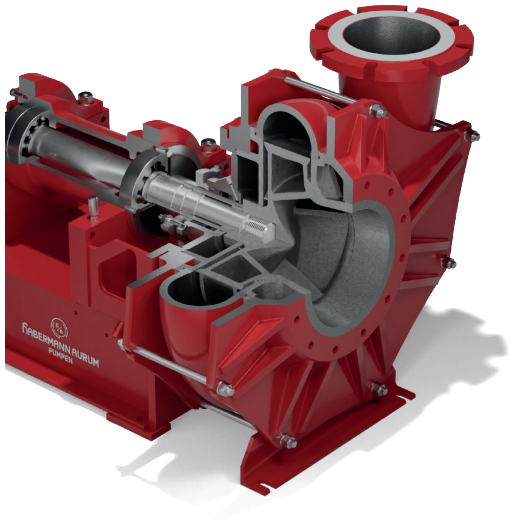
BEDU
POMPEN

SLURRY PUMPS

FOR ABRASIVE AND CORROSIVE MEDIA



made for your process

HABERMANN AURUM PUMPEN has been offering reliable solutions and extensive know-how in slurry transportation since 1927.

1927

Habermann Aurum Pumpen is one of the leading manufacturers of centrifugal pumps, ideal for processing slurries. With almost 100 years of experience and more than 30,000 pumps installed worldwide, serving various applications, we have built a strong market position across the globe. Our fundamental goal is to create the most durable and sustainable industrial pumps by combining our multi-decade experience with the state-of-the-art technologies. Our pumps are integrated into a wide variety of industries, such as: mining and mineral processing, energy industry, metallurgy, chemical and pigment industries, tunnelling and special civil engineering. We are continuously improving our pumping systems to ensure their exceptional quality and optimal performance capabilities. Based on the technical skills of our work force, we customize and manufacture pumps you can rely on, most of which have been in trouble-free operation for more than 60 years, which speaks for their longevity, safety and efficiency.

We always ensure your industrial needs are covered with our proven operational designs combined with the most reliable and robust materials to make a functional unit. Our broad product line of pumps, valves and fittings complies with the most diverse and challenging pumping requirements. Thanks to our in-house engineering we can find solutions to any system demand, regardless of technical complexity or application conditions.

We have built an excellent quality profile, which allowed us to establish Habermann Aurum as a high-valued and reliable partner for industrial pumping systems. We proudly design, produce and install our pumps all over the world. Through our network of partners and branch offices, our market presence extends across continents from Europe to America, Asia and Africa. We are well prepared to meet current and future market demands and to support our customers in the best possible way.

Tradition meets modern technologies.

COMPLETE PUMP SOLUTIONS FOR ANY SLURRY TYPE

Chemical	HPK	NPK	NPW	KB
Separation	•	•	•	
Abrasive chemicals	•	•		
Precipitates, sodium	•	•	•	
Foaming liquids	•	•		
SO4, chloride	•	•		
Fertilizers, PO4	•	•		
Solvents, pigments	•	•		
Recycling	•	•	•	•
Crude oil residues			•	

Quarrying & Aggregates	HPK	NPK	NPW	KB
Sand & gravel extraction	•	•	•	•
Wet sand treatment	•	•	•	•
Limestone slurry	•	•	•	
Slate, marble, granite	•	•	•	•
Kaolin, clay	•	•	•	
Cyclone separation	•	•		
Dredging (harbors, rivers)		•		•

Mining	HPK	NPK	NPW	KB
Coal, ore, phosphates, potash, bauxite	•	•	•	•
Heavy mining slurry	•	•	•	•
Ore slurry	•	•	•	•
Ferric oxide production	•	•	•	•
Fe, Zn, Cu, Ti, salt, Al, etc.	•	•	•	•
Mill scale and separation	•	•	•	•
Frothy slurry	•	•		
Waste recycling	•	•	•	
Thickener underflow	•	•		
Chamber filter press	•	•		

Metallurgy & Energy Industry	HPK	NPK	NPW	KB
Coal & coke processing	•	•	•	•
Hot rolling mills	•	•	•	•
Sinter & scale	•	•	•	
Blast furnaces	•	•	•	•
Bottom ash	•	•	•	•
Flue gas desulphurization	•	•		
Condensates			•	

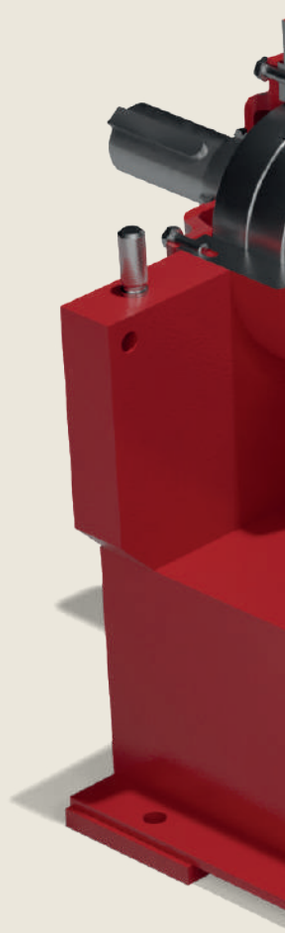
Tunneling, Construction & Civil Engineering	HPK	NPK	NPW	KB
Tunnel construction			•	•
Vertical trenching (wet and dry wells)			•	•
Ready-mix concrete		•	•	
Aerated concrete	•			
Bentonite and cement mixing	•	•	•	
Deep mining - diaphragm wall cutter				•

Agriculture	HPK	NPK	NPW	KB
Sugar industry, beet pulp		•	•	•
Biogas, fertilizers		•		
Livestock waste		•	•	•
Washing installations	•	•	•	•
Organic slurry	•	•	•	
Sewage treatment systems	•	•	•	

NPW

NPW SERIES

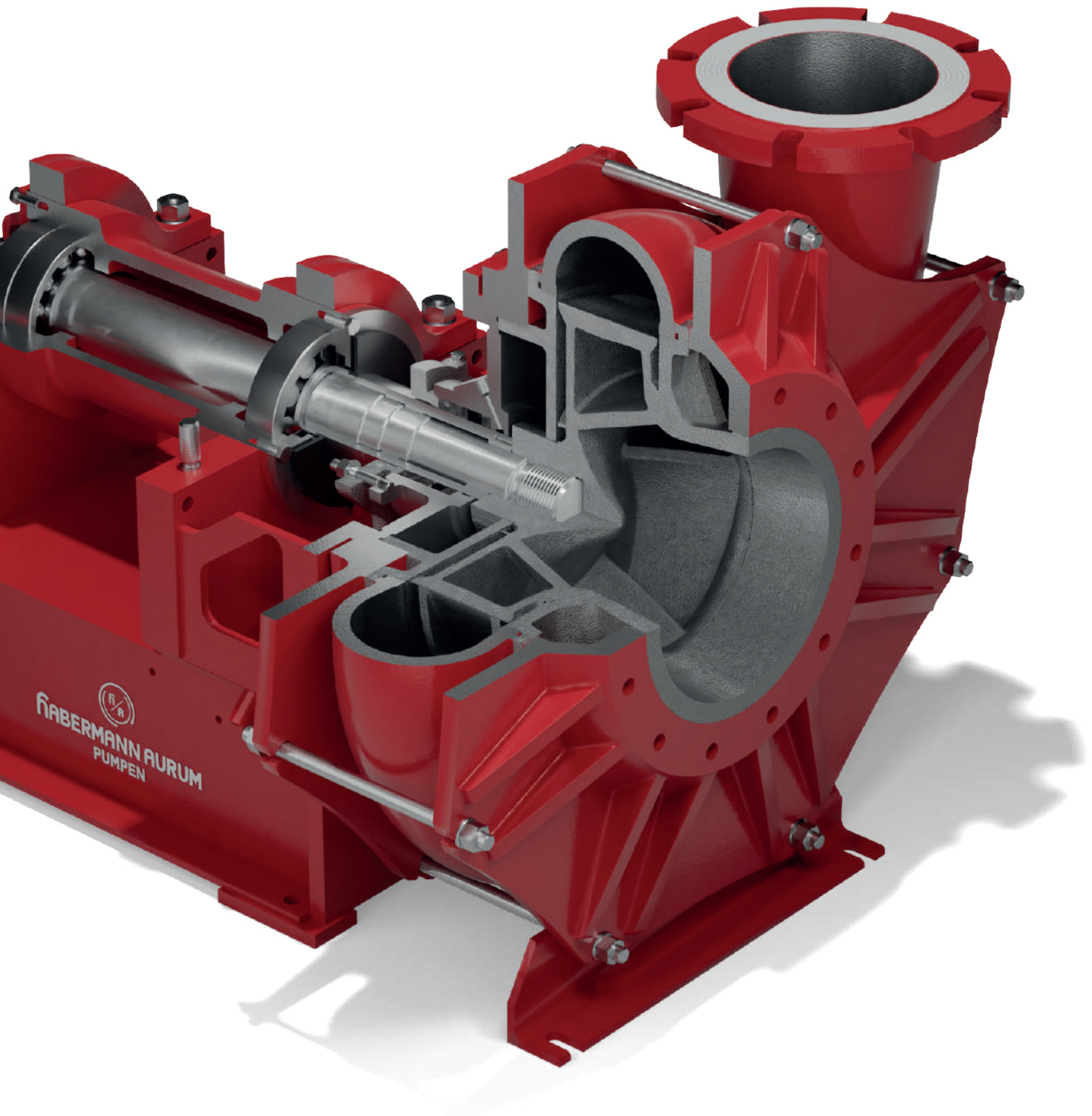
IDEAL FOR INDUSTRIAL SLURRY



Our special tempered casting HBS is a result of our continuous research and improvement.

