

# **SICcast**<sup>®</sup>

Hard as a Diamond





# About Us / The Company





SICcast designs, produces and coats parts effected by strong erosion, abrasion and/or corrosion in liquid media based on patented silicon carbide materials.

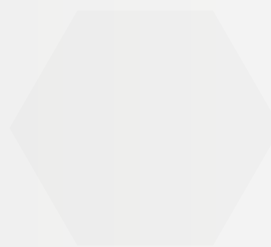
Additionally, SICcast offers the service of coating or repairing parts already effected by erosion, abrasion and/or corrosion with the SICcast-technology.

The benefits of the SICcast-technology are higher service lives and lower costs compared to new parts.



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-  Fields of Application / Products Düchting Pumpen
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## How can we help?

- Do you have a problem with erosion, abrasion and/or corrosion?
- Are you looking for a extremely resilient material?
- Would you like to reduce your maintenance costs and increase the lifetime of your components?

**SICcast develops customized solutions for you!**



Scan the QR Code or go to [SICcast.com](https://www.siccast.com)  
Watch the SICcast imagevideo online.

# SiCcast Mineral Cast



Silicon carbide (SiC) is an artificially produced industrial material with a diamond-like hardness. It is mixed with epoxy resins to create our unique materials.

## The Components:

### SiC:

- Synthetic mineral
- Hardness 9.7 Mohs (diamond: 10 Mohs)
- Sized to varying grades
- High density (min. 80%) fill of varying mesh sizes

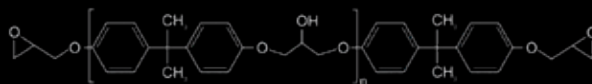


### Epoxy resin:

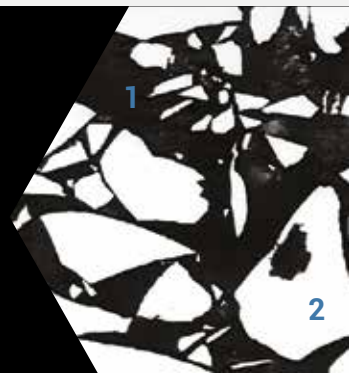
- Epoxy resin: hot or cold curing
- Low shrinkage
- High strength
- High chemical resistance



Silicon carbide



Epoxy resin



1

2

## The Result:

- A metal-free, anti-magnetic, noise and vibration reducing material with diamond-like hardness.
- Due to the chemical binding of the epoxy resin, this material is ductile, temperature shock and impact resilient.
- Precise castings due to low shrinkage of resin.

## Advantages of SICcast:

- High wear resistance due to the high proportion of silicon carbide (more than 80%)
- High chemical resistance pH 0-14 (depending on process conditions)
- High abrasion resistance
- Anti-magnetic, noise-reducing and vibration-damping
- Large parts (up to 8,000 kg)
- Low carbon foot print



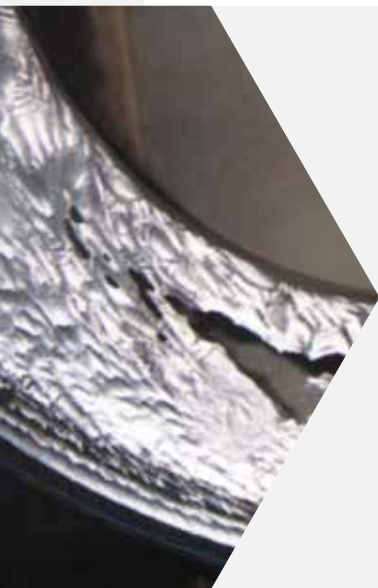
1. Epoxy resin
2. SiC grain

Micrograph (500:1)



# Comparison with Metal

Examples for abrasion and corrosion of pump parts made of stainless steel (left) and SICcast (right) under identical operating conditions (same pump and site).

