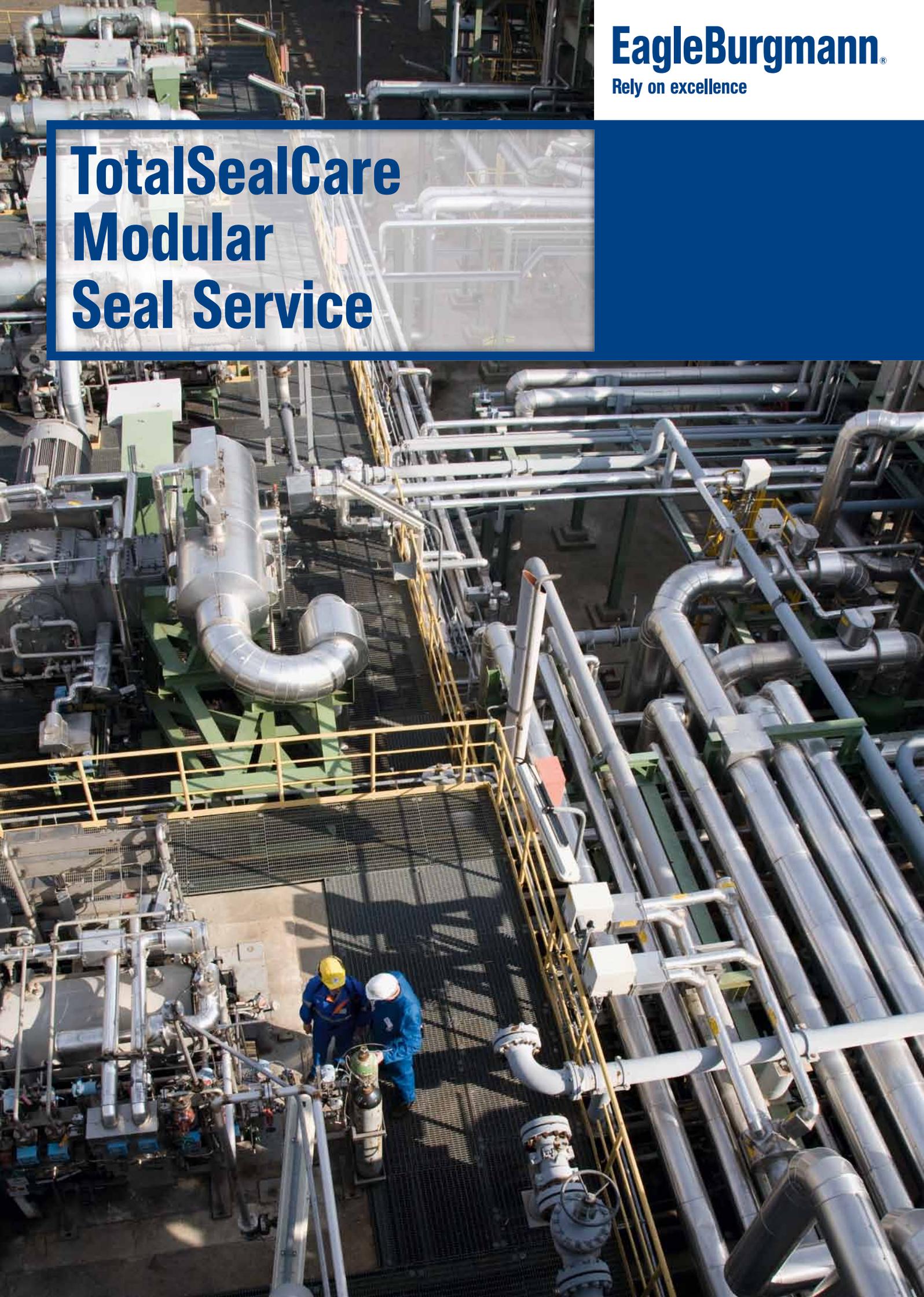


EagleBurgmann®

Rely on excellence

TotalSealCare Modular Seal Service



EagleBurgmann.