HBS

The NPW series are heavy-duty, single-stage metallic centrifugal pumps with easy replacement of wear parts and an adjustable clearance on the suction side. To further satisfy various industrial requirements, the impeller, wear plate and casing are carefully and properly sized to achieve the longest possible service life and improve pump overall performance. Even under the toughest conditions, the NPW pumps have the lowest life-cycle costs.


RABERMANN AURUM
PUMPEN

NPW SERIES

IDEAL TO PROCESS INDUSTRIAL SLURRIES

The NPW metallic centrifugal pumps are mainly used in light to medium wear applications. This series allow easy replacement of wear parts and feature an anchor assembly with tie rods over the casing covers to guarantee maximum operating efficiency.

COMMON APPLICATIONS

AGGREGATES
Sand and gravel extraction, dewatering, wet treatment, mineral processing

ENERGY INDUSTRY
Bottom ash, coal and coke processing

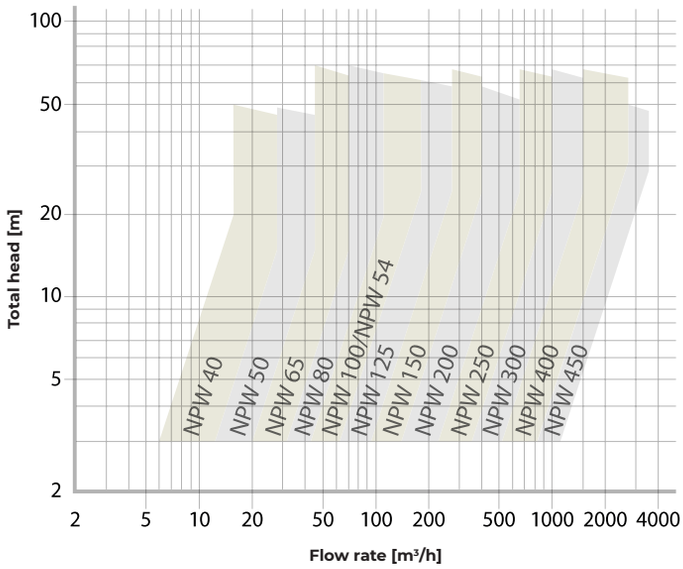
SUGAR PRODUCTION AND AGRICULTURAL WASTE
Organic slurry, biogas, fertilizers, wastewater treatment systems

MINING
Heavy mining slurry, slurry and sump pumps, separation, ore slurry, coal, ore, phosphates, potash, bauxite, ceramics, Fe, Zn, Cu, Ti, salt, Al etc.

TUNNELING, CONSTRUCTION & SPECIAL CIVIL ENGINEERING
Kaolin, clay, slate, marble, granite, sand and gravel, micro tunneling, limestone slurry, vertical trenching (dry and wet wells), bentonite and cement mixing, ready-mix concrete

STEEL INDUSTRY
Sinter and scale precipitates, blast furnaces

PERFORMANCE CHARACTERISTICS OF NPW



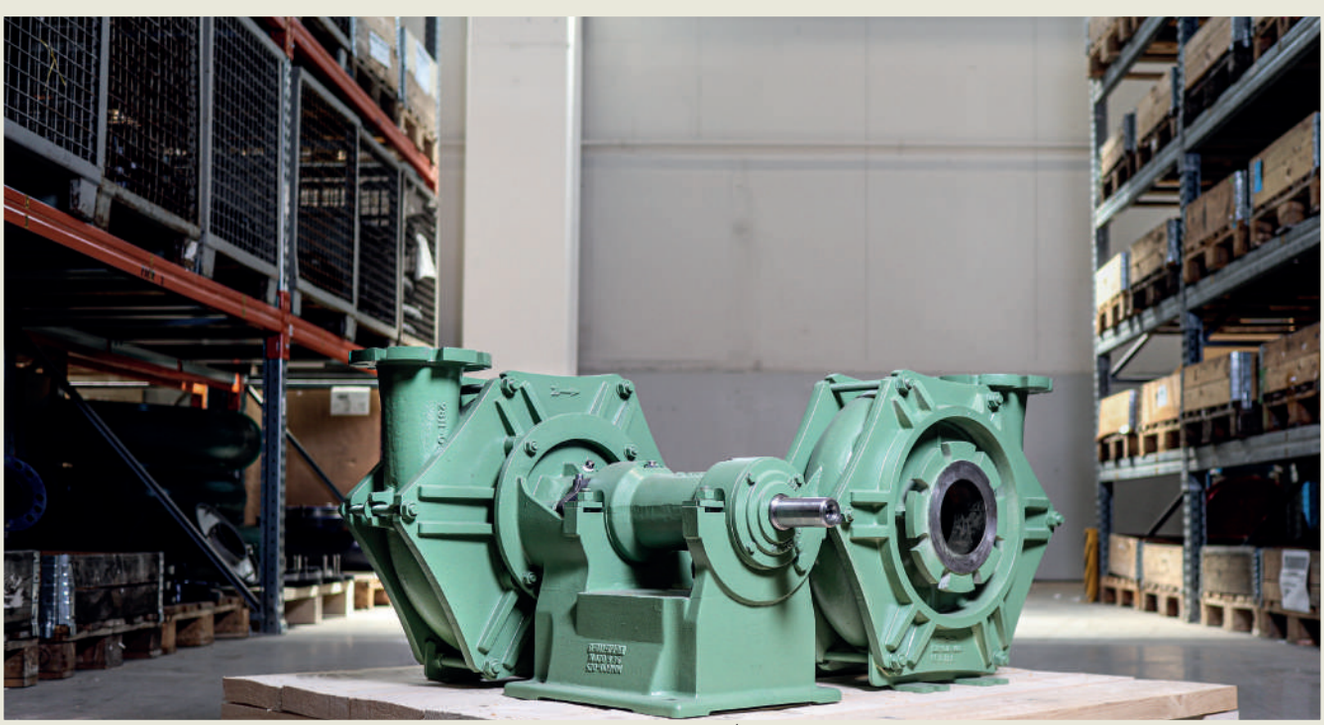
Performance characteristics of NPW	
Flow rate, up to	4600 [m³/h]
Maximum head	70 [m.l.c]
Pump speed, depending on the size, up to	2950 [min⁻¹]
Pump sizes	DN 40 to DN 450
Maximum operating pressure	6 [bar]
Temperature of the slurry, up to	90 [°C]
Static head	8 [mW.C.]
Discharge nozzle arrangement	gradually rotatable
Highly corrosion resistant at pH levels	3 to 14 depending on material

The NPW series are cost-effective pumps for handling various kinds of abrasive media in the following applications:

- Stone slurry processing
- Slurry feed pump in tunnelling
- Mixer pump for the ready-mix concrete production

ADVANTAGES

- optimized quality materials for low operating expenses
- cost-effective version of pumps for tough applications



