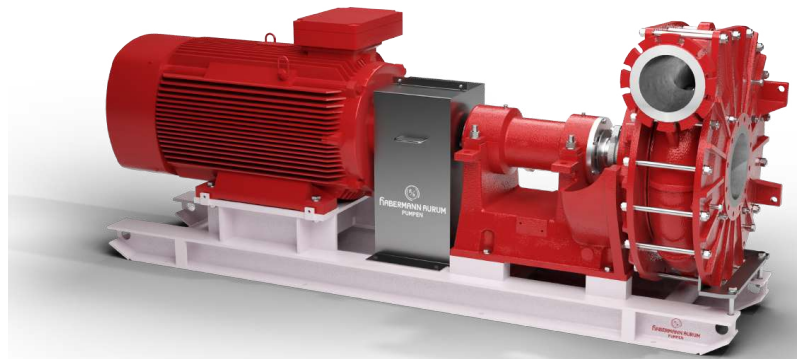


**BEDU**  
≡ POMPEN ≡

# VERTICAL PUMPS

## FOR WET AND DRY INSTALLATIONS



**made for your process**

# VERTICAL VERTICAL PUMPS

## VERTICAL PUMPS FOR WET AND DRY INSTALLATIONS

Possible immersion depth is up to 5 meters.

**5 m**

This construction series can be used for both wet and dry installations. Thanks to the modular structure of our pumping systems, vertical pumps may have the same configuration as HPK, NPK, and NPW series. The available installation depth of up to 1800 mm is suitable for V300 / V320 / V330 series.

These robust pumps are designed to tolerate high concentrations of solids and are fitted with cantilever shaft without a shaft seal. Furthermore, the V330 type is suitable for foaming and gas liquids and discontinuous operation. Additionally, this type may be equipped with shaft seals. The immersion depth for V1 / V2 series is up to 5000 mm. The hydraulic system is identical to the one in horizontal pumps of HPK, NPK, and NPW series and therefore has the same power range.



# V300 / V320 SERIES

## VERTICAL SEMI-SUBMERSIBLE PUMPS FOR WET INSTALLATIONS

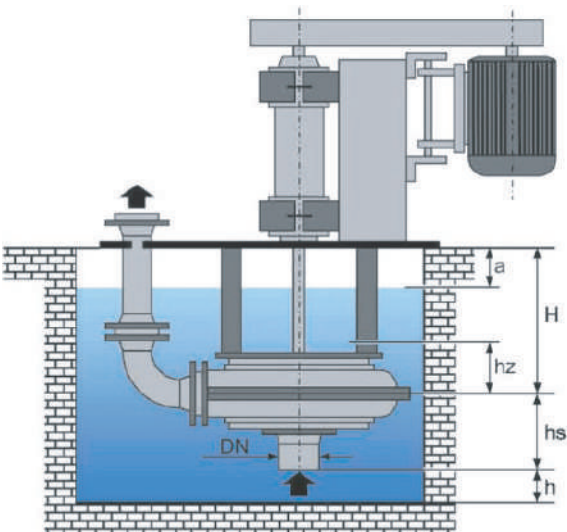
The types V300 / 320 / 340 are vertical semi-submersible seal less pumps suitable for immersion depth up to 1800 mm. Due to the modular construction of Habermann's pumps, the hydraulic components of the V series are exactly the same as in HPK, NPK, and NPW pumps.

Performance characteristics of V300 / V320	
Flow rate, up to	1400 [m³/h]
Maximum head	50 [m.l.c]
Pump speed, depending on the size, up to	2000 [min⁻¹]
Pump sizes	DN 32 to DN 300
Maximum operating pressure	10 [bar]
Temperature of the slurry, up to	90 [° C]
Highly corrosion resistant at pH levels	0 to 14
Standard installation depth	H = 500 / 900 / 1100 / 1350 1500 / 1650 / 1800 [mm]
Standard drive	V-Belt drive, direct motor coupling is possible, depending on the operating point

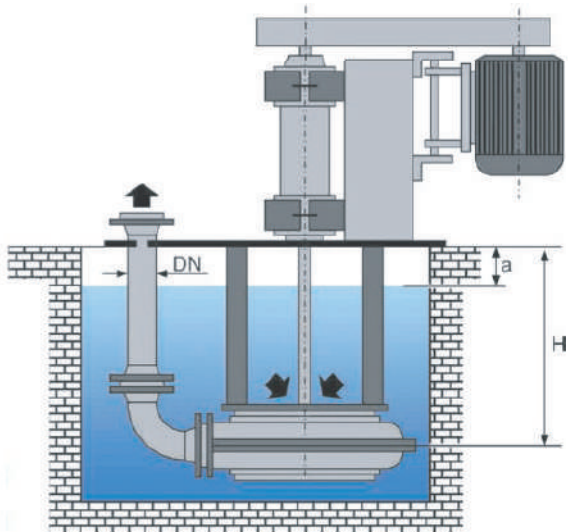


## WET WELL INSTALLATION

Static head	Maximum fluid level	Minimum ground clearance
$h_z = DN + 150 \text{ mm}$	$a_{\min} = 1 \times DN$	$h_{\min} = 1.5 \times DN$



Wet installation **V300**  
(Maximum suction height  $h_s = 2500 \text{ mm}$ )



Wet Installation **V320**

# V330 SERIES

## VERTICAL PUMPS FOR DRY INSTALLATION

V330 series are vertical pumps with an open system designed for froth pumping applications. Due to the special construction of the pump with its own ventilation pipe, V330 type is mainly used in flotation processes, in particular for transportation of aerated slurries. The pumping media flows into the pump through its suction inlet, then the rotating impeller discharges the liquid towards the pressure pipe. Meanwhile the gas or air bubbles in the liquid are released to the atmosphere through the ventilation pipe. This construction is called open system, which is well-suited for discontinuous operation and changing inlet conditions.

