



FlexiCase®

Rotary Seals

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



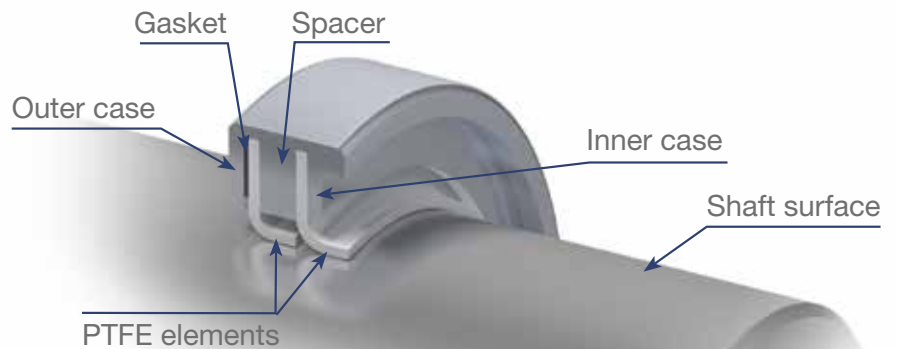
FlexiCase®

The Parker sealing solution for challenging rotary applications in harsh environments

Sealing rotating applications in harsh conditions has always been a challenge in the sealing business. Wear, chemical attack and frictional heating are common failure modes for traditional rotary lip seals. When temperatures, pressure or ambient conditions make life difficult for typically used rotary seals, Parker's FlexiCase® can be the answer. It bridges the gap between conventional lip seals and high-end mechanical seals at low cost.

What is a FlexiCase® seal?

FlexiCase® rotary seals are assemblies designed to seal the most demanding rotary applications where the operating conditions exceed the capabilities of elastomeric seals. They feature an inner diameter lip that seals dynamically on a shaft and a metal casing on the outer diameter to seal statically with a press-fit into a bore. A gasket is positioned between layers of sealing lips and the casing to seal off the potential leak path and to compensate for differential expansion. With some exceptions, FlexiCase® seals are not spring-energized. Consequently, the radial lip contact forces are lower than those of rotary FlexiSeals®, which allows the seal to function at much higher surface speeds of up to 70 meters/second. FlexiCase® seals are manufactured from a wide variety of PTFE composites and other machinable plastic materials. The unique production method allows custom-engineered sealing solutions to fit your needs.



FlexiCase® components

- Casing in metal
- Inner gasket
- Spacer
- Customized sealing lips made from a suitable PTFE compound

Harsh ambient conditions

The combination of a robust metal casing with unique blends of PTFE sealing elements makes this seal suitable for use in conditions of extreme temperatures, surface speeds and chemical attack, such as those typically occurring in compressors, special pumps, hydraulic motors, etc.

FlexiCase® seals offer the following advantages:

- Surface speeds up to 70 meters/second
- Pressure resistance up to 35 bar
- Temperature resistance from -100 °C to 250 °C and more
- Diameters up to 2,000 mm
- Very good chemical resistance thanks to PTFE sealing element
- Low frictional energy loss and friction-related heating
- Unlimited shelf life thanks to PTFE sealing elements
- Long seal life in dry and abrasive conditions (with wiper elements)
- Single- or double-acting operation
- Uni- or bi-directional rotation

Examples of FlexiCase® profiles

Each seal is customized to meet the demands of the specific sealing challenge. Multiple lips, scraper lips, backup elements and embedded springs are only some examples of possible combinations in the seal assembly.



Markets and applications

Automotive

- Water pumps
- Turbochargers and superchargers
- Oil and fuel pumps
- Wheels and axles

Aerospace

- Oil and fuel pumps
- Actuators
- Engine start equipment
- Helicopters

Oil and gas

- Mud pumps
- Downhole pumps
- Skimmers
- Separators
- Chemical pumps

Food and pharma

- Mixers
- Extruders
- Grinders
- Compressors and pumps
- Presses
- Conveyors and sorters
- Packaging

