



# Seals Designed for All Fluid Management Challenges



*Experience In Motion*





## Trusted when reliability matters

As conventional operating environments have become more aggressive — with applications running at higher temperatures and pressures and using more corrosive and erosive fluids — customers increasingly depend on our seals to ensure environmental safety, equipment reliability, long life and low total cost of ownership.

Customers around the world trust Flowserve seals on mission-critical applications in the oil and gas, chemical, mineral and ore processing, pharmaceutical and general industries.

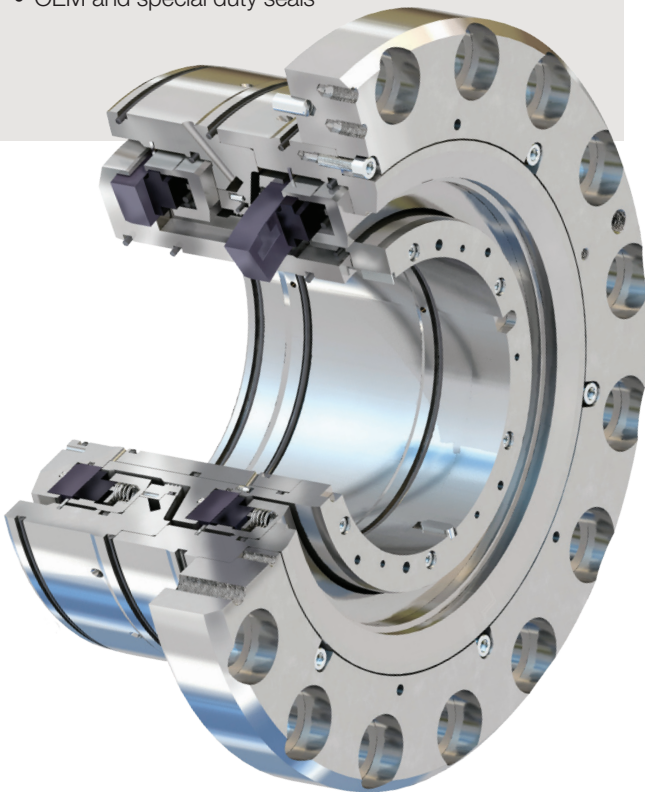
# Sealing solutions for conventional and mission-critical conditions

Flowserve seals are the industry's leading choice for standard and challenging environments alike. For more than 100 years, we've been developing new technologies and techniques to provide advanced sealing solutions that boost your bottom line. We offer the world's most complete portfolio, with more than 100 different types of seals and sealing systems to help maximize production and reduce operating costs.

## Mechanical seals

Our extensive range of mechanical seals includes:

- Standard cartridge seals
- Pusher seals
- Metal bellows seals
- Mixer seals
- Compressor seals
- Slurry seals
- Gas barrier and containment seals
- Split seals
- Elastomer bellows seals
- OEM and special duty seals



## Seal support systems

Mechanical seals don't always work alone. Seal support systems play a crucial role in ensuring seal efficiency and performance by cooling and lubricating seal faces to reduce friction and heat. Seal support systems prolong seal life, improve reliability, minimize downtime and decrease operating costs.

Our extensive range of seal support systems satisfies every piping plan with essential hardware, including:

- Reservoirs
- Gas panels
- Accumulators
- Ampliflow™ gas boosters
- Seal coolers
- Cleanpac™ filters
- Circulators

## Seal accessories

Our seal accessories help customers improve equipment reliability and safety. They include:

- DuraClear™ lubricants
- Bearing Gard™ isolators
- Cyclone separators
- Magnetic separators
- Seal Gard™ flow controllers
- SLD lubrication systems
- Solids excluder bushings





Our dynamic test labs invite customers to witness the qualification of their sealing solution.



# Together, we can help you manage your plant operations efficiently



## Improve equipment uptime

Mechanical seal performance has a direct impact on rotating equipment reliability. We use only the highest-quality materials in seals, which are designed to reduce wear, eliminate corrosion, and mitigate flashing and fretting, which collectively optimize equipment uptime and reduce unscheduled maintenance.



## Lower total cost of ownership

Many interdependent components contribute to the total lifecycle cost of rotating equipment. Our seals are built to withstand not only nominal conditions but also off-design events and external factors. Proven design investments succeed at increasing mean time between repair, reducing maintenance costs and lowering total cost of ownership.