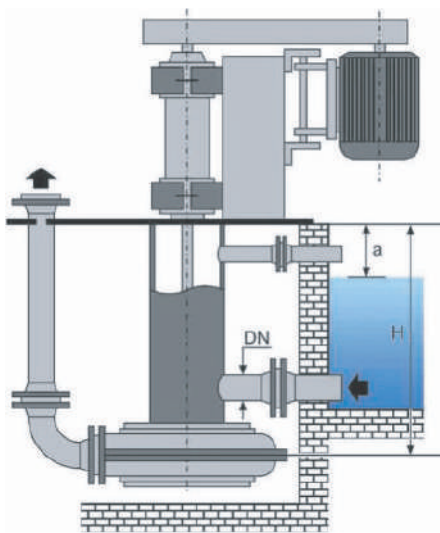
### Performance characteristics of V310 / V330

Flow rate, up to	1600 [m³/h]
Maximum head	50 [m.l.c]
Pump speed, depending on the size, up to	2000 [min⁻¹]
Pump sizes	DN 32 to DN 300
Maximum operating pressure	10 [bar] (2-stage up to 16 bar)
Temperature of the slurry, up to	90 [° C]
Highly corrosion resistant at pH levels	0 to 14
Standard installation depth	H = 500 / 900 / 1100 / 1350 1500 / 1650 / 1800 [mm]
Standard drive	V-Belt drive, direct motor coupling is possible, depending on the operating point



## DRY INSTALLATION

Minimum suction head during the pump start-up	Maximum water level	Minimum ground clearance
$h_z = DN + 150 \text{ mm}$	$a_{\min} = 1 \times DN$	$h_{\min} = 1.5 \times DN$



Dry Installation **V330**



V1 / V2

# V1 / V2 SERIES

## VERTICAL CENTRIFUGAL PUMP

These construction types are suitable for both wet and dry installations. The hydraulic components correspond to those in HPK, NPK, and NPW series. In case of dry installed pump, its hydraulic components are protected with mechanical shaft seal.

### V1 Type

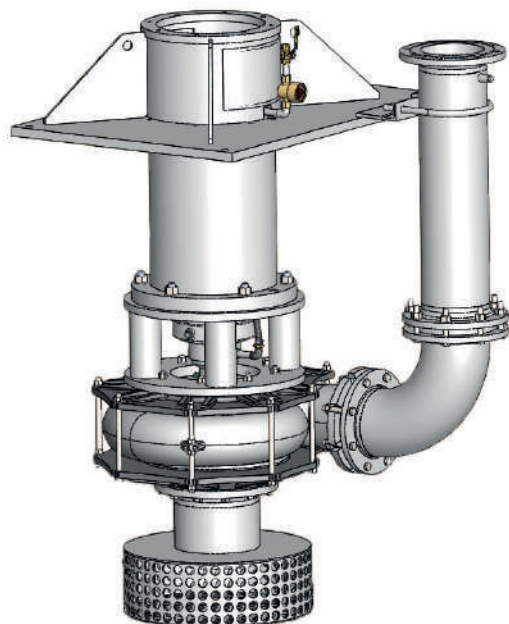
The installation depth for this type is up to 2500 mm or greater with the use of additional shaft seals. The design is suitable for both wet and dry installations.

### V2 Type

This type features an extended linear shaft: the drive shaft is designed in two parts, connected with an intermediate coupling. Due to this design, the permissible installation depth for this type is up to 5000 mm.

### Lubrication System

The integrated lubrication of the bearings and shaft seals ensure efficient operation of the pump under heavy-duty applications.



NPW 200 V1



V2

### Performance characteristics of V1 / V2

Flow rate, up to	2500 [m <sup>3</sup> /h]
Maximum head	60 [m.l.c]
Pump speed, depending on the size, up to	1480 [min <sup>-1</sup> ]
Pump sizes	DN 32 to DN 400
Maximum operating pressure	10 [bar]
Temperature of the slurry, up to	70 [° C]
Highly corrosion resistant at pH levels	3 to 14
Discharge nozzle arrangement	gradually rotatable