Semicon and electronics

- Vacuum pumps
- Wear sleeves

Industrial market

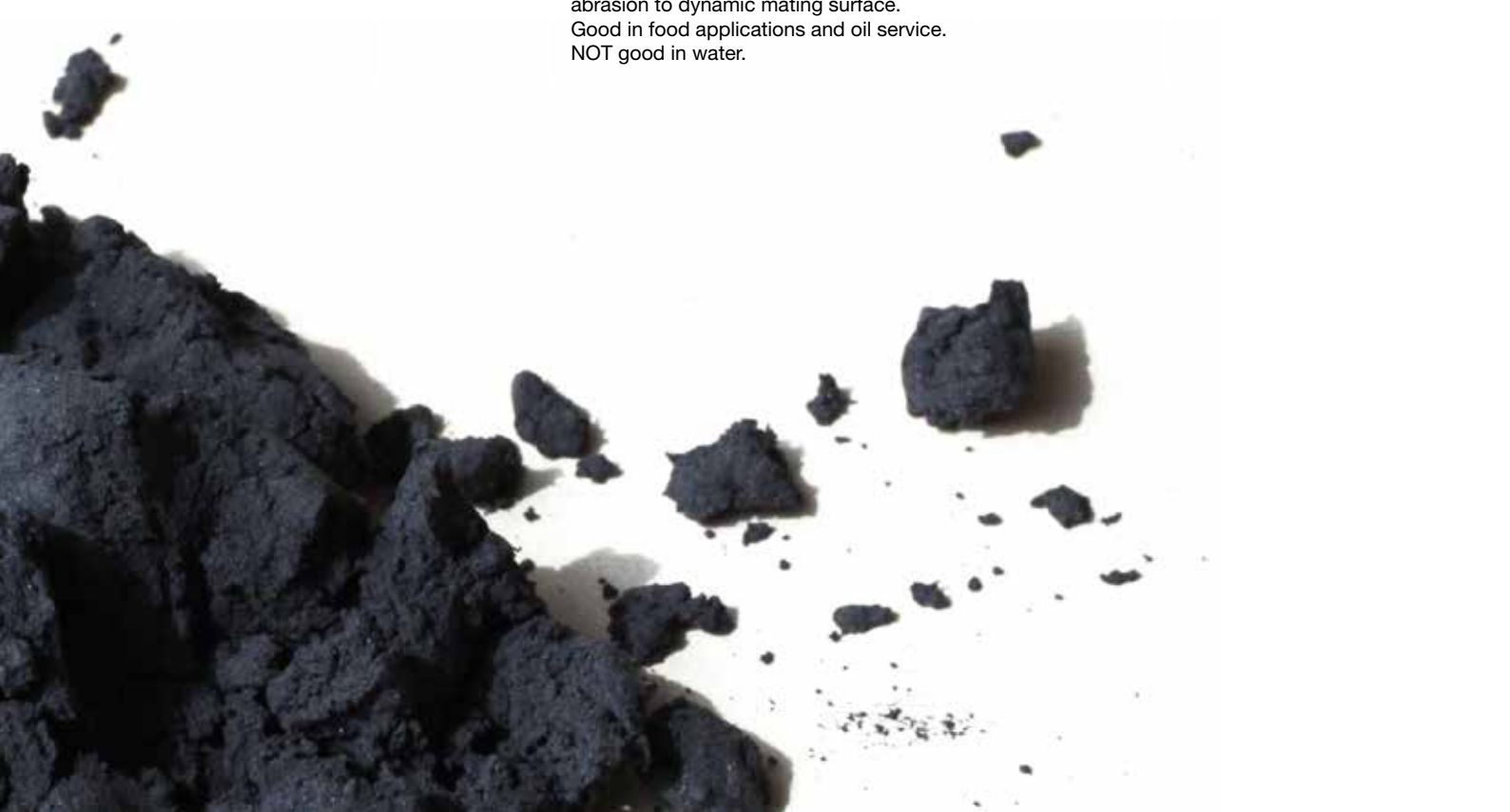
- Mining industry
- Hydraulic motors
- Blowers
- Shafts for electrical motors
- Rotating equipment in paper mill industry and steel mills
- Shafts in lathes and milling machines