**125 years of manufacturing expertise
make us the service partner
of choice – worldwide.**



EagleBurgmann at a glance

- More than 125 years of experience in sealing technology
- More than 5,500 highly-skilled and highly-motivated employees
- Top-quality products
- 250 locations and service centers in close proximity to our customers
- A service team that is there to support you 24/7, 365 days a year
- TotalSealCare – a comprehensive service package to support the individual needs of our customers in any industry

The competitive edge in any industry

Regardless of whether you are in the mining, chemical, petrochemical, oil & gas, refinery, power generation, paper & cellulose or sugar industry, EagleBurgmann is familiar with your sector and your special sealing engineering needs. We have been making a significant contribution to sealing technology for more than 125 years and offer you an extensive product line and the expertise of more than 5,500 highly-motivated employees, backed up by a service portfolio which lives up to the claim "full service".



The expertise to solve your problems

We develop solutions for our customers that enhance system availability, reduce downtime, minimize costs and increase reliability. Our experienced scientists, design engineers and technicians apply their in-depth expertise to provide the products and services that meet your needs. We run trials and investigations at more than 50 test stations in our state-of-the-art R&D facilities, working very closely with our customers, suppliers and external research institutions.

One-stop shopping

Whatever you need, be it a gasket or a gas-lubricated mechanical seal system, EagleBurgmann has the right solution for any industrial application. Our engineers and technicians work with you to develop tailored sealing and service solutions. You get all of the benefits of a collaborative working relationship with a partner who is thoroughly familiar with your needs.

Local presence reduces response time

Time is a factor that should never be underestimated. No one is willing or able to accept extensive downtime or steep cost increases. EagleBurgmann has a network of more than 250 offices and 120 service centers in close proximity to its customers. We are there to serve you 24/7, 365 days a year. We are ready to take on your challenge.



TotalSealCare. One concept, seven modules.

The service portfolio with an individual requirement profile

Every industry has its specific requirements profile which has a major impact on machinery design (e. g. pumps, agitators and compressors). The process media also vary from industry to industry – liquid, gas, aggressive, high-value or hazardous. However, they all have one thing in common – the seal has to be leakproof and free of failures.

EagleBurgmann offers a comprehensive range of solutions that do just that. We offer a highly reliable range of products with a proven track record work, backed up by the individual TotalSealCare portfolio.

We have the idea – you have the choice

The idea behind TotalSealCare is really quite simple. Everything that is needed to deliver world-class service is packaged into seven modules, including complete repair and maintenance of all installed seals, inventory management, engineering, training and electronic documentation. You enjoy the benefits of lower costs, increased system availability and improved reliability. What sets this concept apart is the freedom to choose only those services you need. You can put together your individual combination of TotalSealCare modules, tailored to your specific service needs and preferences. We offer you customized packages which give you unparalleled flexibility and transparency.

The TotalSealCare modules at a glance

1 Consulting & Engineering

After establishing and analyzing all of the installed seals in a system, we develop standardization concepts based on the as-is status. The results we strive for are to reduce the number of seal types, sizes and materials used, and to improve the plant performance of the system. We advise you on codes of practice and statutory regulations, and indicate what actions need to be taken.

2 Maintenance

In the plant or in the service center, qualified fitters and technicians look after all the aspects of seal maintenance – installation, start-up, servicing, conversion, overhaul and repair. We record and document functionally relevant data (failure reasons and related costs). This means it is possible to evaluate seal operating times and maintenance costs on a continuous basis, thereby defining measures for extending service intervals.

3 On-site Service

Our on-site service includes the components of an overhaul service, conversions and service container. We deploy a service unit directly to your premises: equipped with the basic range of seals or a stock of seals discussed with you in advance, and staffed by qualified personnel. On-site, we assure production of the necessary gaskets, ensure that the documentation is complete and advise our customers on the selection and installation of seals. Our range of services also includes complete conversions (e.g. acc. to TA-Luft).

4 Inventory Management

Based on your individual requirements and the applicable quality regulations, we develop a concept for inventory management of complete seals and spare parts. Furthermore, we optimize stocking on site or in the EagleBurgmann service center. In this way, you reduce your administration overhead and concentrate on your key operations.

5 Seminars & Training

We offer an extensive range of continuing education programs in sealing technology. Developed for service and maintenance personnel and skilled staff and engineers from various branches of industry including refining, chemicals, power generation, foodstuffs, paper and pharmaceuticals. Our program includes group seminars, individual training and seminars specifically tailored to your requirements. At our premises or at a location of your choice.

6 Technical Analysis & Support

A team of seal specialists is responsible for rectifying process malfunctions or “bad actors”. The latest methods such as thermography or data logging are used for diagnosing critical items for the operation of the plant and for defining measures to resolve them. In our research and development centers, we perform realistic tests on test rigs or in original pumps. The objective is to extend the MTBF and to increase system reliability by individual and constructive solutions.

