30
Medical Grade Silicone Extrusions .....	31
Packaging, Printing & Sterilization .....	31
EMI Shielding .....	32
Thermal Management .....	34
Optical Products .....	36
Integrated System Solutions.....	36
Specialty Rubber Products .....	37



# Product Overview

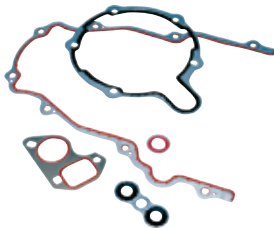
## Composite

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### Gask-O-Seals

Parker Gask-O-Seals have the elastomer molded directly in place within the groove or grooves of a metal or plastic retainer. During assembly, the rubber seal is deformed a predetermined amount to very nearly fill the void areas to achieve controlled confinement. Gask-O-Seals are very reliable elastomer-bonded-to-metal or plastic sealing devices intended for applications requiring extreme reliability, longevity and durability. They are used in a wide range of military, communications, aircraft and marine applications.



### Integral Seals

Integral seals are custom engineered sealing devices designed to solve specific customer sealing problems. The integral seal design bonds the elastomer sealing element to thin metal or engineered plastic retainer plates, allowing for a very complex sealing geometry, ease of assembly and reliable service in a single seal element.

These reliable seals are best suited for high-volume OEM or retrofit applications in automotive, industrial, aerospace and military applications.



### Bonded Piston Seals

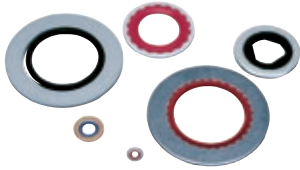
Our bonded piston seals are used in automatic transmission applications, differentials and braking systems. They are manufactured with unique bonding materials and application techniques, then injection or compression molded to steel, aluminum or plastic. The one-piece construction reduces components, is easy to assemble, and offers greater reliability over traditional two-piece construction.



### Carrier Gaskets

Our custom designed carrier gaskets are comprised of an elastomeric seal over-molded onto one or both sides of a thermoplastic nylon carrier. Many material options are available to meet application requirements, and multiple elastomers can be incorporated into a single gasket, tuned for multiple fluid medias.

Additional value-added features can be easily built into the design including noise reduction and oil scraper tabs. The carrier design can also aid in assembly by adding molded-in locator pins or rubber grippers to the torque limiters, which will hold bolts in place during automatic assembly.



### **Fastener and Fitting Seals**

Fastener and fitting seals provide reliable static sealing for screws, bolts, tube fittings and other fasteners.

Available designs are Stat-O-Seals for sealing under the heads of bolts and other similar fasteners, ThredSeals for sealing around the thread roots of any threaded fastener and Lock-O-Seals for sealing tube fitting bosses. Parker fastener and fitting seals are available in a wide range of standard sizes, retainer materials, compounds and surface finishes. Standard and custom fastener seal kits are also available.



### **Active Runner Intake Manifold Valves**

Commonly referred to as Short Runner Valves (SRV) or Charge Motion Control Valves (CMCV) these assemblies vary the air flow rate into a manifold to maximize fuel efficiency and horsepower in automotive vehicles.

The design and production of this product highlights our innovative engineering and manufacturing capabilities. Our design eliminated a machined shaft through the center, and replaced it with a reliable valve comprised of a one piece over-molded assembly.



### **Hygienic Sanitary Gaskets**

Compression controlled gaskets offering long term sealability, excellent wear performance, complete material traceability and easy installation. Designed to meet typical ASME-BPE hygienic clamp unions with nearly flush interface, preventing the entrapment of any media within.

# Product Overview

## Custom Molded Seals

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### Custom Molded or Machined Shapes

Custom molded or machined seals are available in a virtually infinite range of shapes and cross sections. Parker designs and manufactures engineered elastomeric shapes, both homogeneous and inserted, for sealing systems and isolation applications.

