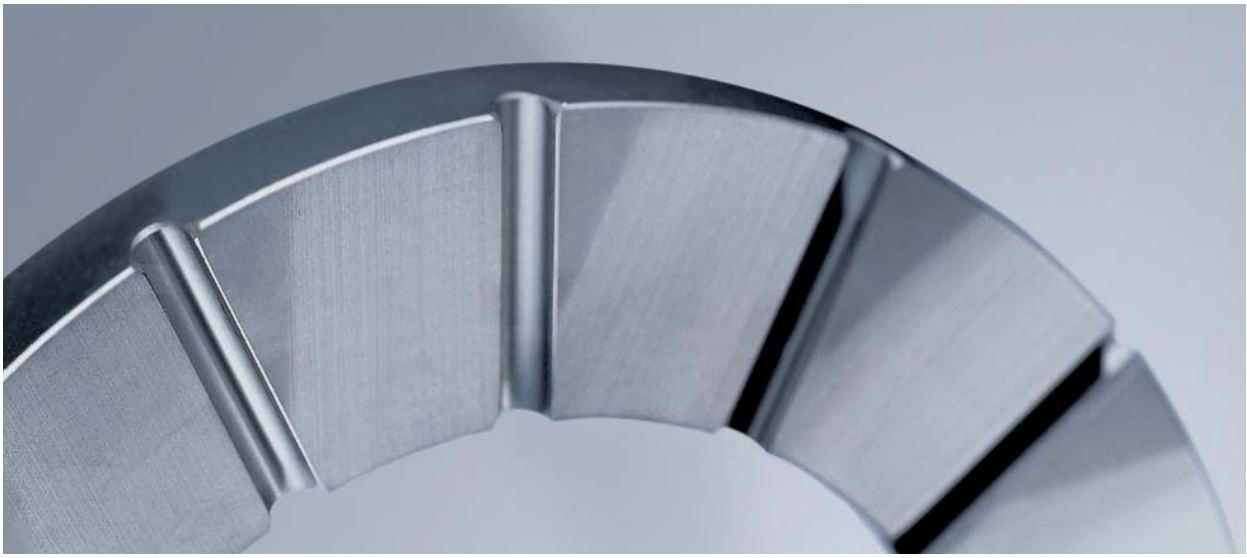
EKasic®



ESK Silicon Carbide

a ceradyne company

FOR OVER 80 YEARS, OUR EXPERIENCED APPLICATION SPECIALISTS HAVE BEEN SUCCESSFULLY DEVELOPING TECHNICAL CERAMIC MATERIALS TAILORED TO OUR CUSTOMERS' NEEDS.

ESK – MASTERING COMPLEXITY.

EKasic® – A VERSATILE SPECIALIST

ESK highlights novel development prospects for silicon carbide, thus opening up new application fields.

Modern mechanical seals and hermetically sealed pumps make very high demands on the materials used in critical areas.

In view of higher pump performance and tougher environmental standards, new bearing and sealing technologies for the transfer of aggressive media require tailor made materials.

Our engineers

- Satisfy the demands of technical systems through focused development projects
- Advise on system integration
- Verify the findings in practice
- Ensure that our innovations can be implemented economically and can be managed logistically

EKasic®
PRODUCT PROPERTIES

Our materials develop applications for technical systems that meet very tough demands:

- Tribological performance under high load (pressure, sliding speed, temperature)
- High resistance to wear
- Resistance to corrosion in aggressive media
- Thermal shock resistance
- Low distortion under thermal loads

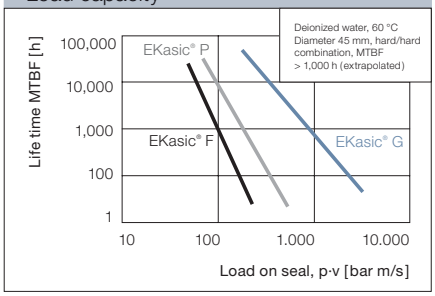
Shaft for magnetically driven pumps

The tribological grades

EKasic® P and EKasic® G

Improved dry run and mixed friction properties prove especially valuable in sliding and friction systems. The porous EKasic® P and the graphite-loaded EKasic® G.

Load capacity



Sliding bearing with lubrication grooves

Sliding rings for mechanical seals

Gas sealing ring for installation in compressors or liquid natural gas pumps

The corrosion-resistant grade

EKasic® C

Resistance to corrosion is a particular problem where aggressive chemicals or hot water are being transferred e.g. by circulating pumps. EKasic® C has proved highly effective in corrosive environments.