7 Service Agreements

We offer our customers specific agreements that are combined from the six service modules. Whether for individual seal systems, critical process elements, specific plant units or an extensive seal service for complete plants, the modular structure of our service makes it possible to satisfy individual requirements. With our well established monitoring instrument, SEPRO, we can also record all seal-related data for documentation and evaluation purposes.

Analysis, standardization and new sealing strategies can save you money.

1

Consulting & Engineering

Plant analysis

Plant survey, evaluation of the current situation on-site, analysis of bad actors and critical applications and much more.

Standardization strategies

Optimal mix of designs, component seals/cartridges, manufacturers, seal types, materials and sizes which will maximize the performance of your plant.

Consulting

On all issues relating to standards, regulatory requirements and environmental & incident handling regulations; applications consulting, identification of possible improvements and engineering alternatives.



First things first – the analysis

We take a careful look before we start suggesting improvements. Module 1 consists of analysis, standardization strategies and consulting. You get a clear picture of the current situation as well as an indication of the next steps. System assessment and evaluation of the current situation means, for example, that we look at every seal on the system. We record the location, machine type, medium and operational data. We pay special attention to issues such as bad actors and seals in critical applications which have only a limited service life. Seal selection, operation, seal and supply system, the seal-machine functional unit or critical applications are all included in a thorough, systematic analysis which lays the groundwork for an action plan designed to help save you money.





**Analysis is well worth the effort:
it can show you how to reduce costs**

Analysis provides an objective basis for developing an action plan to optimize plant performance. We identify opportunities to make improvements. We provide detailed information about possible alternatives and suggest retrofit projects. We also generate standardization strategies which are intended to minimize the number of different seal types, sizes and materials and which help reduce costs and eliminate improper use of your seals. You will be surprised how much cost saving potential TotalSealCare Module 1 is able to identify.



Fast, cost-effective service 24 hours a day, 7 days a week.

2

Maintenance

- **Installation**
Field installation, commissioning, instructions
- **Maintenance**
- **Modernization**
- **Repair**
Assessment, dismantling, cleaning, repair/replacement, pressure testing, repair reports, installation and delivery



Maintenance is better than downtime

Regular maintenance makes your life easier. It is important to monitor operating conditions and check filters/fill levels in the supply system on a regular basis. By constantly keeping an eye on things, you can avoid failures that can cost you money and, in extreme cases, leads to machine downtimes. Maintenance and service have a direct influence on MTBF (Mean Time Between Failures).

Ready to assist you around the clock

Module 2 offers you apart from maintenance, the installation and repair of seals and supply systems by qualified EagleBurgmann fitters and technicians. Our service team is there to support you 24/7, 365 days a year whenever you need us. Depending

on the precise nature and extent of the task, we carry out the work either at your plant or at the nearest EagleBurgmann service center.

Reconditioning – a cost-effective alternative

Reconditioning of mechanical seals, especially on large shafts, can be a cost-effective alternative. If an inspection reveals that refurbishment is cost-effective, the seal will be reconditioned, saving you both time and money.

Professional documentation keeps you informed

Operational data (failures, corrective action and costs) are collected and documented in a repair report. This allows us to continually monitor seal operating times and maintenance & repair costs and identify ways of extending service intervals.



Added flexibility, efficiency and availability. The benefits of on-site service.

3

On-site Service

- Inspection service
- Retrofits
- Service containers



All-inclusive package

Module 3 is our on-site service package which includes inspections, retrofits and mobile service containers – tailored to your specific needs. On large maintenance projects, we place a specially equipped service container at your production site.

The following example illustrates the advantages of this approach: We were given the task of supplying and installing gaskets and seal sets during inspection activity at a power station in Germany. The main emphasis during the service activity was on spindles and housing seals on fittings and valves throughout the power station. A service container was placed on-site, which had a stock of sealing materials to meet project needs. The container was manned by two seal experts, and contained a full set of machinery,

tools and sealing materials. This solution provided immediate access to more than 70 different static seals and stuffing box packings. The service included gasket fabrication and complete documentation for all seals that were issued (nuclear-grade quality).

We offer even more

We also offer a procurement service for special gaskets. We have experience as well as references for air emission retrofit work on entire production systems. We can deliver everything that helps you save time and money.



