

EagleBurgmann®

Rely on excellence

Sealing competence in water applications



Full-Service Partner EagleBurgmann: Bearing up against all waters.

Market standards

50 million seals of the EagleBurgmann MG1 series have been successfully deployed as pump shaft seals throughout the world since 1978. The elastomer bellows seal has become the established standard in water applications.

Pump manufacturer, OEM

Installed in countless pumps series of nearly all well-known manufacturers worldwide are EagleBurgmann seals: as small and large series, with individual material combinations and versions – and in excellent quality.

System operators

Major end users of water technology systems rely on EagleBurgmann. Standardized sealing technology and adaptive service contribute to the success: Improved availability and cost effectiveness.

Product diversity

From individual construction to large series seals, from 6 mm (0.24") to more than 500 mm (19.69") shaft diameter – EagleBurgmann offers a unique range of products.

Media to be sealed

There isn't a medium for which EagleBurgmann hasn't already found a sealing solution: from ultrapure water to sludge, from drinking water to highly contaminated process water.



A wide-angle photograph of the Chicago skyline, featuring numerous skyscrapers of varying heights and architectural styles. The buildings are reflected in the calm water of a lake in the foreground. The sky is a clear, bright blue with scattered white clouds. The overall scene is bright and clear, suggesting a sunny day.

Projects, EPC

EagleBurgmann is an experienced sealing partner for BOT (Build-Operate-Transfer) projects: Early integration guarantees the correct technical configuration and realizes economic advantages.

Innovation

Using innovative coating technology to eliminate "Bad Actors" and increase the pump's period of use: challenging situations are best solved with EagleBurgmann's DiamondFace.

The sealing specialist for all water applications

EagleBurgmann is one of the world's leading system suppliers of sealing technology for water and wastewater applications. For more than 130 years we have been successfully supplying this complex market with its many application scenarios. Numerous pump manufacturers and users rely on EagleBurgmann seals.

Best sealing technology from a single source

EagleBurgmann seals are applied in all types of pumps, macerators and aerators to seal the shaft. Applications are all primary and secondary processes in water extraction, distribution and transport, in water treatment and wastewater treatment, as well as agricultural irrigation and flood control. The demands of manufacturers, operators and the environment regarding safety, leak tightness and ruggedness are challenging. EagleBurgmann responds with not only the most technically safe but also the most cost-effective solution. EagleBurgmann supplies everything from one source – without compromises.

Full service partner with a global presence

Research and development, consulting, engineering, design, production and a broad range of modular services are competencies that our customers demonstrably use to their benefit. Our comprehensive network of production facilities and sales and service centers means we are never far away, wherever you are in the world.

Sealing technology: A key component in the operation of industrial plants.



Reliability and maximum cost-effectiveness

No industrial system can operate without seals. The number of sealing locations and media to be controlled is correspondingly large, as is the number of plant components that need to be sealed: rotating equipment, such as pumps, agitators and compressors; instruments, valves and flanges, not to mention pipes and ducts carrying gases and liquids.

The reliability of the entire system depends on many individual parts. And this is where seals play an important role. As key components they not only protect the respective media and processes to be sealed, but by preventing leaks they also contribute towards the protection of humans and the environment. As such, they influence the process reliability, availability, and economic viability of the system.

Sealing technology also often offers considerable potential for cost reduction – through process-compatible design and standardization, for example. The right product portfolio and knowledge of the processes and standards used allows EagleBurgmann to implement solutions that are not only technically safe and reliable but economically first-rate as well.

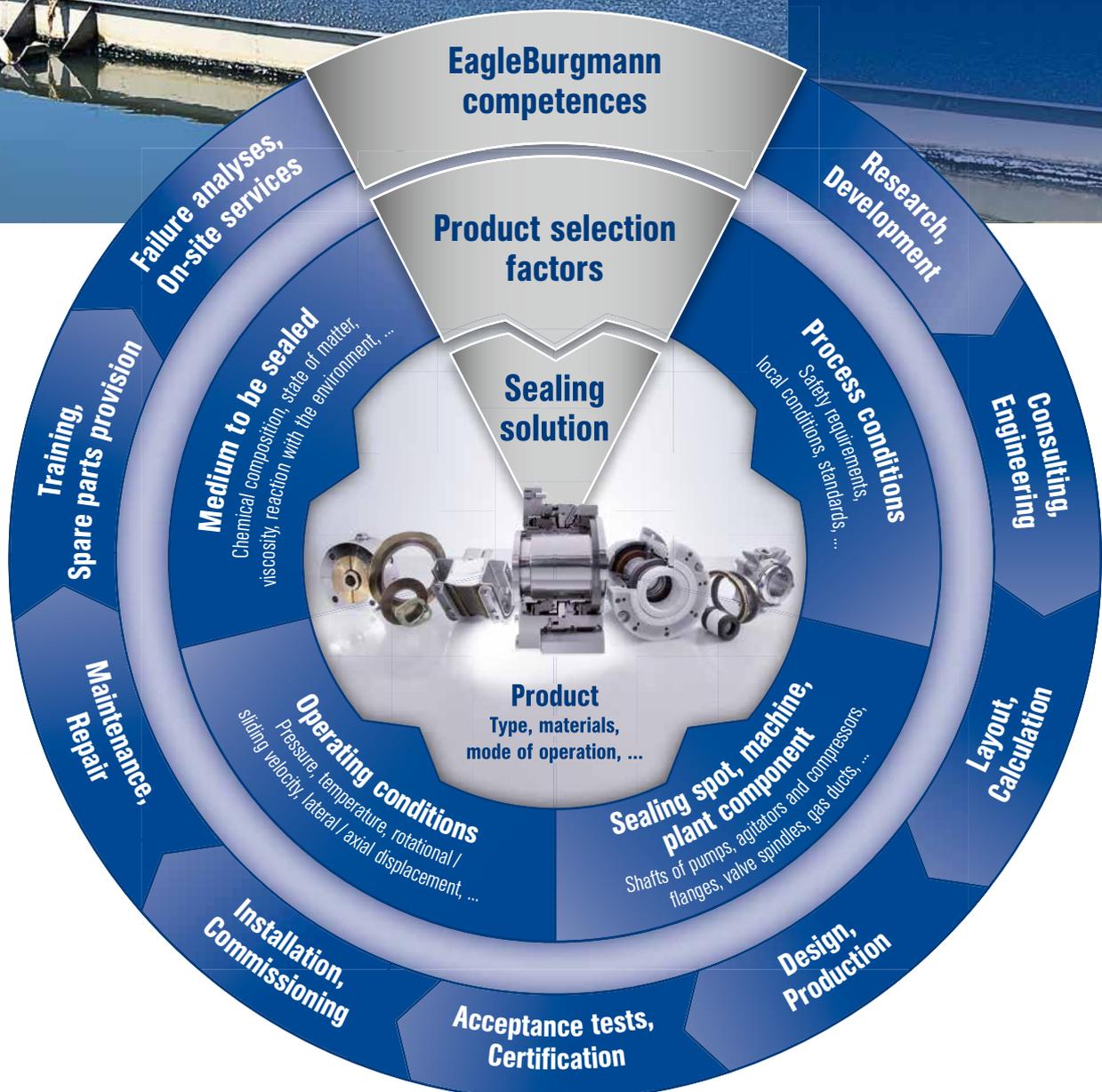




Sealing solutions for any requirement

Several factors play a major role when choosing the product, the product type, the materials used, and how it is operated: process conditions, sealing location, operating conditions, and the medium to be sealed.

No matter what requirements our customers have, we know how these factors affect functionality and economic viability, so we convert this know-how flawlessly into long-term, reliable sealing solutions. EagleBurgmann has all the expertise it needs to manage and support the entire development, life and service cycle of its sealing solutions.



Experience, demand and commitment: The building blocks for perfected sealing concepts for water applications.

Reliable market partner with a global presence

With over 60 subsidiaries and 250 locations worldwide, we use our global focus to the benefit of our customers. Thus our production network, which has plants in Europe, Asia, North and South America, will always ensure that we can produce in line with market requirements and on attractive terms and can supply regional markets.

We also have a comprehensive network of sales and service centers which covers every important economic region. Being close to our customers also means we are precisely acquainted with their processes and individual requirements.

EagleBurgmann is part of the German Freudenberg Group and the Japanese Eagle Industry Group. We are equipped with all the resources we need to offer optimum support to major customers at the international level and be their long-term, reliable partner.

Consulting and engineering with meaning

Technical expertise is gained from knowledge. It is not just knowledge of sealing technology but also of the utilized pumps, plants and systems and the water and wastewater technical processes and operating conditions.

Knowledge management helps us keep our comprehensive knowledge up to date and make it available to the entire company. We use databases, courses and training to develop our employees and bundle our expert knowledge from all around the world.

Our dedicated and committed employees use this wide and varied know-how to give our customers well-founded advice on how to choose the best technical and economical sealing solution as well as how to calculate and design according to need.

High-level research and development

We invest a great deal in research and development in order to consistently improve the performance of our products. EagleBurgmann carries out publicly sponsored research projects and works together with institutes and universities. Joint projects with customers and suppliers are a regular source of new solutions.

Two large research and development centers in Germany and Japan combined with a worldwide network of testing facilities allow us to respond flexibly to the requirements of our customers.



Broad standard product portfolio and custom solutions

A largely standardized and modularly structured product series is an essential part of our seal portfolio. But we also offer individual solutions and provide the necessary development, engineering and production capacity. Using the latest calculation and design methods, such as 3D-CAD, we adapt our products to customer-specific requirements or design new solutions.

EagleBurgmann produces in accordance with the most exacting internal and external standards. We use ultra-modern equipment, optimized and standardized production processes and a great vertical production range – and excellent employees provide the reliable base. Our quality management systems are certified e.g. in accordance with ISO 9001.

Protection of humans, the environment and industrial plants

Safety is an elementary requirement for industrial sealing technology. Ultimately, it's about protecting humans, the environment, products and resources. A lot of what EagleBurgmann does goes far beyond the legal requirements. This sense of responsibility is part of the company culture and is firmly anchored in the guiding principles of the group.

Our environmental management system is ISO 14001 certified and our work safety management system fulfills OHSAS 18001. Regular audits and numerous training courses raise awareness in employees and management alike. This develops a culture in which everyone feels responsible for work safety, the environment and health protection. Within the company and on our customers' premises.