NPW 50/250

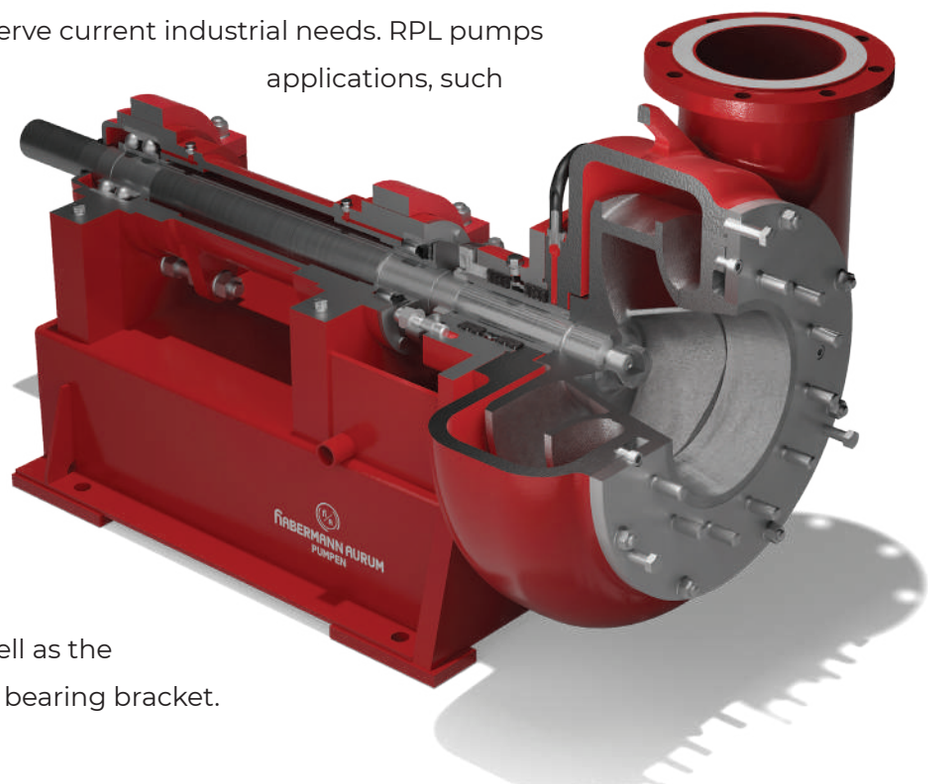
RPL SERIES

SPECIAL DESIGN RPL

LIGHTWEIGHT CONSTRUCTION OF THE PUMP WITH PROTECTIVE FINISH FOR MEDIUM WEAR APPLICATIONS

Our resource efficient PRL pumps with protective metallic finish are designed for light to medium wear applications with low content of soft and solid particles, such as wastewater and coal pulp processing. RPL series are durable, cost-saving pumps that have been proven effective for many years.

This type is one of the first pumps developed by Habermann, which has been further improved and modified to best serve current industrial needs. RPL pumps have had considerable success in applications, such as dewatering, slurry processing and water treatment in tunneling. Based on individual requirements, you can choose either closed or semi-open impellers. Additionally, two-, three-, or four-blade impellers are also available. Trapezoidal thread accommodates impeller on the shaft. To relieve the pressure on the shaft seal, both casing covers of the impeller are equipped with relief blades on the back side. The pump casing, as well as the bearing casing, are provided with robust bearing bracket.



The hydraulic part of the pump, which is easy to install and disassemble, essentially consists of four components:

- Impeller
- Casing with protective finish
- Suction side wear plate
- Drive side wear plate

Performance characteristics of RPL

Flow rate, up to	3000 [m^3/h]
Maximum head	125 [m.l.c]
Pump speed, depending on the size, up to	2950 [min^{-1}]
Pump sizes	DN 32 to DN 400
Maximum operating pressure	10, 16 [bar]
Temperature of the slurry, up to	90 [°C]
Static head	8 [mW.C.]
Discharge nozzle arrangement	gradually rotatable
Highly corrosion resistant at pH levels	3 to 14 depending on material

SHAFT SEALS

MATERIALS

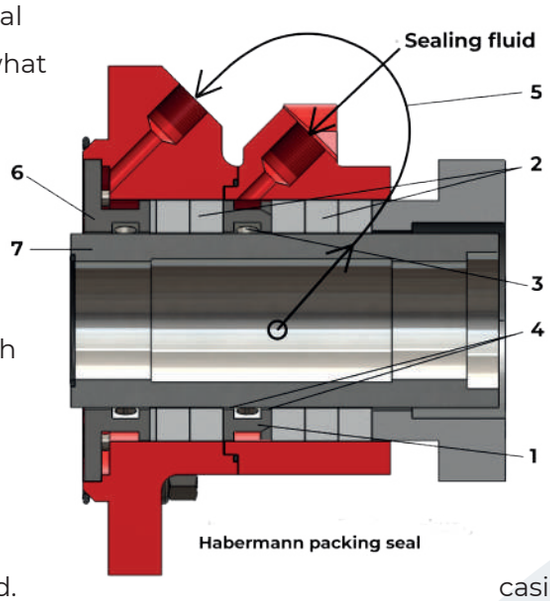
SHAFT SEALING WITH PACKING SEAL

Shaft protective seals are extremely important and must be assembled for prevention the passage of fluids along a rotating shaft. To prevent any inappropriate operation, shafts must have a reliable and secure sealing system that will shield them away from harmful solid particles contained in the working media. Depending on the operating conditions, the shaft is sealed using either packing seal, mechanical seal, or hydrodynamic seal with an expeller.

STANDARD DESIGN OF THE **GLAND PACKING SEAL**

In addition to the excessive pressure on the gland packing, insufficient lubrication of the seal components can cause the seal to start over-leaking and wear over time. However solid particles slipping into the seal arrangement is ultimately what creates the efficiency loss and the need for the seal to be repacked.

To relieve the pressure on the gland packing, the impeller is equipped with back relief blades. In order to keep abrasive particles away from the vulnerable seal components, the seal is flushed with the sealing fluid. The locking ring (1) of the seal is injected with the sealing fluid on the discharge side, which ensures the necessary lubrication of the packing rings (2).



Habermann packing seal

Additionally, it is recommended to install a throttle valve and manometer to set the required pressure and to adjust the amount of the sealing fluid in packing rings. To control the flow of the sealing fluid, a flow control display should also be installed. Sealing fluid enters the locking ring chamber (3) and from there moves to the packing rings (2) via the shaft clearance (4). It flows through the radial holes in the locking ring and via fixed pipe (5) into the locking ring (6), on the suction side. Then the sealing water flows into the pump casing via the shaft clearance (7). The sealing pressure must be at least 0.3 bar greater than the pressure on the impeller hub. To make it easier to replace the packing rings on the suction side, the gland packing has an axially split housing.

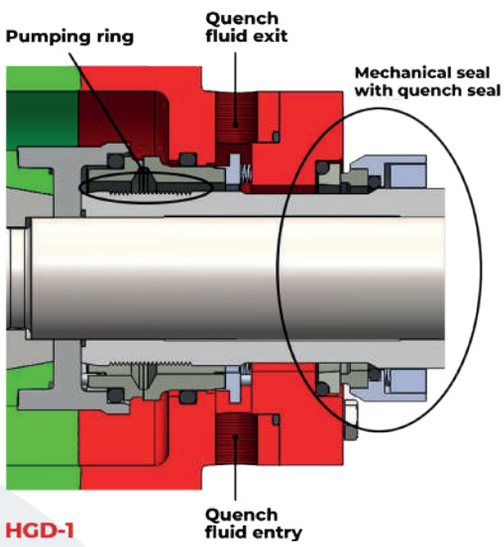
Alternatives to packing seal:

- Single-acting mechanical seal
- Double-acting mechanical seal comprising of HGD-1 mechanical seal on the suction side, mechanical seal on the discharge side and the quench chamber
- Hydrodynamic seal with an expeller and gland packing
- Stationary seal for special pumps

SHAFT SEALING WITH MECHANICAL SEAL

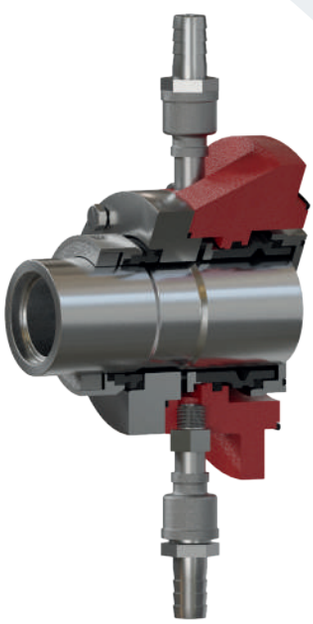
DOUBLE-ACTING MECHANICAL SEAL

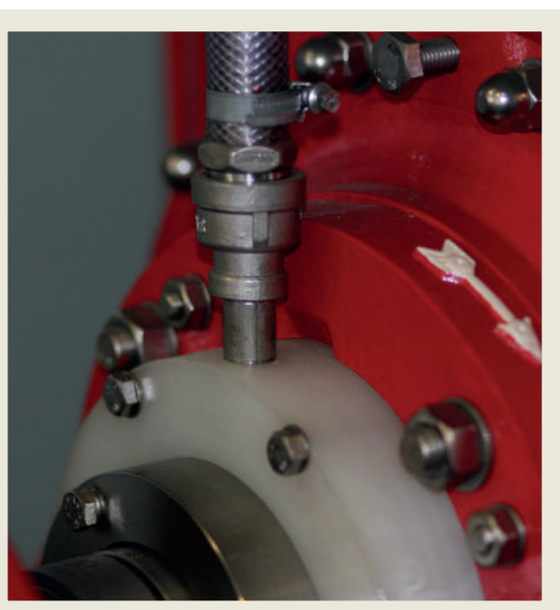
Mechanical seals are available in various designs to handle diverse operating conditions. Due to our precisely machined assembly, the leakage from mechanical seal is extremely low. Our innovative design can withstand high pressures from 16 up to 25 bar. A complex pressurized sealing system is not required. The hydraulic and mechanical forces generated during operation create a tight and leak-free arrangement and prevent solid particles from entering the seal. The space between two seals is lubricated and cooled by means of cooling water.