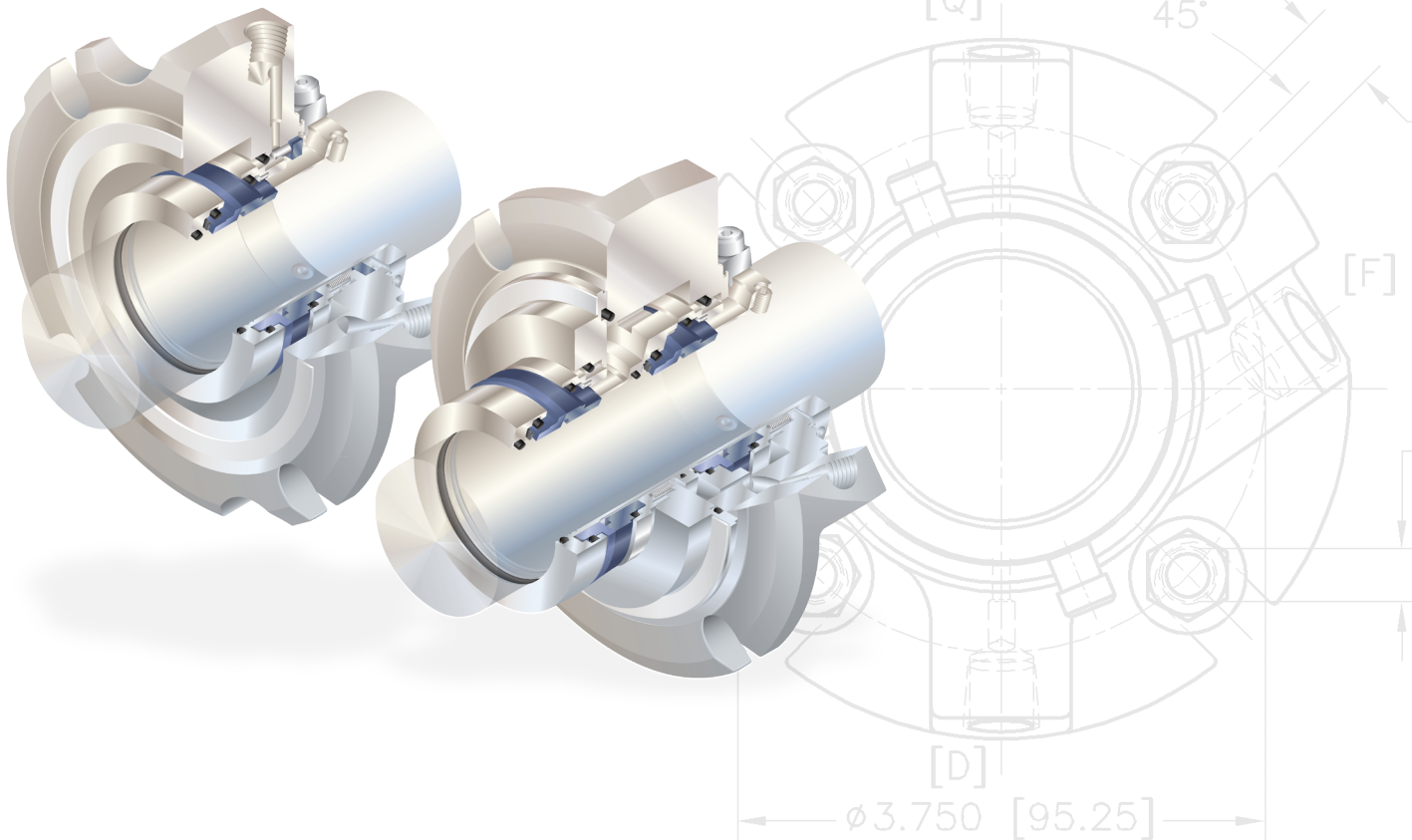
## Reduce environmental impact

Simply put, our seals seal. They keep process fluids inside rotating equipment, protecting our air, land and water.



## Increase plant and personnel safety

Our seals reduce rotating equipment downtime and unplanned maintenance, which lessens the time employees spend in high-risk areas.







## Seal. Every. Application.

We manufacture our seals to fit thousands of different models from hundreds of rotating equipment OEMs — not just Flowserve-manufactured products — so you can use our seals in virtually any industry or application.



# Maximizing your uptime



## Product testing ensures reliability

We test and validate seal designs beyond application limits to prepare our mechanical seals for real-world services.