Parker's custom seals are molded or machined using a wide variety of processes including compression molding, transfer molding, injection molding and liquid injection molding. These seals are designed to work as individual components, or in combination with other sealing products in a system.

Our custom machined seals are molded and cut with precision tooling to a given geometry utilizing the latest technology, ensuring the highest quality.



### Diaphragms and Directional Valve Seals

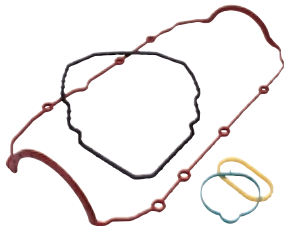
These advanced components can be used in applications that utilize both pressure and/or vacuum to function.

Diaphragms and directional valve seals are used in a variety of media types and can be designed for extreme temperature conditions. They are widely specified in systems with very small operating envelopes and are not limited in size or volume.



### Over-Molded Seals and Sub-Assemblies

Over-molded seals and sub-assemblies provide a value added design solution, often eliminating components in a finished assembly. With proven product design and advanced processing techniques, our design engineers can provide a value added solution to help drive functionality improvements as well as finished component cost savings.

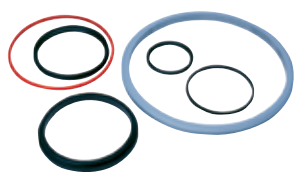


### Press-in-Place Seals

Press-in-place seal design technology provides simple seal retention in straight-walled or dove-tail grooves. These seals are easily installed and removed for time saving assembly. Press-in-place seals can offer high-sealing pressures for less micro-leakage and exceptional sealing properties with non-ideal mating surfaces.

## Extruded Products

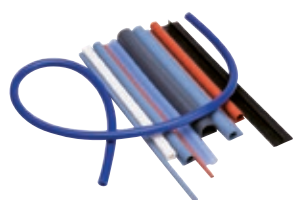
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### Standard and Custom Lathe-Cuts

In addition to the typical square or rectangular lathe-cut cross-sections, Parker offers a number of special cross-sectional configurations. Cross-sections such as double chamfers, D-rings, L-gaskets, external U-sections, angle L-seals and short lip seals are available from any of the major polymer families. Sizes range from .025" through 19.000" (6.35 mm through 482.6 mm) outside diameter. Parker's unique manufacturing process assures high-quality parts and in most cases, no tooling charges.

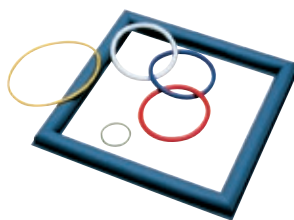
Our TetraSeal is a circular lathe-cut sealing device made with a square cross-section. Available in a wide variety of elastomeric compounds, the TetraSeal is engineered for use in most static applications.



### ParFab Extruded Profiles

These profiles are typically used for fabrication into spliced rings, 4-corner spliced picture frame gaskets or custom parts cut to specific lengths. They can also be supplied in bulk footage with or without pressure sensitive adhesive (PSA).

Parker offers a wide variety of standard extruded profiles in many configurations, such as; solid and hollow-O, solid and hollow-D, U-channel, rectangular, solid and hollow square and hollow-dart configuration profiles, which can be designed for specific application needs.



### ParFab Spliced/Fabricated Products

These products are manufactured using a hot vulcanization process to provide spliced hollow and solid rings and custom gaskets from either standard or custom cross-sections. They offer an ideal, cost-effective sealing solution for many applications.

ParFab parts can be fabricated into low closure force seals, large diameter O-rings, non-standard O-rings and custom profiles with inside diameters larger than 2.5" (63.5 mm). Extruded profiles with a flat surface, can be provided with pressure sensitive adhesive.



### Non-Sealing Extruded Products

Parker also offers solutions for non-sealing applications requiring spacers, rubber springs, insulation and vibration dampening. These products can be supplied in the form of sleeves, bumpers, tubing, pills, grips, rollers and many other configurations extruded from a variety of basic rubber and thermoplastic materials.

