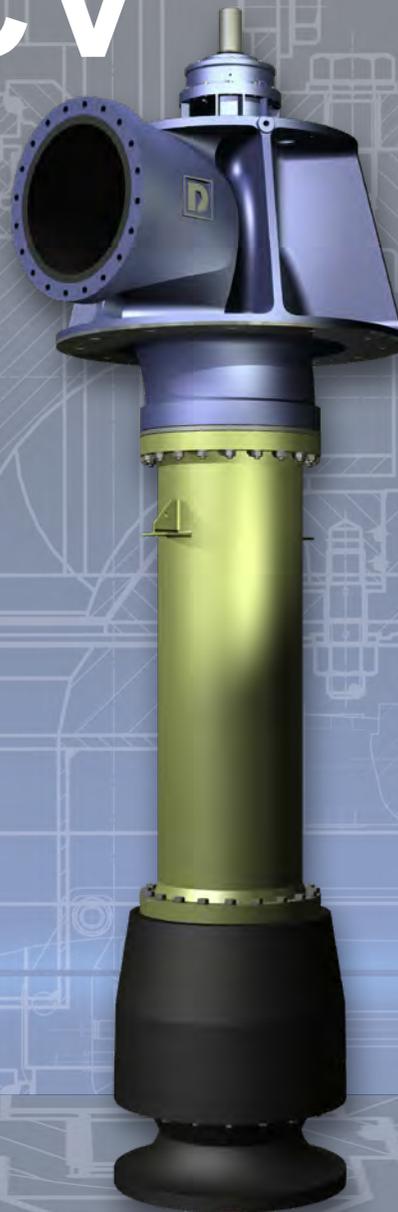




**DÜCHTING**  
**PUMPEN**

# Product Overview

# TYPE MCV



## FLUE GAS DESULFURIZATION

The flue gas cleaning in Germany started with the adoption of the „Großfeuerungsverordnung“ - a regulation for open fire - in 1982. From the very beginning DÜCHTING PUMPEN took part in this business and today has one of the largest populations in European power stations. With the development of the material **SICcast**<sup>®</sup> now almost every FGD pump is built completely in **SICcast**<sup>®</sup>. Through this unique and innovative technology our products are increasingly favored beyond the borders of Europe.



## WATER TREATMENT

DÜCHTING PUMPEN has worked in desalination with high-pressure centrifugal pumps in reverse osmosis now since the early 90s. While the demand for higher quantities and pressures has risen over the past years DP has kept up with the development and can now offer high-pressure pumps, including energy recovery units. The materials used for these pumps have been proven in numerous applications and the performance data has been adjusted to market demands by means of CFX programs.



## MINING

Since the early 50s DÜCHTING has supplied pumps to the mining industry, especially German hard coal mining - at first only as maintenance and primarily with respect to underground mining. In the following years new pumps and wear-resistant centrifugal pumps for the processing of coal were added. Today DÜCHTING PUMPEN covers the entire market for centrifugal pumps in mining including high-pressure cooling centrifugal pumps.



## INDUSTRY / OIL & GAS

The chemical industry profits from the **SICcast**<sup>®</sup> - material of DÜCHTING PUMPEN.

As far as this field of application is concerned the high chemical resistance of **SICcast**<sup>®</sup> is of primary importance: its corrosion resistance with respect to acids will even exceed that of Ni-alloys.

These pumps are entirely metal free in all wetted areas - even the single- or double-acting mechanical seals.





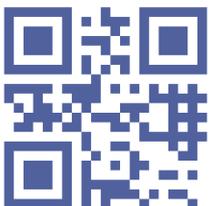
### Quality through experience

**DÜCHTING PUMPEN** is a privately owned German company with more than 77 years of experience in the field of advanced centrifugal pumps for use in many different industries.

Our motto “Quality Through Experience” forms the basis of our sophisticated product range. The capabilities of our company in the construction, manufacturing, testing and commissioning of our products is highly respected in the industries we serve.

Our reputation is based on a sustainable company policy, focusing on efficiency, reliability, innovation and thorough customer after-sales service which is provided by partners in the countries where our products are installed.

In order to meet the current demand for highly efficient and reliable products in seawater desalination, DÜCHTING PUMPEN offers optimized high-pressure pumps and energy recovery turbine units. To minimize total energy costs in high pressure seawater desalination plants, we are at your service during both design and operation.