Modular service concept ensures maximum flexibility

Products and services are two sides of the same coin. Professional installation and commissioning, practical knowledge transfer, intelligent provision of spare parts as well as regular servicing and maintenance extend operating periods and protect investments.

The need for services varies according to operator and system and is as diverse as the industry itself. Failure mode analysis, tailored on-site services and engineering services related to sealing technology are playing an increasingly important role.

Whether individual sealing systems, critical process elements, specific plant units, or a comprehensive service agreement for entire plants - our TotalSealCare modular service concept has the solution for every requirement. The individual service modules can be combined as needed to ensure maximum flexibility.



Comprehensive product portfolio: Sealing solutions for every requirement.

An overview of the EagleBurgmann product lines

Our comprehensive product portfolio covers all the requirements of water-related applications and their peripherals. From mechanical seals for pumps, agitators and compressors via magnetic couplings, carbon floating ring seals, seal supply systems, compression packings and gaskets to single and multiple layered fabric, rubber or steel expansion joints.

Based on a decades-old partnership with our customers, we have developed a product range of standard high-grade solutions which satisfy many of the various requirements. We also design and manufacture special and one-off customer-specific solutions to suit individual applications.

This may mean a large series seal or an engineered one-off solution: EagleBurgmann products are rugged, reliable and easy to install, and they offer a very attractive cost-benefit ratio.

On the following pages we introduce our product portfolio; this is followed by a number of sample applications from real life, categorized by the fields of: Water extraction, water treatment, water transportation, wastewater technology, flood control as well as industrial and special water applications.

You will find further references at our website eagleburgmann.com, or gladly upon request.

Mechanical seals for pumps



EagleBurgmann has an entire range of liquid and gas lubricated seals for sealing pump shafts. These are available as standard seals or special versions, as single or multiple seals, full or semi-split. A wide range of high-grade material qualities and surface technologies, such as the innovative DiamondFace coating, rounds off the program.

Mechanical seals for agitators



Dry-running, gas and liquid lubricated seals for steel or glass-lined tanks. For sealing in normal and sterile processes. Economic and technical requirements are completely satisfied through the rugged construction designed for practical application and the choice of materials.

Mechanical seals for compressors



The complete sealing program for all types of compressors from a single source. Available versions are single / double seal, tandem and tandem seal with intermediate labyrinth. Rugged, non-wearing and contract-free for the most stringent of permanent requirements.

Magnetic couplings



The most consistent sealing technology for areas of application with very high requirements. Hermetically sealed magnetic couplings guarantee leak-free and maintenance-free pumping and mixing. Media are reliably kept in closed system circuits.

Successful and proven mechanical seals for water applications



MG1 / eMG1 elastomer bellows seal



Cartex-SN / Cartex-DE



EK777



M7N



BT-AR

Carbon floating ring seals



Maintenance-free compact labyrinth cartridge seals with high operational performance and low leakage.

Seal supply systems



Mechanical seals and magnetic couplings need supply units for flushing, cooling, pressurization, and leakage compensation according to application, type, and mode of operation. EagleBurgmann supplies the entire range from a single source.

Compression packings



The economical and reliable method of sealing pump shafts and valve spindles. A broad product range, innovative materials, material combinations and special impregnating agents and lubricants enable solutions for even the most demanding requirements.

Gaskets



Ready to install seals or sheet materials. State-of-the-art materials, material combinations and production methods allow us to supply a multitude of versions, variations, and shapes.

Expansion joints

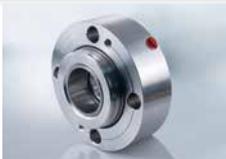


As the flexible connecting elements in air and exhaust ducts and also pipeline systems, the task of expansion joints is to compensate pressure and temperature fluctuations, vibrations and misaligned joints. They also must be reliably tight and media-resistant. Standard expansion joints and customer-specific solutions of fabric, rubber or metal are the optimal solution.

Special products



Special applications require innovative and specific solutions. In addition to special seals and sealing elements for marine technology and the aerospace industry, we also provide high-quality metal bellows, diaphragm couplings and sealing systems for rotary kilns.



SHV



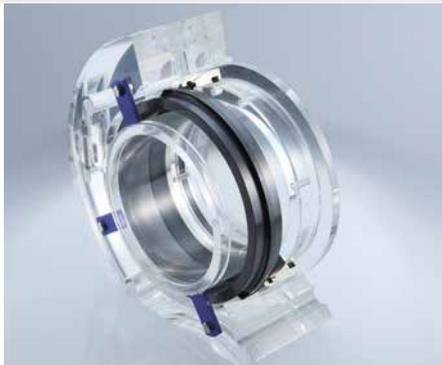
Unitex



MG9



Splitex



HGH split mechanical seal

DiamondFace seal face coating

Innovative technology

A microcrystalline layer with all the attributes of natural diamond is applied to the sliding faces by chemical vapor deposition in a vacuum furnace.

Outstanding properties

Seal faces with DiamondFace are extremely hard and resistant to wear, offer excellent thermal conductivity and demonstrate greatest chemical resistance. The layer adhesion exceeds all known practical requirements.

Convincing advantages

For mechanical seals this means a considerably longer service life with accordingly extended maintenance intervals and greatly reduced life cycle costs.

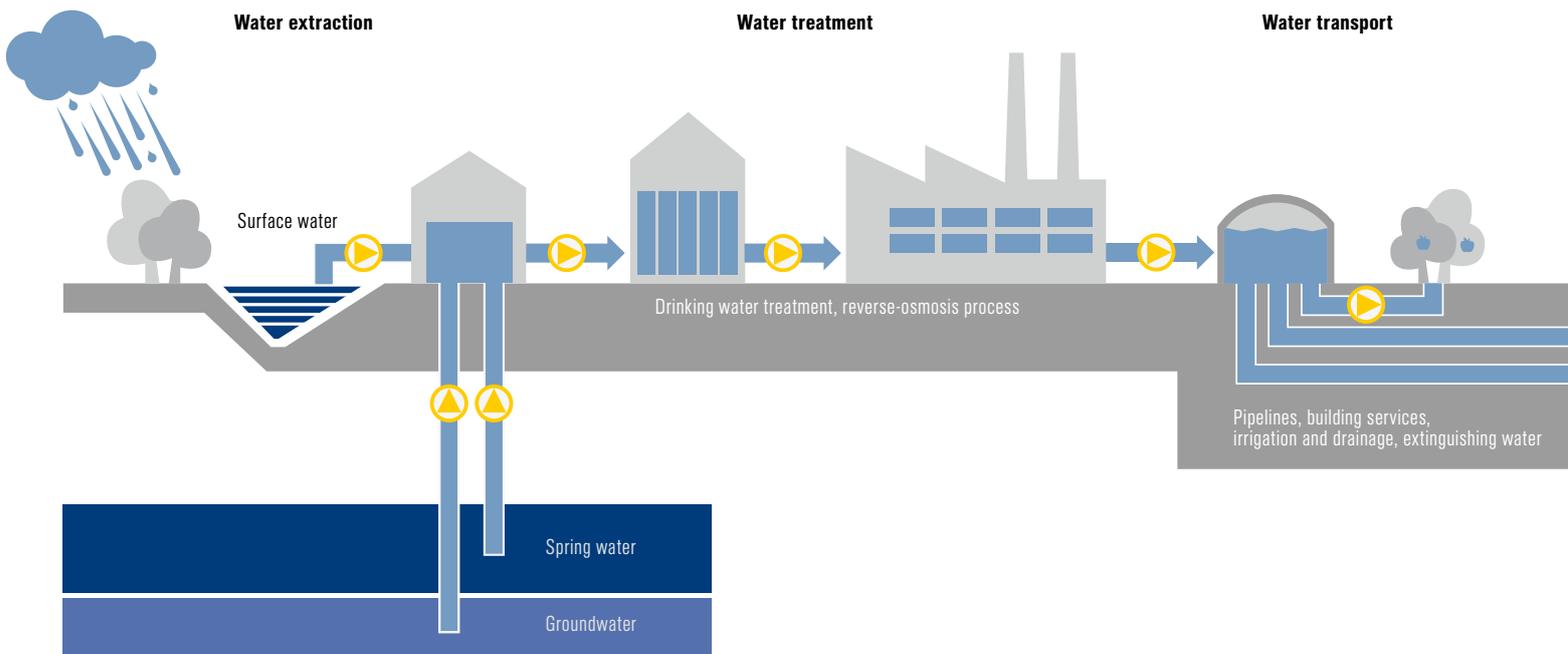
From water procurement to wastewater treatment: Sealing solutions for all applications.

Following the oil and gas and energy production, the water market is the third largest market worldwide. It covers the extraction of drinking water via water treatment, from the transport through pipe systems to the end consumer, the transport and treatment of wastewater and on to the flood control of entire cities.

Water is becoming an ever-increasing valuable commodity. Not the least because the megacities of the world and agriculture are recording increased demand. At the same time, large quantities of water are being provided for industrial applications. Whether chemicals, power plant technology or paper production, the automobile industry or metal processing, every industry consumes variously conditioned process water for the manufacture of nearly every product.

Wells, water pipe networks, drainage systems, sewage treatment plants, desalination and water treatment plants, agricultural irrigation – different types, sizes and capacities of pumps are in use in all primary and secondary processes. The requirements are as diverse as the fields of application and the machine portfolio. Excellent sealing technology by EagleBurgmann proves on a daily basis that saving resources, reliability and cost effectiveness can work together excellently.

On the other hand, nearly one billion people have no access to clean water. To redress this need, states, municipalities and the industry are working worldwide for even better solutions for the set-up and maintenance of infrastructure, for a way to use fresh water and save resources, and to find a more careful and environmentally-friendly treatment of wastewater and a sustainable flood control.