The all-rounder

EKasic® F

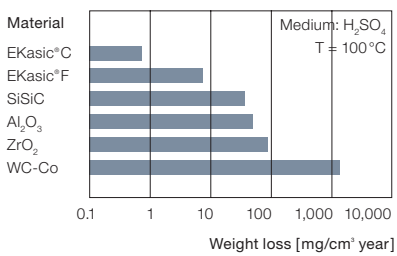
Good chemical resistance, low specific density, high hardness and wear resistance, outstanding thermal conductivity properties and resistance to fluctuations in temperature: EKasic® F combines all these specific advantages of sintered silicon carbide particularly for bearings and seals for use in pumps.

The high-strength grades

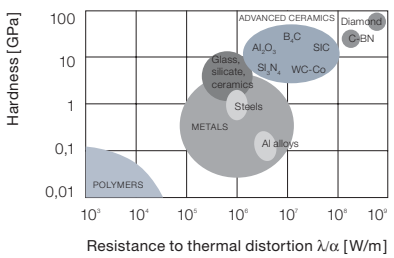
EKasic® F plus and EKasic® T

Two high-density materials achieve the optimum strength for silicon carbide. These non-porous, fine-grained grades guarantee very high mechanical strength and edge stability. EKasic® F plus and EKasic® T are the ideal materials for complex thermal and mechanical loads.

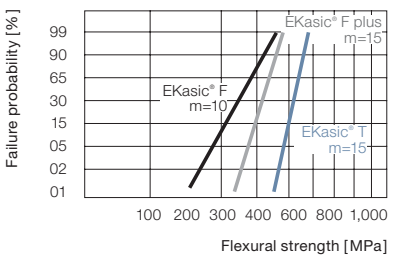
Corrosion resistance



Hardness and deformation resistance



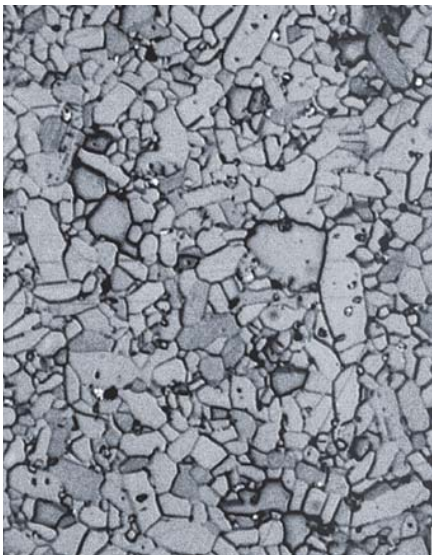
mechanical strength and reliability



EKasic®–THE MICROSTRUCTURE DETERMINES THE PROPERTIES OF A MATERIAL

Grain size 10 – 1,000 µm, density > 3.02 g/cm³

Grain size 10 – 1,500 µm, density > 3.10 g/cm³



Mean grain size < 5 µm, density > 3.10 g/cm³

EKasic® G

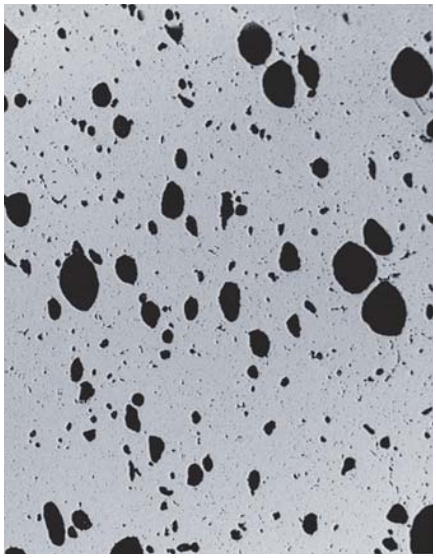
EKasic® G contains graphite inclusions 50 - 120 µm in size. Distributed homogeneously in the microstructure, they considerably reduce the coefficient of friction and improve resistance to wear in the event of marginal lubrication. The self-lubricating effect of the graphite particles permits temporary dry running. The coarse-grained microstructure lastingly prevents corrosion caused by hot water. Therefore the material is ideal for tribological applications with boundary lubrication. This is, for example, often the case in sliding bearings and mechanical seals.