Our material development and design expertise also solves demanding drive belt needs. We offer high and mid-grade belt materials with superior tension and ozone resistance characteristics. Belts designed for the vacuum cleaner industry are thoroughly tested on a state-of-the-art life test stand, designed exclusively for this market.



# Product Overview

## Metal Seals

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### Dynamic Metal Seals

Parker's dynamic metal EnerRings offer a new design option for critical low duty-cycle, all metal sealing in mission critical applications. Frequently selected for high-pressure/high-temperature (HPHT) service, dynamic metal seals excel under extreme environments. Typical applications include valve stem seals, both quarter-turn and rising stem, and fluid couplings.



### Ultra-High-Temperature Metallic Seals

In the never-ending search for higher efficiency and reduced emissions, jet engines and gas turbines are now running hotter than ever. Parker's latest EnerRing resilient turbine seals offer robust ultra-high-temperature sealing solutions for compressor, combustion chamber and power turbine stages.

With Parker metal seals offered in advanced nickel-based superalloys, turbine blade alloys, and with optional integral thermal insulation, engine designers can find solutions tailored for every application. This includes extended service to 1800°F (982°C) and extreme resistance to stress-relaxation for 30,000 hours of service between scheduled replacement.



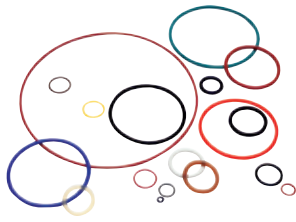
### Metal Seals and Gaskets

Parker provides metal seals in a wide range of base metals and plating finishes. Applications include cryogenic, high vacuum, ultra-low leakage, high radiation, and significant thermally induced movements. They are suitable for use in compressors, heat exchangers, jet engines and other high-temperature or chemically reactive applications. They are available as metal jacketed gaskets, corrugated gaskets and flat gaskets in a wide range of sizes and shapes.

Our resilient metal seals include O, C, E, U, and V sections from 0.031" to 0.625" (0.78 to 15.8 mm) with any diameter from 0.180" (4.6 mm) upwards, depending on the selected product. We also manufacture AS1895 E type seals and MS 9141 and 9142 metal O-rings.

## O-Rings

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### O-Rings

O-rings are available in all AS568 inch sizes as well as a wide range of international metric sizes to DIN 3771, ISO 3601 and JIS B2401. In addition, Parker is tooled in over 1,500 non-standard O-ring sizes which are available on special order, and can make practically any custom O-ring imaginable.

Parker O-rings can be molded in a wide range of elastomer compounds ranging from basic neoprene to special perfluorinated materials called Parofluor ULTRA. Parker O-rings are recommended for both static and dynamic sealing service in practically all vacuum, gas and liquid applications. With the widest range of compounds available in the industry and a full complement of specialty material formulations, Parker has the product to meet the world's needs.



### O-Ring Accessories

To assist in the installation of O-ring seals, Parker provides a number of useful items for use in sizing, installing and lubricating O-rings. Parker O-Lube and Super-O-Lube are our two lubricant products used for O-ring installation.

Parker offers special O-ring kits in a wide range of compounds as well as petroleum or silicone-based O-ring lubricants to facilitate seal assembly installation.

Also available are brass and plastic O-ring installation and extraction tools, O-ring sizing cones and Pi tapes.

# Product Overview

## Packings



### Rod Seals

The PolyPak line of fluid power rod and piston seals has been the industry standard for over 40 years. Parker's PolyPak rod seals are available in a variety of profiles, energizers and seal materials – providing sealing solutions for light, medium, and heavy duty hydraulic applications.

Additionally, Parker offers a full line of asymmetrical rod seals, U-cups, and PTFE rod seals for both hydraulic and pneumatic applications. Seal profiles are available in both standard and metric sizes as well as in a full range of rubber, urethane and PTFE materials.