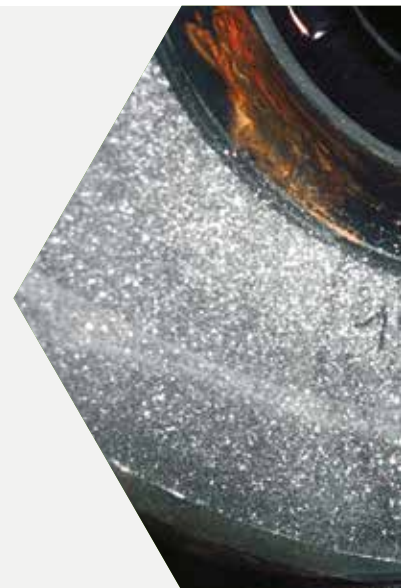


Suction-side wear plate made of Duplex Stainless Steel

- First indicators of wear after short period
- Outage after 16,000 h of operation because of wear

Suction-side wear plate made of SICcast Mineral Cast

- Even surface
- No wear at edges after 16,000 h of operation



Impeller made of Duplex Stainless Steel

- Heavy wear after 11,000 h of operation

Impeller made of SICcast Mineral Cast

- No wear after 24,000 h of operation





Wear Resistance



Corrosion Resistance

Metals are designed to withstand corrosive environments (e.g. Duplex SS) or abrasive environments (e.g. White Irons).

SICcast handles both corrosion and abrasion at the same time.

SICcast materials are best suited if you have solids in combination with a corrosive medium (pH value 0-14; depending on process conditions).

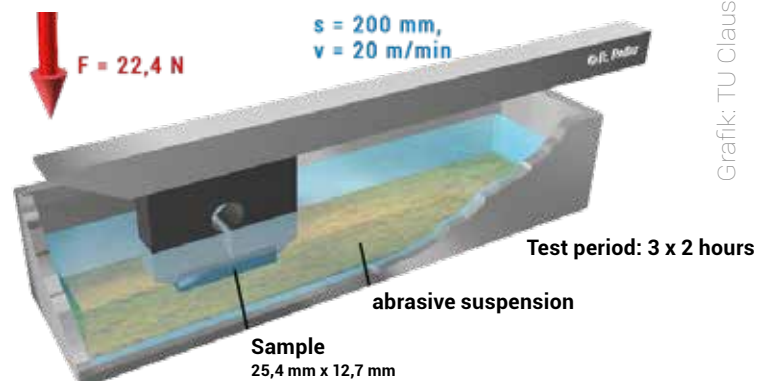


Material	Loss in volume [mm <sup>3</sup> ]
SICcast EP 135	22,66
SIConit	33,10
1.4404	192,22
Alloy 625	152,66
1.4462	140,15
St52	130,38

## Miller Wear Test

The purpose of this test method is either to rank the abrasivity of slurries in terms of the wear of a standard reference material or to rank the wear resistance of different materials in relation to a reference slurry.

The wear rate is determined by volume loss.



Grafik: TU Clausthal

# SICcast EP 135 / For casted parts

SICcast EP 135 consists of silicon carbide, which can be mixed with a hot-curing epoxy resin (EP) under vacuum and cast in moulds. The temperature-controlled casting process keeps shrinkage very low. Parts from 1 kg to 8,000 kg can be produced with a high accuracy in high-precision casting. Precision tolerances achieved by machinery equipped with diamond tools.



Silicon carbide (SiC) is mixed with epoxy resin (EP) under vacuum.



It is then cast into precise moulds.



The filled moulds are heated as a hardening process.



After the hardening process the fittings are machined with diamond tools.

# SIConit / For Repair & Protection

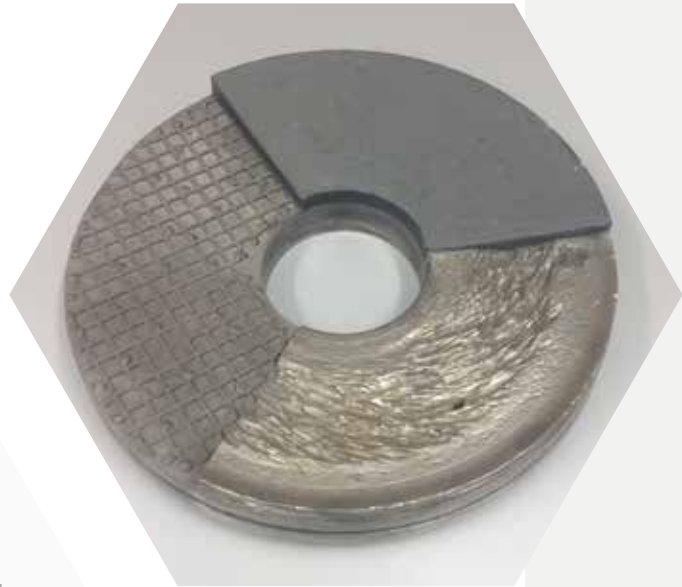
## The SIConit® spectrum

SICcast offers the matching SIConit wear protection for any kind of application.