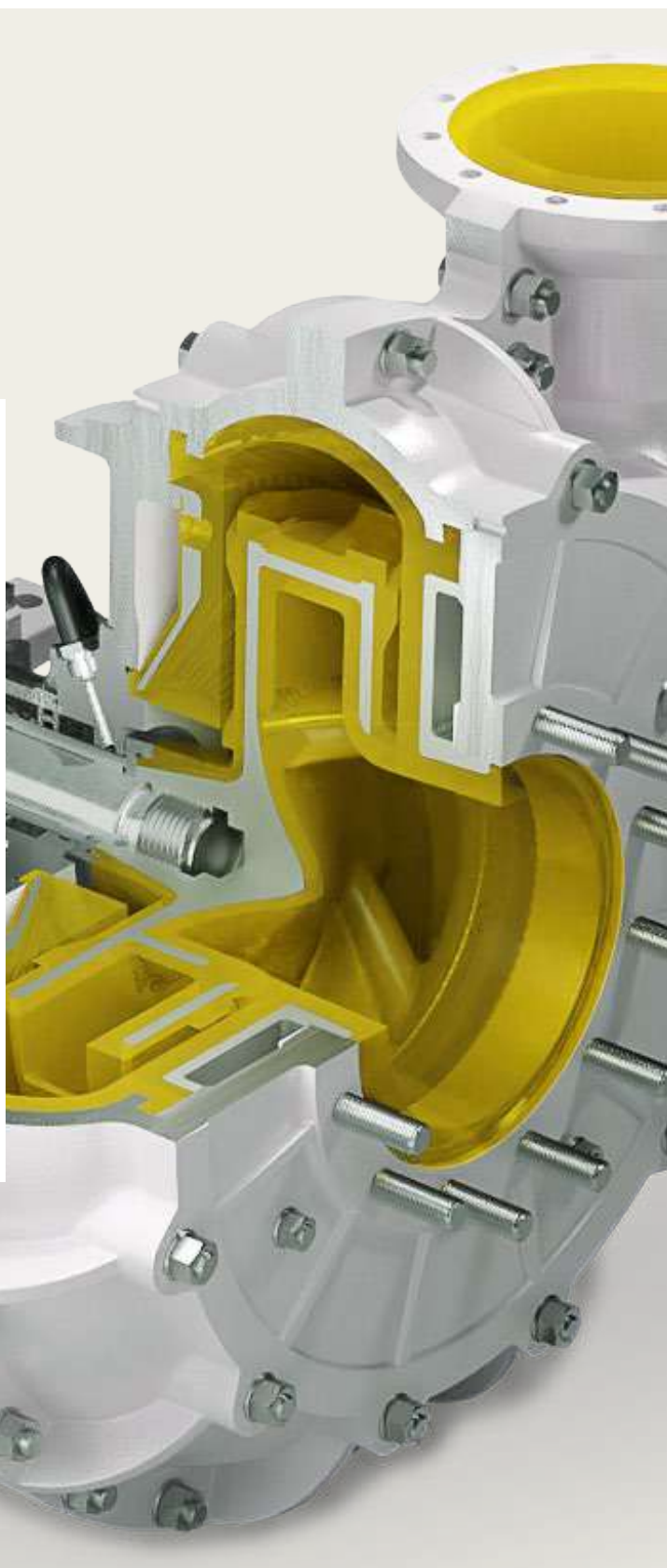
**HABERMANN AURUM  
PUMPEN**

# OUR MATERIALS IN THE PUMP ENGINEERING

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## LININGS OF OUR PUMP SERIES

[www.habermann-aurum-pumpen.de](http://www.habermann-aurum-pumpen.de)



APFLEX®  
POLYURETHAN

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CERAM-  
CARBIDE®

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APG  
RUBBER

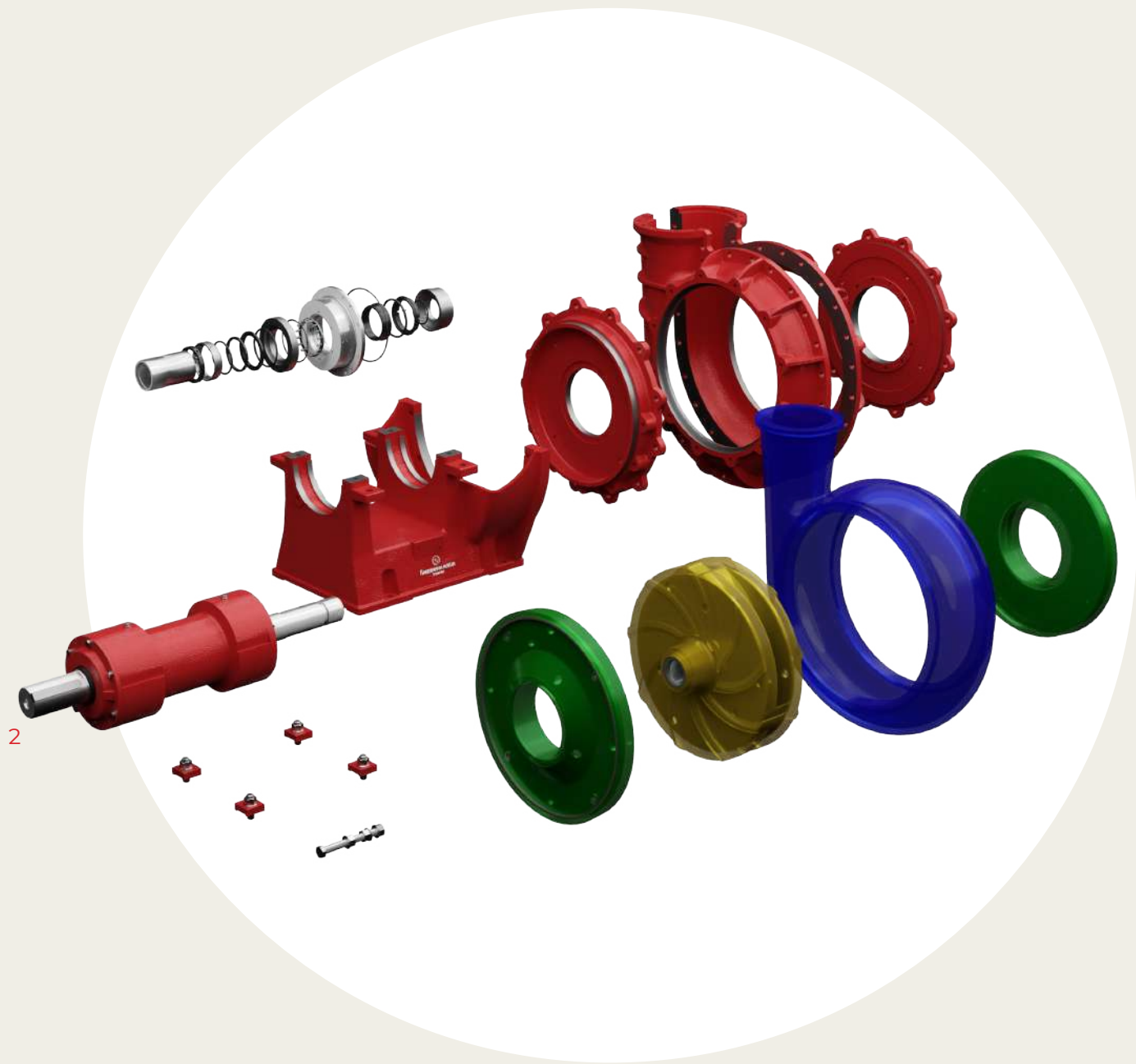
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FKM  
MATERIAL

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HBN  
CASTING

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Individual adaptation to your plant situation,  
thanks to the greatest variety of materials. This is  
the greatest advantage of the HPK pump series.

