



## Mechanical **Face Seals**

When the Going Gets Tough




**GOETZE**<sup>®</sup>







## Good Reasons for Choosing **GOETZE®**

- Quality Brand
  - Cost Efficiency
  - In-depth Experience
  - Trusted Partner
  - Leading Expertise
  - Customer Service
  - Global Partnership
  - Customized Solutions
  - Extensive Product Range
  - Innovative
- 



## Mechanical Face Seals by **GOETZE®**

### Rock Solid – For Pure Efficiency

Mechanical face seals from Federal-Mogul Powertrain's GOETZE® brand are found wherever the going gets really tough: in heavy technical equipment such as construction machinery, conveyors, mining machinery, concrete and cement mixers, tunnel boring and agricultural equipment. Our face seals ensure lubricant retention within wheel hubs and axles, track rollers, transmissions and many more components.

We are present all over the world to support our customers, whatever harsh conditions they face. Our portfolio of designs and advanced materials covers applications including some of the biggest equipment around: we manufacture face seals with a diameter of up to 1,425 mm – in fact the world's largest cast iron face seals.

Within the last 60 years, Federal-Mogul has built a strong position in the global face seals market. We have a reputation for solving even the hardest sealing tasks. Face seals bearing the GOETZE® brand offer proven durability in the most arduous conditions, providing increased powertrain and rotation systems efficiency even in the harshest environments that demand 'Rock Solid' solutions.





# Our Products

## Every Application Has Its Solution

Many face seal applications can be solved with standard seal designs. However, the variety of function, design and manufacturing details often requires customization. In fact some of our current design options go back to individual applications which at some point asked for modifications. For over 60 years, our team of application engineers have amassed a wealth of experience, which we leverage for new requirements. In particular, our experts look to the adjacent system not just the seal itself, keeping the overall function in mind to design an optimized solution. Challenge us to solve your application needs.

Mechanical face seals are widely used in rotating equipment and applications to seal between rotating shafts and stationary casings and prevent leakage. We use special hard cast iron materials such as Duronit and Coronit offering performance benefits in harsh application conditions.



### O-Ring Type

#### Standard product

The most common mechanical face seals design is the o-ring, with two symmetrically tapered seal rings and two o-rings. O-ring designs have two versions - the 76.90H with a ground profile; and the 76.97H with an as-cast profile. In general, both versions are completely interchangeable.



### Square Bore Type

#### Better mud packing behaviour

The mechanical face seal type 76.95 consists of two metallic angular seal rings with identical contours. The seal rings are assembled with trapezoid elastomer parts positioned against the housing bore. Type 76.95 provides stiffer spring characteristics than standard o-ring designs.

The HSL seal is an evolution and special form of the square bore seal. It uses a unique and patented design for the elastomeric part of the seal with an integral dirt exclusion lip and heavyduty spin protection. These features improve protection significantly, leading to reduced leakage, extended service life and resisting compression from mud.



### Asymmetric Type

#### Less installation space

There are two different versions: the inverted seal ring design provides a considerable savings potential with regards to the cross section and manufacturing technology. The countering style shows advantages when there is limited installation space.



### Adaptor Ring

#### Facilitates easy repairs

In some sealing applications, the use of standard designs 76.90H / 76.97H is more complicated due to functional, construction or production reasons. When installing standard designs into cylindrical bores, 76.91 adapter rings can be used instead of re-machining the housing, with maintenance time and cost savings. These adapter rings are also an exceptional choice when strong abrasive environments result in significant retaining lip wear on housing contours.