SIConit is a silicon carbide composite material for repair and protection of surfaces exposed to erosion, abrasion and/or corrosion (pH value 0-14). SIConit can be used under chemically varying operating conditions.

The SIConit composite material consists of a very high share of silicon carbide and cold-curing epoxy resin. SIConit can be used for restoring damaged metal surfaces or as a protective coating.

Highly wear-resistant coating material as protection against corrosion and abrasion.



# Fields of **Application** / Products

For us at SICcast it is of primary importance to reduce your maintenance costs and to increase the service life of components and machines which are subject to abrasion and corrosion.

Our engineers design all components subject to wear, that they can be produced with SICcast materials.

## Products:

- ◆ Pumps and pump components
- ◆ Agitators / Mixers
- ◆ Nozzles
- ◆ Reducers
- ◆ Pipes
- ◆ Cyclones
- ◆ Tank coatings
- ◆ Filters
- ◆ Value components



## Fields of Application:

- Power Plants
- Waste Incineration
- Flue Gas Desulphurization (FGD)
- Fertilizer
- Waste Water
- Chemical Industry
- Seawater Desalination
- Marine Industry
- Pulp and Paper
- Cement Industry
- Mining
- Mineral Processing
- Maintenance and Repair



# Fields of **Application** / Products: DÜCHTING PUMPEN

Mineral cast pump

**TYPE MC**

by 



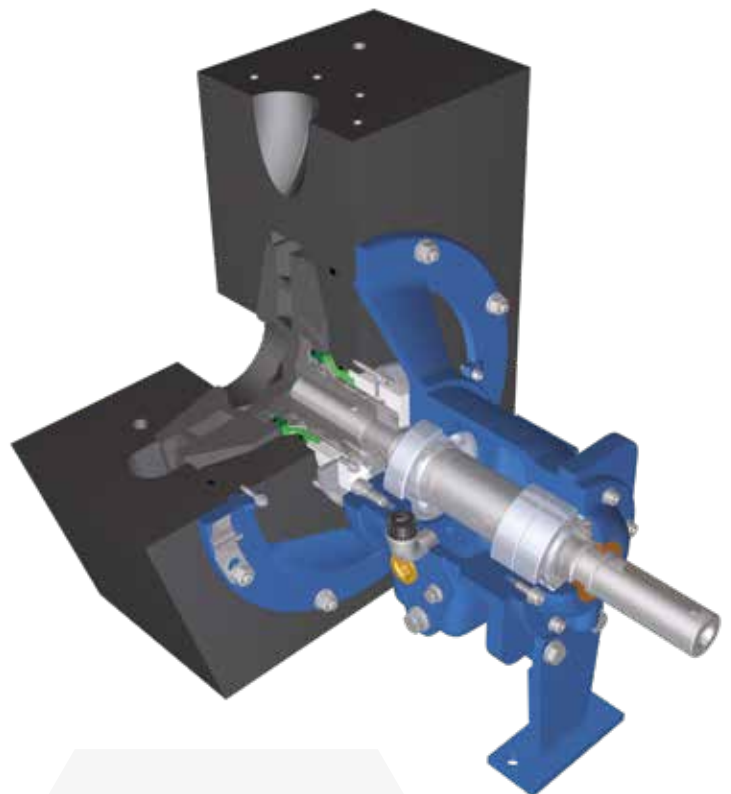
## Fields of Application:

Pumping of abrasive and corrosive liquids.