Vertical turbine pump

## TYPE MCV

Made of corrosion resistant materials.

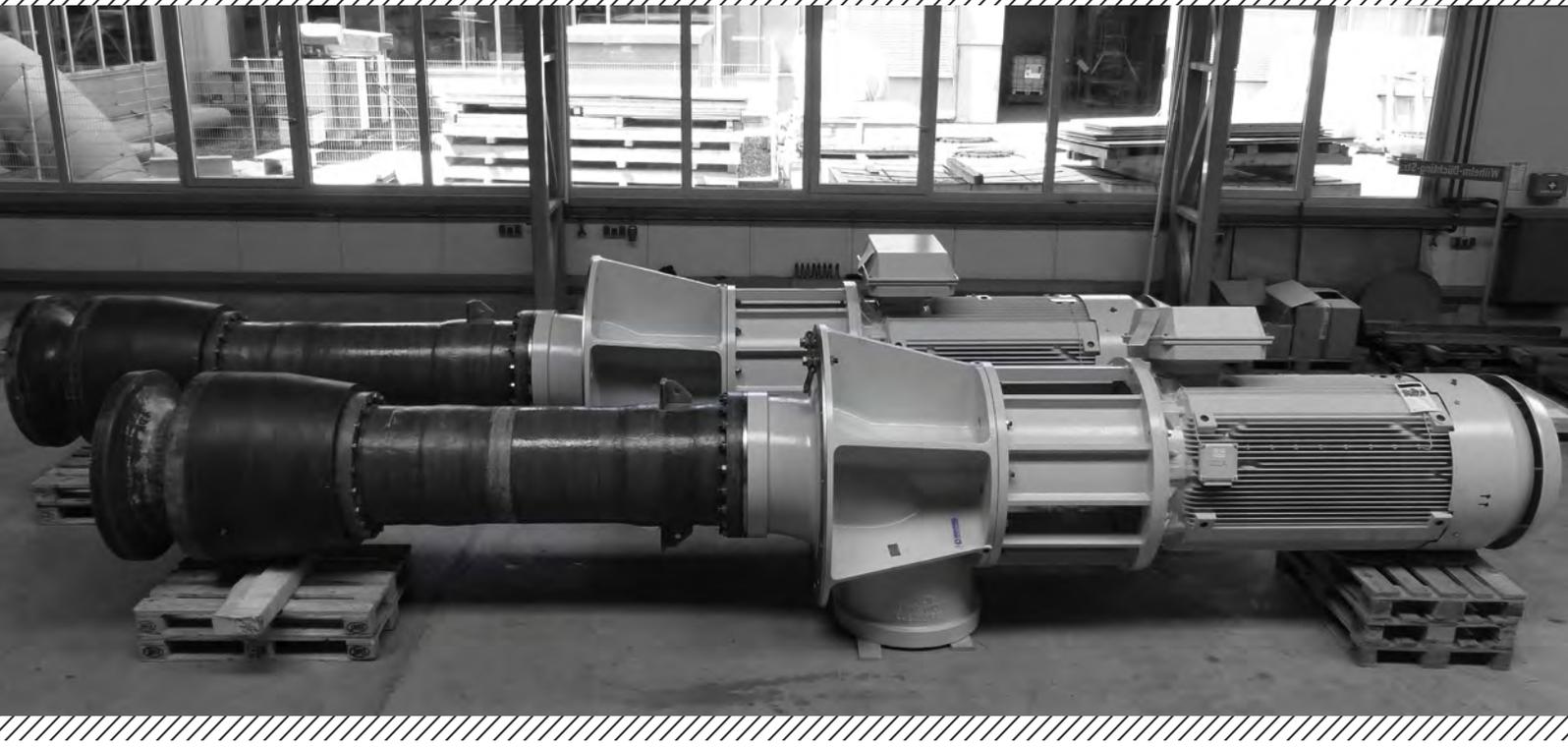


### MCV Design

Single-stage vertical centrifugal sleeve-bearing pump.

- Handling of abrasive and corrosive liquids
- Vertical mixed flow pump designed for desalination plants to work as intake pump
- Suitable for a wide flow range
- Suction flange: vertical
- Discharge flange: radial
- **SICcast<sup>®</sup>** - inlet housing and diffusor withstand hard particles
- Shaft sealing by a single acting mechanical seal
- Polygon sleeve bearings support long shafts and protect against vibration. Radial bearings made of SiC on SiC
- The modular design makes it possible to produce extremely large pumps at low costs





## Fields of Application

Handling of abrasive and corrosive liquids.