HGD-1

When the seal is flushed, the water entry pressure should not exceed 0.5 bar. With mechanical seals ranging from ø43 to ø100 in size, cooling water consumption is about 5-20 l/h. As an alternative, thermosyphon system with unpressurized quench fluid may be used to flush the seals. Since the fluid absorbs the friction from the seals, it is cooled and recycled in a closed loop. In addition, the quench fluid must be extremely clean (drinking water), as the seal is quite sensitive to the abrasion by solid particles. The transfer port on the protective shaft sleeve supports fluid's recirculation in the seal.

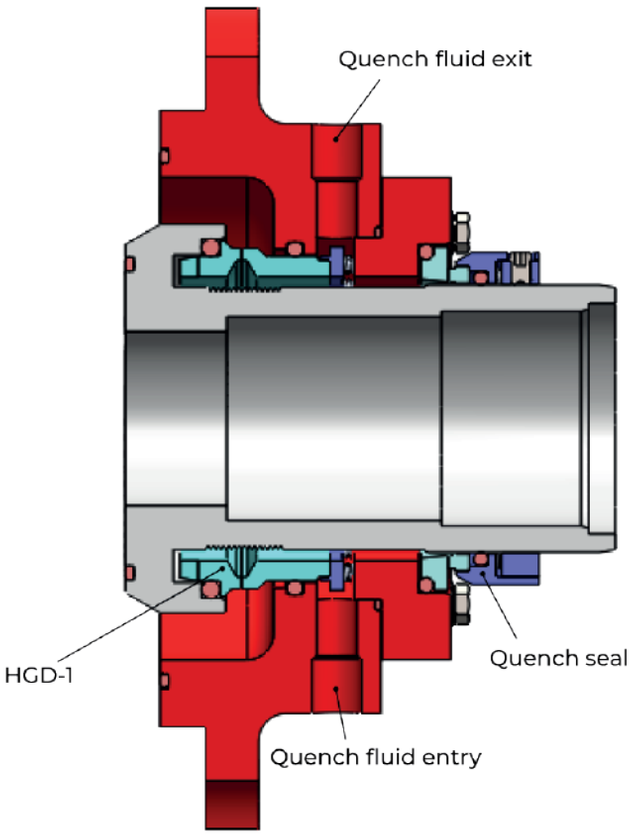




HGD-1 AND HGD-2

HGD-1
CARTRIDGE VERSION

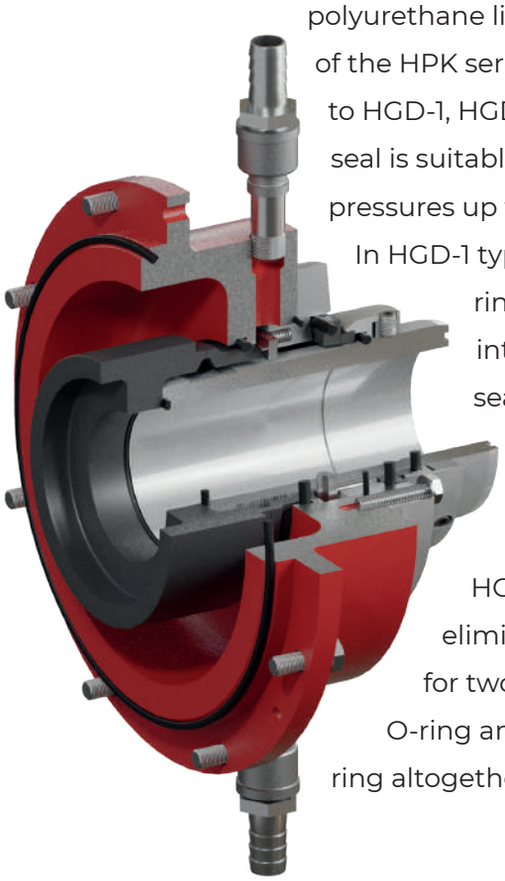
The cartridge seal version is based on a proven HGD-1 design. It consists of an entirely pre-assembled and factory tested seal unit, which allows to avoid assembly errors. After installing it into the pump, the only thing left to do is to remove the assembly locks and the seal will be ready for operation. It is not necessary to realign the primary seal after impeller adjustment. The self-adjusting design ensures the seal alignment to be compensated automatically. The HGD-1 cartridge version is available in both double and single mechanical seal types.



MECHANICAL VERSION

HGD-2

The HGD-2 is a further modified HGD-1 version and is the mechanical seal used for polyurethane lined impellers of the HPK series. Similarly to HGD-1, HGD-2/QD shaft seal is suitable for operating pressures up to 25 bar.



In HGD-1 type the mating ring is integrated into the rotating seal, which was replaced as a single seal ring for the HGD-2 seal. This eliminated the need for two springs, the O-ring and the mating ring altogether.

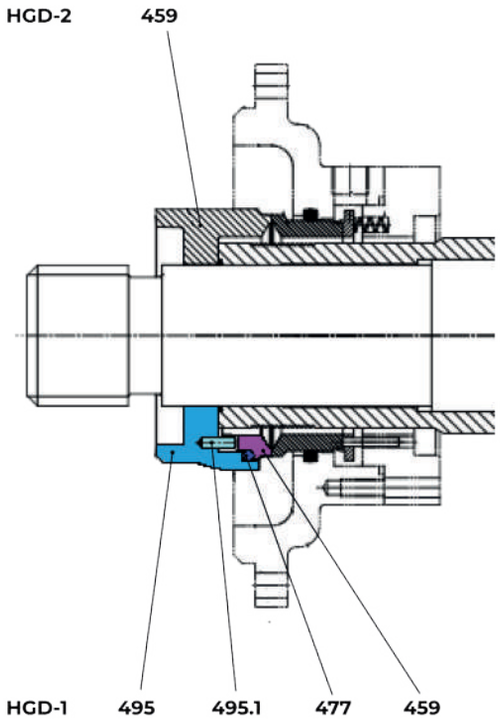
Thereby, the cooling water located in the quench chamber is not exposed to the pumped media, and the compact seal design enables relatively simple and fast installation in case of repair.