## 72-hour turnaround equals minimal downtime

When you experience an unscheduled outage and need a new sealing solution, our Quick Response Centers are ready to design, manufacture, assemble and deliver seals to your facility within 72 hours.

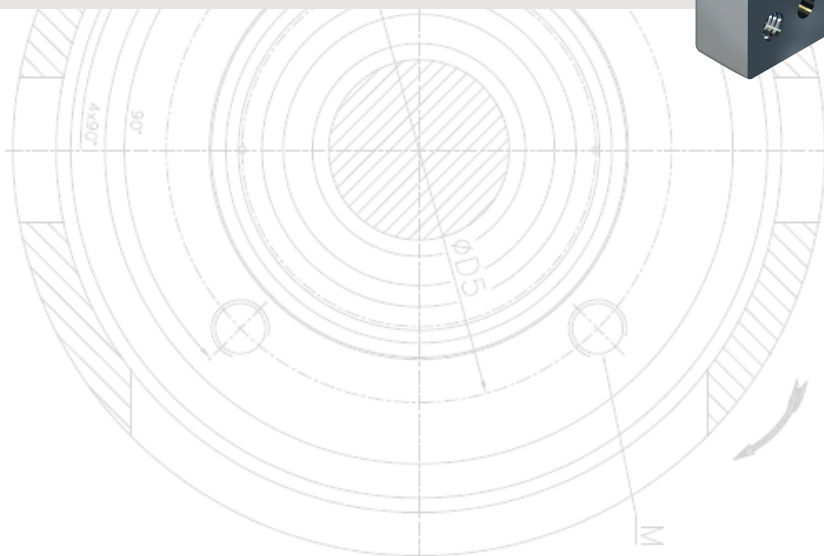
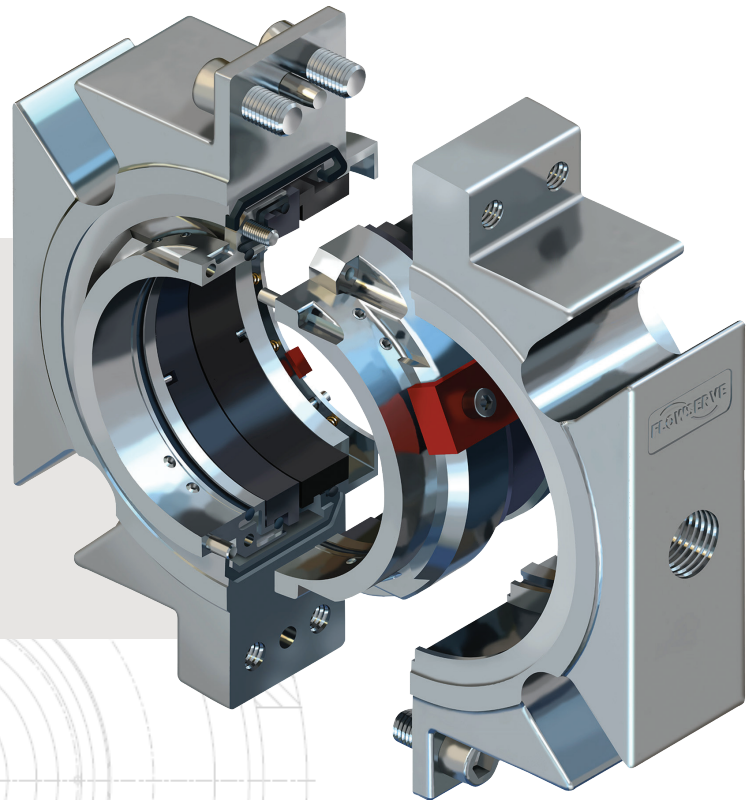


## Extensive inventory ready for immediate delivery

For rapid support of plant maintenance activities, we inventory a wide range of standard and pre-engineered seal designs for common rotating equipment along with our complementary systems and accessories, which can be shipped within 24 hours to anywhere in the world.

## Technical expertise

The success of an application isn't just about seal design. It also depends on selecting the right model, design options, materials, arrangements and piping plans. Our engineers help you determine the most appropriate seal and sealing system to ensure your plant is operating efficiently at all times.







We scrutinize every detail  
and are never satisfied with  
“good enough.”



# Choosing the right seal for the right solution

Although you'll find similar components in seals from other manufacturers, it doesn't mean that all mechanical seals perform equally. The precision with which we design, test and manufacture our products is what sets our seals apart from other seal suppliers. Our relentless pursuit of precision helps you achieve higher levels of success.



