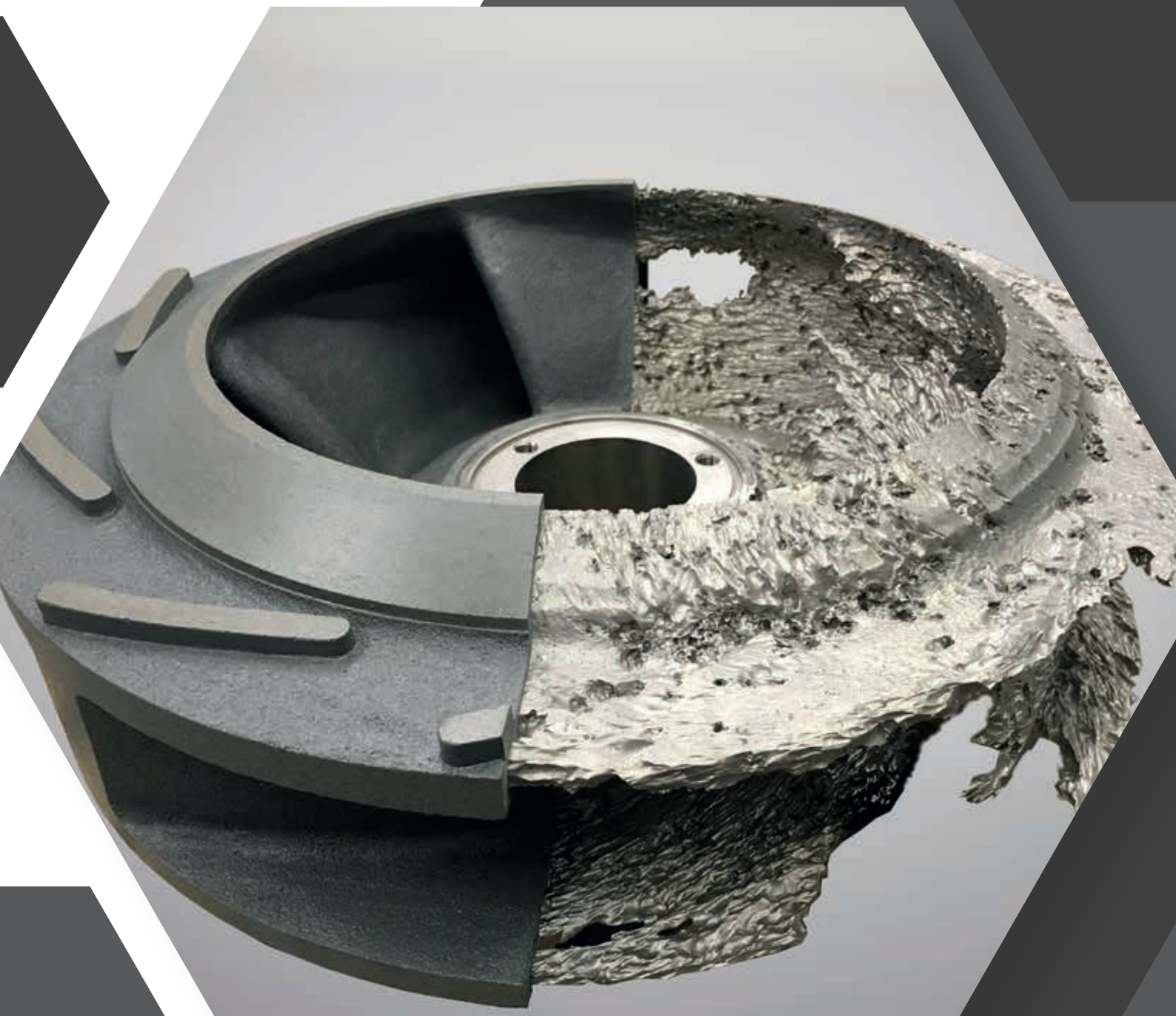
SICast®

Hard as a Diamond

abrasion
corrosion









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.