- Seawater intake
- Water treatment plants
- Cooling in power plants
- Salt water applications

## Materials

All wetted parts (except shaft) are made of metal free materials to avoid corrosion totally.

Different shaft materials available according to the application requirements.

All hydraulic parts and the discharge bend are manufactured in **SICcast**<sup>®</sup>. Anti-corrosion lifetime guarantee for all **SICcast**<sup>®</sup> parts in seawater applications.

## Technical Data

<b>Pump Size:</b>	<b>DN 150 to DN 1000</b> (6" to 40")
<b>max. Pressure:</b>	<b>8 bar (120 PSI)</b>
<b>max. Flow:</b>	<b>12500 m<sup>3</sup>/h</b> (55000 gpm)
<b>Total head:</b>	<b>up to 60 m (180 ft)</b>
<b>Rotating Speed:</b>	<b>up to 1800 rpm</b>



### Inlay

Discharge bend fully lined with **SICcast**<sup>®</sup> - minimises abrasion and maximises corrosion resistance.

### Intermediate / Riser Pipe

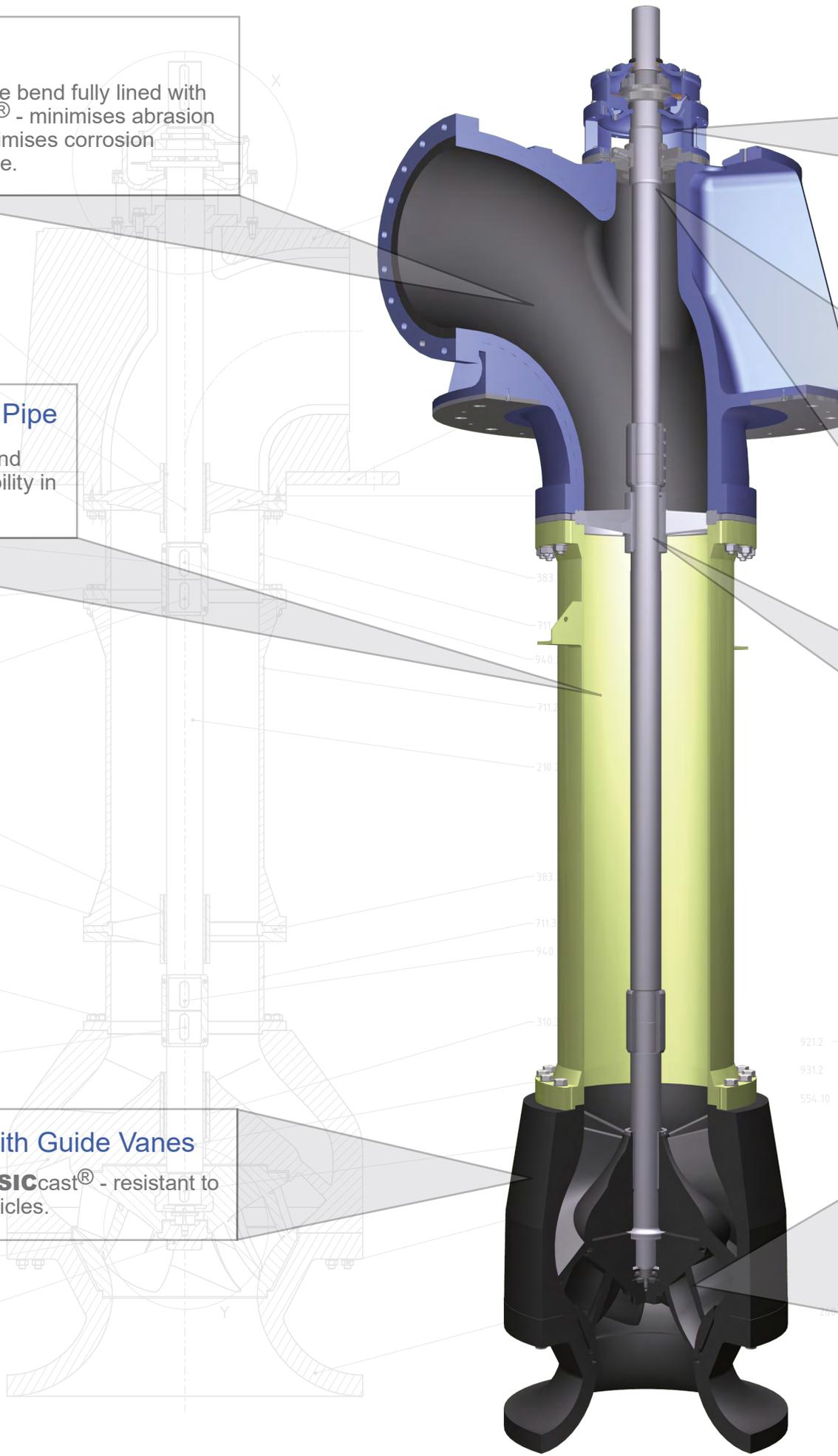
Modular design of shaft and rising main provides flexibility in length.