## Seal design and modeling

Analytical techniques, including finite element analysis and specialized multi-physics models, are specifically tailored for the unique characteristics of mechanical seals. Better modeling accuracy proven in the lab means safer and more reliable mechanical seals in the field.



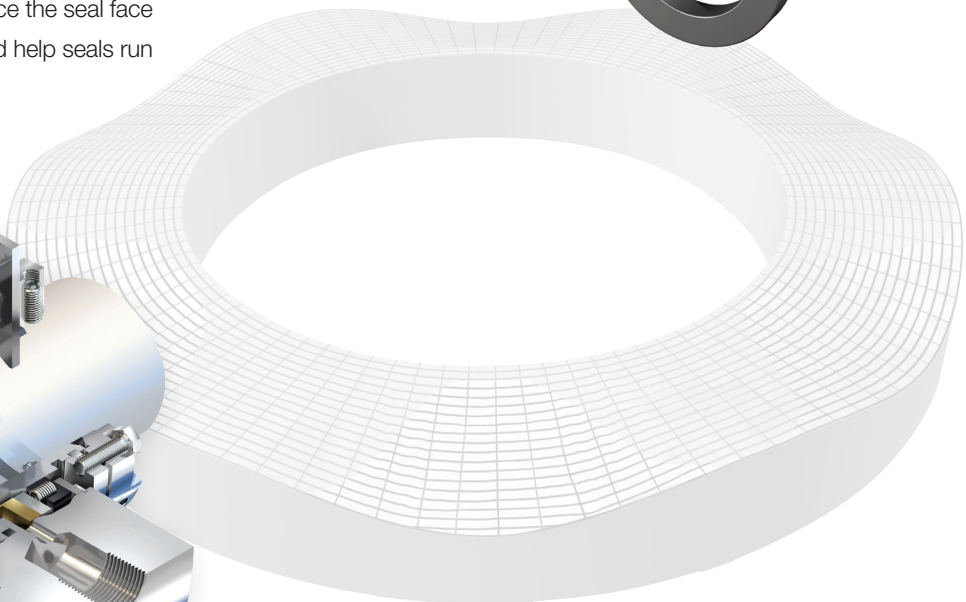
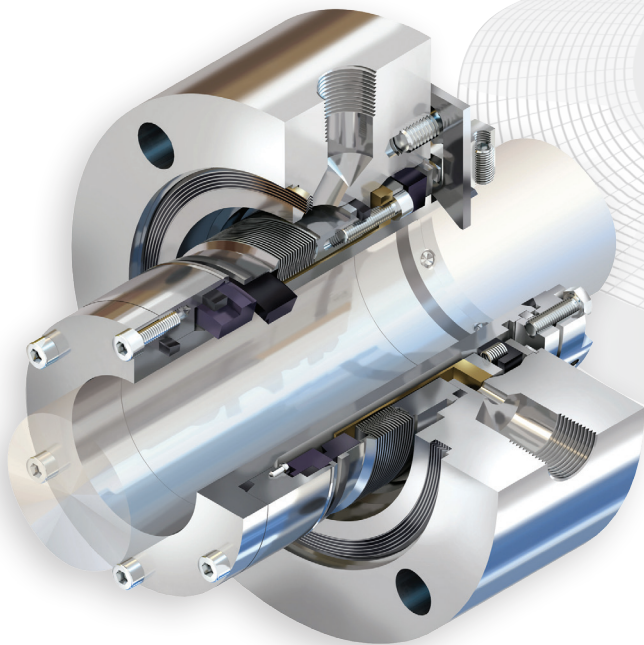
## Engineered materials