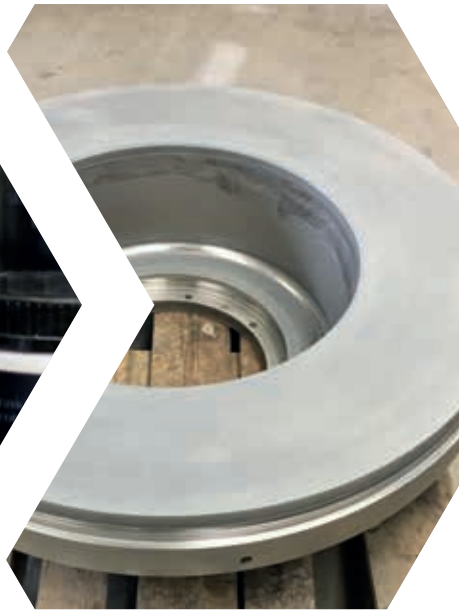
The benefits of the SICcast-technology are higher service lives and lower costs compared to new parts.

Go to SICcast.com -
to check the entire SICcast history
and the latest news.

IF YOU HAVE A WEAR PROBLEM -
SICcast develops customized solutions!



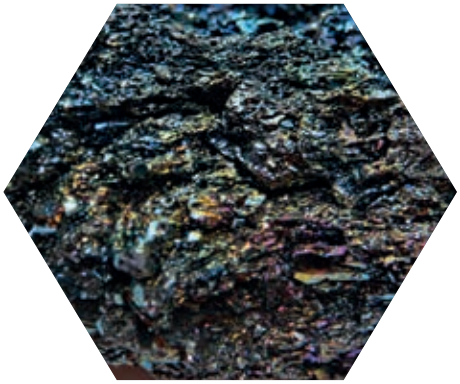




- Do you have a problem with erosion, abrasion and/or corrosion?
- Are you looking for a extremely resilient material?
- Would you like to reduce your repair costs?
- Would you like to additionally protect your components against wear and increase its service life?

Contact SICcast, we will find a solution for you!

Scan the QR Code or go to SICcast.com
Watch the SICcast imagevideo online.



SICcast - Mineral Cast / SICcast - Materials

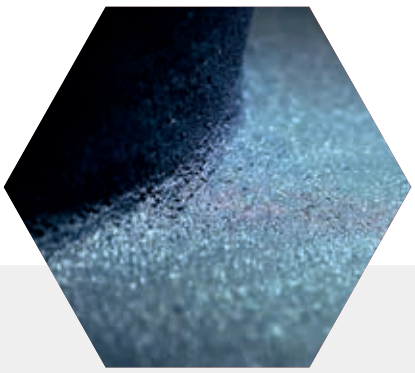


Silicon carbide (SiC) is an artificially produced industrial material with a diamond-like hardness. Epoxy resin (EP) is mixed with silicon carbide under vacuum and is then cast into precise moulds.



Advantages of SICcast:

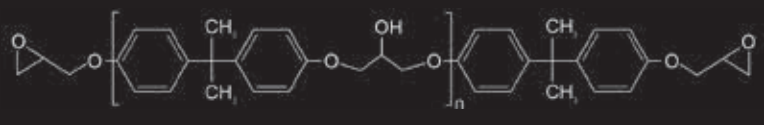
- high wear resistance due to the high proportion of silicon carbide (more than 80%)
- anti-magnetic, noise-reducing and vibration-damping
- high chemical resistance
- large parts (up to 8,000 kg)



SICcast EP 135 can be used up to 135 °C.



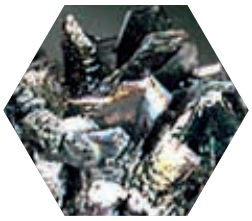
Silicon carbide



Epoxy resin

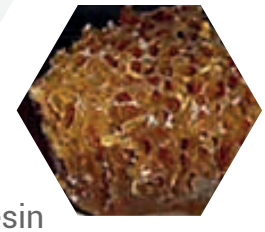
SICcast EP 135 consists of silicon carbide, which can be mixed with a hot-curing epoxy resin (EP) under vacuum and cast in moulds. The temperature-controlled casting process keeps shrinkage very low. Parts from 1 kg to 8000 kg can be produced with a high accuracy in high-precision casting. Precision tolerances achieved by machinery equipped with diamond tools.