EKasic® C

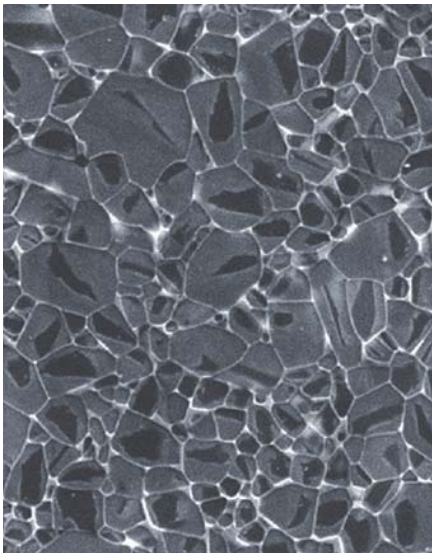
EKasic® C is highly corrosion resistant and even largely resistant to attack by hot water. The material tolerates an increased load, permitting the surface load in tribologically loaded systems to be increased, and guaranteeing optimum smooth running. In combination with the good wear properties, the operating limits of pumps and sealing systems can be significantly extended.

EKasic® F

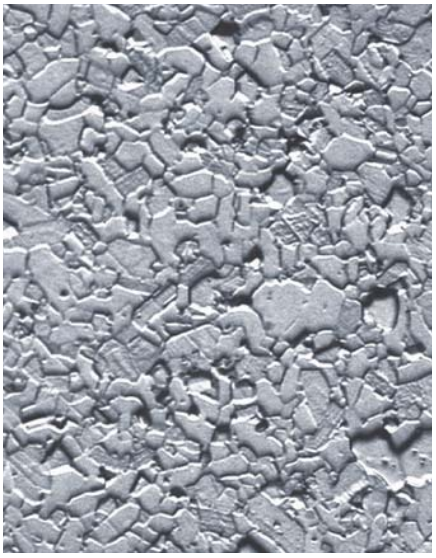
The fine-grained EKasic® F is an ideal material for mechanical seals, sliding bearings and valves. EKasic® F is often mated with graphite. When EKasic® F is self-mated or runs against EKasic® P, the range of possible applications is correspondingly extended. EKasic® F's good thermal conductivity and its excellent resistance to high temperatures, corrosion and thermal shock mean that it can also be used as a nozzle or thermal lining and in chemical facilities.



grain size < 5 µm, density 2.76 – 2.89 g/cm³



grain size < 2 µm, density > 3.21 g/cm³



grain size < 5 µm, density > 3.16 g/cm³

EKasic® P

EKasic® P is a specialty material with improved tribological properties. The incorporated cavities with a diameter of 10 – 200 µm serve as lubricating pockets on the running surface of slide or friction counterparts. They enhance hydrodynamics and thus reduce the coefficient of friction when liquid lubricants are used. Graphite or EKasic® F is often chosen as a slide counterpart. If the supply of lubricating fluid drops, improved emergency running properties boost reliability.

EKasic® T

As a non-porous material, EKasic® T succeeds in meeting the great demand for high-strength, extremely tough silicon carbide that also exhibits high thermal conductivity and good wear resistance. At more than 550 MPa, its strength is outstanding for a silicon carbide material. Additionally, EKasic® T's edge stability is correspondingly high, which is a requirement when used, for example, in rotary valves or gas sealing rings. Moreover, the excellent mechanical properties and fine-grained microstructure render it suitable for use in miniaturized components.

EKasic® F plus

Compared with other single-phase silicon carbide materials, fine-grained EKasic® F plus offers superior strength and greater wear resistance, particularly for valves and nozzles. This is due to its non-porous nature. As far as design engineers are concerned, the key property of EKasic® F plus is its greatly increased mechanical reliability.

ESK's EKasic® Offers you

PROVEN EXPERTISE

For over 80 years, ESK has been a competent development partner and reliable supplier of series products for challenging applications worldwide.

A ONE-STOP SUPPLIER

All production processes, from powder to component, are performed at ESK's own plant. Outstanding quality and maximum flexibility are thus ensured at each production stage.

CERTIFIED QUALITY

Each processing stage occurs in line with very rigorous checks at ESK's own plant. We are ISO 9001 and ISO 14001 compliant.

HIGH STANDARDS

Our experts are not just satisfied with finding a first-rate solution to today's challenges, but go a step further by thinking of your future needs. So you benefit from solutions that develop innovative production capability, make processes more dynamic and reduce costs.

OUR CUSTOMERS – OUR PARTNERS

Our top priority is close collaboration with you – our partner. This is the only way to develop ideas that make your company cutting edge and let us open up novel applications.

ESK collaborates with you to develop solutions customized to meet your needs. Please don’t hesitate to get in touch.

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