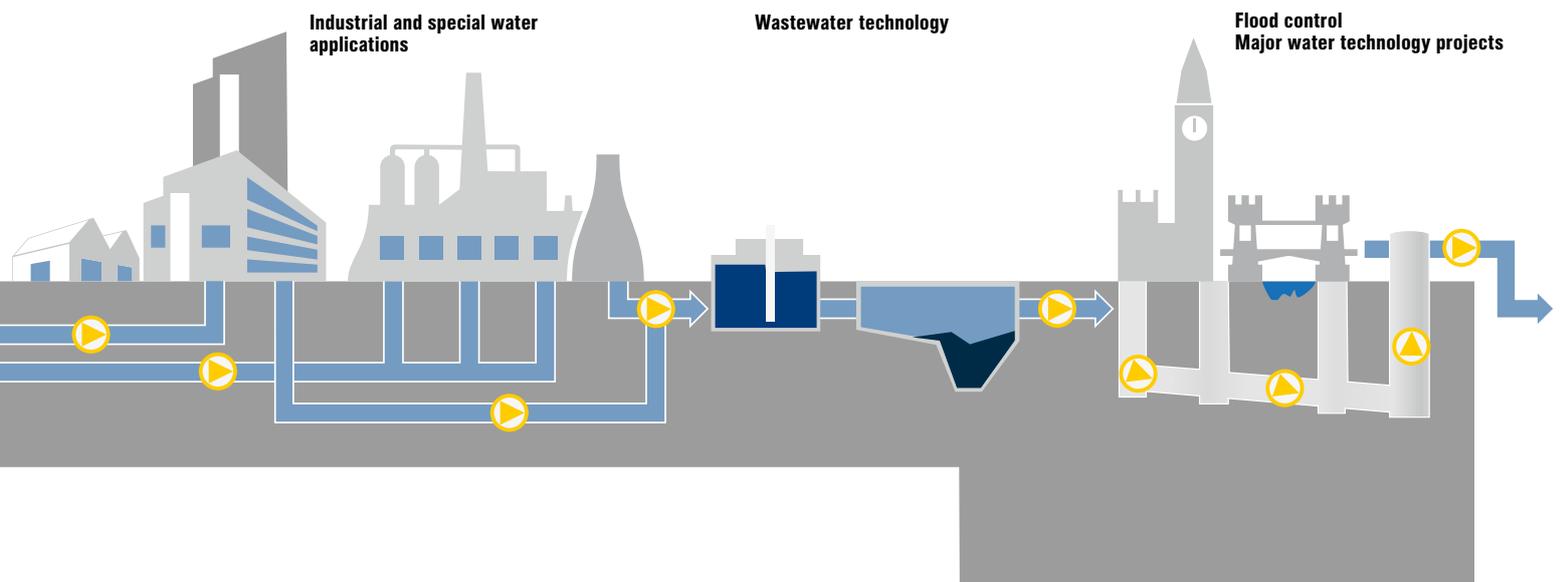
The medium of water

Water is not just water. It forms a widely varied media group of completely demineralized deionized water, from drinking water, mineral water, brine, thermal water, pit water, seawater, brackish water, rainwater to the partial currents of the most various wastewater compositions e.g. gray and black water with a high percentage of solids and pollutants and, not least, different compositions of industrial process water.

The challenge here lies in sealing the rotating equipment in water applications: depending on the purity, solid or gas content, the dissolved substances or the pH value, "water" places the highest demands on the utilized construction and face materials of the mechanical seal and also often enough on the type of seal.

For drinking water applications, not only does the resistance of the materials play a role, but also the safeness of the utilized face and structural materials of the seal must meet the strictest of standards and be certified with, e.g. FDA, WRAS, ACS or KTW.

We present the situation, the challenge for the sealing technology, and solutions in six fields on the topic of water to provide an overview of the versatility of the applications and solutions of EagleBurgmann.



Submerged: Reliable sealing in water extraction.

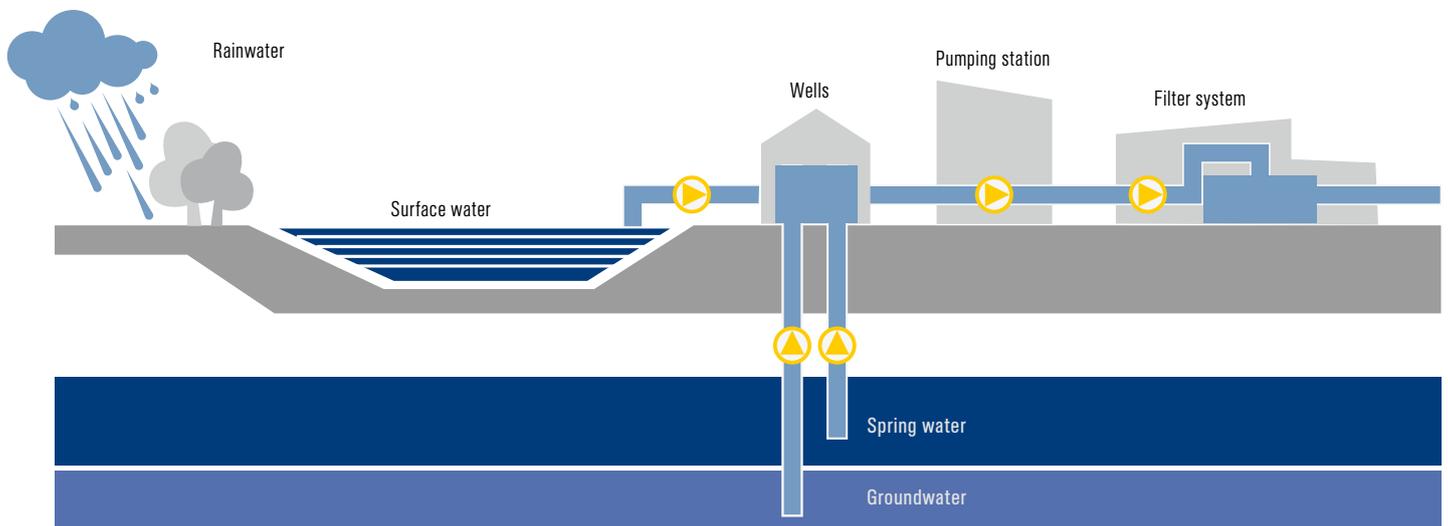


Drinking water is often pumped as groundwater or spring water to the surface from very great depths. Tubular casing and submersible motor pumps are used here and are either seated directly in the borehole or are operated underwater in deep wells. Since these aggregates are difficult to access, the components must be absolutely reliable.

For these applications requiring longevity and reliability, EagleBurgmann applies rugged seals: the million-fold proven elastomer bellows seal MG1, for example. As a universal seal it is used as single or double seal in submersible motor pumps. The MG1-MG1 tandem sealing system is operated with an unpressurized oil quench between the seals. This makes it predestined for an extremely long operating period.

However, EagleBurgmann solutions are also deployed in the volute casing pumps of water extraction, whether as dry or wet installation: the MA/MD and Cartex series cartridge seals and the HJ977GN, LA200, LB500 or M3N component seals are convincing because they are easy to install and reliable in operation, even when the medium to be conveyed is extremely polluted.

Water extraction





The tradition-steeped manufacturer, Oddesse, from Oschersleben, Germany, deploys EagleBurgmann type MG9 mechanical seals in his successful submersible motor pumps. The pumps are used, among others, in water procurement, in the industry and agriculture, in mining, shipbuilding and in the offshore sector. Operating conditions: Temperature: $t \dots 80^\circ\text{C}$ (176°F), frequency: $\dots 50$ und 60 Hz , rotational speed: $n \dots 3,600\text{ min}^{-1}$.



The Lar reservoir is located in a nature reserve approx. 50 km northeast from Tehran. The Iranian capital is primarily supplied with drinking water from there. 32 Amacan pumps from KSB are used here in continuous operation to deliver the untreated water. They are sealed with specially designed EagleBurgmann MG4 elastomer bellows seals.



Installed in the Zapadnaya pump station to the southwest of Moscow are two Indar vertical pumps. They deliver hourly up to $5,000\text{ m}^3$ drinking water to the city of the Russian capital. Both machines are equipped with EagleBurgmann M74 component seals. Shaft diameter: 120 mm ($4.72''$), temperature: $t \dots 20^\circ\text{C}$ (68°F), pressure: $p = 9\text{ bar}$ (131 PSI), rotational speed: $n = 980\text{ min}^{-1}$.



The drinking water pump station in the Dutch town of Manderveen deploys vertical type CFU centrifugal pumps from Johnson Pumps. They have been reliably delivering over 3.6 million cubic meters of drinking water in continuous operation since 2013. The pumps are sealed with EagleBurgmann M7N mechanical seals with drinking water approved materials. Further operating data: Temperature: $t = 15^\circ\text{C}$ (59°F), pressure: $p = 6\text{ barg}$ (87 PSIG), rotational speed: $n = 1,450\text{ min}^{-1}$.



At the Wahnbach dam approx. 25 km southeast from the German city of Cologne, a pumping station delivers untreated water for the drinking water supply of approx. 800,000 inhabitants in the Bonn, Rhein-Sieg, Ahr region to the nearby treatment plant. The water is extracted in various depths from the approx. 50 meter deep reservoir with a pumping capacity of $1,600 \dots 3,200\text{ m}^3/\text{h}$. Installed here are Ritz pumps which are sealed with EagleBurgmann Cartex-SN cartridge single seals. Operating conditions: Pressure: $p = 11\text{ bar}$ (160 PSI), rotational speed: $n = 1,400\text{ min}^{-1}$.



An extensive major project for water procurement and supply of the South European country of Montenegro was realized by Xylem Austria, Lowara Vogel. The untreated water is first delivered from the Bolje Sestre water extraction station by four vertical Vogel volute casing pumps to the treatment plant and then on to the Reljici pumping station (photo) located 30 km away. Here the drinking water is pumped by six Vogel multistage pumps to the high-level tank located 6 km away. From there it supplies the northern coastal area (73 km towards Croatia) as well as the southern coastal area (34 km towards Albania). All pumps are equipped with EagleBurgmann types M74 and H74 mechanical seals.



The Swiss city of Geneva and its surrounding region are supplied with up to 80 % of their drinking water from Lake Geneva and up to 20 % from groundwater. The Bella Vista groundwater pumping station operated by SIC, the regional service provider, delivers water whenever the lake water treatment plant is switched off. The station was equipped in 2012 with a 6-stage Wilo EMU borehole pump with a power of 275 kW. EagleBurgmann MG1 are used to seal the shafts. Shaft diameter: 70 mm ($2.76''$).

Treated: Focus on sealing materials.