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

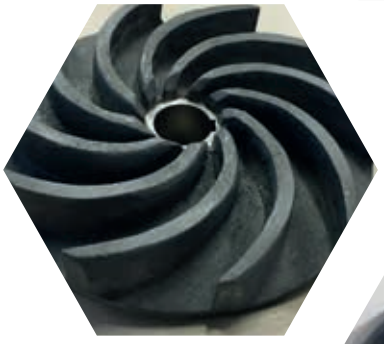


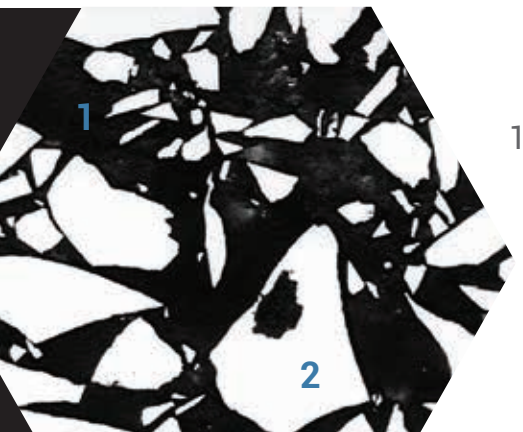
Epoxy resin:

- Hot curing epoxy resin
- Low shrinkage
- High strength

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.





1. Epoxy resin
2. SiC grain

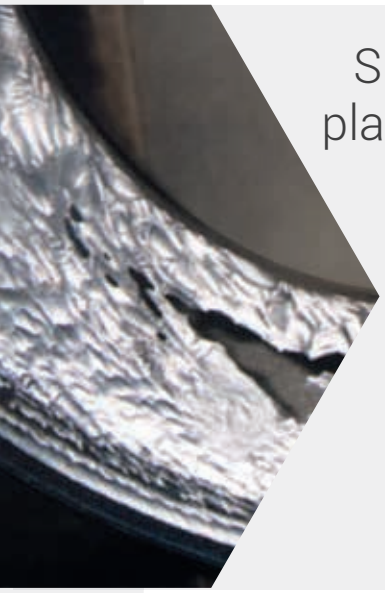
Micrograph (500:1)



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).

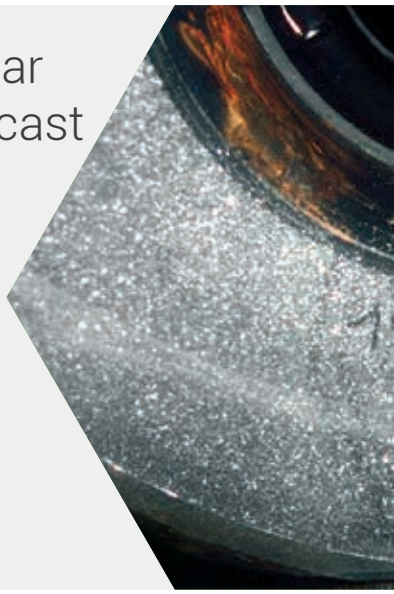


Suction-side wear plate made of Duplex Stainless Steel

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

Suction-side wear plate made of SICcast Mineral Cast

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





Impeller made of Duplex Stainless Steel

- Heavy wear after 11,000 operating hours

Impeller made of SICcast Mineral Cast

- No wear after 24,000 operating hours







Wear Resistance

Corrosion Resistance

Hastelloy

DUPLEX Stainless steel

NI-Hard 4

SICcast®

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

SICcast handles both corrosion and abrasion.

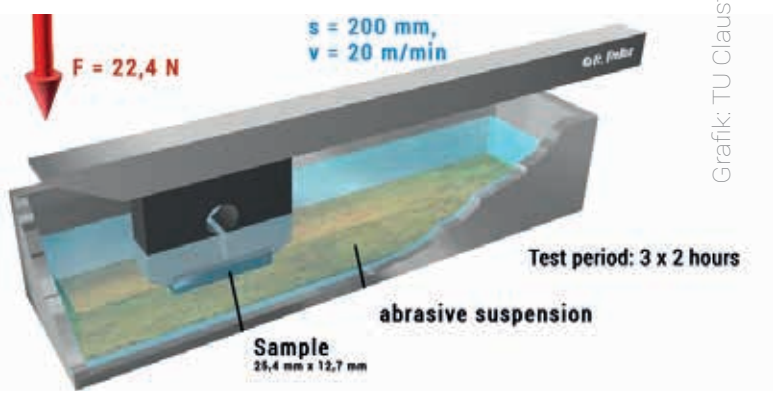
SICcast materials are best suited if you have solids in combination with a corrosive medium (pH value 0-12).