# Content.

COMPANY .....
THE HISTORY OF OUR MATERIALS.....
APFLEX® .....
CERAMCARBIDE® .....
APG RUBBER AND FKM .....
HBN CASTING .....







**HABERMANN AULUM PUMPEN**  
has almost 100 years of experience  
and in-depth expertise in solids  
transport.

# 1927.

Habermann Aulum 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 workforce, 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 Aulum as a highly 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.**

# Our materials.

## Proven and latest qualities in pump technology

### The history of our developments

The company Habermann Aurum Pumpen LLC is a medium-sized company which has been dealing with the hydraulic transport of solids **since 1927**.

For this initially only metallic pumps were designed, built and tested under the most difficult conditions, mainly in the mining and in the steel producing industry. Towards the **end of the 1950s** Habermann Aurum Pumpen was one of the first manufacturers who broke new ground in this field.

An armoured pump with elastic lining was built, designed and exhibited for the first time at the mining expo **at the end of 1950**. This pump had the designation GP and already had replaceable hydraulic wear parts.

The replaceable wear plates, as well as the impeller had a metallic core on which a thick-walled rubber coating protection served as against wear. A similar replaceable armoured insert was inserted loosely into the outer metal housing, similar to a tube in a bicycle tire. The entire hydraulics of the pump was protected by elastic components.

By exploiting the trampoline effect - the grain hits and is thrown back - could thus, with fine-grained media up to 5 mm it was possible to increase the service life of the pumps extremely. In addition, the effect was that certain rubber coatings were chemically far more resistant. This effect made it possible to open up new business fields in other industries. In retrospect, this turned out to be a stroke of luck, as mining in Europe was on the decline. This design has been consistently optimized both in terms of design and efficiency.

At GP, GP-I and GP-II series were followed by the HP-I to HP-IV series up to current HPK.

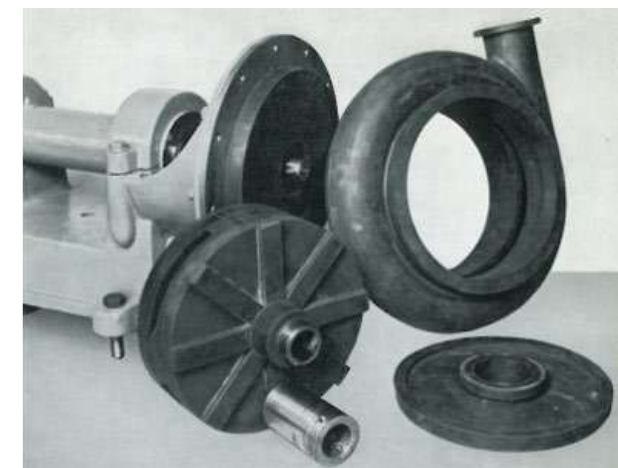
In the mid-1960s, the first trials were carried out with specialized polyurethanes, This has significantly expanded the range of this series.

**Today**, from the smallest pump HPK 32 to the HPK 500, there are three different special polyurethan grades available. These are also known by our registered brand name APFlex®. These materials are supplemented up to the

nominal size of HPK 125 by two permanently developed special rubber and FKM quality. To round off this very universal series, there are also metal wear plates and impellers, which are made of some very hard or acid-resistant cast qualities.

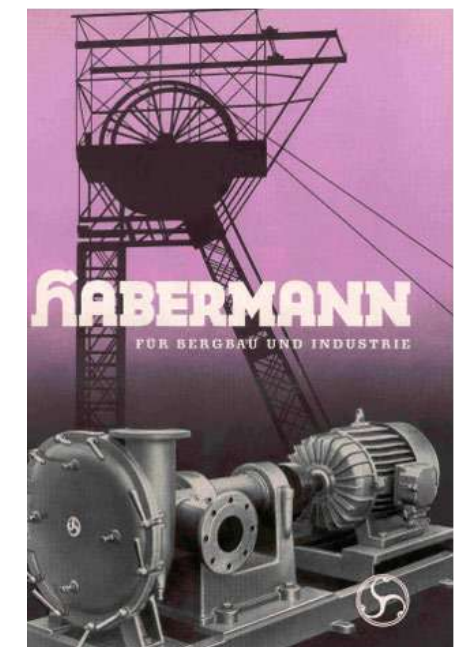
Not to be forgotten is the execution made of our CeramCarbide® material up to HPK 100. This wear and acid-resistant polymer casting with silicon carbide inclusions complements the above-mentioned material variants in this almost universal HPK pump series.

The advantage of this pump type is the ability to replace individual worn components. As a result, total life cycles of well over 15 years are often achieved.



**Armoured pump from 1960**  
with elastic lining

By our products, we equate sustainability with durability. The basis for this is a conscious use of resources, careful selection of materials and and quality workmanship. Since the foundation of our company, we have been contributing to the conservation of resources.