The optimal mix of inventory and procurement. What you should expect from state-of-the-art inventory management.

4

Inventory Management

- Optimized stockage
- Inventory administration
- Customer-specific stockkeeping



The perfect stock – let us configure it for you

Module 4, Inventory Management, means that we work together to define an individual strategy for complete seals and spare parts, tailored to the specific needs at your site. The stock can be held on-site or at our Service Center. We take full responsibility for inventory management and set up your stock based on your individual needs and applicable quality standards. The benefits – optimized logistics and guaranteed availability of seals and spare parts. We help reduce your administration overhead and save money.



From practitioners, for practitioners. Know more than others.

5

Seminars & Training

- Basic theoretical & practical knowledge
- Advanced sealing technology
- Expert-level sealing technology



Expertise – how to do a good sealing job

Module 5, Seminars & Training, is targeted for maintenance and repair teams, operating personnel and engineers, planners, etc. who need to know more than everyone else. Anyone who works in industries as diverse as refining, chemicals, pharmaceuticals, food processing, energy or oil & gas, where seals play an important role, and who wants to enhance their theoretical and practical expertise should carefully consider this module.

Always up to date

Under the motto “from practitioners for practitioners”, we keep our customers up to date with the latest developments through our extensive seminar program tailored to your needs. We provide training at EagleBurgmann facilities or on-site. Our training schedule includes basic and advanced courses, group seminars, individual training and special seminars to meet specific needs. It is not that hard to be more knowledgeable than the rest.



Technical support starts with root cause analysis – but there is much more to it than that.

6

Technical Analysis & Support

- **Analysis of failures and bad actors**

- **Diagnostics**

e.g. leakage testing, thermal imaging, data logging and flow measurement

- **Application testing**

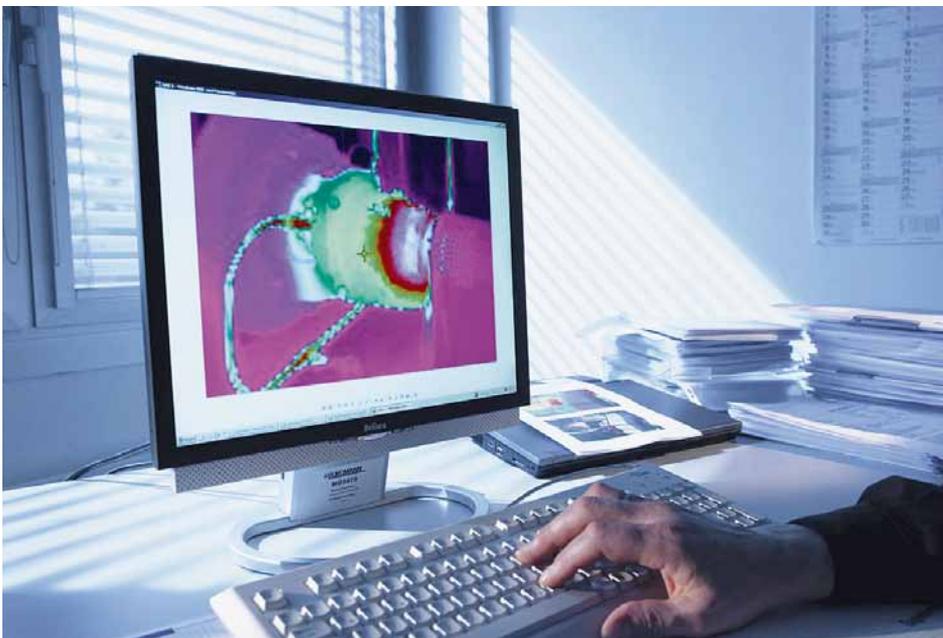


Finding solutions

When a part fails, there is always a reason. You simply need to find it. We deploy our seal technology expertise and apply tools such as thermal imaging and data logging to identify failure mechanisms, detect leaks and monitor seal performance during ongoing operation. Our experts apply thermal imaging to detect and analyze hot spots, as well as helium leakage detectors to check for gas leaks at valves, etc. Flow measurement provides valuable information about the condition of buffer fluid and cooling circuits. Data loggers and software programs collect and document up to 128 million measurements which are available for review at any time. However, even the most sophisticated equipment cannot provide all of the answers.

Our highly qualified engineering team has the necessary experience and expertise to identify failure mechanisms, draw the correct conclusions and take the appropriate corrective action.