# Our Services

## Conquer Every Challenge

### Application Engineering

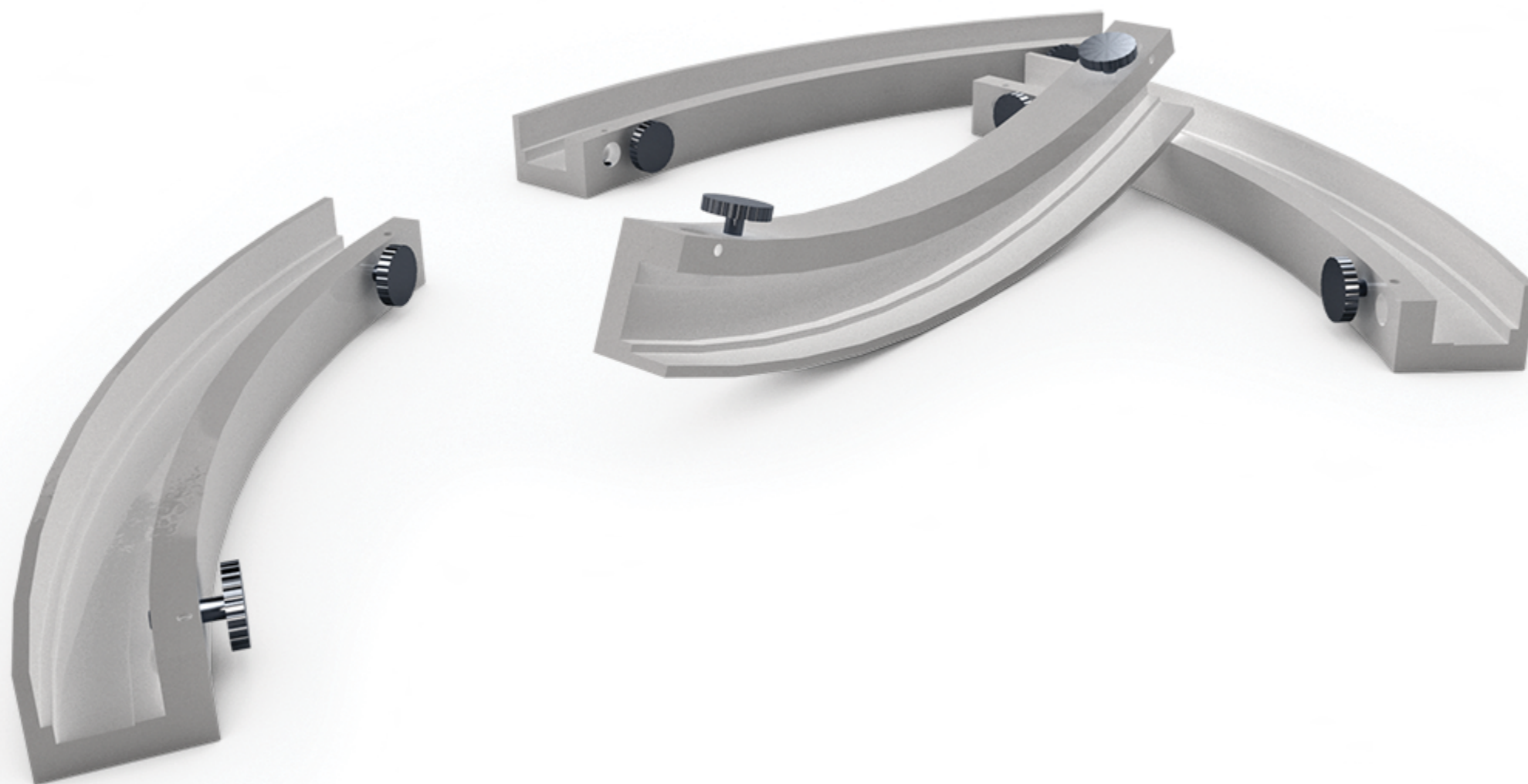
Our team of application engineers provides design support and technical expertise to optimize your design and systems according to your specific requirements. We understand technical challenges for sealing solutions across temperature extremes, with abrasive media and fluids, in highly pressurized applications, and those featuring fast moving mechanical parts. We use established design and application engineering methods to create optimal sealing solutions.

### Testbed Services

With our testbed service we support you to pre-test seals according to your individual requirements, before starting field tests to simplify your test procedures and save time and effort. Our extensive test-rigs and facilities, together with rigorous methods, help to ensure product performance and to reduce total cost of ownership for our customers.

### Assembly Service

We offer assembly tools to optimize the assembly process and to ensure a proper function of the seals. Together with understanding the varying needs for series production, and maintenance tasks, we are able to offer customer specific assembly tools for special requirements. This customization extends to sealing solutions using new materials, designs, and applications.



# Our Product Life Cycle



Products follow a standard life-cycle through phases optimized for best results, with the co-ordination of specialists from engineering, production, logistics and quality. These include the phases of: analysis, planning, realization (together known as development), series production, and service.