Materials

Each application requires a unique combination of case, gasket, spacer and seal lip materials. Standard casing materials are the traditional stainless steel grades as well as more specialized corrosion-resistant metals. NACE-compliant metal elements are possible when required. Some of the most common PTFE compounds used for the sealing elements are listed below:

| Compound code | Material base | Application | Temp. Range °C | Friction Rating |
|---------------|--------------------------|--|----------------|-----------------|
| PS801 | Virgin PTFE | Light duty service. FDA approved. Excellent for cryogenic and low molecular weight gas service. | -195 to 232 | lowest |
| PS802 | PTFE + graphite | General purpose. Good wear in soft shaft applications. High speed and lower pressures. | -195 to 232 | low |
| PS807 | PTFE + carbon graphite | Excellent resistance to heat and wear. Recommended for dry or semi-dry applications. Good in liquids and steam. Graphite added for lubricity. | -195 to 260 | low |
| PS803 | PTFE + glass/ molybdenum | Excellent wear and heat resistance. High pressure applications. Good in hydraulic oil. Abrasive in rotary service against soft metals unless lubricated. Molybdenum added for lubricity. | -156 to 287 | moderate |
| PS832 | PTFE + glass bead | FDA compliant. Exceptionally strong and prolonged life of the base "modified PTFE". Abrasive in rotary service against soft metals. | -156 to 287 | moderate |
| PS873 | PTFE + polyimide | Excellent in dry service with low wear rate in vacuum and inert gases. Very low abrasion to dynamic mating surface. Good in food applications and oil service. NOT good in water. | -267 to 260 | low |



A complete sealing solution

Sleeves

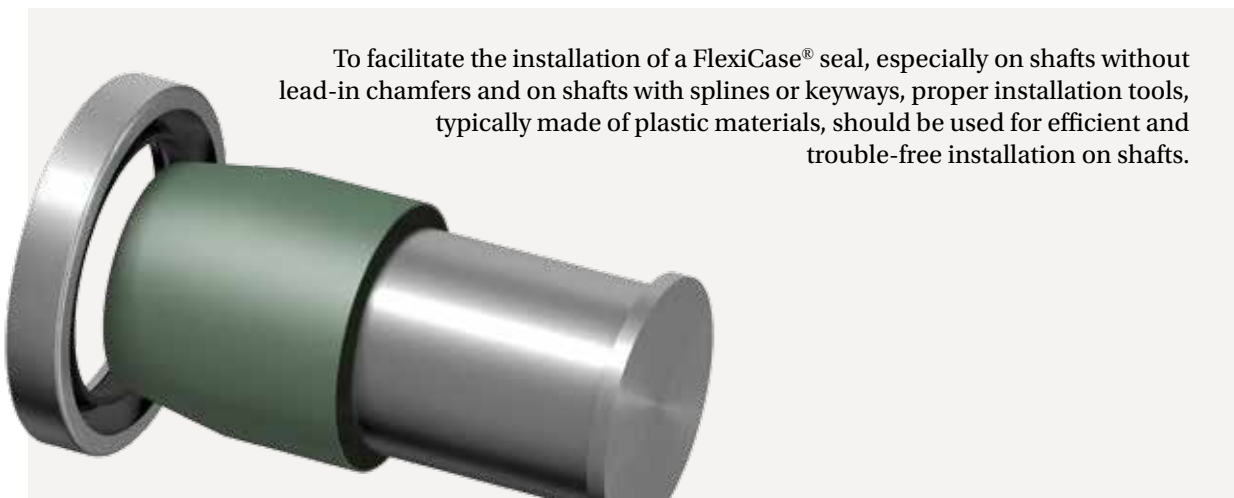


A FlexiCase® sealing solution is not complete without a well suited counterface where the shaft surface finish is $0.2 - 0.4 \mu\text{m} R_a$ with hardness of $56 R_c$ or more. The most common failures in FlexiCase® applications are related to dynamic shaft surfaces which are not suitable as mating surfaces for seals. Unsuitable mating surfaces can result in premature seal failure and irreparable damage to the shaft. As surface treatments to achieve the desired surface quality may either be very costly or even impossible, customized sleeves provide a viable solution. They can be easily fitted on any cost-effective shaft as the ideal running surface for the FlexiCase® used. In addition, they are easy to replace during maintenance and can even revitalize worn shafts.

Common sleeve materials

4140 CRS, AR400, 300 Series SS, Tool Steel, 17-4 PH, Bronze

Installation tools



To facilitate the installation of a FlexiCase® seal, especially on shafts without lead-in chamfers and on shafts with splines or keyways, proper installation tools, typically made of plastic materials, should be used for efficient and trouble-free installation on shafts.