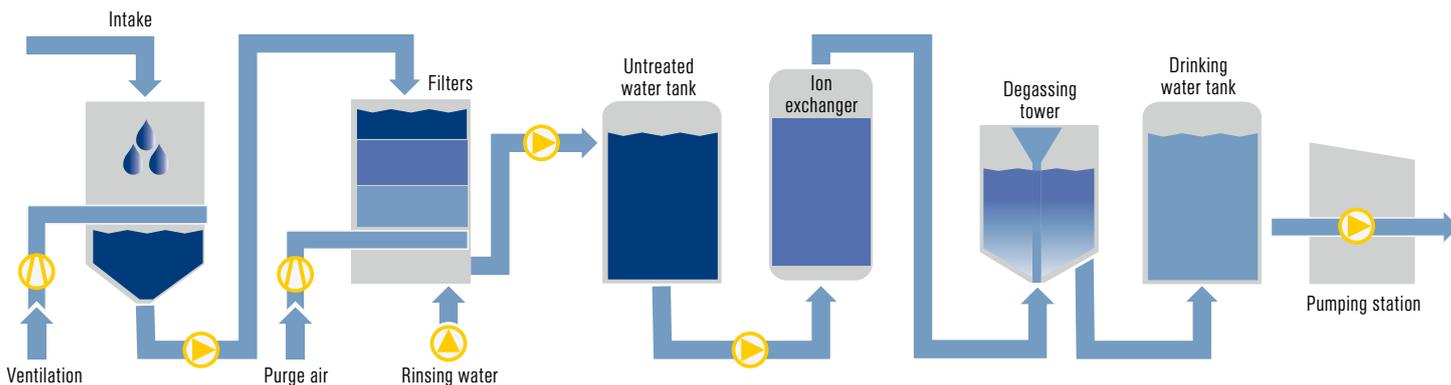
Various processes are used for the treatment of drinking water, depending on the quality of the untreated water. Mechanical, physical or chemical treatment: the end product is water as comestible. To guarantee top quality, the utilized medium-contacting seal materials need to be foodstuff approved.

Structural materials deployed in drinking water and food must be declared safe by national certification authorities. As a result, the materials will often need several certificates and approvals, e.g. as per KTW (Materials in Contact with Drinking Water), Germany; FDA (Food and Drug Administration), USA; or WRAS (Water Regulations Advisory Scheme), UK.

EagleBurgmann has the corresponding certificates for each medium-contacting material of its seals. In addition to the quality recognized as safe, our customers - regardless whether OEM or operator - can rely on the unlimited performance of our face materials: long operating periods, the least wear and optimal leak tightness are the distinguishing features of our seals.

Together with our customers and suppliers we continue to develop better solutions. And so our new generation of eMG1 and eMG elastomer bellows seals received an innovative, series-optimized silicon carbide high performance material: eSiC-Q7 is a friction and wear optimized face material with hydrodynamic properties. In practice this means up to 50% longer operating periods, expanded emergency running properties and reduced power consumption. The eSiC face material can be used in numerous water applications.

Water treatment





Grundfos BioBooster A/S develops and distributes a new generation of compact, decentralized and modular sewage treatment plants for water treatment of hospitals (shown here the system of the hospital at Herlev, Denmark), among others. These plants run maintenance-free in continuous operation. Their central components are new types of BioBooster filter units, each of which contain three EagleBurgmann MG1 shafts seals. They effectively prevent contaminated water from leaking into clean water.



Shut-off devices from KSB Service AG are installed in the municipal water supply and in water supply and treatment plants. The valve spindles here are sealed with EagleBurgmann Chemstar compression packings made of 100% PTFE with a PTFE dispersion impregnation. Valve and seal are subject to pressures up to 25 bar (508 PSI) and temperatures up to 65 °C (149 °F).



SPX-Johnson type CFB 200-400 pumps for the recirculation of separated water are installed in a membrane ultrafiltration plant of the Dutch Water Treatment Company. The medium is very aggressive, has a solids content of 50 mg/l and exhibits dissolved solids of up to 3,800 mg/l. The mix also includes toxic hydrogen sulphide (H₂S) which requires reliable leakage detection. The pumps are sealed with EagleBurgmann Cartex-DN double seals. The seals are supplied by means of the EagleBurgmann TS1016 system as per API Plan 53.



SWM Services GmbH at the Unterföhring location in Munich, Germany, is a considerable contributor for supplying the Bavarian state capital with drinking water. To guarantee the outstanding quality of the drinking water, the supply network pipeline is sealed with EagleBurgmann 9107/KH EPDM jacketed rubber-steel-gaskets.



Different KSB Etanorm pumps are installed in all areas of the water treatment plant of Sinergy Kft., a member of the Alteo Group, in the Hungarian town of Tiszaújváros. Water from the Tisza river is pumped with 7 bar (102 PSI) in the filtration. The separated permeate is discharged with 1 bar (15 PSI), the procured drinking water is fed with 3 bar (44 PSI) pressure in the water conduits. All pumps are reliably sealed with EagleBurgmann MG13 mechanical seals. Further operating conditions: Temperature: $t = +20\text{ °C} \dots +40\text{ °C}$ ($+68\text{ °F} \dots +104\text{ °F}$), rotational speed: $n = 1,475 \dots 2,975\text{ min}^{-1}$.



The drinking water treatment plant in Choisy Le Roi, France, encompasses an area of 16 ha, making it one of the world's largest plants of this type. Approx. 1.8 million inhabitants of Paris and its surrounding area are supplied with drinking water procured from the Seine. The operator Veolia had recently made considerable investments in the renewal of the technical facilities. As such, ITT Flygt installed single-stage vertical non-clogging SSF/SSFV pumps which are equipped with EagleBurgmann HGH210 semi-split mechanical seals. Operating conditions: Medium: untreated river water, flow rate: 15,000 m³/h, pressure: $p = 4.5\text{ bar}$ (65 PSI), rotational speed: $n = 420\text{ min}^{-1}$.

Desalinated: Sealing technology in reverse osmosis processes.



Seawater desalination plants are already ensuring a sustainable supply of drinking water to many countries today.

In the last few years it was possible to considerably reduce the energy expenditure for the osmosis process. This opens new perspectives for the new construction of such major water technology projects. The requirements towards pumps and their shaft seals along the reverse osmosis process chain vary greatly.

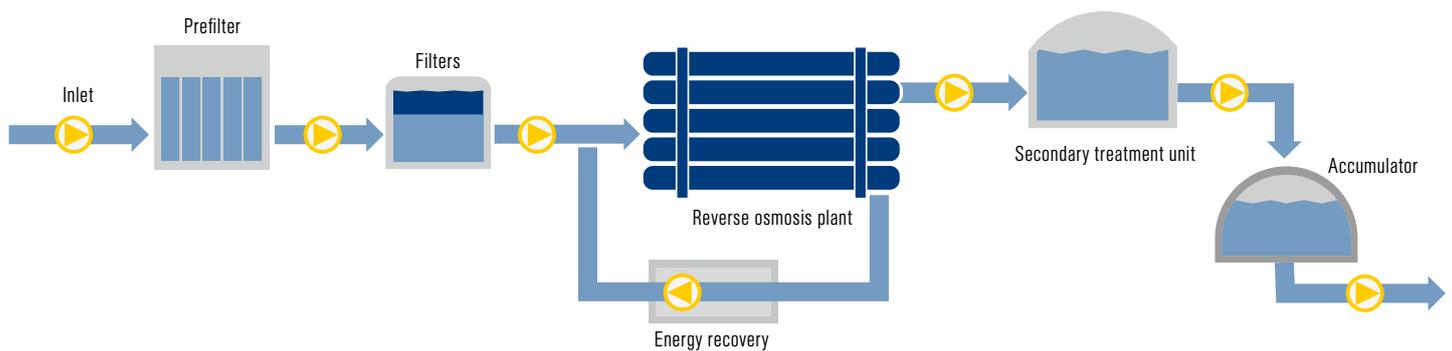
The seawater is drawn in by tubular casing pumps or large submersible motor pumps, then added to the filter systems by booster pumps, usually single-stage axially split volute casing pumps.

The purified water is then pressed through several multistage high pressure pumps into the actual reverse osmosis system. The separated brine is returned to the ocean, the procured drinking water is pumped into tanks for remineralization. Additional pumps are used in energy recovery.

The high to extremely high salt content of seawater and the separated brine and high pressures up to 60 bar (870 PSI) require a technically sound configuration of seal and materials.

The preferred seals are EagleBurgmann SHV, Cartex and H75 mechanical seals. Structural materials of choice are often Hastelloy® and Superduplex due to their resistance.

Seawater desalination





With a daily production amount of 318,500 m³ of drinking water, the Tuaspring Desalination Plant is the largest seawater desalination plant in Southeast Asia. It went into production in 2014 as the second Singapore plant and is operated by Hyflux. Several Sulzer type AFP submersible pumps with 90 mm (3.54") shaft diameter are installed in the seawater removal. They are sealed with an EagleBurgmann MG1 in a special face material combination. Operating conditions: pH 7 ... 9, temperature: t = +26 °C ... +36 °C (+79 °F ... +97 °F), rotational speed: n = 1,480 min⁻¹.



In Tungun, a suburb of Gold Coast in Queensland, Australia, a seawater desalination plant in continuous standby operation ensures that the drinking water supply of the surrounding cities is maintained. Nine ERU pumps from Nijhuis are deployed in the recirculation of filtered seawater. The shafts of the pumps are sealed with EagleBurgmann SHV1 mechanical seals. They have been operating faultlessly since 2008 without flushing. Operating conditions: Temperature: t ... 28 °C (82 °F), pressure: p = 65 bar (943 PSI), rotational speed: n = 1,500 min⁻¹.



The seawater desalination plant at La Caleta on Tenerife, Spain, produces 10,000 m³ of drinking water each day, thus covering roughly 40% of the requirement of the surrounding communities. The plant operated by Ayuntamiento de Adeje was built completely underground for ecological reasons. All five Sulzer ZF200 high pressure booster pumps are sealed with EagleBurgmann type SHV mechanical seals. Operating conditions: Pressure in the seal chamber: p = 55 bar (798 PSI), rotational speed: n = 1,679 min⁻¹.