### Piston Seals

Our diverse range of piston seal profiles suit a broad range of hydraulic and pneumatic applications. Parker's designs and materials extend our piston seal solutions across the full range of industry temperatures and pressures. The most common families of piston seals include:



#### ChemCast Piston Seals

ChemCast piston seals provide flawless sealing at temperatures over 300°F (149°C) and pressures exceeding 50,000 psi. At the same time, they eliminate hydraulic piston drift, cold flow and metal-to-metal contact. Each seal consists of a self-lubricating, reinforced, heat-stabilized thermoplastic outside diameter sealing ring and an oval elastomeric back-up ring.



#### Urethane Piston Seals

We supply a complete line of urethane single and bi-directional piston seals. Parker's Molythane and Resilon family of urethane materials are industry known for their high levels of performance and quality.



#### PTFE Piston Seals

Parker's complete line of PTFE energized piston seals is offered in various PTFE compounds including bronze, glass and graphite loaded solutions. Profiles include energized PTFE rings, T-seals, capped seal designs, as well as engineered profiles.



#### Integrated Pistons

Our integrated piston combines piston, bearing and seal into a single product. This integrated solution enables design engineers to tighten clearance gaps and in turn improve the performance of the cylinder. Integrated pistons are available using a variety of core materials and seal materials.



### **Wipers and Scrapers**

Parker offers a complete line of canned, energized and snap-in rod wipers. J-canned wipers are urethane-bonded-to-metal wipers designed to press into a groove for ease of installation and replacement.

We also have a full line of single and double lip snap-in wipers manufactured in a wide range of urethanes and traditional elastomers.



### **Wear Rings and Bearings**

Manufactured in nylon, PTFE and composite materials, our full line of wear rings and bearing products are designed to maximize value for cylinder manufacturers. Standard as well as tight tolerance wear rings are available in a variety of heights, thicknesses and cut (butt, skive and step-cut configurations). PTFE bronze-filled and graphite-filled PTFE bulk strip, cut-to-length and machined rings are also available in a variety of heights and thicknesses.



### **V-Packings**

Parker manufactures a wide range of V-pack solutions from homogenous rubber, fabric reinforced rubber, PTFE, PEEK and other engineered materials. Different designs, stack configurations and material choices are available for high temperature and pressure applications. Various cap and back-up devices are available to extend the service life and performance of Parker's V-packings.



### **T-Seals**

T-Seals feature an elastomer seal element with nylon or PTFE back-up rings to prevent the seal from extruding or rolling in the groove. Parker's T-Seal product line is available in a variety of materials and configurations for industrial applications.



# Product Overview

## PTFE Seals

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### **PTFE FlexiSeals**

Our full line of spring energized PTFE lip seals are used on rod, piston, face and rotary sealing applications. FlexiSeals are typically used in areas where elastomeric seals cannot meet the frictional, temperature, or chemical resistance requirements of the application.

Utilizing a variety of jacket profiles, PTFE compounds, spring types, and lip configurations, these seals can be designed to meet the requirements of the most demanding seal environments.



### **PTFE Fluid Power Seals**

Parker's PTFE fluid power seals include piston seals, rod seals, buffer seal rings, rod wipers, rotary swivel seals and wear rings. Standard inch, metric and custom designs are available.

PTFE seal materials are produced in all of the standard filled or unfilled configurations from compounds commonly used in hydraulic or pneumatic PTFE fluid power components. Proprietary high-performance compounds are available for especially demanding applications.



### **PTFE FlexiLip and FlexiCase Rotary Seals**

FlexiLip high-speed PTFE lip seals are designed for rotary applications where elastomer lip seals fail, and mechanical seals are too costly. The filled PTFE sealing element provides chemical compatibility, a wide temperature range and high pressure capability.

FlexiLip seals will run in dry and abrasive media environments and are available in single, dual and triple sealing lip designs, as well as in metal-retained FlexiCase configurations.

