

HR seals – the robust and economical solution
for media with a high solids content

EagleBurgmann®
Rely on excellence

Mechanical seals for dredger pumps



4x
longer operating periods.

> 65%
saving in the 1st year.

A large industrial dredger pump is shown in operation, discharging a massive, dark plume of sediment into the air. The pump is mounted on a blue and orange vessel. The background is a clear blue sky.

Are you still using yesterday's sealing technology?

The operating conditions for dredger pumps are extraordinary harsh and demanding, particularly with respect to the pumped medium. This is extremely abrasive and high in solids with particle sizes from just a few micrometers up to 200 mm (7.87"), placing massive stresses on the pump and its shaft seal.

Compression packings or lip seals are often used in typical dredger pumps to seal the rotating shaft from the housing. The service life of these seals is very limited, often as short as just 3 months.

Replacing worn or damaged seals is a technically very demanding task; it is also time-consuming and correspondingly expensive.

Electrical or diesel-driven dredger pumps have to run continuously in order to be cost-effective. This cannot be achieved reliably with conventional lip seals. There is also the trend towards building dredgers with even larger pumps. The cost of installation is thus increasingly difficult and expensive.

Extending the service life of the seal is therefore an important factor in the reliability and availability of the pump, and thus of significant interest to any dredging equipment operator.

EagleBurgmann offers, for all dredging applications, the latest sealing technology which has proven its worth thousands of times in practice. Series-produced solutions are available, or custom designs for individual cases. Investment in modern mechanical seal technology pays for itself!

You can benefit as well with mechanical seals from the EagleBurgmann HR series:

- Short return on investment
- Lower operating costs
- Reliable operation
- Longer service life
- Scheduled service intervals*

* And on the subject of servicing, with our modular TotalSealCare program we offer customized sealing services.

Why not give us a call?

Best arguments in favor of HR seals: The costs, price and performance are all just right.



In use worldwide

EagleBurgmann HR mechanical seals are applied successfully in dredger pumps from big-name pump manufacturers and operators, e.g.:

- Damen Dredging
- Boskalis
- G.I.W – Teus Vlot
- Hollandsche IJssel
- Ellicott – Idreco
- ICH
- Vosta – LMG
- Warmann

Since 1996, more than 1,000 of our mechanical seals have been brought to service in dredger pumps in the Netherlands alone.

The EagleBurgmann HR in practice

An EagleBurgmann HR2S1/290-G11-E1 successfully seals the shaft of a type 7570 MD Damen dredger pump on the "PIRAT X", one of the largest dredgers in operation (see picture above) owned by dredging contractor Johann Bunte Bauunternehmung from Papenburg/Germany. Discharge pressure is 16 bar (232 PSI). The seal performs well and shows an MTBR of over one year.

Call us for further references.

You can count on it

Financial comparison: Lip seals - Mechanical seal

Lip seals

Purchase costs: **€ 15,000**
Cost of replacing the lip seals
including pump downtimes, loss of production, service engineers: **€ 85,000**
Lip seal service life: **3 months***
Annual cost of operating the pump: 4 x (85,000 + 15,000) = € 400,000

* The short service life is caused by the very high p - v value (combination of pressure and speed).

Mechanical seal

Purchase costs: **€ 45,000**
Cost of replacing the mechanical seal
including pump downtimes, loss of production, service engineers: **€ 85,000**
Service life of a mechanical seal (single seal with quench): **12 months**
Annual cost of operating the pump: 1 x (85,000 + 45,000) = € 130,000

Saving in the first year: € 270,000 = 67 %!

In the subsequent years the seal can be serviced, hence no costs for replacement will occur.

All technical specifications are based on extensive tests and our many years of experience. The diversity of possible applications means, however, that they can serve only as guide values. We must be notified of the exact conditions of application before we can provide any guarantee for a specific case. Subject to change.

Time to switch: To reliable seals.



Today's innovative dredger pump seals

Mechanical seals from the EagleBurgmann HR series have it all, both economically and technically: longer service life, longer MTBF interval and fast ROI.