Horizontal shaft, double suction turbine pump type C of Ebara, Japan. These large pumps exhibit a high degree of efficiency, e.g. when pumping water in the concentration process of seawater desalination plants. Successfully sealed with two each EagleBurgmann EK777 single seals and supplied in acc. with API Plan 31+65. Operating conditions: Shaft diameter: 180 mm (7.09"), temperature: t = 30 °C (86 °F), discharge pressure: 33.9 barg (491.7 PSIG), rotational speed: n = 1,190 min⁻¹.



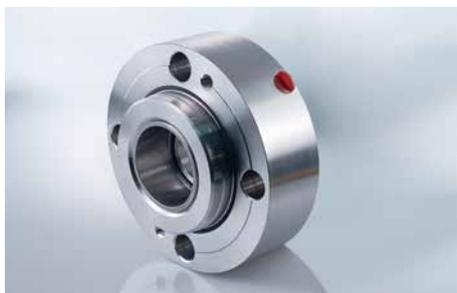
The Spanish company Abengoa operates a reverse osmosis plant as DBOOT project (Design, Build, Own, Operate and Transfer) in Skikda in Algeria. 100,000 m³ of drinking water is procured daily from the Mediterranean Sea. The shafts of the Sulzer inlet pumps (type ZE-400) are sealed with EagleBurgmann H75. Due to the high proportion of sand, EagleBurgmann cyclone separators ZY203 (API Plan 11) are installed to protect the seal. Pressure: p = 6 bar (87 PSI).



Fapmo centrifugal booster pumps (type 600700H) deliver water from the Red Sea to the reverse osmosis in Yanbu/Marafiq, Saudi Arabia. The complex consists of a 690 MW power station and two desalination plants with a daily drinking water capacity of 60,000 m³. EagleBurgmann Cartex-QN cartridge seals, supplied in accordance with API Plan 32, reliably seal the pumps. Shaft diameter: 158 mm (6.22"), temperature: t = 20 °C, 44 °C, 80 °C (68 °F, 111 °F, 176 °F), seal chamber pressure: p = 0,8 barg (1.6 PSIG).



A multistage type MNR06 high pressure pump of Fapmo, France, was delivered for the reverse osmosis process for the expansion of the seawater desalination plant Sur in Sharqiyah, Oman. It is sealed with an EagleBurgmann SHV2 mechanical seal. Operating conditions: Temperature: t = +22 °C ... +50 °C (+72 °F ... +122 °F), pressure: p = 71 bar (1,030 PSI), rotational speed: n = 3,150 min⁻¹.



The desalination plant Al-Zawrah in the Ajman emirate was planned and built by the Spanish Cadagua. It has a daily drinking water production of approx. 45,600 m³. Seven KSB RPH pumps are installed in the reverse osmosis plant. They are sealed with EagleBurgmann SHV1 mechanical seals. Temperature: t = +18 °C ... +35 °C (+64 °F ... +95 °F), pressure: p = 63 bar (914 PSI), rotational speed: n = 2,770 min⁻¹.

Moved: Seals for continuous performance.



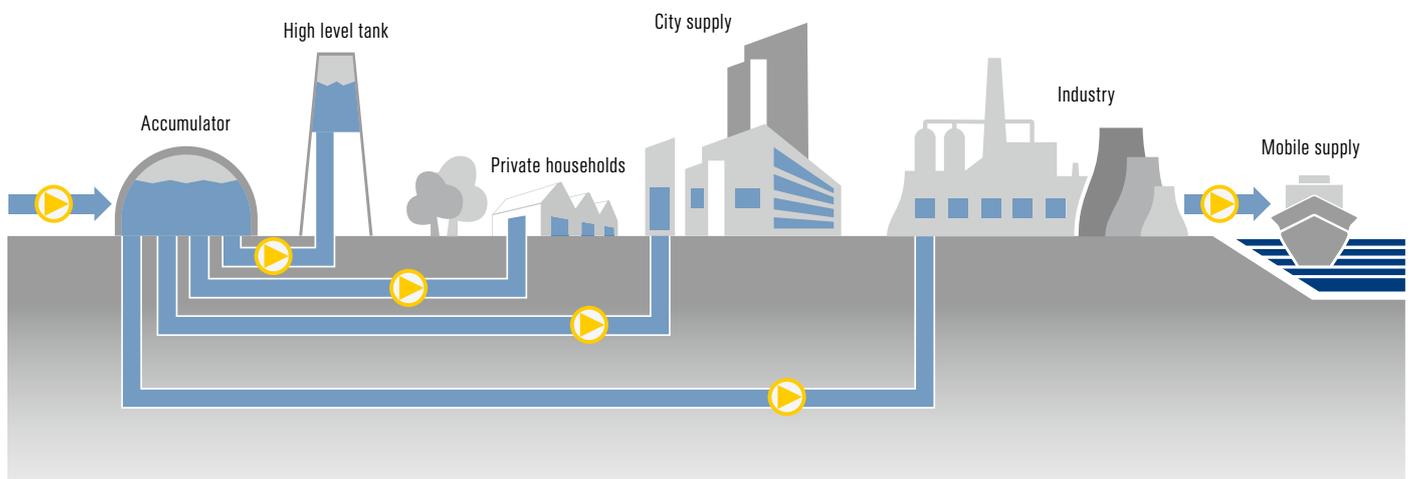
Water transport means transportation across large distances through pipelines or in the drinking water pipes of municipal networks and up to fine distribution within buildings: Pumps keep the medium under pressure and in movement. Large dimension pipeline pumps with a pumping capacity of 15 - 20,000 cubic meters per hour are no longer uncommon, and the demand for higher performance is growing increasingly.

The consumer, on the other hand, is requesting more continuous and less high performance. Whether pressure boost pumps in the drinking water network or pumps in heating circuits - they often run for years without any interruptions to speak of - also thanks to the mechanical seals of EagleBurgmann. Impressive proof: The end user of a centrifugal pump needed to replace the installed EagleBurgmann M3N after 16 (!) years of hot water operation.

It is not always necessary to master ultimate challenges for the applications in the sector of water transport and distribution. Availability, longevity and ruggedness - those are the properties sought by the sealing technology.

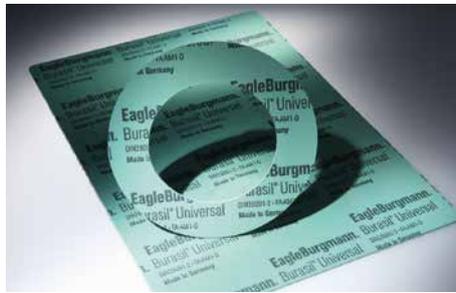
Whether in irrigation and drainage, in swimming pools or garden pumps or in fire extinguisher pumps: EagleBurgmann supplies the optimal seal in each case. From the BT-AR small large series seal to Engineered Systems for pumps with a shaft diameter of up to 500 mm.

Water transport





Multistage Hilge sterile pumps of the Contra series are also installed for the distribution and storage of various qualities of pharmaceutical waters. They are CIP and SIP capable and also EHEDG certified; parts with product contact are executed in the Hygienic Design. Successfully sealed with EagleBurgmann type SHJ mechanical seals. Typical operating conditions: Temperature: $t = +20\text{ }^{\circ}\text{C} \dots +90\text{ }^{\circ}\text{C}$ ($+68\text{ }^{\circ}\text{F} \dots +194\text{ }^{\circ}\text{F}$), pressure: $p = 2 \dots 9\text{ bar}$ ($29 \dots 131\text{ PSI}$), steam sterilization at $+121\text{ }^{\circ}\text{C} \dots +135\text{ }^{\circ}\text{C}$ ($+250\text{ }^{\circ}\text{F} \dots +275\text{ }^{\circ}\text{F}$).



For the regional transport of wastewater, the German pump manufacturer Wilo SE deploys EagleBurgmann Buratex compression packings of graphite coated cotton in his centrifugal pumps. Challenges, such as the high solids content, pressures up to 10 bar (145 PSI) and temperatures up to $35\text{ }^{\circ}\text{C}$ ($95\text{ }^{\circ}\text{F}$) are not a problem for the shaft seal. The pump case is reliably sealed with EagleBurgmann Burasil Universal fibrous material gaskets (see picture).



A Swiss paper producer operates Karhula (Sulzer) double suction centrifugal pumps of the type ZPP 11-250. They are installed as mixer pumps in pulp treatment and as headbox pumps. After four pumps with two sealing points each were retrofitted to EagleBurgmann Splitex split mechanical seals, the availability of the system increased significantly. Operating conditions: Medium: Water with pulp content $<5\%$, temperature: $t = 40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$), pressure: $p \dots 3\text{ bar}$ (44 PSI), rotational speed: $n = 1,050\text{ min}^{-1}$.



Nijhuis HGT1-350.500 extinguishing water pump skids are deployed in the Tempa Rossa oil field in Italy, which is operated by Total E&P Italia. The water is provided as required with a volume of $1,330\text{ m}^3/\text{h}$ and a pressure of 8.4 bar (122 PSI). The horizontally split pumps with bearings on both sides are usually sealed with EagleBurgmann Buraflo compression packings, but Cartex-SN cartridge seals are installed in this case.



The paper production has installed numerous pumps for conveying the central medium water in different qualities and compositions. To pump fresh water, one end user from Switzerland uses an Allweiler NHT100-200 volute casing pump. After packings with flushing were retrofitted to EagleBurgmann Unitex cartridge seals without flushing, the operating costs dropped significantly. Operating conditions: Temperature: $t = 20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$), pressure: $p \dots 5\text{ bar}$ (73 PSI), rotational speed: $n = 2,900\text{ min}^{-1}$.



Speck BADU 90/15 pumps have been among the most successful swimming pool pumps on the market for decades. A reliable shaft seal plays a significant part in that. Type BT-AR EagleBurgmann BT elastomer bellows seals are installed in the BADU series after they had been qualified in extensive practical tests on the systems of the pump manufacturer in Neunkirchen/Germany. Operating conditions: Shaft diameter: 20 mm (0.79"), temperature range: $t = +28\text{ }^{\circ}\text{C} \dots +38\text{ }^{\circ}\text{C}$ ($+82\text{ }^{\circ}\text{F} \dots +100\text{ }^{\circ}\text{F}$), pressure: $p = 0.8\text{ bar}$ (11 PSI), flow rate: $15\text{ m}^3/\text{h}$, rotational speed: $n = 2,850\text{ min}^{-1}$.