## Rotary Shaft Seals

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### Rotary Shaft Oil Seals

We offer a complete line of oil seal products including the proprietary Clipper Oil Seal design, with integrally precision-molded rubber/aramid fiber outer case and elastomeric inner lip. Stainless steel garter springs provide correct interference with rotating shafts. Varying profiles include factory split, MIST, single-lip, dual-lip, excluder and molded-in spring.

Parker Oil Seals are elastomer-lipped metal-retained rotary shaft seals available in a multitude of configurations, including single, double and triple-lip; with and without springs; with scraper, flat, and dual lips for appropriate contaminant exclusion or fluid retention.



### ProTech Bearing Isolators

ProTech bearing isolators are the ultimate in bearing protection with their unitized, two-piece non-contact design providing zero lubricant leakage and total exclusion of contaminants. Patented, with additional patents pending, ProTech, ProTech 360, and ProTech Millennium are far superior to isolators that rely on other internal seals for sealability.

ProTech is available in standard flanged, non-flanged, pillow block, narrow, split, multi-port and step shaft profiles. Custom designs accommodate seal needs for split air purge, turbine and grease purge systems.



### High Speed Shaft Seals

FlexiLip high-speed PTFE lip seals are designed for rotary applications where elastomer lip seals fail, and mechanical seals are too costly. The filled PTFE sealing element provides chemical compatibility, a wide temperature range and high pressure capability.

FlexiLip seals will run in dry and abrasive media environments and are available in single, dual and triple sealing lip designs, as well as in metal-retained FlexiCase configurations.

# Product Overview

## Medical Component Manufacturing



### Liquid Silicone Molding

Parker's Medical Systems Division uses tested and certified medical and implantable grade silicone, thermoplastic and TPE base materials from key material suppliers for molding elastomeric medical components. We also offer our customers customized material formulations whenever necessary per the customer's specific functional requirements.



### Thermoplastic & TPE Molding

Parker's Medical Systems Division offers medical thermoplastic and thermoplastic elastomer injection molding capabilities. Material selection includes:

- ABS
- Acetal
- Acrylic
- Carbon fiber composites
- EVA
- LCP
- Nylons including glass filled
- PEEK
- Polycarbonate
- Polyetherimide (PEI)
- Polypropylene
- Polystyrene
- PTFE
- PVC
- Thermoplastic elastomers to 5 shore A

## Medical Device & Instrument Assembly



### Silicone Medical Device Assembly

Parker's extensive silicone device assembly, fabrication, and packaging is completed at our FDA Registered ISO 13485 certified manufacturing facilities. We contract manufacture the following types of silicone devices in either Class 10,000 or Class 100,000 certified clean rooms:

- Cardiovascular catheters
- Endotracheal catheters
- Feeding catheters & devices
- Multi-port urological catheters
- Nasal airways with single & dual balloons
- Orthopedic devices
- Pediatric catheters
- Peritoneal dialysis catheters
- Surgical wound drainage tubes
- Tracheostomy catheters
- Wire-reinforced diagnostic catheters



### General Medical Devices

We are a single source FDA registered and ISO 13485 certified finished medical device engineering & manufacturing firm, offering single use devices, non-sterile reusable devices and in-vitro diagnostic assembly, testing, packaging, sterilization and distribution.

#### Class I, II and III medical devices:

- Audiology
- Cardiac cath lab
- Cardiology
- Chronic care
- Clinical laboratory
- Critical care
- Emergency room
- Labor and delivery
- Neurology
- Oncology
- Operating room
- Respiratory therapy
- Sleep labs

## Medical Grade Silicone Extrusions

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### Single and Multi Lumen Tubing

With in-house precision extrusion tool & die building capabilities, Parker's Medical Systems Division offers OEMs a wide range of medical grade single and multi-lumen tubing and extruded profiles.