	Loss in volume [mm³]
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

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 in SICcast material.



Products:

- Pump Components
- Grindstones (Rotor / Stator)
- Piping Components
- Tank Liners
- Cyclones
- Nozzles





Fields of Application

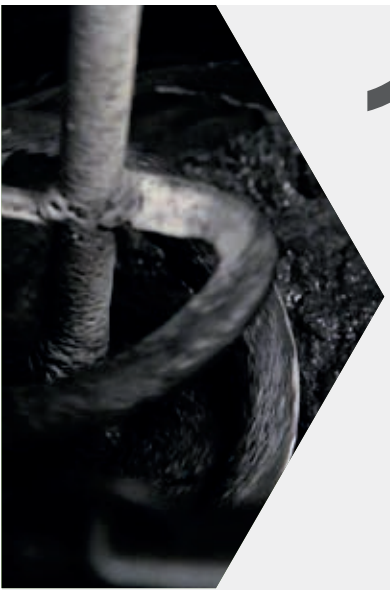
- Energy Recovery
- Waste Incineration Plants
- Chemical Industry
- Flue Gas Desulphurization Plants
- Environmental Technology
- Glassworks (Kaolin Sludge)
- Bio-Chemistry
- Fertilizer Plants
- Petroleum Industry
- Salt Extraction





SICcast EP 135 /
For casted parts

SICcast EP 135 is produced using a hot-curing epoxy resin and silicon carbide. This castable silicon carbide is used for casting complex parts exposed to erosion, abrasion and/or corrosion in the pH value 0-12.

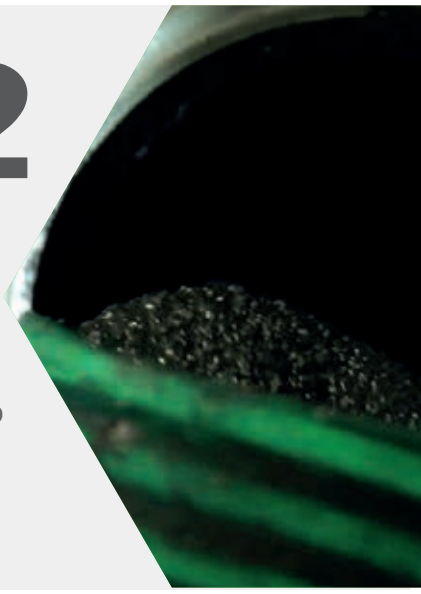


1

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

2

It is then cast into precise moulds.



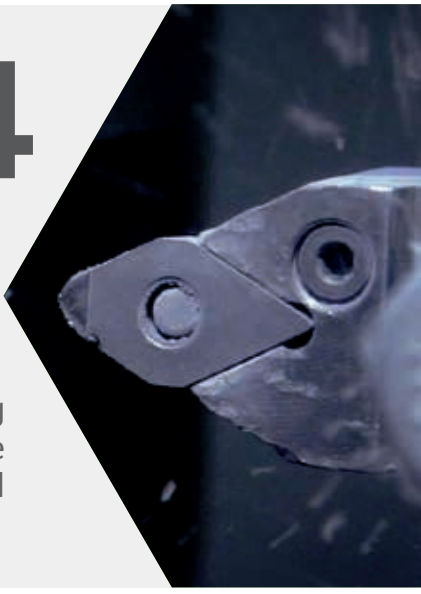


3

The filled moulds are heated as a hardening process.