### Bowl with Guide Vanes

made of **SICcast**<sup>®</sup> - resistant to hard particles.

- 310.1
- 904.1
- 210.1
- 902.5
- 920.5
- 554.5
- 862
- 912.2
- 901.6
- 920.6
- 554.6
- 940.3
- 310.2
- 904.2
- 901.7
- 920.7
- 554.7
- 902.8
- 920.8
- 554.8
- 940.4
- 112
- 230
- 260

- 383
- 711
- 940
- 711.3
- 210
- 383
- 711.3
- 940
- 310
- 921.2
- 931.2
- 554.10



### Motor Connection

Flexible connection for different motor sizes.

### Bearing

Reliable thrust bearing. The lubrication system ensures a long bearing life time. Single acting mechanical seal by standard, gland packing also available.

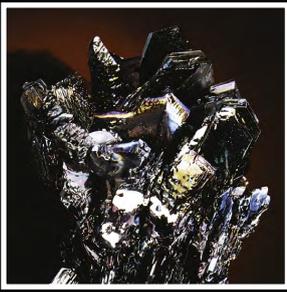
### Radial Bearing

Optimized shaft guidance for minimized vibrations.

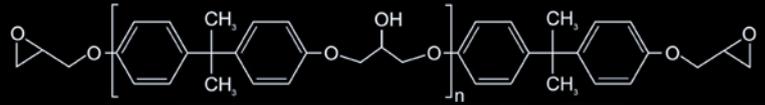
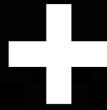
### Impeller

**SICcast®** mineral cast mixed flow impeller with spatially curved vanes, optimized to efficiency. Keyed to the shaft and bolted from the bottom. Additional radial bearing close to the impeller.





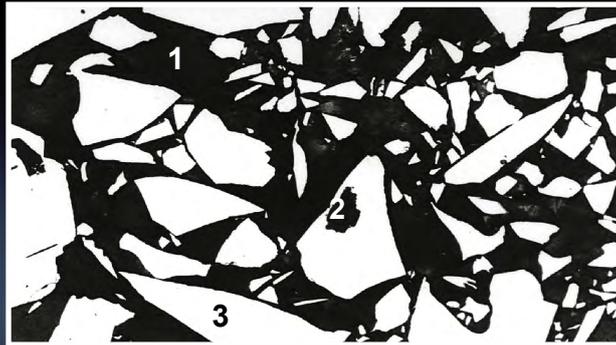
*Silicon carbide*



*Epoxy resin*



*Polished section scale 500:1*



**SICcast®**

1. Bonding Agent
2. Bonding Agent that has penetrated into a SiC grain
3. ground, polished SiC grain

## SICcast® the Company

Established in the mid-nineties, **SICcast®** is growing together with our customers.

Started with the casting of several pump parts for the MC series and afterwards for the MCC series of affiliated company **DÜCHTING** pumps.

The important key feature of the material is the simultaneous resistance against corrosion and abrasion. **SICcast®** materials are designed for this phenomenon of erosive corrosion. On the basis of the hardness of silicon carbide, 9.7 on the Mohs' scale (hardness close to diamond) and the high filling grade of the components, it has very good results in casting new pump parts and also in coating worn spare parts.



## Mineral cast SICcast®

**Hard as a Diamond.**

Silicon carbide (SiC) in a special mixture with Epoxy resin cast into precision moulds under vacuum. Fittings are machined with diamond tools. Thanks to the temperature-controlled casting process, parts of up to 8 tons can be cast.