- Color coded tubing & rods
- Continuous laser monitoring of tubing size during extrusion
- Custom and standard sizes
- Medical grade silicones from all major suppliers
- On-line cutting to length & 50 ft. coils
- Profiled tubing & rods
- Single & multilane tubing
- Wire-reinforced tubing
- X-ray striped & X-ray opaque tubing

## Packaging, Printing & Sterilization

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### Packaging

Parker's Medical Systems Division can assist in all aspects of packaging selection and utilize vendors who deliver quality materials, on time and at reasonable prices. We will arrange D.O.T. approved transit testing for your product as requested. All of our packaging equipment is fully validatable and incorporates total process controls.



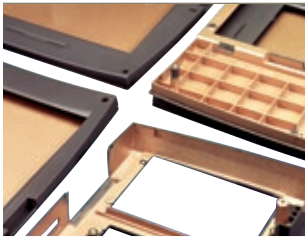
# Product Overview

## EMI Shielding



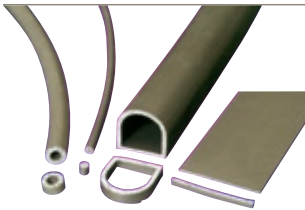
### Automated Form-in-Place Elastomer Gaskets

Automated CHOFORM technology dispenses form-in-place conductive elastomer gaskets on metal or plastic housings. The system applies programmed gasket beads with exceptional accuracy in three full axes, compensating for uneven surfaces in casting and molded parts to provide consistent, highly reliable seals. ParPhorm gaskets provide non-conductive form-in-place seals.



### Conductive Adhesives, Coatings & Inks

CHO-SHIELD coatings provide EMI shielding, anti-static protection, corona shielding and surface grounding in a wide range of applications. CHO-BOND adhesives are electrically conductive epoxy, silicone and other specialty resins that cure at room temperature, elevated temperature or in humidity. CHO-FLEX conductive coating is designed for EMI shielding of flexible circuit laminates; it can be creased, heat-formed or scratched without affecting performance.



### Conductive Elastomers

Versatile CHO-SEAL and CHO-SIL conductive elastomers are available in many application grades. They can be extruded, molded or die-cut into EMI gaskets or grounding contacts. In applications for electronic enclosures and handheld devices they can be over-molded onto metal or plastic substrates or housings. CHO-MUTE RF absorbers are offered as an alternative to conductive elastomers where microwave absorption is desired as a solution.



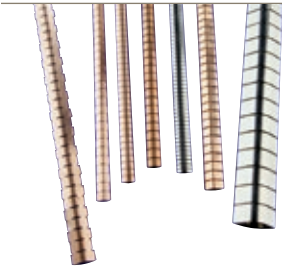
### Engineered Thermoplastic

Injection molded engineered thermoplastics provide advance solutions to “metal replacement technology.” Our fully integrated operations provide concept to production support to customers in a variety of markets. PREMIER is the first commercially available conductive thermoplastic for real world EMI shielding solutions. It is a blend of PC/ABS thermoplastic polymer alloys and conductive fillers engineered for stable electrical, mechanical and physical performance. PREMIER provides world class shielding effectiveness, requires no machining, plating, painting, vacuum coating, or other added processing steps. The elimination of secondary operations can reduce costs by up to 50% compared to die castings, bent formed metal, machined extrusions and plastic plated parts. PREMIER provides cost-efficient EMI shielding for applications in telecommunications, computer servers, commercial, automotive and defense electronics.



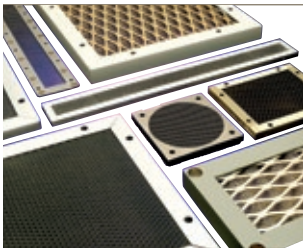
### Low Closure Force, Foam-Based Gaskets

SOFT-SHIELD gaskets provide choices in price and shielding performance. Available in lengths, strips and die-cut parts. Materials include conductive fabric, foil/fabric, conductive yarn and knitted wire jackets over foam cores.