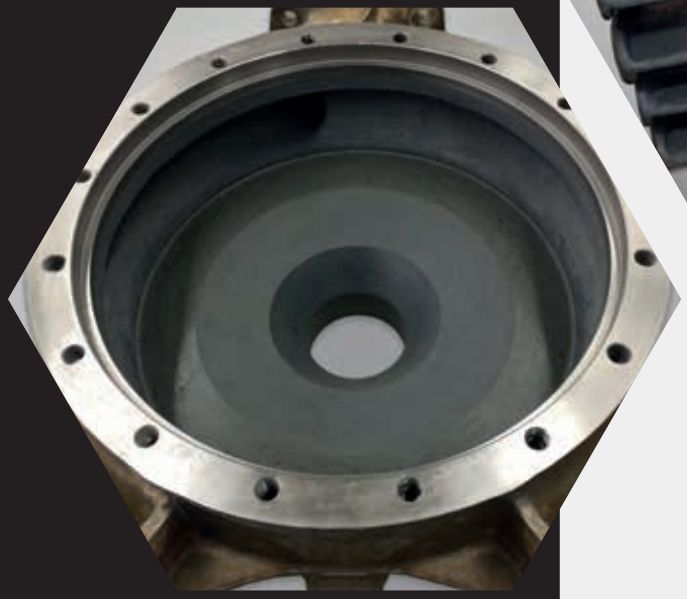
4

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

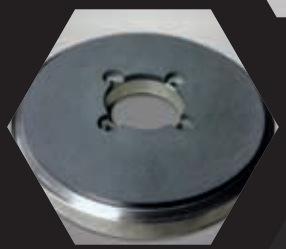


SIConit / For Repair & Protection









The **SIC**onit® spectrum

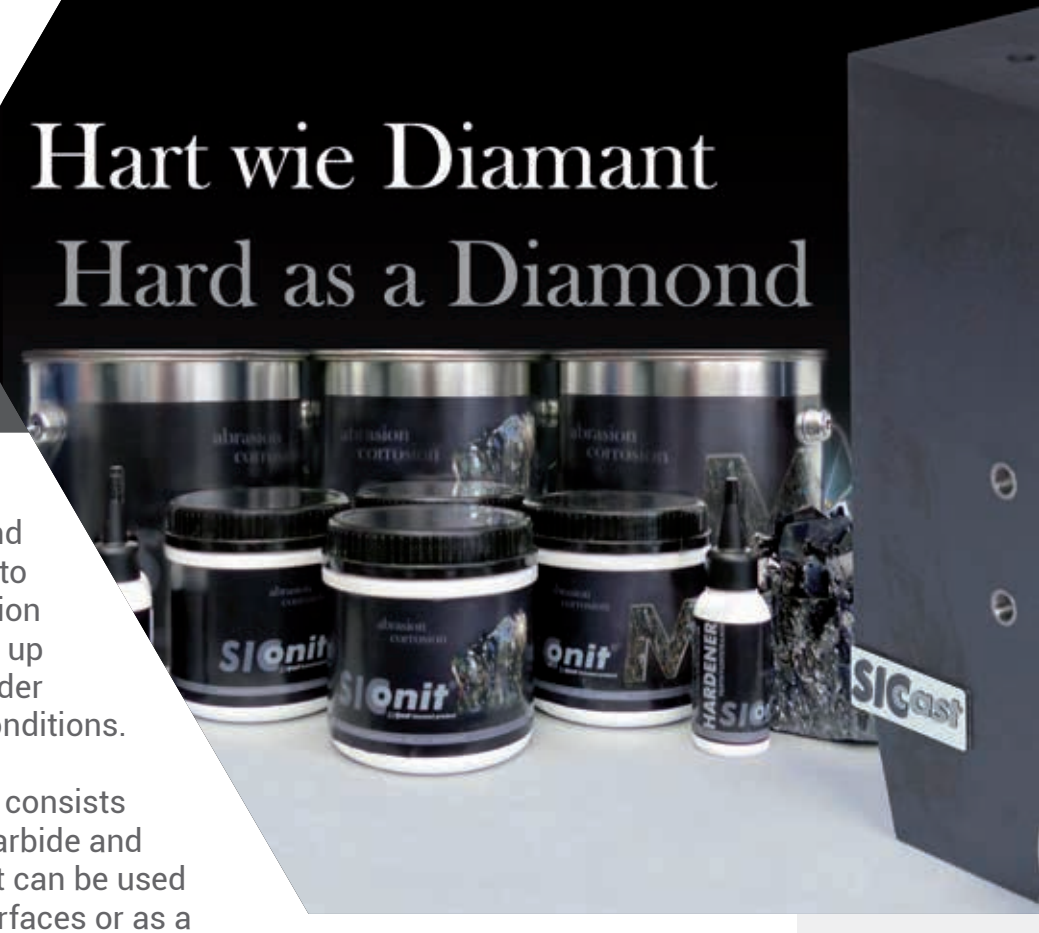
SICcast offers the matching SIConit wear protection for any kind of application.