We conduct trials under realistic conditions to test open and closed loop sealing systems. We have the state-of-the-art equipment at our R&D facilities to design solutions for your production process. Our goal is always to increase the service life of rotating machinery.





TotalSealCare is distinctive. So every service agreement is unique.

7

Service Agreements

- For critical process elements*
- For specific plant units*
- For entire plants*

* customer-specific mix of the six service modules.

- **Monitoring**
Documentation/analysis



Total flexibility: TotalSealCare

The modules discussed on the previous pages can be combined to meet your own requirements, needs and preferences. You can put together your own individual service package.

Every one is different. The service agreement

Once you have selected the modules you want, we put together a tailored, full-service package for you which is defined in a service agreement that reflects your specific needs. We can either take responsibility for a certain specified area or provide a comprehensive seal service for the entire plant.

We can offer you a service agreement which matches your exact needs. The agreement may cover individual

seals, weekly inspections, improvement of key performance indicators, immediate seal replacement by our technicians or service support for all of the seals that are installed at your plant. In some instances, we will set up a service center at or near your plant. Every service agreement is different and offers you just what you need. Our service is designed to make life easier for you. Because we provide trained personnel, you can concentrate on production and your core business. That is what we mean by customized service which helps you increase plant availability, improve reliability and reduce costs.

Keeping an eye on your seals

Our Internet-based SEPRONet software allows you to access, document and edit a comprehensive set of data about your seals. SEPRONet ECO offers all of the basic administration and documentation functionality. SEPRONet PRO includes extensive performance analysis functions for customers who have a service contract.





High-profile customers rely on EagleBurgmann

TOTAL Raffinerie Mitteldeutschland GmbH near Leuna is one of Europe's most modern refineries. The plant has the capacity to process 11 million MT of Russian crude a year. EagleBurgmann has signed a fixed price agreement for the repair of all mechanical seals installed at the refinery.

The Shell Rheinland Refinery has an annual capacity of approx. 17 million MT. As the largest refinery in Germany, it also relies on the services of EagleBurgmann. Special measures to significantly increase the service life of mechanical seals have been defined in a tailored service agreement. If you would like to find out what EagleBurgmann's TotalSealCare can do for you, please contact us. The adjacent box lists some of our customers. We would be glad to provide additional references and examples on request.

Companies that have placed their trust in EagleBurgmann and TotalSealCare

Chemical industry:

- Infracor Chemiepark Marl, Germany
- INEOS, UK
- Bayer Leverkusen, Germany
- BASF Nanjing, China
- BASF Ludwigshafen, Germany
- IQA Tarragona, Spain

Refineries:

- Shell Rheinland Refinery, Wesseling and Godorf, Germany
- Petroplus Refinery, Ingolstadt, Germany
- Petrobras, Brazil

Pharmaceuticals:

- GlaxoSmithKline, Irvine, UK
- Pfizer, Ringaskiddy, Ireland
- Cytec, Drogenbos, Belgium
- Merck, Sharp & Dohme, La Vallee, France

Power generation:

- Vattenfall Europe
- EON, Germany
- EniPower, Italy

Argentina · Australia · Austria · Belarus · Belgium · Bulgaria · Brazil · Canada · Chile · China · Colombia · Cyprus · Czech Republic · Denmark · Ecuador · Egypt · Estonia
Finland · France · Germany · Great Britain · Greece · Hungary · India · Indonesia · Iraq · Iran · Israel · Italy · Japan · Jordan · Kazakhstan · Korea · Kuwait · Latvia · Libya
Lithuania · Malaysia · Mauritius · Mexico · Morocco · Myanmar · Netherlands · New Zealand · Nigeria · Norway · Oman · Pakistan · Paraguay · Peru · Philippines · Poland
Qatar · Romania · Russia · Saudi Arabia · Singapore · Slovenia · Slovak Republic · South Africa · Spain · Sweden · Switzerland · Syria · Taiwan · Thailand · Trinidad and Tobago
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EagleBurgmann is one of the internationally leading companies for industrial sealing technology. Our products are used everywhere where safety and reliability are important: in the oil and gas industry, refining technology, the petrochemical, chemical and pharmaceutical industries, food processing, energy, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 5,500 employees contribute their ideas, solutions and commitment towards ensuring that customers all over the world can rely on our seals. Our modular TotalSealCare service underlines our strong customer orientation and offers tailor-made services for every application.

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