### Fingerstock

SPRING-LINE beryllium copper and stainless steel gaskets combine high levels of EMI shielding effectiveness with spring-finger wiping and low closure force properties. Beryllium copper's high tensile strength and superb electrical conductivity are ideal for shielding over a broad frequency range. SPRING-LINE gaskets are available in bright tin, bright copper and bright nickel finishes. Standard length (16 inch, 406 mm) and custom length strips are available in a wide variety of cross sections. For low compression grounding contacts, individual fingers are available with pressure sensitive adhesive for convenient peel and stick application.



### Shielded Ventilation Panels

Shielded vent panels provide high levels of EMI shielding in applications such as computer network and wireless infrastructure cabinets. These vent panels feature aluminum honeycomb within rolled aluminum frames. The result is a lightweight, high airflow solution for enclosures requiring both cooling and high levels (50 dB at 10 GHz) of shielding. An optional intumescent coating provides fire barrier properties. On exposure to flame or heat at 300°F (149°C) the coating expands rapidly to fill the honeycomb cells and prevent flame passage. Standard panels feature 1/8 inch (3.2 mm) honeycomb cells, 1/4 inch (6.4 mm) thick. Complete frame/honeycomb assemblies are chromate conversion coated.



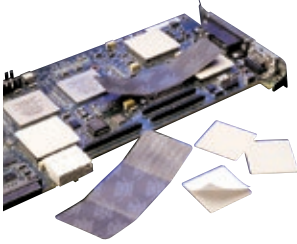
### Metal Gaskets

Wire mesh EMI gaskets include knitted mesh strips, mesh frame gaskets, compressed mesh and wire mesh with elastomer cores. SOFT-SHIELD gaskets meet the needs of low-cost, low closure-force shielding applications.

# Product Overview

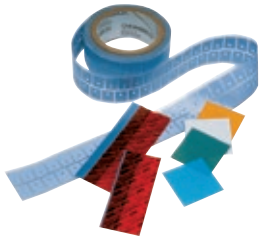
## Thermal Management

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### Heat Spreaders

T-WING and C-WING heat spreaders provide a low-cost, effective means of cooling IC devices in restricted spaces where conventional heat sinks aren't appropriate. They typically provide junction temperature reduction of 68°F (20°C) when applied on microprocessors and cache chips in laptop PCs and other high density, handheld electronics, and on disk drives. They're easily added by peel and stick application.



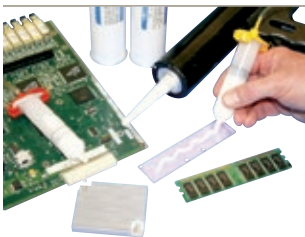
### Phase-Change Thermal Interface Materials

THERMFLOW materials are thermally enhanced polymers designed to minimize the thermal resistance between power dissipating electronic components and their associated heat sinks. This low thermal resistance path maximizes heat sink performance and improves the reliability of microprocessors, memory modules, DC/DC converters and power modules.



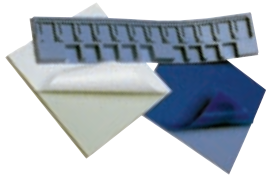
### Thermally Conductive Adhesive Tapes

THERMATTACH tapes are double-sided adhesive systems that replace mechanical fasteners for bonding heat sinks to ceramic or metal packages. They provide excellent thermal, mechanical, environmental and chemical properties.



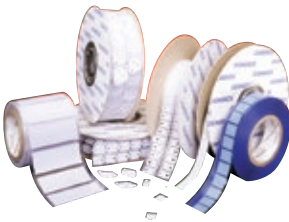
### Thermally Conductive Fully Cured Dispensable Gap Fillers

THERM-A-GAP Dispensable Gap Fillers are ideal for applications where gap filling pads overstress component solder joints and leads which can result in catastrophic system failure. These materials are highly conformable, one component, pre-cured silicone gels that can be dispensed to fill large and uneven gaps in electronics assemblies.