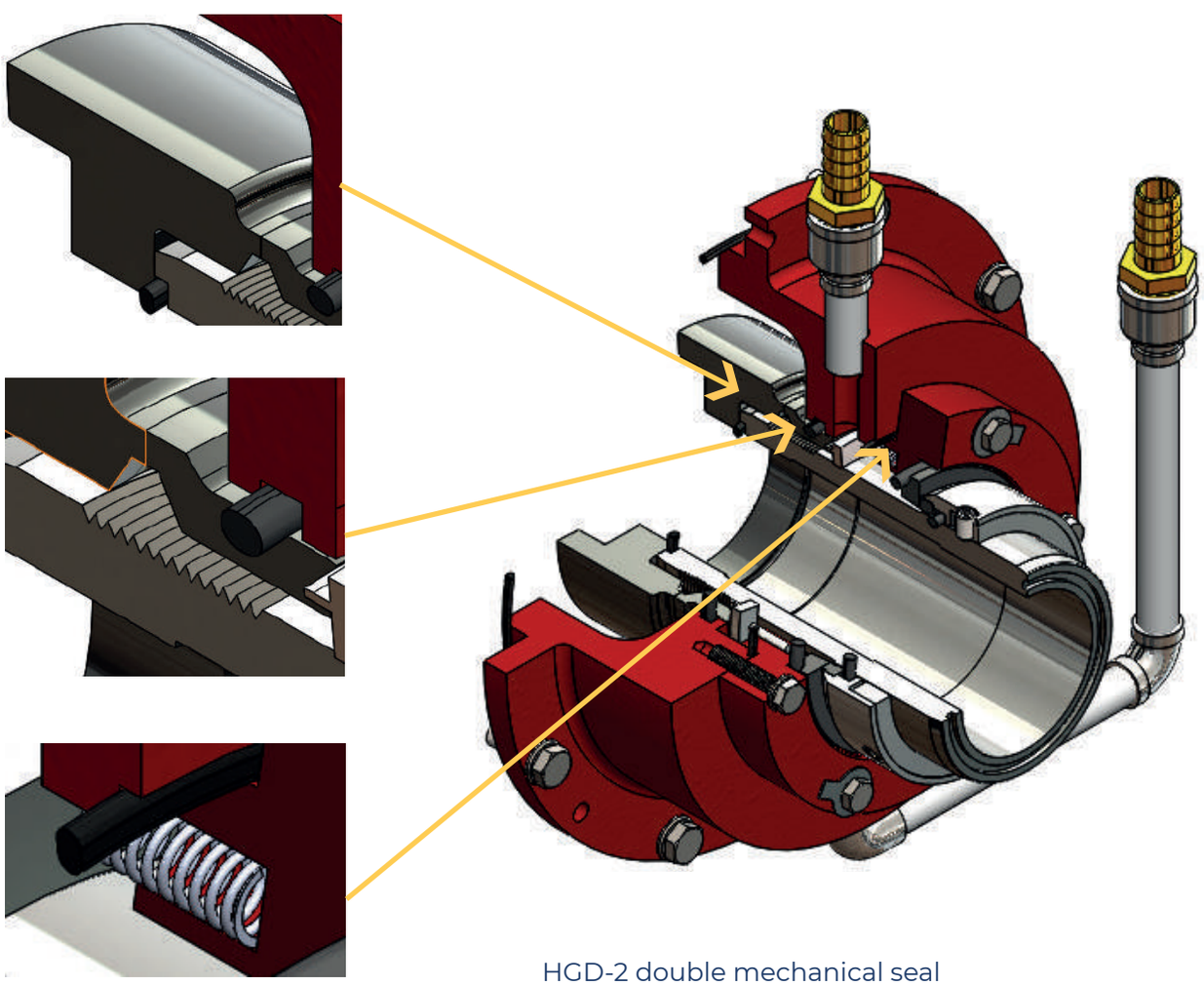
The other advantages, such as the elimination of a complex pressurized sealing system, direct cooling of the seal rings through the quench chamber, and restricted entry of solid particles due to generated rotational forces, are identical to those of HGD-1 type. The required cooling water consumption of approx. 5-20 l/h is also similar to the HGD-1. Alternatively, as with HGD-1, an unpressurized thermosiphon system can also be used. The transfer port on the protective shaft sleeve supports fluid's circulation for cooling and lubrication of the seal.

COMPARISON
HGD-1 / HGD-2

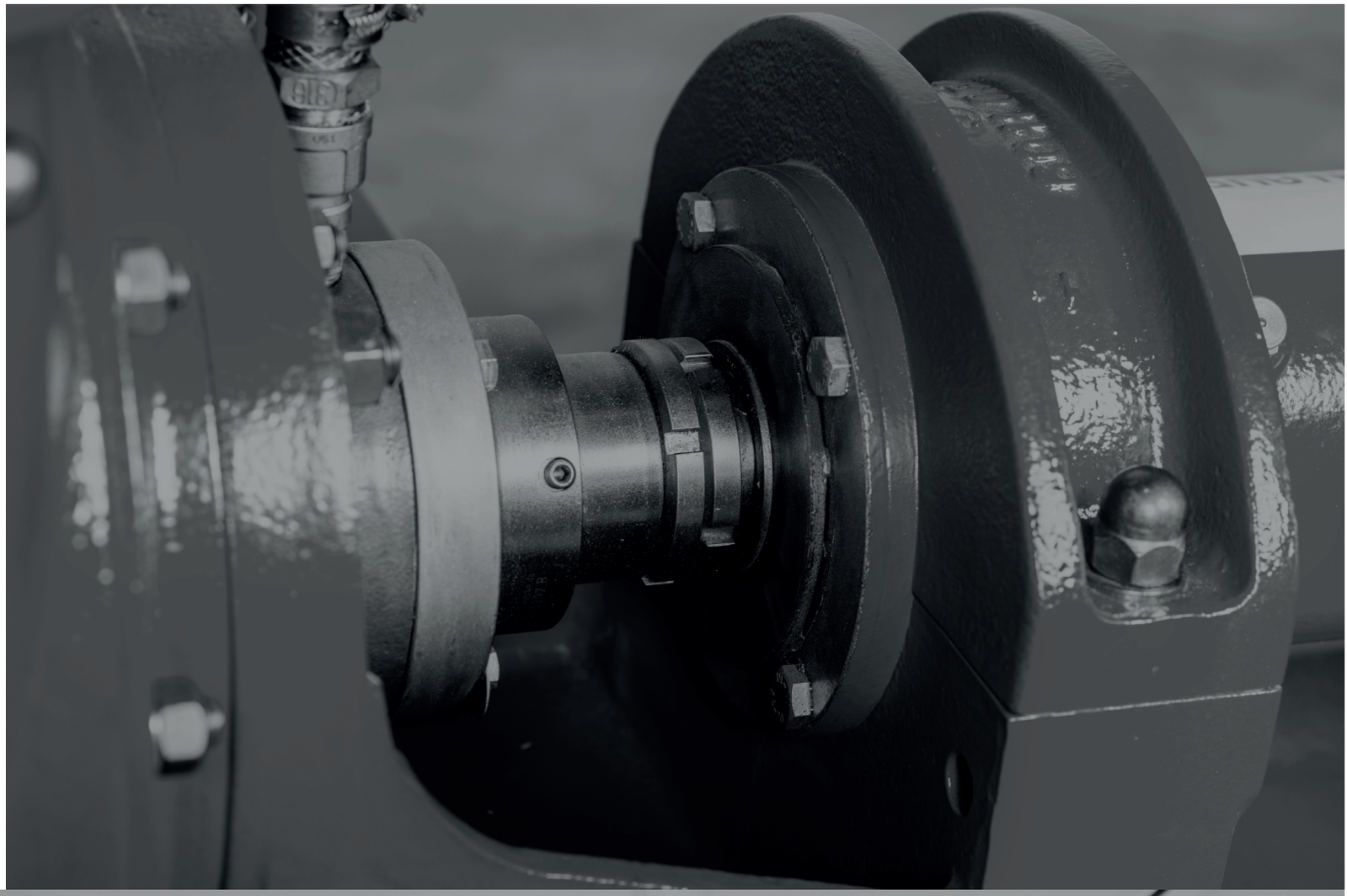
HGD-2 type is just as reliable as HGD-1, but has a more compact design. In HGD-1 type the mating ring (Item 495) is integrated into the rotating seal (Item 459), which was replaced by a single seal ring (Item 459) for HGD-2. As a result, springs (item 495.1), the O-ring (item 477) and the mating ring (item 495) are no longer required for the overall assembly.