**Brochure from 1960**  
Fig. of a metallic ST pump  
for the mining industry



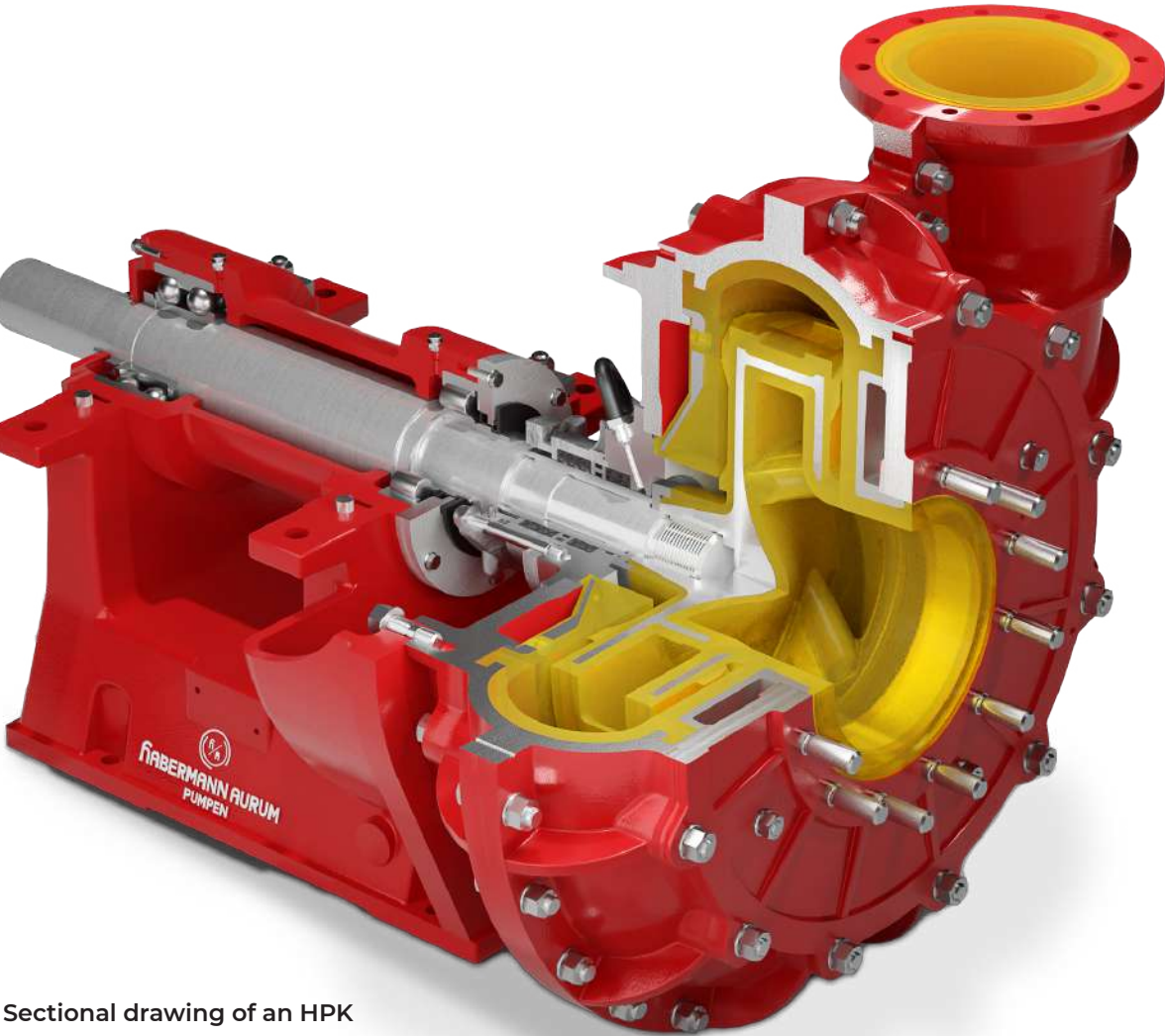
Innovative special polyurethanes

Hot-cast, highly elastic, hydrolysis-resistant

APFlex® special polyurethanes have high wear, cut and oil resistance. APFlex® materials utilize the so-called „trampoline effect“, which gives them great advantages of their wear behaviour compared to metallic cast materials. Due to special formulations of the APFlex® It can be used in corrosive or abrasive media.

For diluted acids, for example, the following empirical values are available:

- H2SO4 up to 35%
- P2O5 up to 70%
- HCL up to 25%
- Alkaline solutions: e.g. NaOH compound without limitation of concentration.



Sectional drawing of an HPK slurry pump  
APFlex® lining in 10-01 quality



The special polyurethanes are differently dyed for easier recognition of the quality of materials, since the components are interchangeable.

APFlex® polyurethane materials in comparison

Quality	APFlex® 10-01	APFlex® 60-01	APFlex® 50-01
Shore hardness	A 88 - 90°	A 75 - 80°	A 88 - 90°
Operating temperature	-30 to +75 °C	-30 to +75 °C	-30 to +95 °C
pH suitability	0 - 14	5 - 10	0 - 14
Properties	abrasion and corrosion resistant, suitable for acids and alkalis, oil resistant.	particularly abrasionresistant and resistant to the known treatment oils.	thermal resistance; chemically as resistant as APFlex® 10-01

The abrasion values possible with APFlex® cannot be achieved with any other rubber or FKM quality.