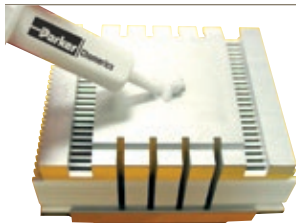
### **Thermally Conductive Gap Fillers**

THERM-A-GAP elastomers are used to fill air voids between PC boards or high temperature components and heat sinks, metal enclosures and chassis. The exceptional conformability of these advanced materials enables them to blanket highly uneven surfaces, transferring heat away from individual components or entire boards and allowing chassis parts to be used as heat spreaders where space is restricted.



### **Thermally Conductive Insulators**

CHO-THERM thermally conductive, electrically insulating interface materials consist of silicone, fiberglass and ceramics. They are produced with numerous thermally conductive, dielectric fillers that transfer heat from electronic components to heat sinks or other heat sinking devices.



### **Thermal Greases and Gels**

Our thermal grease is formulated to efficiently conduct heat and fill the voids between hot components and heat sinks. These are non-curing, dispensable, highly conformable materials which require no cure cycle or mixing and dispenses to fill highly variable tolerances in electronics assemblies. The material is thermally stable. They require virtually no compressive force to deform under assembly pressure leaving solder joints and leads stress free.



# Product Overview

## Optical Products

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### Optical Display Products

Using a wide variety of shielding components that can be combined with high light transmission plastics and glass, our optical engineers can design the best solution for shielding and viewability. We offer a wide range of filter products that are being used in the military, aerospace, medical, information technology and industrial markets. Our unique lamination and optical technology are used to create products that are being used in control panels, computer monitors, laptop screens, consumer and military handheld devices, aircraft cockpits, in-flight entertainment screens and medical devices.

## Integrated System Solutions

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### Integrated System Solutions

Parker's Chomerics Division offers integrated system solutions for EMI shielding and thermal management applications. This includes (PREMIER or traditional) thermoplastic housings OR machined or purchased metal housings with companion shielding/thermal products and supply chain components. It also includes glass or plastic based optical products with gaskets, frames/bezels and display/user enhancements. Our in-house core competencies for thermoplastic injection molding, metal fabrication, EMI shielding and thermal management products, optical displays, test services and supply chain management can be fully leveraged to provide a complete one-stop solution.

## Specialty Rubber Products

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### Non-metallic Expansion Joints

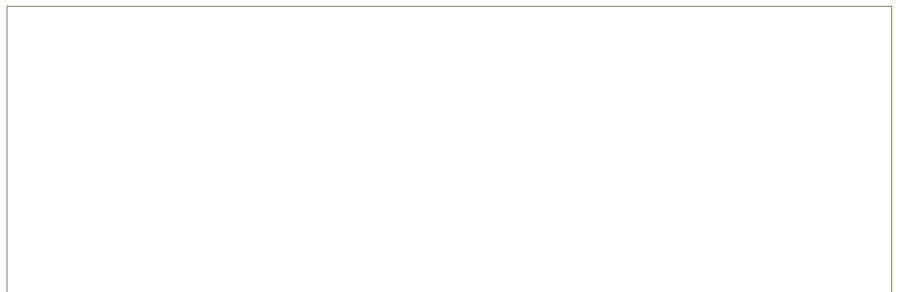
Parker manufactures custom fabric expansion joints for gas turbines, fossil-fuel-fired power generation and industrial facilities serving pulp and paper, refining, cement, waste treatment and other non-utility industries.

Expansion joint material capabilities include rubber mixing, calendaring, vulcanization, pressing, extruding and sheeting FKM, EPDM, CR, nitrile, TFE, HNBR, silicone and other commonly used compounds. Parker has in-house capabilities to weave, braid, coat, twist, and sew with fiberglass, aramid fiber, ceramic, stainless and specialty metals.



### Oil & Gas Elastomer Products

Parker's drilling and well-servicing products span a broad range – including blowout preventers, packer elements, diaphragms, drill pipe/casing protectors, hammer union seals, packer cups, cement plugs, liner wipers, flex plugs, oil saver rubbers, pipe wipers, rod strippers, swab cups, pulsation dampeners, test cups and water saver rubbers.



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