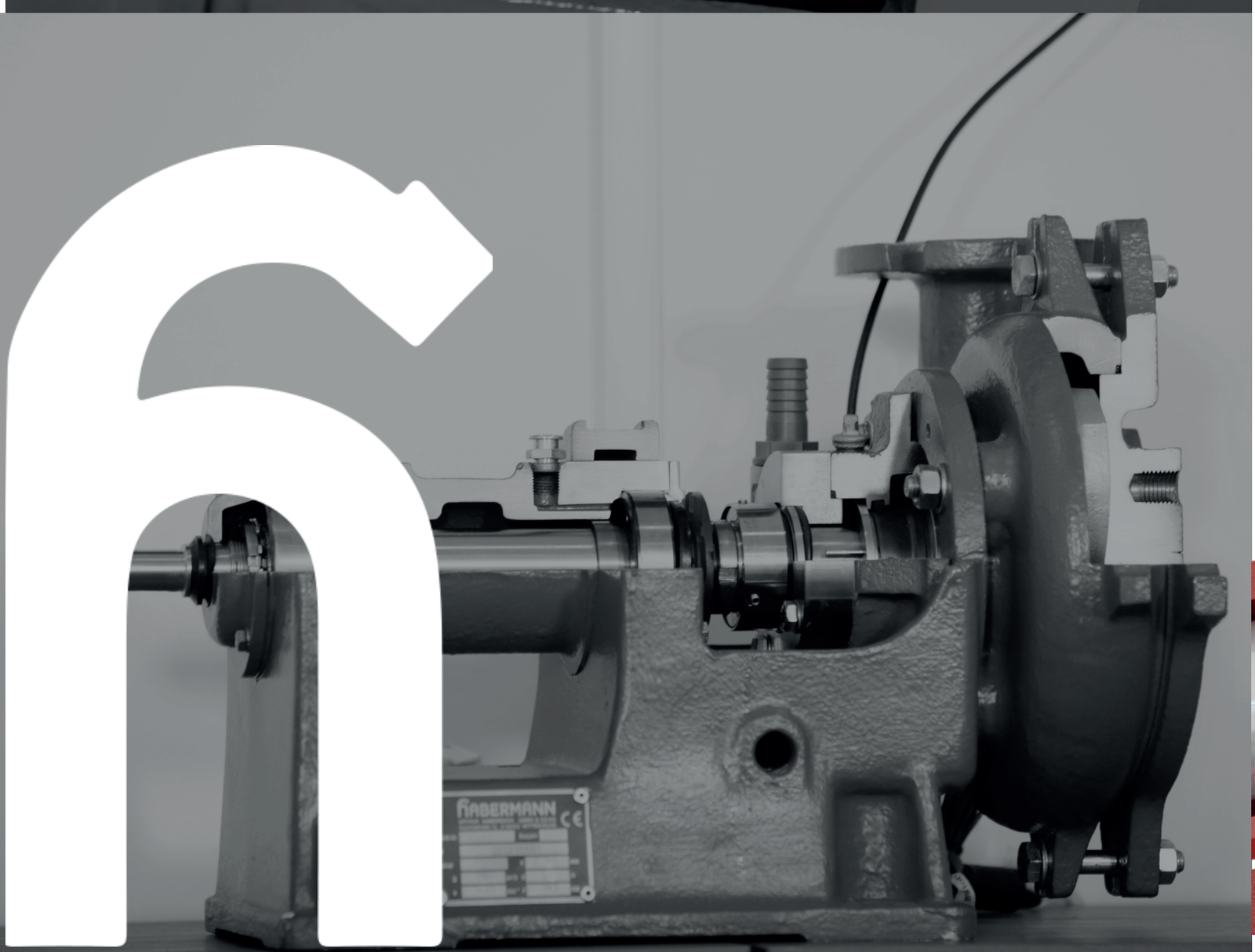
COMPARISON OF HGD-1 AND HGD-2



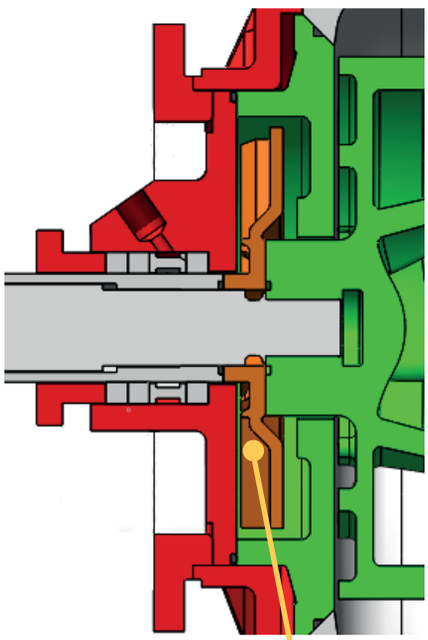


HGD-2 double mechanical seal with quench chamber



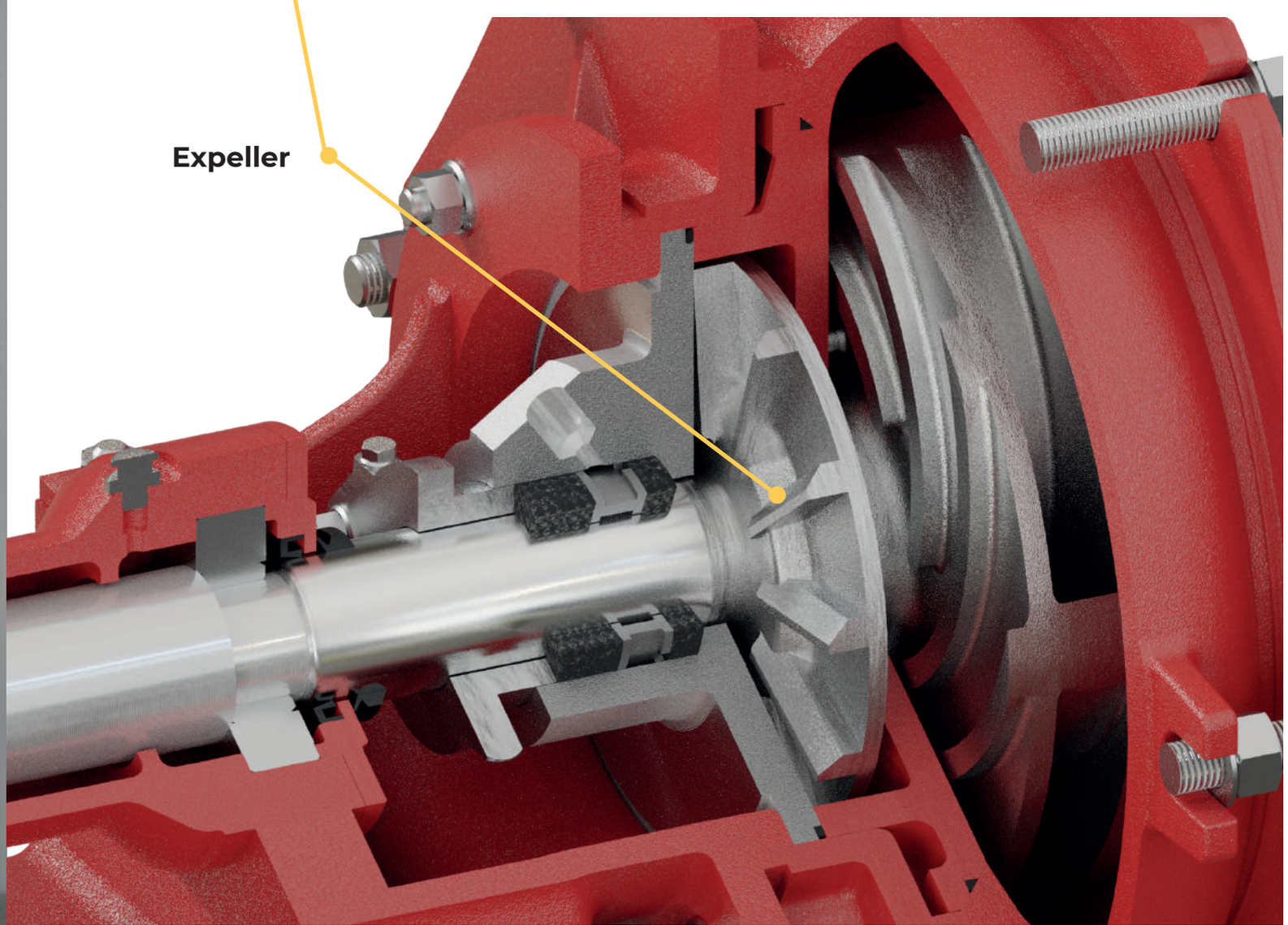

RABERMANN

SEALING WITH HYDRODYNAMIC SEAL



EXPELLER

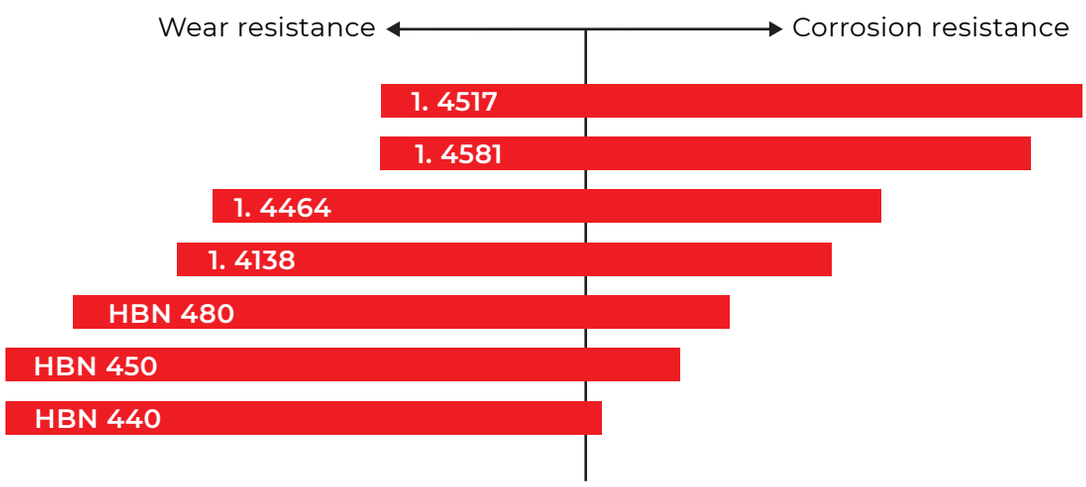
Shaft sealing by means of expeller, also known as relief impeller, is available for most of our pump series. This sealing type is particularly suitable for fine-grained pulp. It can be used as an alternative to mechanical seals for extreme applications or if the supply of clean sealing water is not possible due to the installation conditions. The application limit is close to the boiling point of the pumped media. The gland packing serves as a stationary seal and the expeller - as a dynamic component. The most commonly used materials for the relief impeller are metal and polyurethane.