# CeramCarbide®.

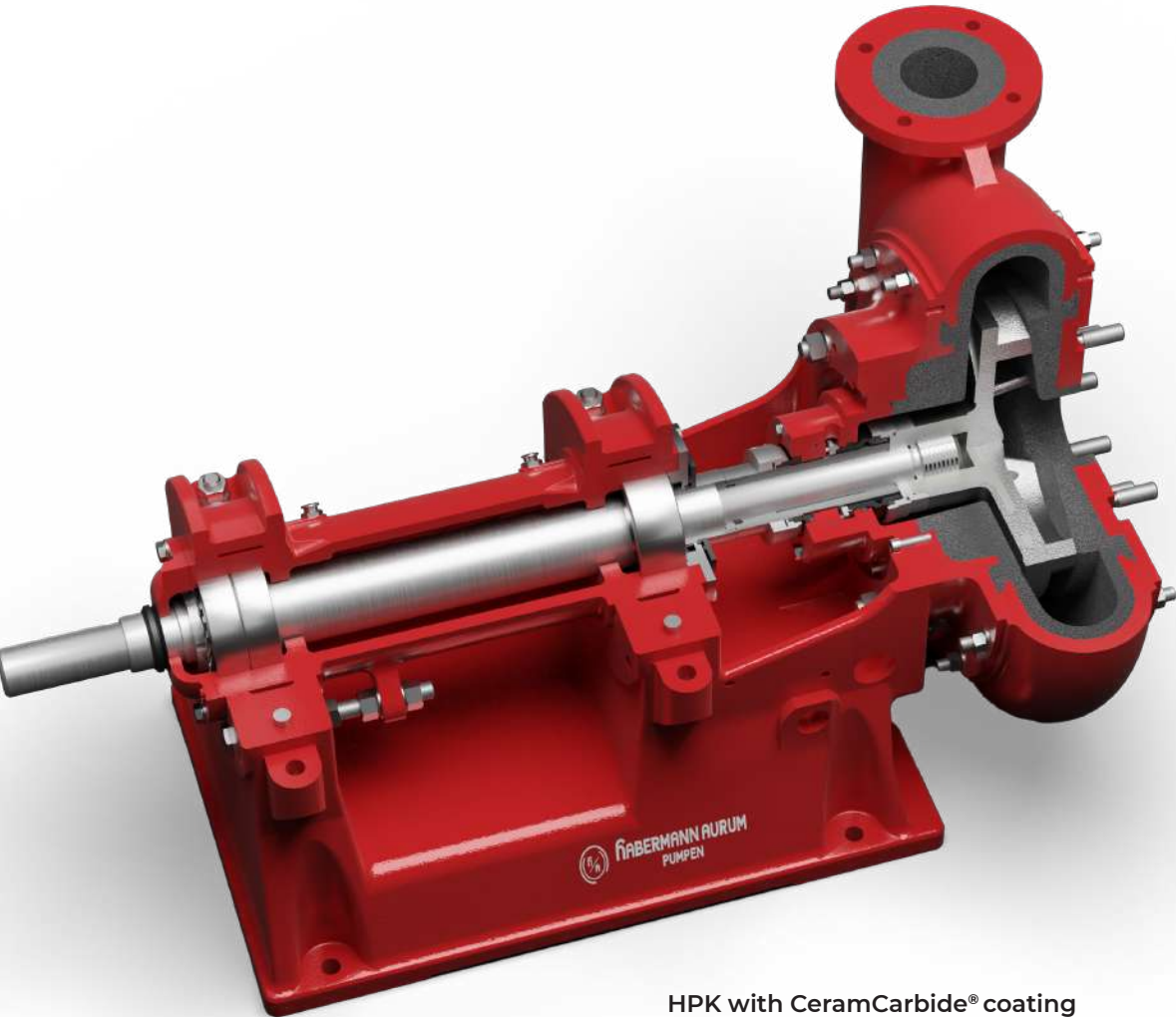
Non-metallic composite material

## Wear and corrosion resistant

CeramCarbide® is a non-metallic composite material which consists of more than 80% of silicon carbide and about 20% of a vinyl ester resin as a binder. Silicon carbide is a non-oxide ceramic. It has a very good resistance to acids and alkalis and it is still wear and corrosion resistant even at very high temperatures.

The silicon carbides are treated with a predefined mixture with vinyl ester resins and then casted.

Vinyl ester resins, also known as VE resins, are synthetic resins that form thermosetting plastics of high strength and chemical resistance when cured.



HPK with CeramCarbide® coating



CeramCarbide® is a lightweight material, which is almost as hard as a diamond (approx. 9.5 on the Mohs hardness scale).



## CeramCarbide® properties

Operating temperature	up to 160°C
pH suitability	0 - 14
Characteristics	abrasion and corrosion resistant, suitable for acids or alkalis, high hardness due to silicon carbide inclusions, application in very fine-grained media

For mixed stresses from corrosion and abrasion and grain sizes up to 3 mm CeramCarbide® lined pump is an ideal solution.



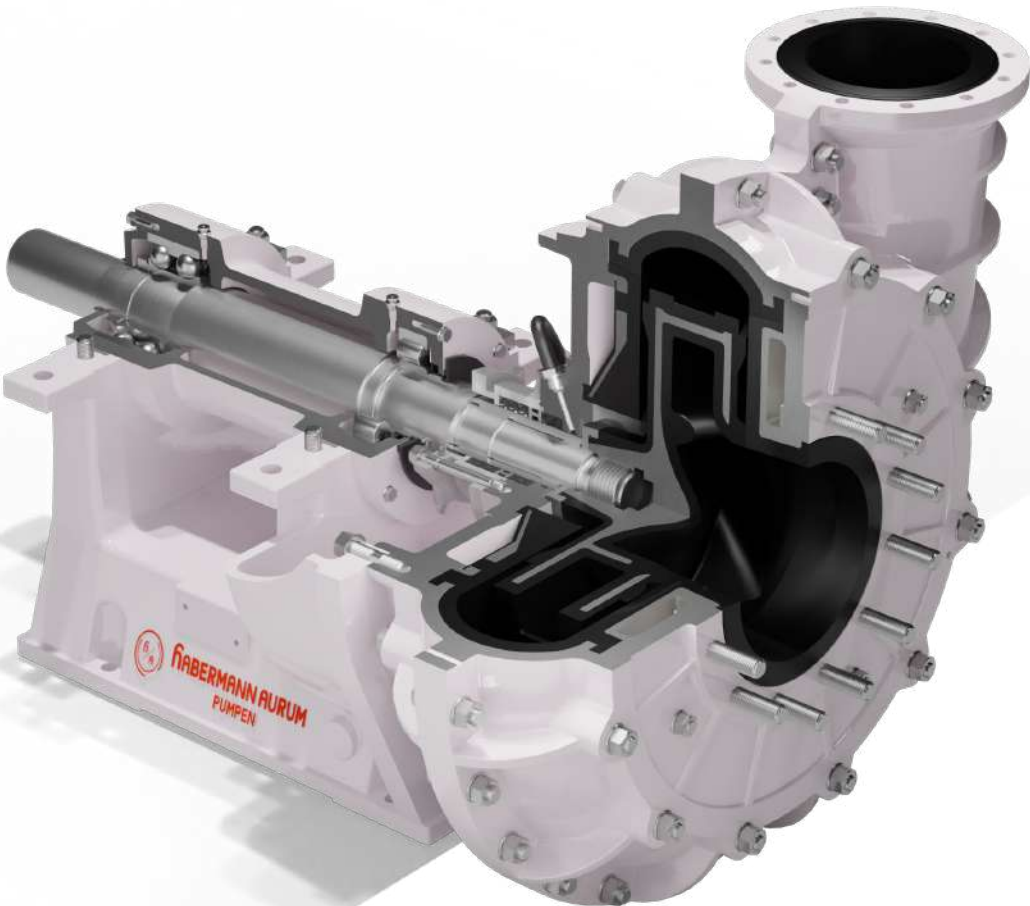
# APG Rubber and FKM.