SIConit® — **trowelable** wear protection for applications

SIConit® **X** — **brushable** wear protection for coating metallic surfaces exposed to abrasion and corrosion

SIConit® **F** — **brushable** wear protection for coating metallic surfaces exposed to light abrasion and corrosion

Hart wie Diamant
Hard as a Diamond



SIConit is a silicon carbide composite material for repair and protection of surfaces exposed to erosion, abrasion and/or corrosion (pH value 0-12) at temperatures up to 90°C. 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.

Application video

Watch an application video online:

Fields of Application:

- Extruders
- Conveyors
- Mixers
- Pumps
- Pipes
- Fans
- Centrifuges
- Cyclones
- and many others

Industries:

- Pump Production
- Maintenance industry
- Paper industry
- Clay processing industry
- Cement industry
- Building materials industry
- Filler manufacturers
- Waste Water treatment plants
- Chemical production
- Seawater Desalination
- Mining
- Mineral Processing
- Power

Service: SIConit - For Maintenance

SIConit®

is a coating and rebuild material
which can be applied with a spatula.

SIConit® X & SIConit® F

are coating materials which can easily
be applied with a brush.

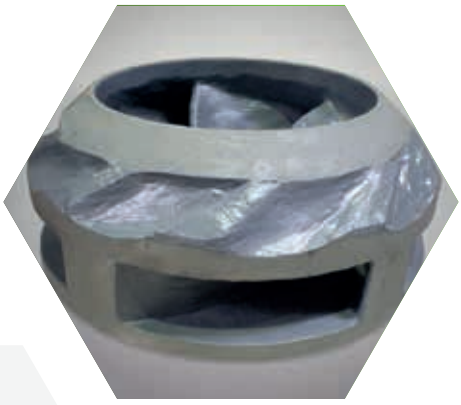
worn-out



coated with SIConit



ready-to-use









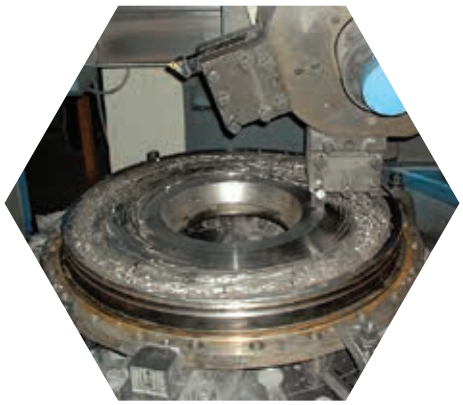
Service: SICcast - Revamping

Advantages:

- Retrofitting of existing systems with well-proven and established mineral cast
- Savings 30-50%
- Reduced delivery times
- Increased operating life
- Reconditioning of worn-out and damaged parts
- Guaranteed fitting accuracy

SICcast®

Preparation of the worn-out part



Casting with SICcast EP 135



Final machining and finishing

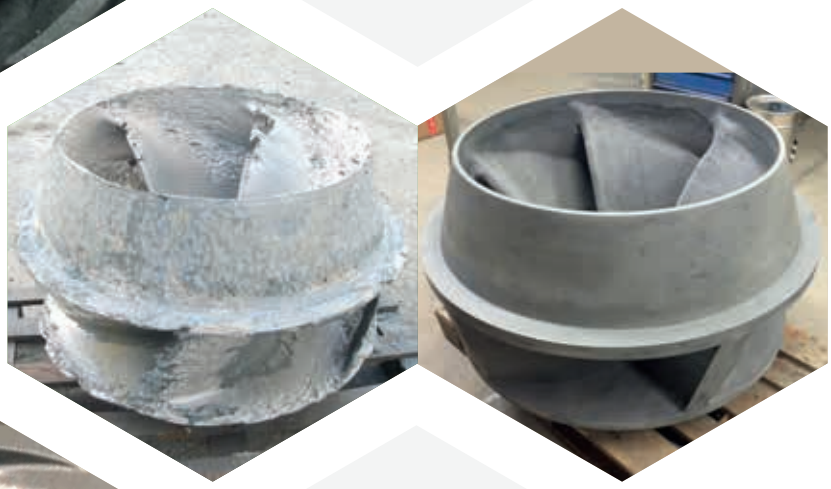


The result is a complete overhaul with our patented revamping technology including our original SICcast material.