This material is extremely wear resistant, temperature insensitive and shockproof. It is mainly used in heavy conditions such as in flue gas desulfurization of coal-fired power plants, incineration plants, fertilizer production, titanium dioxide and iron oxide production.



## Operational Experience

Pictures of a Duplex Stainless Steel impeller which has been replaced by a SICcast impeller.



Impeller made of Duplex Stainless Steel  
Heavy wear after 11,000 operating hours

## Advantages

- Highly wear resistant
- Fully corrosion resistant
- Easy quality control of castings
- Lower noise & vibrations compared to metal



Impeller made of SICcast®  
No wear after 24,000 operating hours

## Comparison with Metal

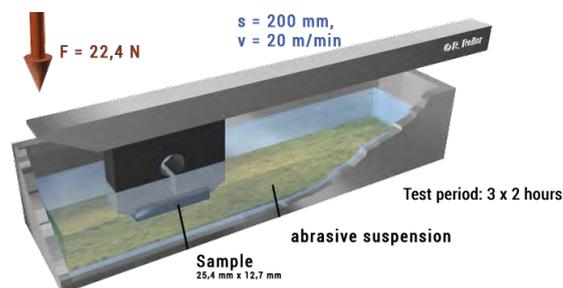
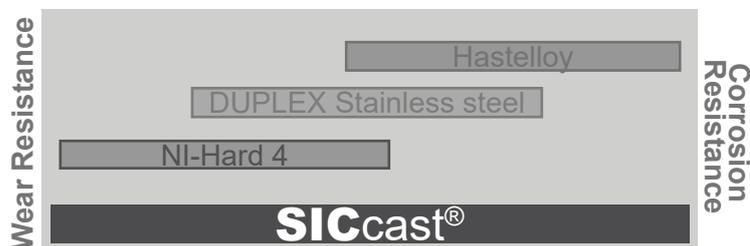
In regards of resistance, metals are only a compromise between conflicting requirements.

Having only corrosion and no abrasion, it will be also possible to use hastelloy. It's the same with abrasion only. Abrasion in a neutral medium can be done by using Ni-hard or similar.

## Miller Wear Test

Standard test method for determination of slurry abrasivity.

The Miller Number is an index of the relative abrasivity of slurries. Its primary purpose is to rank the abrasivity of slurries in terms of the wear of a standard reference material. The wear damage on the standard wear block is worse as the Miller Number gets higher.