Hot-pressed, highly elastic materials

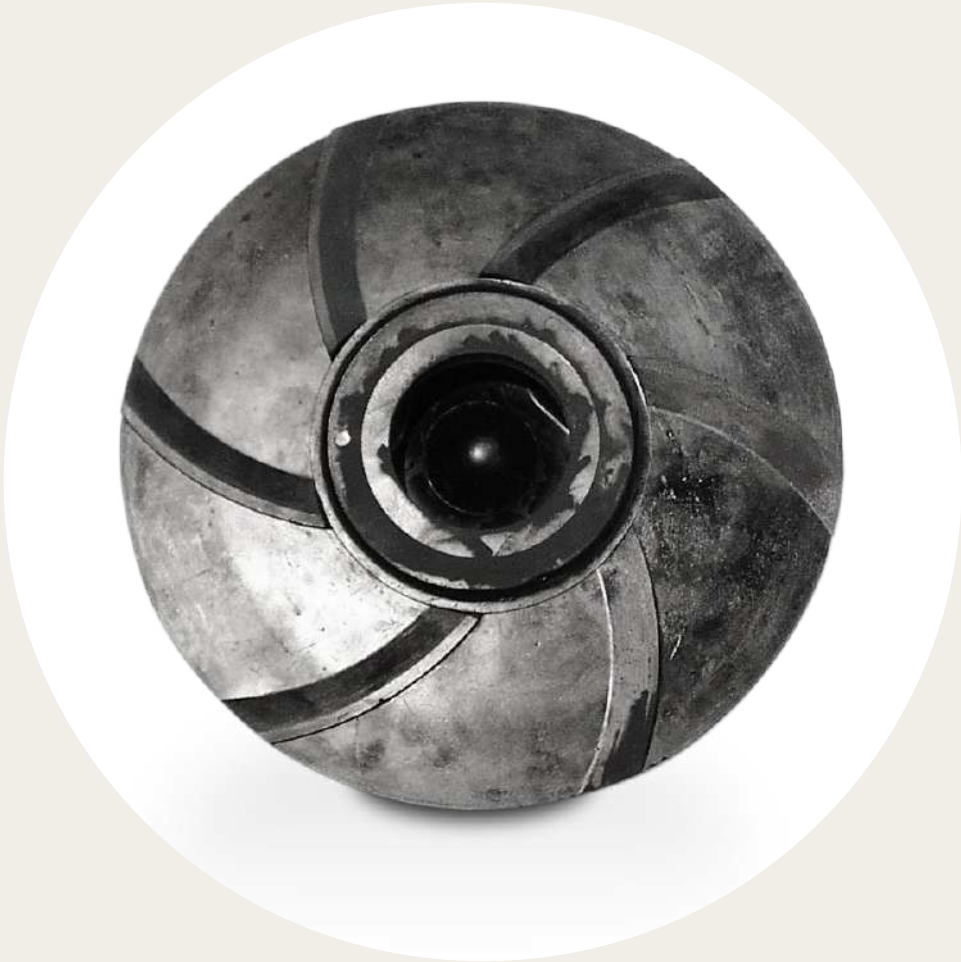
## Temperature, abrasion and corrosion resistant

Temperature, abrasion and corrosion resistant rubber and FKM (fluorocarbon rubber) grades are hot-pressed, highly elastic rubber or FKM materials. They have a high wear resistance. These materials also utilize the so-called „trampoline effect“, and have great advantages in terms

of their wear performance compared with metallic cast materials. The special compositions allow these materials to be used in corrosive or abrasive/ corrosive media.



HPK pump with rubber lining



Due to their high elasticity and incision resistance, rubber parts made with APG rubber or FKM material are much more suitable for pumps handling fine-grained media than any highly wear-resistant cast steel.

## APG and FKM grades in comparison

Quality	APG 2201	APG 2210	FKM
Shore hardness	65°	55°	65°
Temperature	max. 130 °C	100 - 105 °C	max. 100 °C
pH suitability	0 - 14	0 - 14	0 - 14
Characteristics	abrasion and corrosion resistant, suitable for acids and alkalis, use with fine-grained media	more abrasion resistant, suitable for acids and alkalis, use with fine-grained media	abrasion and corrosion resistant, suitable for acids and alkaline solutions (e.g. hydrochloric acid up to 98 % resistant), for use with fine for fine-grained media

All rubber wear parts which come into the contact to the medium have a higher temperature resistance.