CASTING MATERIALS

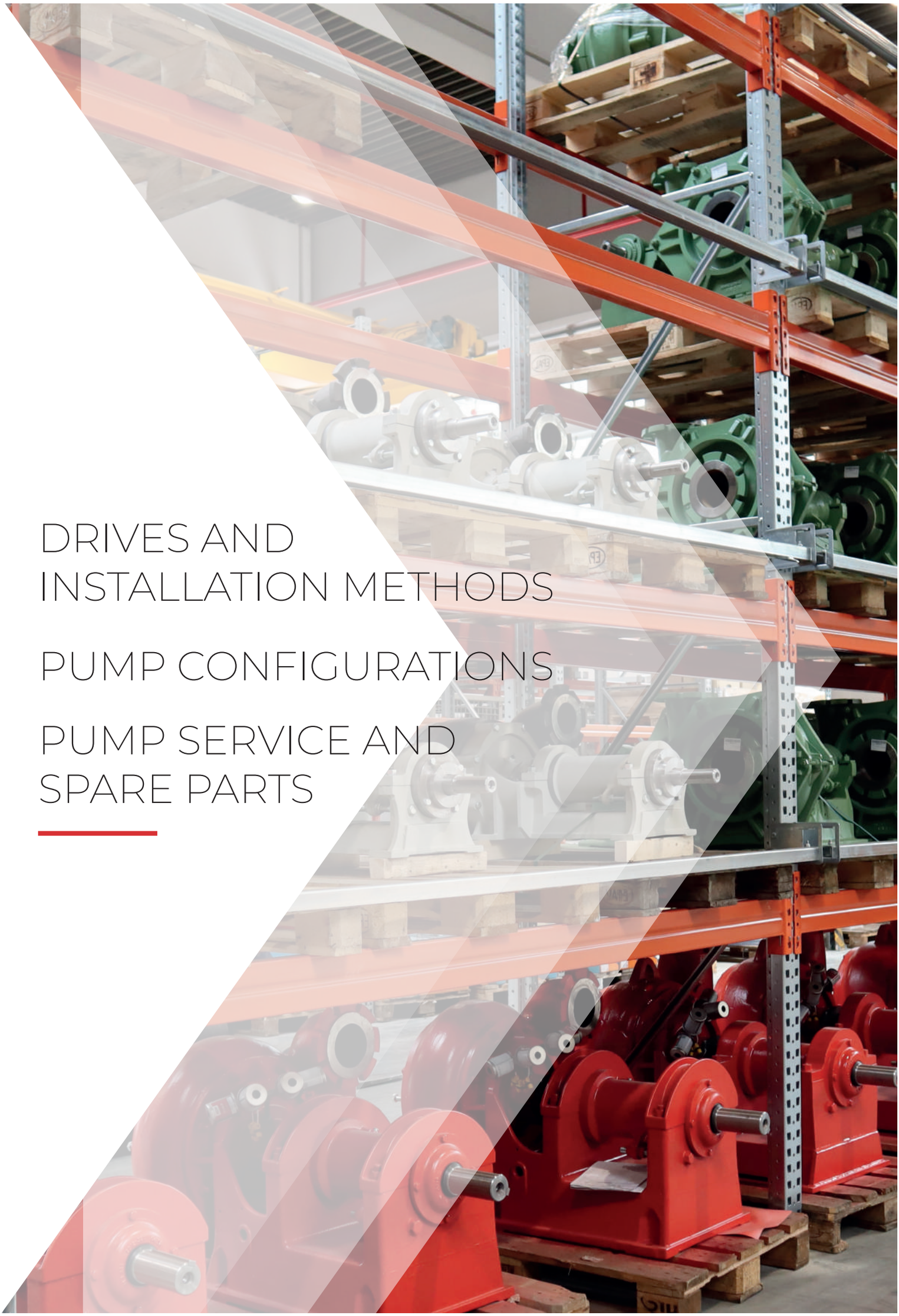
Highly wear-resistant casting materials from Habermann Aurum Pumpen were modified and perfected throughout the years based on our own experience and research. We have developed wear and corrosion resistant alloys specifically for pumps processing aggressive media and used for medium to heavy duty applications. Due to their unique combination and high hardness level, these materials significantly improve mechanical properties of the pump components. In addition to tempered steel and duplex steel, we offer cast materials of our own alloy development that are tailored to respective applications: HBN 440, HBN 450, HBN 480 with a Brinell hardness of up to 650 HB.

WEAR AND CORROSION RESISTANCE
OF VARIOUS HABERMANN AURUM MATERIALS



MATERIALS AND THEIR HARDNESS ACCORDING TO BRINELL SCALE

Material No.	Hardness [HB]
1.4517	230 - 300
1.4581	130 - 200
1.4464	230 - 300
1.4138	260 - 330
HBN 480	620
HBN 450	650
HBN 440	600



DRIVES AND INSTALLATION METHODS

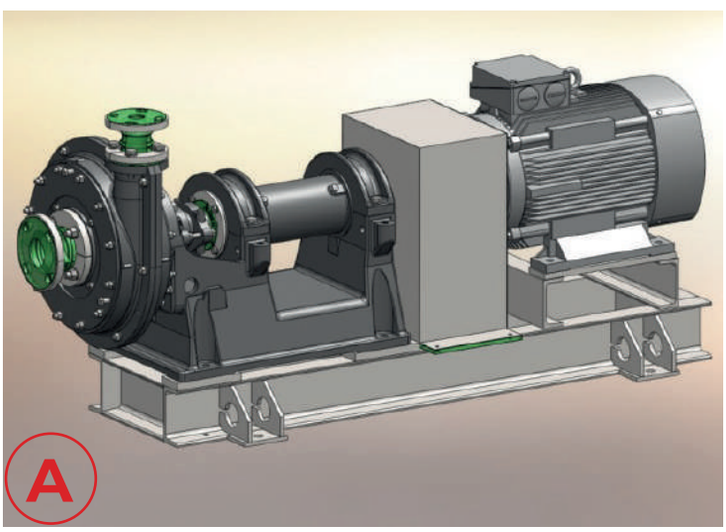
PUMP CONFIGURATIONS

PUMP SERVICE AND SPARE PARTS

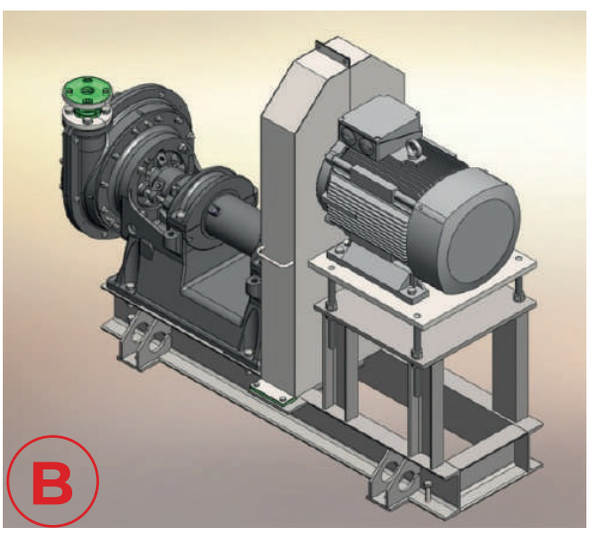
DRIVES AND INSTALLATION

V-BELT DRIVE

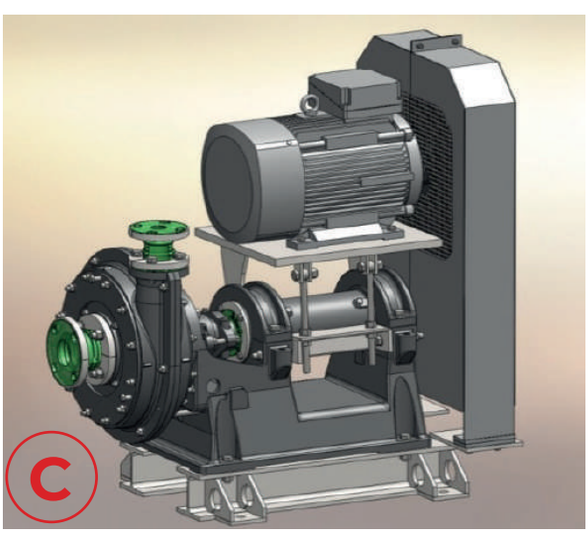
Slurry pumps are directly coupled with the electric motor only in exceptional cases. This method may be accommodated in case of compatible motor speed, depending on the pump size.
Today, the most commonly used drives are V-belt drives with high motor powers of up to 315 kW. The taper lock bushes make it easier to install and remove the V-belt pulleys, eliminating the need for tensioner to hold it together. Further advantage of the V-belt drive is that the operating characteristics of the pump can be easily adapted to the workflow changes by replacing the V-belt pulleys. This flexible design with easy installation and alignment has a very long shelf life and high efficiency.