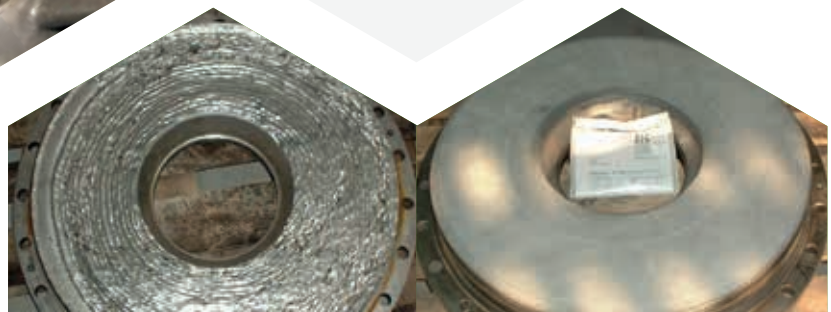
Revamping / The Results

The SICcast revamping technology can be used for a wide range of different parts.



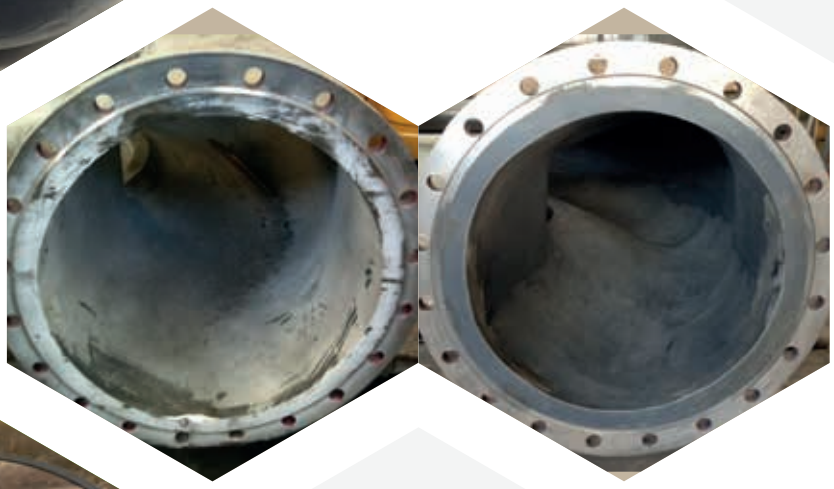


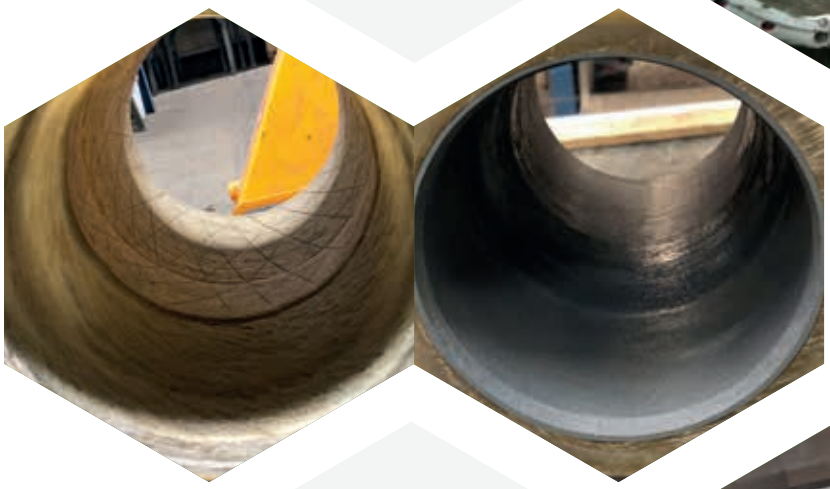






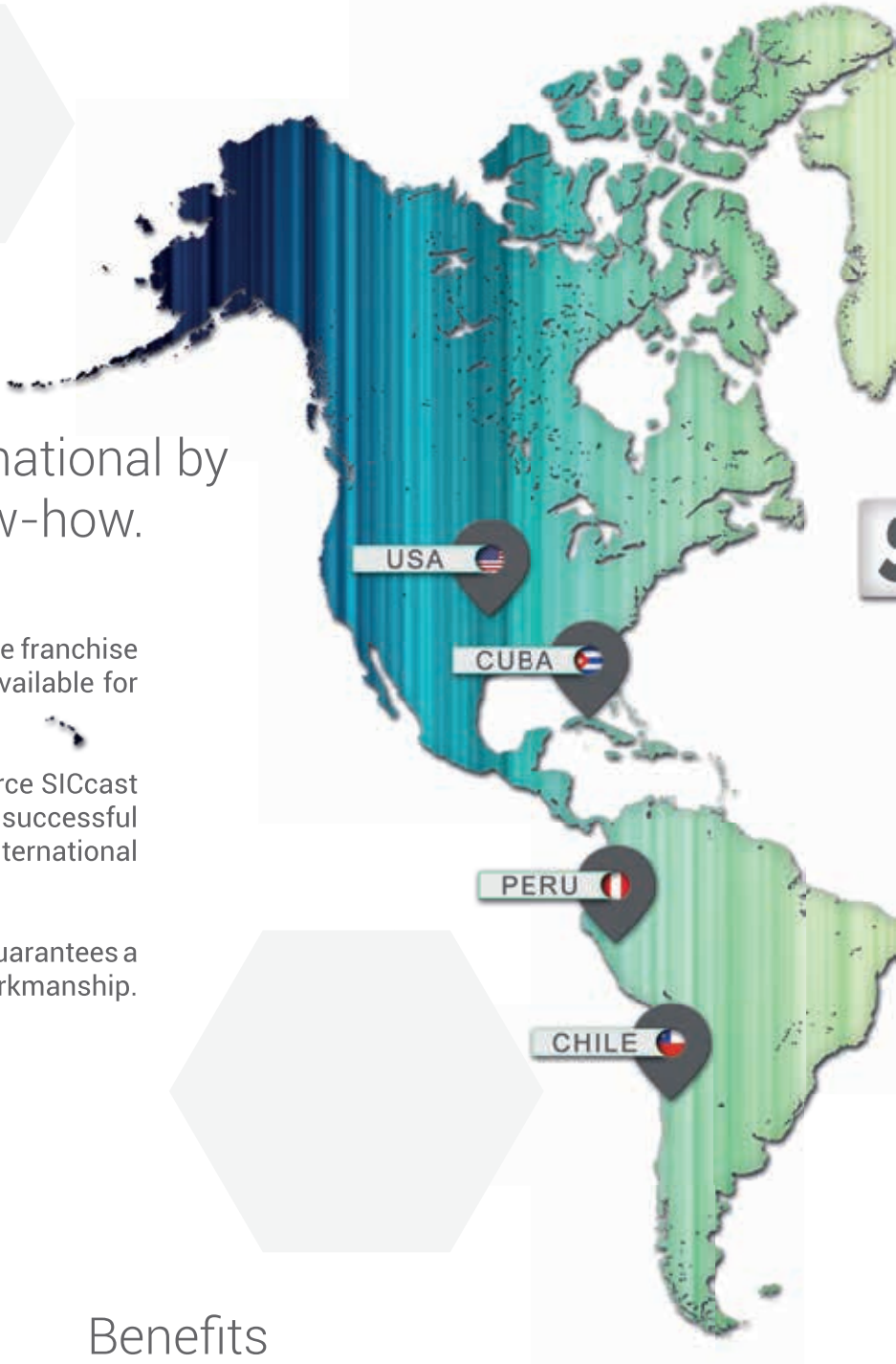








International / SICcast Franchise



SICcast 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 current list of Franchise-Partners online.

SICcast Checklist -
Feasibility check.

Fill out this form with as much infomation as possible.

Part:

Hydraulic or pneumatic transport

◯ Hydraulic ◯ Pneumatic

Manufacturer of original part

_____

Part description / type

_____

Reason for breakdown:

◯ Corrosion ◯ Abrasion

Lifetime of original part

_____ years _____ months

Original part price

approx. _____ €/piece

Amount of equal wear parts of this type in your factory

_____ pieces

For rotating equipment
Rotating speed

_____ r/min

Type of medium:

Operating temperature

max. _____ °C

Maximum size of solids

_____ mm

Solid Content

_____ %

Chemical formula or type of medium

_____

pH-value

_____

Operating pressure

_____ bar

Flow rate

_____ m³/h

Additional notes

_____

_____

_____

Please send original drawings and photos of the whole part and in addition detail photos of the worn area - if available. A digital checklist is also available online at: **SICcast.com**

SICcast® Mineral Cast -

Let's customize your solution!

SICcast®

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