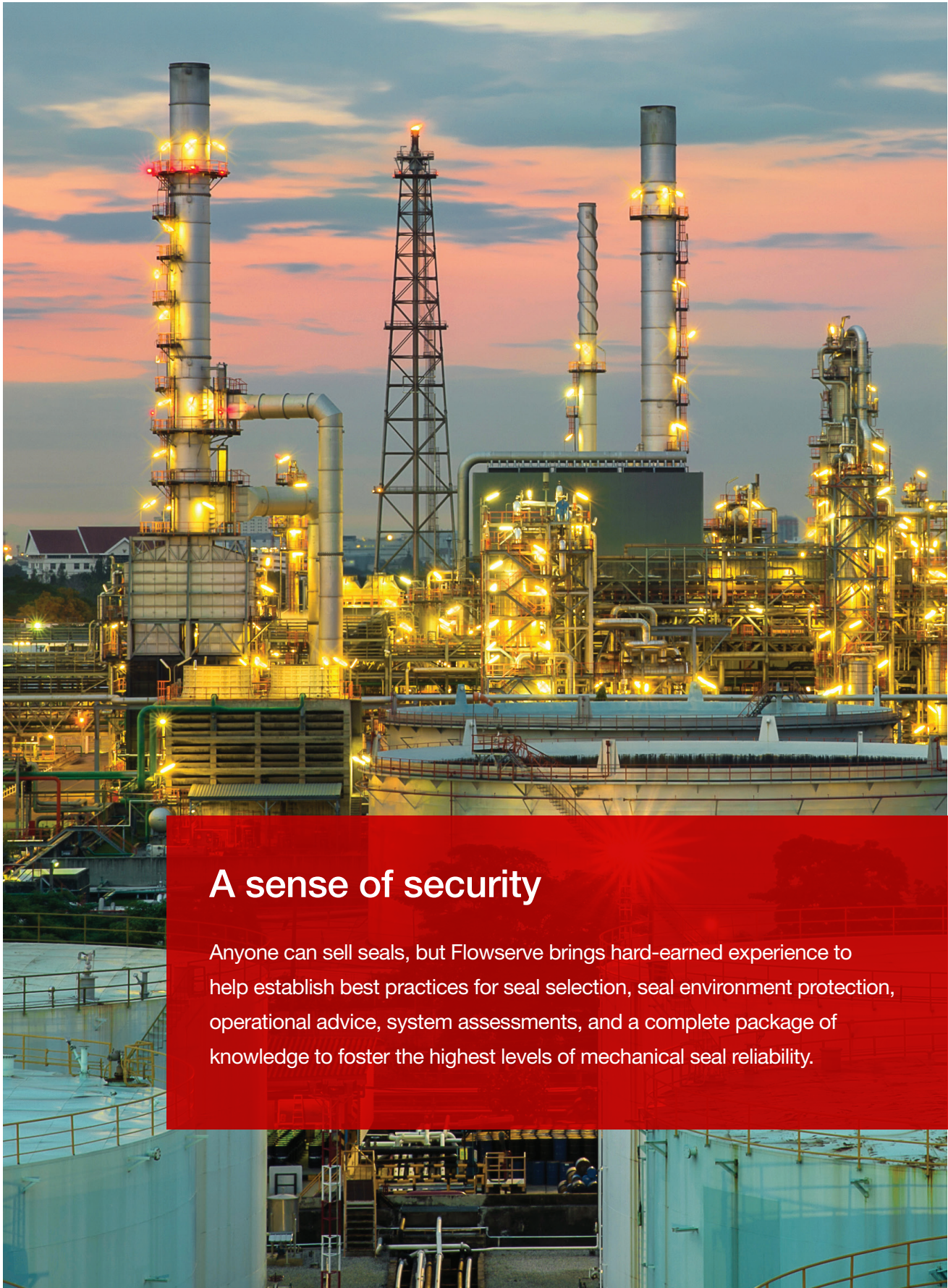
We manufacture our seals from multiple materials, including metals, overlays, ceramics and carbons. Advances in these materials have greatly enhanced seal performance. One example is our diamond-coated silicon carbide, which can reduce the seal face friction by up to 90% and help seals run cooler, longer.



## Precision Face Topography

Our innovative designs and micro features have produced seal topographies that enhance fluid film, create lift, minimize emissions, and reduce friction and wear. These advanced designs enable our seals to operate in the most demanding environments while maximizing seal life and reliability.





## A sense of security

Anyone can sell seals, but Flowserve brings hard-earned experience to help establish best practices for seal selection, seal environment protection, operational advice, system assessments, and a complete package of knowledge to foster the highest levels of mechanical seal reliability.



# Keeping you up and running

Solving the industry's most complex fluid control challenges doesn't stop with seals. Flowserve also provides a full range of technical and repair services to ensure seals and the equipment they protect are operating efficiently.