- Forget all about the time-consuming replacement of lip seals.
- Shorten expensive stoppages for your pumps.
- Increase the availability of your equipment.



• No more fault-prone lip seals



• Fast return on investment



• Significantly longer seal life



• Can be used with up to 60% solids content



• No flushing of the seal required

Down to details: Experience – combined with convincing technology.



The sealing specialist for dredger applications

For over 20 years, EagleBurgmann has been working with big-name manufacturers and operators to further develop sealing technology for dredger pumps.

Today, MTBF values of way over 8,000 hours are achieved with mature, proven EagleBurgmann mechanical seals. The largest seal ever for this field of application with a shaft diameter of 370 mm (14.57") was recently successfully tested, and will be brought into service in 2015.

Typical operating conditions for dredger pumps

Pressure: $p_1 = 6 \text{ bar (87 PSI)}$

Temperature: $t = \dots 30 \text{ }^\circ\text{C (86 }^\circ\text{F)}$

Solids content: $\dots 40 \%$

Particle size: $\dots 20 \text{ mm (0.78")}$ in the seal area, $\dots 200 \text{ mm (7.87")}$ in the pump

EagleBurgmann HR series

HR mechanical seals are specially designed for use in media with high solids contents, and are available as single (HR2S1) or double seals (HRKS-D). Single seals may be operated without external flushing or product circulation.

Technical features

- Bi-directional
- Stationary multiple springs
- Rotating seat
- Stationary seat arranged directly behind the pump impeller
- Spring protection sleeve
- Seal face and seat made of silicon carbide (Q_1, Q_2)

Advantages

- Specially designed for use in media with high solids contents without external flushing or product circulation
- Water hammer resitant
- 40 % solids content for single seals and 60 % for dual seals
- Can be operated under vacuum without additional locking
- Springs are protected from pumped medium
- No damage to shaft by dynamically loaded O-Ring
- Insensitive to shaft deflections due to stationary design
- Preinstalled cartridge seal with housing and shaft sleeve make assembly and servicing much easier.

Wide range of application

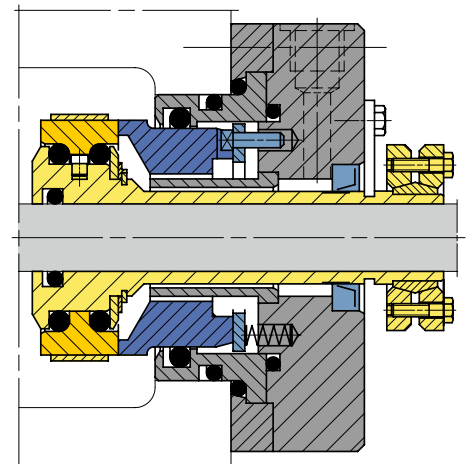
Shaft diameter: $d_N = 36 \dots 370 \text{ mm (1.4" } \dots 14.57\text{")}$

Pressure: $p_1 = 16 \text{ bar (230 PSI)}$

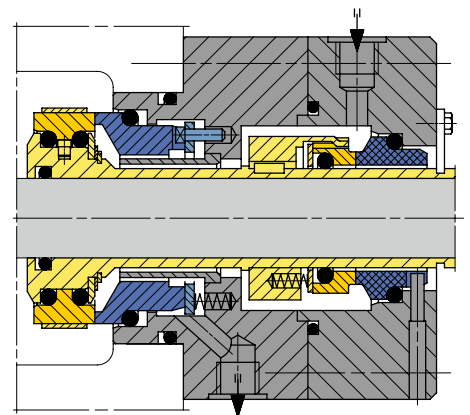
Temperature: $t = -20 \text{ }^\circ\text{C } \dots +160 \text{ }^\circ\text{C (-4 }^\circ\text{F } \dots +320 \text{ }^\circ\text{F)}$

Sliding speed: $v_0 = 10 \text{ m/s (33 ft/s)}$

A quench should be provided on the atmosphere side if operated under vacuum.



Single seal type HR2S1*



Dual seal type HRKS-D*

* Yellow colored parts rotating, blue ones are stationary; grey: housing

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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, power, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 6,000 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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