# HBN Casting Materials.

Highly wear-resistant metallic linings

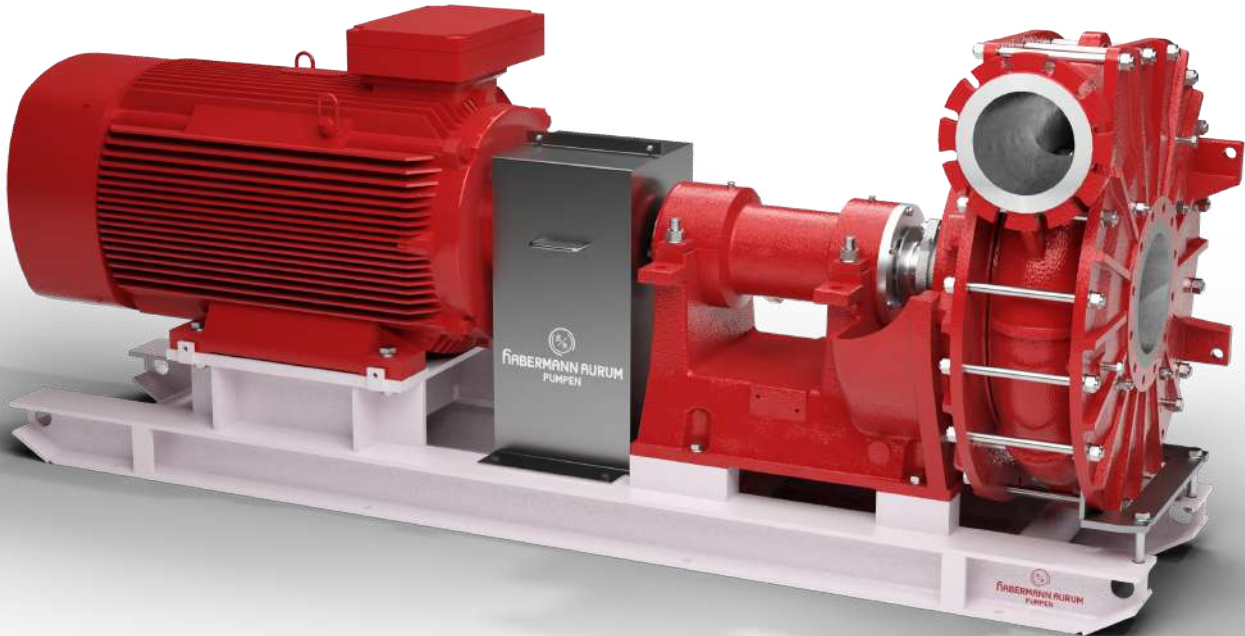
## Wear and corrosion resistant

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

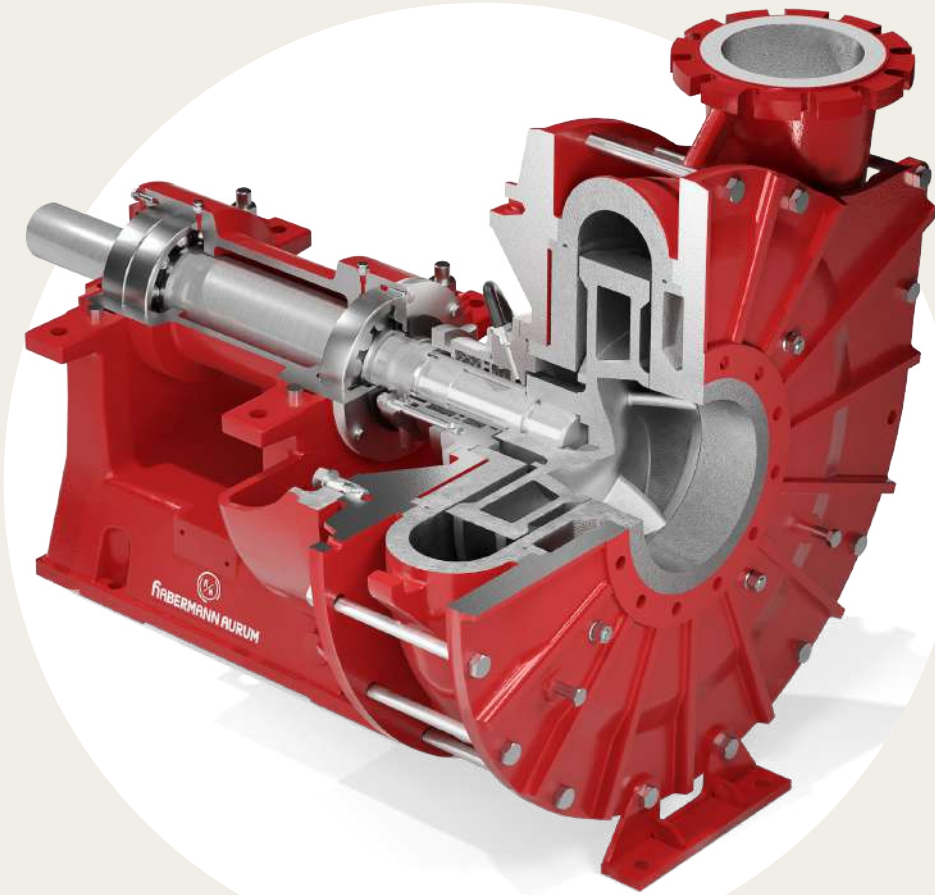
We have developed the wear and corrosion resistant alloys especially for pumps for medium to heavy duty use with aggressive media Due to the special alloy and high

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.



## 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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