The UNIBAD bathing water circulating pumps with integrated hair and fiber filter, from the German pump manufacturer Herborner Pumpentechnik, are deployed in bathing complexes, water entertainment areas, and theme parks. The pumps are sealed with EagleBurgmann MG1 single elastomer bellows seals made of non-wearing materials. Operating conditions: Temperature: $t \dots 40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$), pressure: $p \dots 4\text{ bar}$ (58 PSI), rotational speed: $\dots 1,800\text{ min}^{-1}$.

Clarified: Wastewater pumps sealed properly.

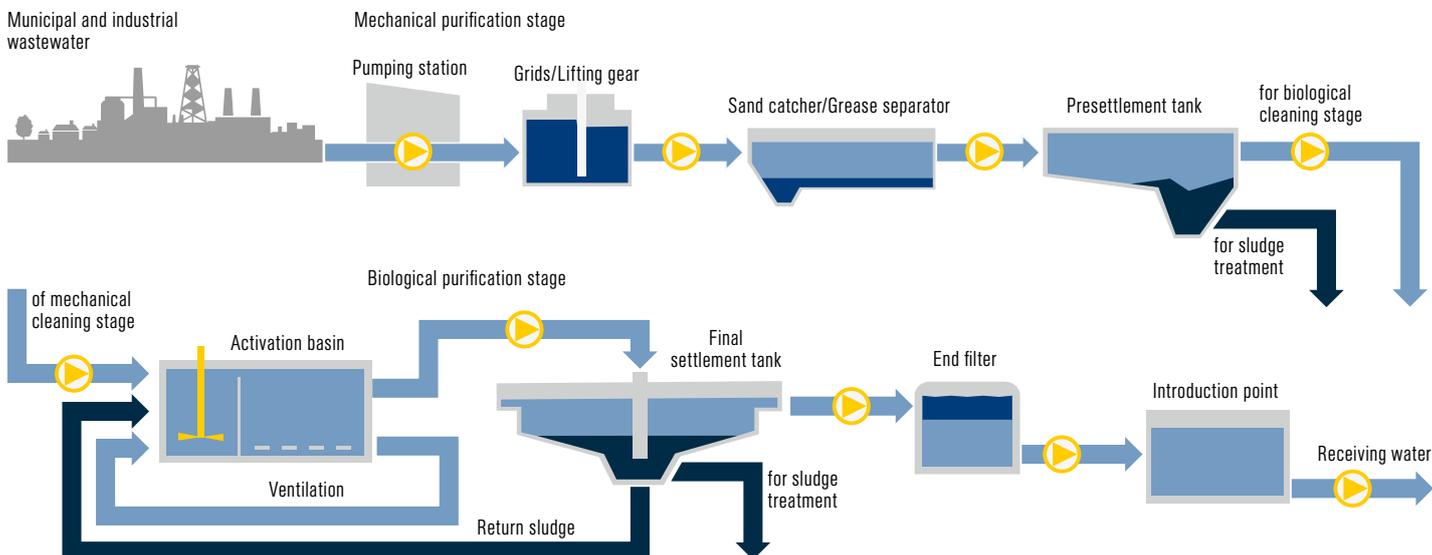


The pumping of wastewater places great demands on the installed circulation, submersible and eccentric screw pumps and the macerators and aerators. Solids content, gas content and alternating medium composition also stress the shaft seals to a high degree. Clogging or plait development in wastewater pumps is very problematic anyway. Sensitive zones are the gap between the impeller and housing, the impeller inlet edges and the mechanical seal compartment.

The protection of the seal and functionality of the pumps are guaranteed by the interaction of various measures: openly configured seal compartment, A-shaped seal cover, product-protected springs, self-cleaning large dimension single springs in the rotating part of the seal and resistant materials of seal faces and stationary seats and secondary seals.

EagleBurgmann seals for the wastewater sector are the suitable solution for all operating and process conditions. The optimal seal is available depending on the solids content of the medium: For <math>< 5\%</math>, e.g., the elastomer bellows seals of the MG series with large exterior spring, for <math>< 10\%</math> the HJ977GN with protected spring (also perfectly suited for plait-developing media). EagleBurgmann cartridge seals of the Cartex series are deployable even up to 40% solids in the medium.

Wastewater technology





The UNIPUMP wastewater block pumps of the German manufacturer Herborner Pumpentechnik are preferably installed in process engineering plants, e.g. for the safe function of wastewater transport systems on ships. The pumps are sealed with an EagleBurgmann MG1 single elastomer bellows seal made of non-wearing materials. Optionally available in double version with quench for dry running prevention. Operating conditions: Temperature: $t \dots 60\text{ }^{\circ}\text{C}$ (140 $^{\circ}\text{F}$), pressure: $p \dots 6\text{ bar}$ (87 PSI), rotational speed: $n \dots 3,600\text{ min}^{-1}$.



The pumping station Laakwijk in The Hague, Netherlands, was modernized in 2013 and equipped with Nijhuis type RW1-500.735 high performance pumps. The wastewater from households and accumulated surface water within the municipal areas is pumped here to the sewage treatment plants of Delfland. Operating conditions: Pressure: 2.8 bar (40 PSI), capacity: 3,400 m^3/h . Double shaft seals of the type EagleBurgmann Cartex-DN are installed here. They are supplied by an EagleBurgmann QFT2000 quench tank.



Hidrostal screw centrifugal impeller pumps of the PeroClean / Selfclean series are the solution for preventing deposits in the pump sump. The system of screw centrifugal impeller, special suction head and adapted pump sump sets solids and fibrous materials of the wastewater in rotational motion, thus enabling complete suction. The correct shaft seals for this pump series are EagleBurgmann MG1 in tandem arrangement with materials adapted to the product and atmosphere side. Delivery head: $h = 15\text{ m}$, rotational speed: $n = 2,850\text{ min}^{-1}$.



Dewatered sewage sludge (dry residue content up to 36%) with admixtures of caustic lime is pumped by a Seepex hopper pump BTI 17-24. The demanding application is sealed with EagleBurgmann Cartex-QN in cartridge design. Further operating conditions: Temperature: $t = 20\text{ }^{\circ}\text{C}$ (68 $^{\circ}\text{F}$), pressure: $p = 12\text{ bar}$ (174 PSI), delivery rate: $1 \dots 4\text{ m}^3/\text{h}$.



Installed in the central sewage treatment plant of the Polish city of Poznan are 12 Netzsch NEMO eccentric screw pumps of the type NM125 for the recirculation of sewage sludge - two machines each per digestion tower. They are reliably sealed with rugged EagleBurgmann MG1. The pumps have been running faultlessly to the satisfaction of the end user for nearly 20 years. Operating conditions: Temperature: 36 $^{\circ}\text{C}$ (97 $^{\circ}\text{F}$), delivery rate: 80 m^3/h , rotational speed: 130 min^{-1} .



An ultra-modern wastewater system was recently erected on Germany's second largest island of Usedom in the Baltic Sea. Among others, it includes eight pump stations each equipped with several Wilo EMU FA pumps. The wastewater is pumped to the sewage treatment plants in the Polish Świnoujście over a 100 km long pressure line network. The wastewater system is challenged by the different seasonal workloads. During the summer there is 40% more wastewater to manage. The reliability of the pumps is secured, not least, by EagleBurgmann MG1 elastomer bellows seals in tandem arrangement.



The Gut Großblappen purification plant is one of two sewage treatment plants which cleans the household and industrial wastewater of the German city of Munich. The pipe systems of the treatment plant are reliably sealed with EagleBurgmann Bursil universal fibrous material gaskets. The seal consists of high-grade aramid fibers and special functional fillers with NBR rubber.



Vertical shaft mixed flow pump of Ebara Japan. These large VZ type pumps are applied in e.g. wastewater treatment plants. EagleBurgmann has experience in providing mechanical seals of the S series. Shaft diameter: 220 mm (8.66"), rotational speed: $n = 259 \dots 370\text{ min}^{-1}$.

Powerful: Seals for flood control and major water technology projects.



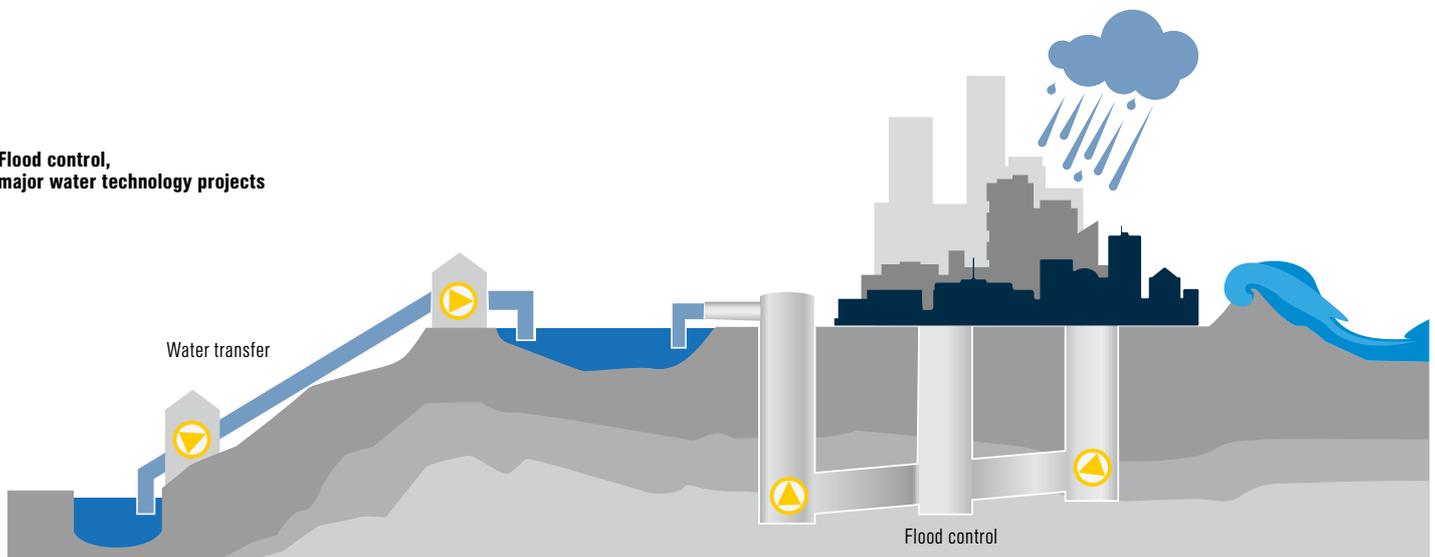
Climate change, environmental protection and growth are causing more large cities to specifically collect and drain rainwater and surface water, or storm water from coastal regions. Deep shafts and large-scale tunnel systems are being built for that purpose in London or Tokyo, for example. At the bottom of the collecting shafts, which in London have a diameter of over 30 meters, super pumps are installed which impress with mega data: weighing over 50 t, with more than 12 MW drive power, over 100 meters delivery head and a volume throughput of over 300 cubic meters per second.