- Flue Gas Desulphurization
- Incinerators
- Pigment Industry
- Chemical Industry
- Water Treatment
- Seawater Desalination
- Fertilizer Industry / Potash Industry

## Technical Data:

<b>Max. Pump Size:</b>	<b>DN 300 (12")</b>
<b>Max. Pressure:</b>	<b>16 bar (230 PSI)</b>
<b>Max. Flow Rate:</b>	<b>1500 m<sup>3</sup>/h (6600 gpm)</b>
<b>Max. Head:</b>	<b>90 m (300 ft)</b>
<b>Max. Rotating Speed:</b>	<b>3600 rpm</b>



# - MC & MCC

Mineral cast pump

## TYPE MCC

by 



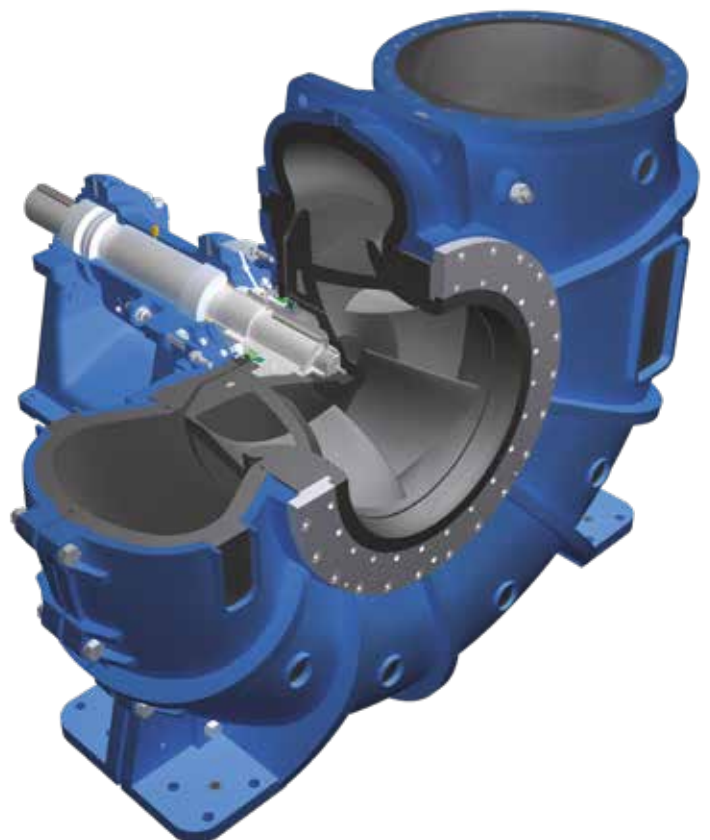
### Fields of Application:

Pumping abrasive and/or corrosive liquids.

- Flue Gas Desulphurization
- Incinerators
- Water Treatment
- Seawater Desalination

### Technical Data:

<b>Max. Pump Size:</b>	<b>DN 1000 (40")</b>
<b>Max. Pressure:</b>	<b>6 bar (90 PSI)</b>
<b>Max. Flow Rate:</b>	<b>20000 m<sup>3</sup>/h (88000 gpm)</b>
<b>Max. Head:</b>	<b>40 m (130 ft)</b>
<b>Max. Rotating Speed:</b>	<b>1200 rpm</b>

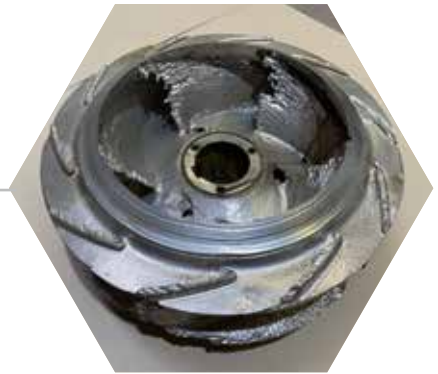


# Service: Maintenance & Reengineering

**SIConit**<sup>®</sup>

## Maintenance:

worn-out component of the customer



SIConit Coating



machining



refurbished component ready-to-use



## Advantages:

- Retrofitting of existing systems with well-proven and established mineral cast
- Savings 30-50%
- Reduced delivery times

# Reengineering:

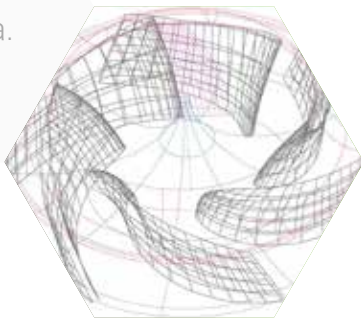
Your part as an improved version in SICcast material.