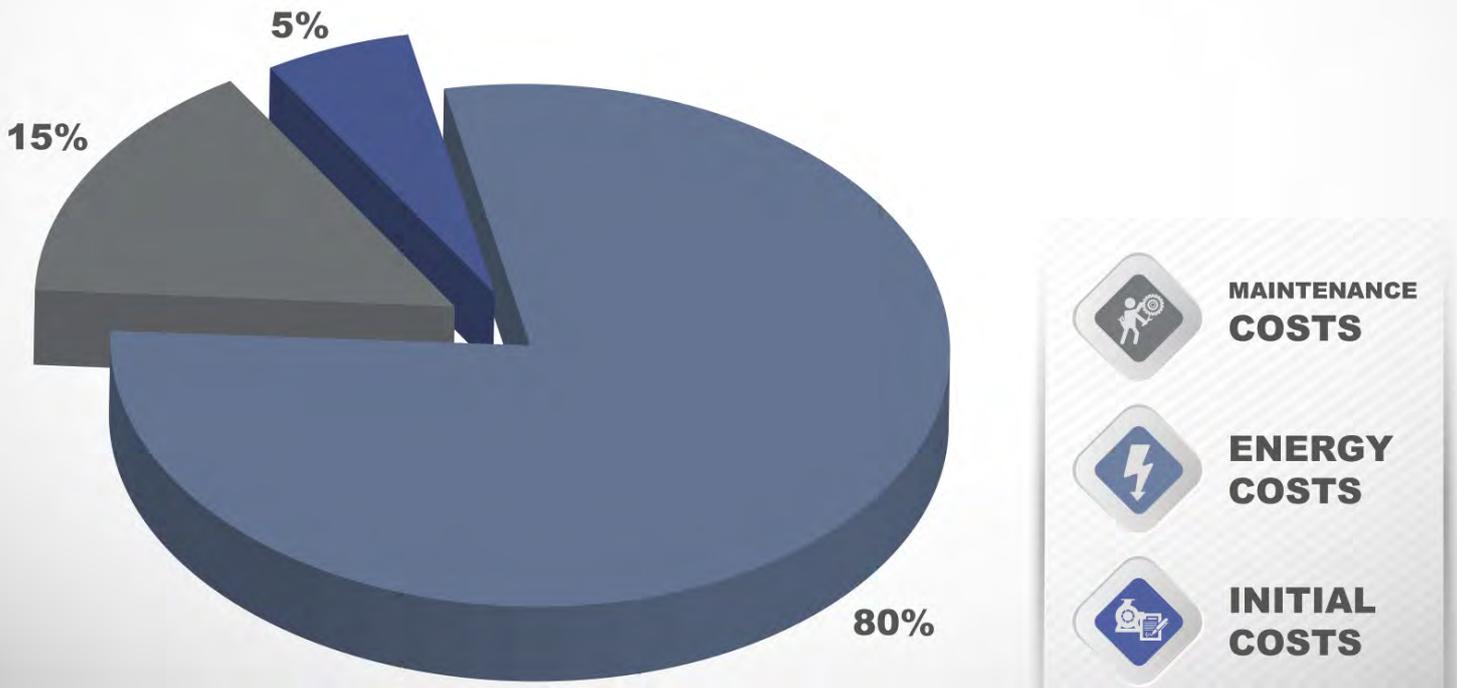


Grafik: TU Clausthal

The mineral cast from SICcast® covers both corrosion and abrasion perfectly.

SICcast® materials will be very advantageous if you have solid in combination with a non-neutral medium, a leach or an acid (pH-value 0-12).

	Loss in weight [mg]	Loss in volume [mm <sup>3</sup> ]
<b>SICcast EP 135</b>	57,12	22,66
<b>SIConit</b>	75,13	33,10
1.4404	1.528,15	192,22
Alloy 625	1.297,16	152,66
1.4462	1.093,17	140,15
St52	1.023,48	130,38



## Life-Cycle-Costs

### Average life cycle costs for industrial pumps.

Evaluating the Life-Cycle-Costs will identify the most financially attractive alternative. The initial purchase price is a very small part of the life cycle cost for high usage pumps. Minimizing energy consumption and plant downtime have a big influence on the total Life-Cycle-Costs.

### Energy costs

DÜCHTING PUMPEN offers a wide range of impeller sets for high efficiencies.

- ▶ high efficiency leads to low energy costs

### Maintenance costs

Robust design leads to long lifetime of the pump parts.

- ▶ low wear leads to low maintenance work and costs

Easy accessible and changeable wear parts lead to short downtime for overhauls.

- ▶ short downtime leads to low maintenance costs





## After-Sales-Service & Spare Parts

With its service and spare parts department DÜCHTING PUMPEN offers the full range of After-Sales-Service.

With its own service technicians and several service partners worldwide DÜCHTING Service is everywhere and always available.

### Inhouse - Service

- Maintenance
- rebuild & repair
- damage analysis
- performance tests with vibration analysis
- site staff training
- and much more



### Site - Service

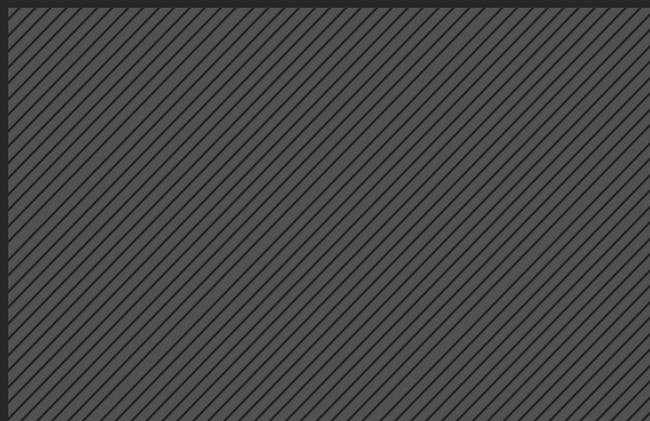
- start-ups
- commissioning assistance
- Revisions
- Repairs
- Troubleshooting
- laser alignment
- vibration & condition analysis
- flow rate measuring
- whole pump rebuild and repair
- mechanical seal exchange
- on-site training
- and much more



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