Even the required seals for these gigantic pumps can sometimes weigh more than 300 kg. Due to the cramped conditions and the vertical pump construction, mechanical seals are often executed in split design. Since the pumps are difficult to access in the 100 m deep shafts, the seals must hold up until the respective pump inspection.

And the sealing technology challenges continue to increase: EagleBurgmann is designing and building split seals for multistage pumps with shaft diameters over 500 mm (19.69") and for static pressure peaks of up to 50 bar (725 PSI) for a recent pump storage power plant.

Well-known manufacturers of large pumps and end users of water projects worldwide rely on EagleBurgmann sealing technology. Our proven HGH type split seal has become the reliable established standard for major water technology projects e.g. in China, Azerbaijan, USA, India or Russia.

Flood control, major water technology projects





Wilo EMU pumps in various sizes are set up dry in a pump station in the German Saxon city of Heidenau. They ensure that rainwater and flood water from the Elbe with 2 m³/s are pumped to the nearby river. EagleBurgmann MG1 single seals have proven to be the utilized seal. Further operating conditions: Delivery head: h = 7 m, rotational speed: n = 585 min⁻¹.



In the Indian State of Karnataka, the major project "Tunga Lift Irrigation Scheme" pumps water over great distances for agricultural irrigation in the northern regions. The water is taken from the river Tunga near the city of Shimoga. Several Andritz high performance pumps have been installed for that. Pumping capacity: 375 ... 500 l/min. To seal the shafts with a diameter of 420 mm (16.54"), EagleBurgmann HGH300S1 are installed. Further operating conditions: Temperature: t = +5 °C ... +35 °C (+41 °F ... +95 °F), pressure: p = vacuum ... 10 bar (145 PSI).



Horizontal shaft mixed flow / axial flow pumps of Ebara (type HZ/HS) are highly efficient and applied e.g. for conveying river water. EagleBurgmann has experience in providing special double mechanical seals of the S series. Shaft diameter: 140 mm (5.51"), rotational speed: n = 185 min⁻¹.



In a segment of the Yellow River project in China, Ebara vertical centrifugal pumps are installed to pump river water over a 450 km long pipeline. They must overcome a total altitude difference of 600 meters. Sealing occurred with EagleBurgmann HGH200S1. Since the installation the beginning of the 2000s, the seals have been working faultlessly despite the solids charged medium. For inspections and in order to carry out maintenance work on the shaft seal, the seals have been equipped with a pneumatically activated EagleBurgmann "Pneumostop" shut-down seal.



Draining the 2,000 m high plateau where Mexico City is located is problematic due to the extraordinary geographical situation. Frequently occurring heavy rainfall causes entire districts to be flooded. As a result, the National Water Commission – Conagua – realized a mega project to dispose of the surface water in the municipal area. The La Caldera pump station forms the core of this project. It has a capacity of 40 m³/s. The water is collected here and conveyed out of the municipal area. The pump station was equipped by KSB, with 24 pumps of the type KRT, among others. They are sealed with EagleBurgmann MG1 elastomer bellows seals in various hard/hard and hard/soft material combinations.



The Lee Tunnel project in London, Great Britain, will realize a gigantic system for collecting and disposing of rainwater in the municipal region. It is one of Europe's largest water technology projects. The pipes have a diameter of 7 meters and a length of over 7 km; the collecting shafts with several mega pumps installed at the base run to depths of up to 80 meters and have a diameter of over 30 meters. The pumping capacity of every single pump is 1,950 ... 3,050 l/s, rotational speed: 350 min⁻¹. Split seals of the type EagleBurgmann HGH300S1 are installed as shaft seal. Shaft diameter: 400 mm (15.75").

Process oriented: Seals for industrial and special water applications.



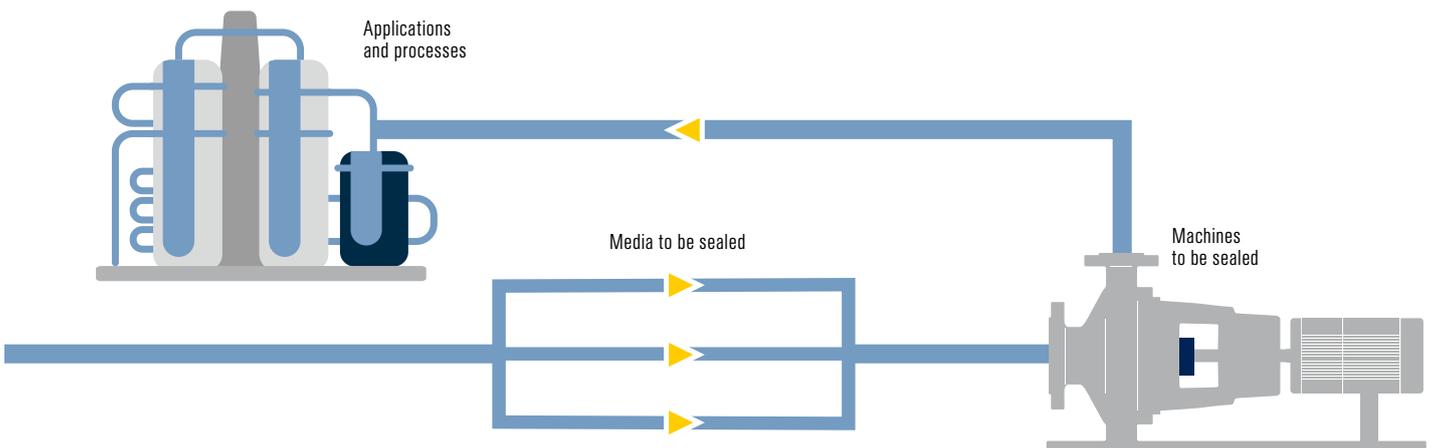
Water is a universal medium. It is sometimes very dominant in industrial applications, such as in pulp and paper production, and sometimes very special, such as e.g. as ultrapure water in the washing processes of wafer technology, or as conditioned feed water in power plant technology and in water reinjection on oil platforms.

In addition there are numerous specific water applications that differ either due to the special challenge of the medium and/or the application (e.g. ultrapure water, hot water) or the particularity of the machine (e.g. pump as turbine).

The requirements towards sealing technology are just as diverse as the applications. Machine, process conditions, sealing location, operating conditions and the medium to be sealed indicate the direction for the choice and technical configuration of the sealing system and reliable application.

EagleBurgmann can respond to industrial requirements with a broad product range, from large series to customer-specific individual design. EagleBurgmann seals are standard in many sectors and industries. For example, our Cartex series: over 500,000 seals found satisfied users in nearly all areas of the industry. Since its market launch, more than 50 million units of our MG1 elastomer bellows seals have been installed worldwide in all types of water, wastewater and chemical pumps..

Industrial and special water applications





At Vreughdenhil Dairy Foods, one of the world's largest manufacturers of milk powder, process water is pumped by 13 Homa type CMX24/34 pumps at the Gorinchem, Netherlands location. The pump cases are made of stainless steel. The correct seals in this case are EagleBurgmann MG1 in tandem arrangement. Temperature: $t = 40\text{ }^{\circ}\text{C}$ (104 °F), pressure: $p \dots 3\text{ bar}$ (44 PSI), rotational speed: $n = 960\text{ min}^{-1}$ or $1,450\text{ min}^{-1}$.



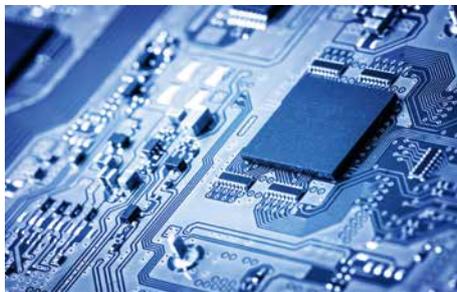
The pumps in an ultrapure water plant in Germany are sealed with EagleBurgmann M7N component seals. The medium is pumped with a temperature of $30\text{ }^{\circ}\text{C}$ (86 °F). It has a conductivity of $\leq 1\text{ }\mu\text{S/cm}$. An effective equipotential bonding must be ensured in order to prevent the resulting problem of electrochemical corrosion at the sliding faces of the seal. The entire system is correspondingly grounded for that reason.



The ULA oil platform operated by BP in the Norwegian North Sea applies multistage Indar submersible pumps as seawater lift pumps. They convey seawater to the platform for various applications. The four pumps are sealed with EagleBurgmann MG1 in seawater resistant materials. Operating conditions: Temperature: $t = +5\text{ }^{\circ}\text{C} \dots +15\text{ }^{\circ}\text{C}$ (+41 °F ... +59 °F), rotational speed: $n = 1,765\text{ min}^{-1}$.



The Norwegian manufacturer Jets Vacuum A/S supplies toilet vacuum systems for different applications, such as for ships and offshore installations. The Vacuumator pumps are installed directly in the line network. They generate a continuous vacuum which makes the system independent from exterior influences and pumps gray water and solids to the wastewater cleaning station. EagleBurgmann supplies specially designed MG97 elastomer bellows seals for the first fit of these vacuum pumps.



Two KSB pumps are installed at ST Microelectronics in France to pump ultrapure process water ($\sigma = 0.05\text{ }\mu\text{S/cm}$) for the manufacture of electronic components. After retrofitting the shaft seal to an EagleBurgmann HRC1 with DiamondFace coating of the seal faces, operating periods were extended by a factor of 250. Operating conditions: Temperature: $t = +20\text{ }^{\circ}\text{C}$ (68 °F), pressure: $p = 2\text{ bar}$ (29 PSI), rotational speed: $n = 3,000\text{ min}^{-1}$, sliding velocity: $v_g = 10\text{ m/s}$ (33 ft/s).