**SICcast**<sup>®</sup>



Adapt to your technical data.



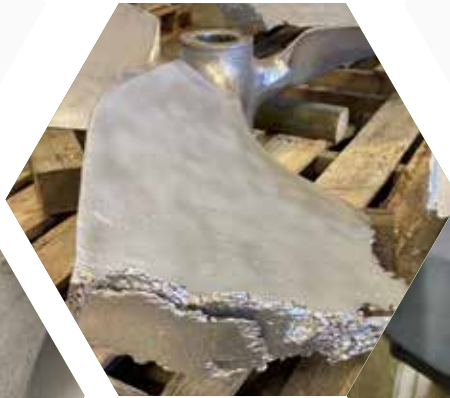
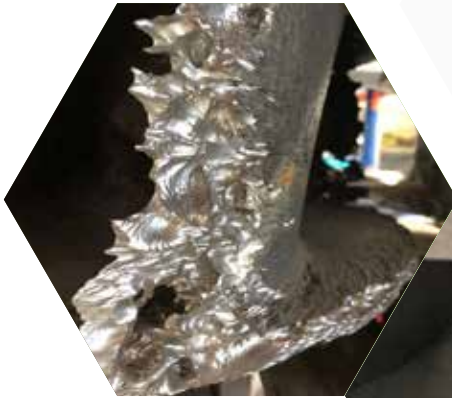
- Increased operating life
- Reconditioning of worn-out and damaged parts
- Guaranteed fitting accuracy / plug-play



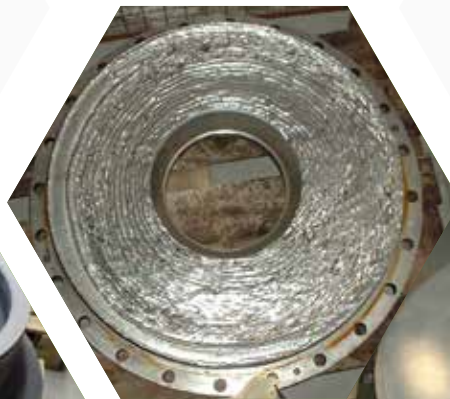
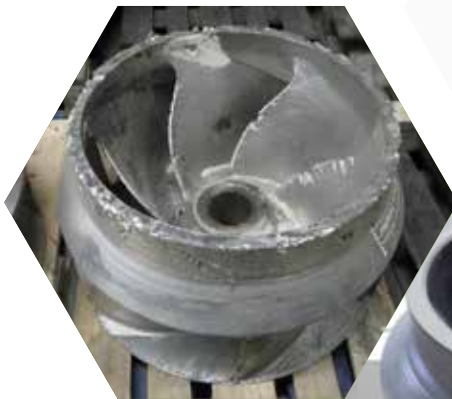
To check the feasibility scan the QR Code

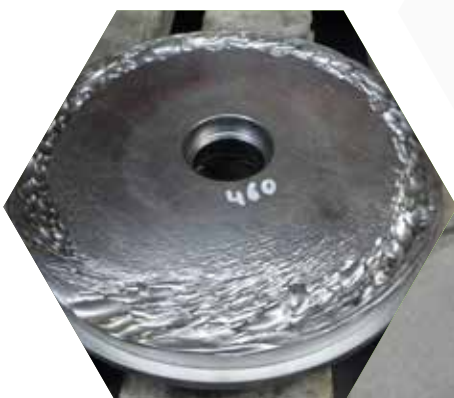
# References

The SICcast service technologies can be used for a wide range of different parts.



**SICcast**<sup>®</sup>





# International / SICcast Franchise

**SIC**cast goes international by passing on its know-how.

SICcast is establishing a worldwide franchise structure to make the concepts available for the global market.

Our partners are fully trained, source SICcast material and offer the entire successful concept of SICcast to international customers.

Direct contact with the customer guarantees a high degree of confidence and workmanship.



## Benefits

- Trainings at the headquarters
- Licensing of franchisees
- Original materials made in Germany



See the list of Franchise-Partners online.

The logo for SICcast, featuring the word "SICcast" in a bold, sans-serif font. The "S" and "C" are dark grey, while the "I" and "C" are light grey. A registered trademark symbol (®) is located at the top right of the "t".

**SICcast**®

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