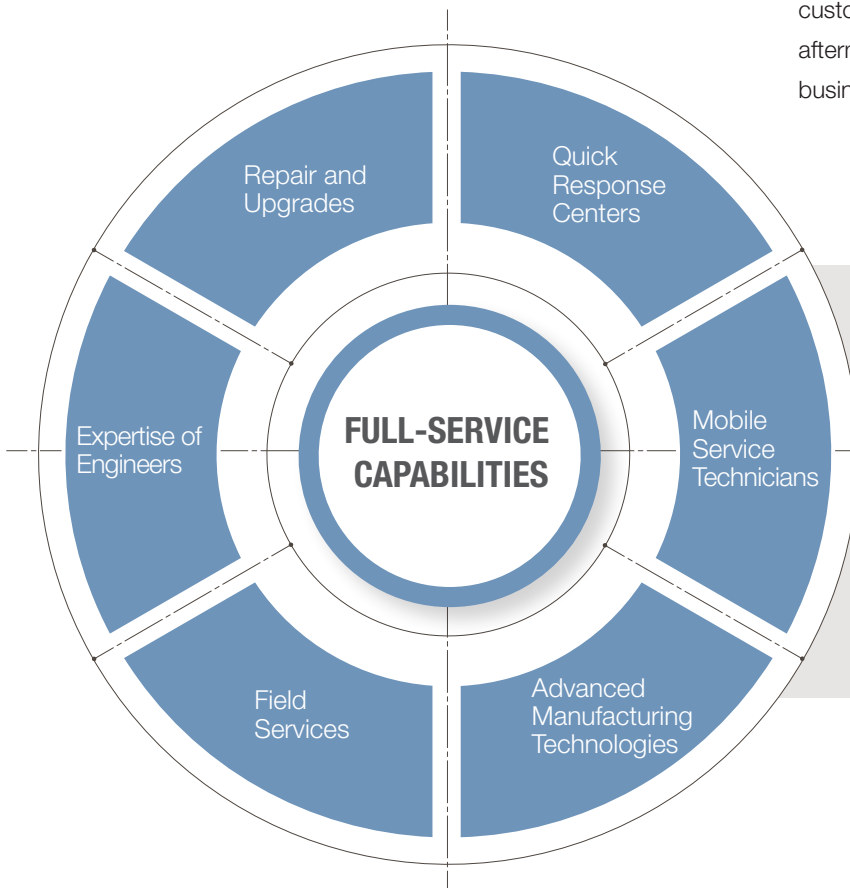
## Security knowing your plant is supported by reliable service

Our well-equipped Quick Response Centers, mobile service fleets and advanced manufacturing technologies, along with the unrivaled expertise of our engineers and technicians, enable us to address every service requirement for process equipment, on- or off-site, regardless of the seal or rotating equipment manufacturer.



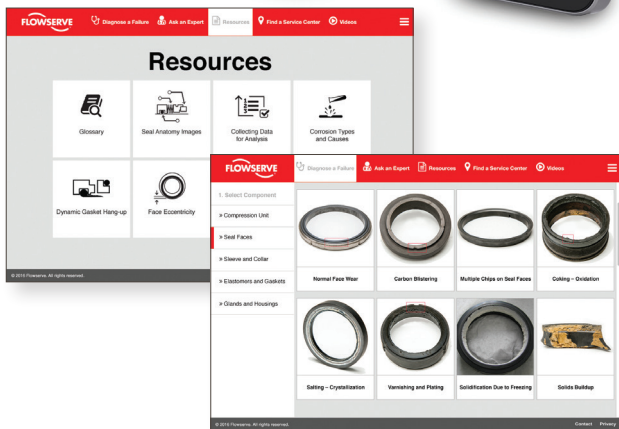
## Reduce lifecycle costs

LifeCycle Advantage solutions are long-term partnerships focused on delivering improved performance on mutually defined key performance indicators (KPIs). The objective of every LifeCycle Advantage program is to reduce lifecycle costs of your rotating equipment and improve profitability by emphasizing reliability, energy efficiency, inventory, safety, procurement, environmental impact and training. By including KPIs to measure results, customers can look beyond traditional equipment and aftermarket purchase agreements for alternative, value-based business relationships that focus on performance and results.



## Understanding the entire system – not just seals

If a seal stops sealing, we can assess your situation, including the entire system and pinpoint the cause — no matter where it is in your operation. By taking a holistic approach, we can help identify root causes, repair equipment and establish best practices to avoid recurring issues.



## Seal Failure Analysis app

Designed to visually identify and prevent mechanical seal failures, this free tool is an invaluable resource to the plant personnel tasked with troubleshooting seal failures, maintaining equipment and maximizing uptime.

- Diagnose a failure
- Ask an expert
- View helpful videos and resources
- Find a service center

[sealfailureapp.com](http://sealfailureapp.com)

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