Within the GOETZE® brand organization, product and application engineering functions are integrated in one unit to provide maximum support to customers and ensure the optimum solution is produced for each case; whether an adaptation of an existing product or a unique design.

The team's extensive experience, robust analytical models, unique test facilities including functional and long-term testing, and comprehensive manufacturing capability are all utilized to achieve the best results for our customers.



## Analysis Phase

**Mutual Understanding** - You are looking for a committed professional partner for your development projects utilizing specialized rigorous engineering approaches. Ideally they can address complex challenging sealing issues of all scales in harsh extreme environments: a sealing expert across many sectors with decades of experience, a trusted and reliable supplier in all situations.

Our service is first and foremost based upon a deep understanding of what you really need. A direct contact from our globally active team simplifies and speeds up the path to mechanical sealing solutions. We work together with your purchasing, engineering, production, logistics and quality functions to meet and exceed all standards and expectations.



## Planning Phase

**Comprehensive project and product development expertise** - You are seeking a partner with in-depth sealing specific product development knowledge, able to provide technical consultants to support every detail of your specifying requirements, and engineers who are able to speak your technical language, drawing upon extensive testing data and resources. A partner that utilizes a blend of industry-standard project management and their own efficient methods is able to ensure projects are completed to specification, time and budget.

We provide first-class support for complex mechanical sealing product development. We consult fully with your engineers for specific requirements, considering all options. Our team executes comprehensive and wide-ranging tests on our own specialized testbed and laboratories. We assist throughout the project planning phase, including full support for your production and logistics planning.



## Realization Phase

**Design validation step by step** - When examining support for product prototyping, you seek a partner who can assist preparing field tests to validate designs. A partner who has extensive experience, expertise, and data to support insightful interpretation of field test results based upon their own expertise. You seek a partner able to ensure your quality and manufacturing processes are robust for reliable series release and production.

We supply first samples, prototypes and assembly tools for your testing as well as advance testing of seal function before prototype field tests. Our team acts as consultant, adding insight for interpreting field test results and provides you with the assurance of our expertise and experience that highest quality standards are met for progression to series production.



## Series Production Phase

**First-class delivery performance** - You need a reliable, trustworthy supplier who acts with integrity. One with high quality standards across their products and services. A partner working with high process quality standards certified and accredited against the toughest standards including automotive. One with the logistics capability to ensure production security and delivery. You also seek someone attuned to your business needs, able to react and continuously improve series production runs.

We offer to be a long-term partner, able to supply constantly high quality diverse manufacturing with 100% quality checks, using high level quality certified standards from the automotive industry. Our certified production processes are tuned to high environmental standards. Our team also provides first class delivery performance to ensure production security and business continuity. We are committed to continuous improvement and lean manufacturing, listening to our partners for joint successes.



## Service Phase

**Support for your whole product life** - You search for fast supply of all our sealing solutions, including the availability of seals even for obsolete vehicles and equipment. You want a supplier with service operations expertise to improve your service business, offering a way to reduced total costs of ownership, as well as an established and well-known brand.

We provide service solutions to cover your short-term demands and long-term aftersales support, even for obsolete vehicles and equipment. GOETZE® is a popular brand with valued quality. Our strong marketing and sales support is set to enable better business opportunities for you.



# Tenneco and **the GOETZE® Brand**

## Rock Solid - For Pure Efficiency

Founded 1887 by Friedrich GOETZE in Burscheid, Germany, the globally well established GOETZE® brand is owned by Tenneco.

Tenneco is one of the world's leading designers, manufacturers and marketers of automotive products for original equipment and aftermarket customers, with 2019 revenues of \$17.5 billion and approximately 78,000 team members working at more than 300 sites worldwide.

Our four business groups, Motorparts, Ride Performance, Clean Air and Powertrain, deliver technology solutions for diversified global markets, including light vehicle, commercial truck, off-highway, industrial, motorsport and the aftermarket.

As a member of Tenneco, we will continue carrying the GOETZE® brand, delivering premium products to maximize our customers' satisfaction and build a long-term partnership through our reliable, efficient, and lowest total costs of ownership services.







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