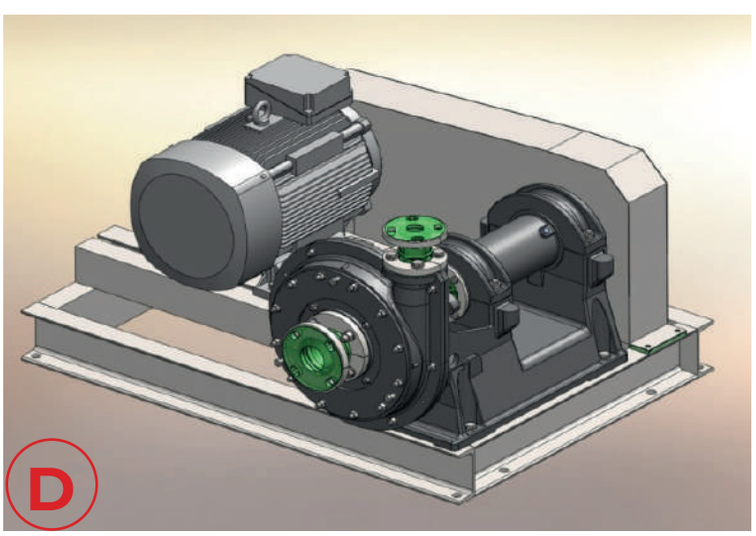
Direct coupling



V-belt drive with e-motor mounted in longitudinal axis of the pump



V-belt drive with e-motor mounted above the pump bearing



V-belt drive with e-motor next to the pump on the suction side, to the left or right optionally.
(On request, with separate base frames for pump and motor)

PUMP SERVICE

Our professional team of experts is here to offer you complete optimization and repair services to ensure the safety and efficiency of your pumping system. Our goal is to not only properly repair your pump, but to clarify why a possible failure could occur and ensure that all pump components are in fully operational condition.

SPARE PARTS

With original spare parts from Habermann Aurum Pumpen, you get the highest quality and functionality when replacing individual components. Powered by our multi-decade experience and a vast network of partners, we can support you with suitable products and solutions globally.

MODERNIZATION

Our modernization services allow you to modify and improve Habermann Aurum pumps and systems that have been in operation for a number of years. Whether you wish to maximize your production capacity or optimize specific processes within an application, we will assist you every step of the way.
Thereby you can ensure an optimal performance across your network and extend your pump's shelf life without having to invest in new systems. We will work with you to find the best possible solutions that are tailored to your needs.

MAINTANANCE AND REPAIR SERVICES

- System analysis
- Pump optimization
- Productivity assessment
- Pump commissioning and integration
- Maintenance and repair services

WE HAVE THE SOLUTION FOR YOU

HBN Casting Materials.

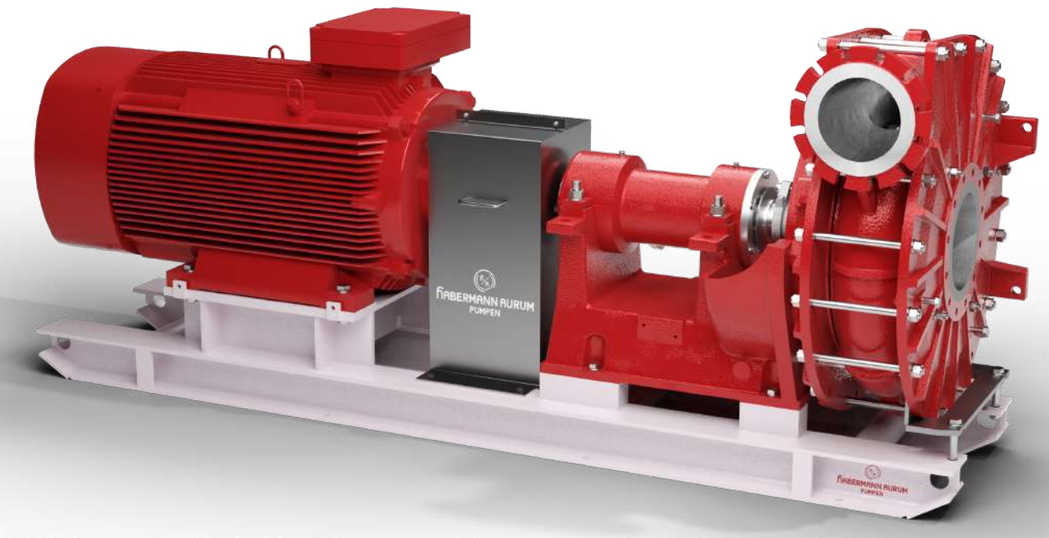
Highly wear-resistant metallic linings

Wear and corrosion resistant

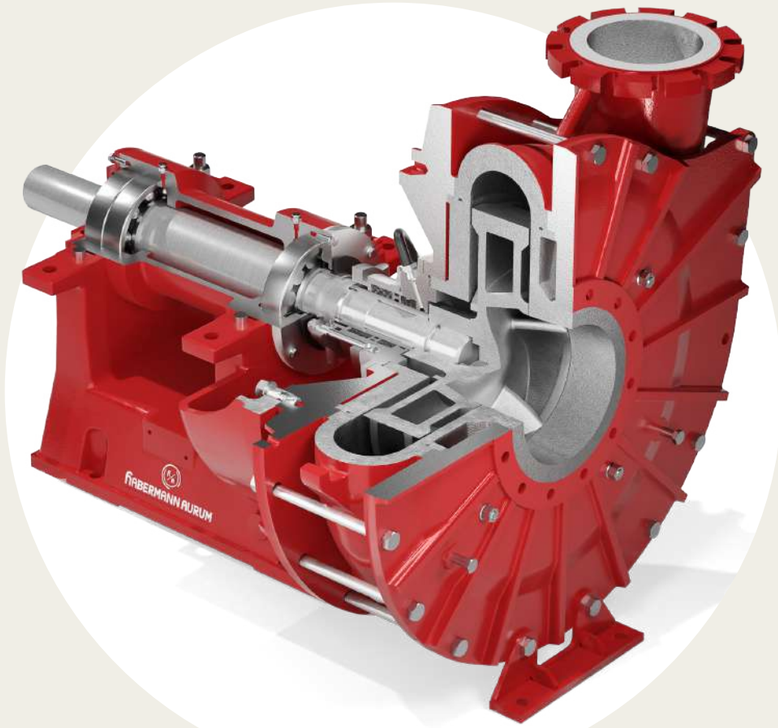
Highly wear-resistant cast materials from Habermann Aurum pumps are modified materials developed based on our own foundry experience.

We have developed the wear and corrosion resistant alloys especially for pumps for medium to heavy duty use with aggressive media Due to the special alloy and high hardness, these materials improve considerably the mechanical properties of pump components.

Additionally, to heat-treated steel and duplex steel, we offer casting materials tailored to the specific application from our own R&D:
HBN 450 and HBN 480 with a Brinell hardness of up to 650 HB.



NPK slurry pump lined with HBN cast material



The HBN 450 and HBN 480 are chrome-molybdenum castings, which is produced after a complex quenching and tempering process, it has a consistent hardness of up to 650 HB.

HBN casting materials in comparison

Quality	HBN 450	HBN 480
Hardness	650 HB	550 HB
Operating temperature	max. 130 °C	max. 130 °C
pH suitability	6 - 9	4 - 10
Media	coarse-grained, up to approx. 150 mm	coarse-grained
Characteristics	abrasion resistant	abrasion resistant and conditionally corrosion resistant

HBN wear and corrosion properties

Due to the special alloy, these materials improve the wear and corrosion properties of our pump components considerably.

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made for your process

- Expert advice
- A customer-oriented organization that adapts to the requirements and wishes of your organization
- Innovative and customized solutions
- Breakdownservice, 24 hours a day, 7 days a week
- Technical service with extensive test facilities, working from our own workplace or at your location
- A fast and appropriate solution for all your issues
- Wide range of liquid pumps
- Repair, maintenance and revision

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