The Italian company LGB Elettropompe in Padua is specialized, among others, in the manufacture of high-grade electrical pumps. The Z220V-SX series is installed in commercial and industrial dishwashers. The series seal is supplied by EagleBurgmann BT. The BT-AR elastomer bellows seal with correspondingly designed materials is the right solution. Operating range: Medium: Water with detergents (2 g/l), temperature: $t = 75\text{ }^{\circ}\text{C}$ (167 °F), pressure: $p = 1\text{ bar}$ (15 PSI), rotational speed: $n = 2,800\text{ min}^{-1}$.



LUK Oil operates the ISAB refinery to the north of the Italian city of Syracuse on Sicily's west coast and has retrofitted its Flowserve 20LNH multistage pumps with respectively two EagleBurgmann Splitex split mechanical seals. The pumps convey seawater in cooling towers. Temperature: $t = +32\text{ }^{\circ}\text{C} \dots +40\text{ }^{\circ}\text{C}$ (+90 °F ... +104 °F), pressure: $p \dots 4\text{ bar}$ (58 PSI), rotational speed: $n = 980\text{ min}^{-1}$. The 6-inch seals are operated with API Plan 02.



Grundfos type NK250-400 pumps are installed in the district heating grid of the Danish city of Esbjerg. They function as boiler feed, mixing and distributor pumps for hot water which is moved at temperatures of up to $110\text{ }^{\circ}\text{C}$ (230 °F). The delivery capacity is $960\text{ m}^3/\text{h}$. Grundfos installs EagleBurgmann MG13 elastomer bellows seals as standard shaft seal in their NK series.



Two Amamix type KSB submersible motor agitators for circulating drilling mud are installed in the USA. The continuously operating machines prevent the dissolved solids from settling in the emulsion. The installed EagleBurgmann HJ97G mechanical seals with encapsulated springs are the optimal solution for such highly viscous media. Operating conditions: Density: 2.1 g/cm^3 , temperature: $t = 60\text{ }^{\circ}\text{C}$ (140 °F).



Reverse running pumps for generating power are deployed wherever turbines are not economical. The municipal works of Kufstein, Austria, operate a drinking water power plant in the Theaterhütte high-level tank. A KSB Etanorm M80-250 is installed here to generate electricity (19.5 kW). Pumping capacity: 50 l/s.

A plant in Breech, Germany, (photo) has installed eight KSB Etanorm M150-310 in parallel connection to build up pressure. When run in reverse, they are used as turbines. Medium: Water, pumping capacity 146 l/s, power 55 kW. EagleBurgmann MG13 mechanical seals are installed in both cases. They have been operating without faults for over 10 years.



Magna Steyr is an Austrian automobile manufacturer with a large production location in Graz. A sprinkler system is installed throughout the entire production plant which, in emergencies, can prevent a fire from spreading. This system uses diverse pump types which are sealed with EagleBurgmann Cartex cartridge seals (see picture), MG elastomer bellows seals, M2 and M3 component seals or with packings. Ruggedness is a requirement for all components when the availability of use of the system is tested on a regular basis. In this process, the pumps are operated with closed gate valves up to their workload limit.



The Nassfeld ski resort in Carinthia, Austria relies on modern artificial snow technology in terms of snow guarantee. To that end, an extended system of pump stations and pipelines were installed in a number of expansion stages. In 2015, the manufacturer Lowara Vogel supplied four additional high pressure pumps, three volute casing pumps as booster pumps before the filters and one volute casing pump as medium pressure pump for the valley region. In sum, approx. 1,440 m³/h is pumped with up to 50 bar (725 PSI) from the reservoir to the system. The shaft seals in the high pressure sector are EagleBurgmann H75, the low pressure range uses EagleBurgmann MG12.



MTU Friedrichshafen, Germany, is one of the leading manufacturers of large diesel engines. Diesel engines of e.g. the type BR2000 are used to power ships. The engine is cooled with two separate pumps over two circuits. One pump drives the cooling circuit in the engine. The coolant is successfully sealed with EagleBurgmann MG97S6 with special materials. Temperature: $t = -20\text{ °C} \dots +100\text{ °C}$ ($-4\text{ °F} \dots 212\text{ °F}$), pressure: $p = 2 \dots 4\text{ bar}$ (29 ... 58 PSI), rotational speed: $n \dots 3,200\text{ min}^{-1}$.

The second pump, a MG9 is also installed here, pumps seawater through a plate heat exchanger, thus lowering the temperature of the water in the cooling circuit of the engine. Temperature: $t = +5\text{ °C} \dots +35\text{ °C}$ ($+41\text{ °F} \dots +95\text{ °F}$), pressure: $p = 2 \dots 4\text{ bar}$ (29 ... 58 PSI), rotational speed: $n \dots 3,200\text{ min}^{-1}$.



A Worthington pump from 1924 in the Littleton Pump Station to the west of London pumps water from the Thames to the Queen Mary Reservoir. After 90 years the seal system of packings was retrofitted to an efficient EagleBurgmann HGH200 split mechanical seal. The seal has been running faultlessly since it was commissioned. The operator of the plant, Thames Water, thus achieved significantly improved maintainability and availability of the pump station. Medium: River water, outlet pressure: $p = 1.2\text{ barg}$ (17.4 PSIG), rotational speed: $n = 140\text{ min}^{-1}$.



The Dutch company Duijvestin is growing tomatoes in Pijnacker, one of Europe's largest greenhouse systems in Europe. The heating of the 13.5 hectare complex was converted to geothermal heat in 2010. Pumps of the SPX Johnson CombiLine series ensure the hot water is lifted up from the 2,000 meter depths. The pumps are sealed with EagleBurgmann Mtex-DE metal bellows seals in double version. They are supplied by an EagleBurgmann TS1016 system in accordance with API Plan 53A. Operating conditions: Temperature: $t = +70\text{ °C} \dots +75\text{ °C}$ ($+158\text{ °F} \dots +167\text{ °F}$), pressure: $p = 4.5\text{ barg}$ (65.3 PSIG), rotational speed: $n = 2,950\text{ min}^{-1}$.

TotalSealCare Service: We have the idea, our customers the choice.

The idea behind TotalSealCare is quite simple. Divided into seven modules one will find everything that makes up the best service. From full servicing of all installed seals, to stock management and on to engineering, training and electronic documentation.

Advantages: reduced costs, increased plant availability and greater reliability.

And the best thing about this is that our customers only choose the services they actually need. Because the modules are individually combinable, TotalSealCare can compile a service offer that corresponds to requirements and needs. Custom-tailored and unique in its flexibility and transparency.



Consulting & engineering

After all seals are established and analyzed in a system, we prepare standardization concepts based on an as-is status. The anticipated results are to reduce the number of seal types, the sizes and materials used and to improve the key figures of the system. We advise on the codes of practice and statutory regulations and indicate the actions that need to be taken.

Maintenance

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

On-site service

Our on-site service includes components of overhaul service, conversions and service container. We deploy a service unit directly on the customers' premises: equipped with the basic suite of seals, or a stock of seals discussed in advance, and staffed by qualified personnel. On-site, our work includes producing the necessary gaskets, ensuring that the documentation is complete and advising our customers on selecting and installing seals. Our range of services is rounded off by complete conversions (e.g. in accordance with TA-Luft).

Inventory management

Based on the customers' individual requirements and the applicable quality regulations, we develop a concept for inventory management of complete seals and spare parts. We also optimize stocking on site or in the EagleBurgmann service center. This means for our customers reduces administration overhead and they can concentrate on their key operations.

Seminars & training

The EagleBurgmann Academy offers an extensive range of continuing education programs in seal technology. For service and maintenance personnel, skilled staff and engineers from various branches of the industry, such as refining, chemicals, power generation, foodstuffs, paper and pharmaceuticals. Our range includes group seminars, individual training and seminars specifically tailored to specific requirements. These seminars are held at our premises or a location of customers' choice.

Technical analysis & support

A team of seal specialists is responsible for rectifying process malfunctions or "bad actors". We use the latest methods such as thermography or data logging to diagnose positions that are critical to the operation of the system and work out measures to rectify this. 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 increase system serviceability through individual and constructive solutions.

Service agreements

Our customers are offered specific agreements that can be combined from the six service modules. Whether for individual seal systems, critical process elements, specific system areas or an extensive seal service for complete plants: the modular structure of our service makes it possible to satisfy individual requirements. With our tried-and-tested monitoring instrument, SealCare Pro, we can also record all seal-related data for documentation and evaluation purposes.

Algeria · Angola · **Argentina** · **Australia** · **Austria** · Bahrain · Bangladesh · Belarus · **Belgium** · Botswana · **Brazil** · Bulgaria · Cameroon · **Canada** · **Chile** · **China** · **Colombia** · Congo · Cyprus · **Czech Republic** · **Denmark** · **Ecuador** · Egypt · Estonia · Finland · **France** · Gabon · **Germany** · Ghana · **Great Britain** · Greece · **Hungary** · **India** · **Indonesia** · Iraq · Ireland · Israel · **Italy** · Ivory Coast · **Japan** · Jordan · Kazakhstan · Kenya · **Korea** · Kuwait · Latvia · Lebanon · Libya · Lithuania · Madagascar · **Malaysia** · Mauritius · **Mexico** · Morocco · Myanmar · Namibia · **Netherlands** · **New Zealand** · Nigeria · **Norway** · Oman · Pakistan · Paraguay · Peru · **Philippines** · **Poland** · Qatar · Romania · **Russia** · **Saudi Arabia** · Serbia · **Singapore** · Slovak Republic · Slovenia · **South Africa** · **Spain** · Sudan · **Sweden** · **Switzerland** · **Taiwan** · **Thailand** · Trinidad and Tobago · Tunisia · **Turkey** · Ukraine · **United Arab Emirates** · Uruguay · **USA** · **Venezuela** · **Vietnam** · Yemen · Zambia · Zimbabwe · www.eagleburgmann.com/world



B-WSE / EI / 3,000 / 05.16 / 19.7.3 © EagleBurgmann Group Marketing, Germany

EagleBurgmann, a joint venture of the German Freudenberg Group and the Japanese Eagle Industry Group, 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, power, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 6,000 employees in more than 60 subsidiaries 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.

eagleburgmann.com

info@eagleburgmann.com