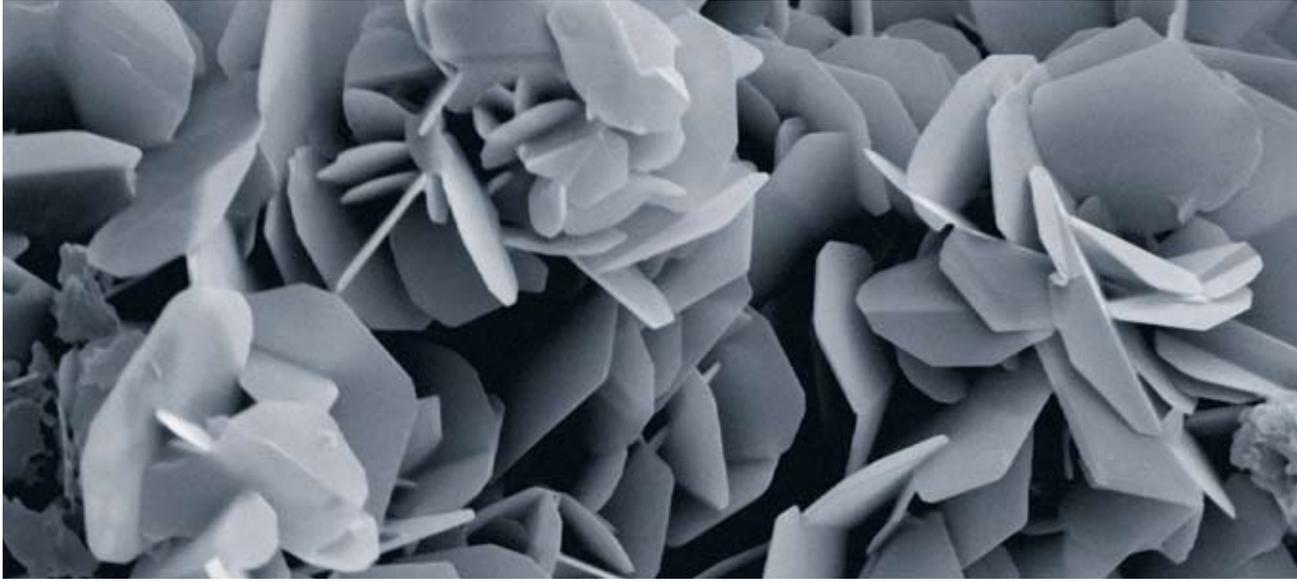




# BORON NITRIDE



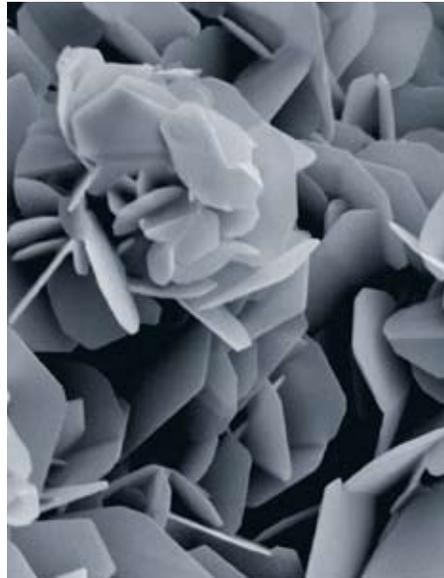
BORONID® · EKamold® · MYCROSINT®

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

ESK – MASTERING COMPLEXITY.

# BORON NITRIDE – UNIQUELY VERSATILE

With its boron nitride products, ESK offers cost-effective, environmentally sustainable and technically advanced technologies.



## One Material – Many Talents

Boron nitride is both extremely heat resistant and virtually chemically inert, an electrical insulator and a good heat conductor. It is also an outstanding lubricant and release agent with excellent non-wetting properties.

## For Various Industries

Boron nitride from ESK is used in many different industries, either as an indispensable part of the production process or as an essential functional component in industrial systems.

## In a Variety of Forms

We produce boron nitride in the form of powders, suspensions, sprays or sintered parts.

## Product Design Customized for You

ESK's experts work closely together with customers and partners on the continual development of boron nitride. That is how we tailor our product design to your individual requirements.

# BORONID® AND EKamold®

## BORON NITRIDE IN POWDER FORM



BORONID® is used as an additive for polymers and in the production of lubricants and release agents.

You specify your requirements, we optimize your product's properties and behavior.

BORONID® and EKamold® are processed in a number of defined stages in which the particle size, powder morphology and chemical composition are tailored to requirements.

The flow properties, dispersion behavior, lubrication and release properties can thereby be tailored to the particular application, and optimized mixtures can be produced.

For example, they can be given the ideal thermal conductivity for use in polymers, the coefficient of friction can be tailored for lubricant applications, or the release characteristics of ceramic coatings or viscosities of liquid suspensions can be customized – whatever is best for the application.

### Typical Applications

- Additives for high-performance lubricants
- Release agents for aluminum extrusion
- Starting material for cubic boron nitride

### BORONID® Product Properties

Custom product design with respect to

- Thermal conductivity
- Flow behavior
- Heat resistance
- Coefficient of friction in lubricants
- Dispersibility in polymers
- Release and lubricating properties for coatings

### Your Advantage

- Efficient, reproducible processing
- Constant quality of your product
- Efficient material consumption
- Permits innovative solutions

# EKamold®

## BORON NITRIDE SUSPENSION OR SPRAY



EKamold® suspensions are used as lubricants, for example for light-metal casting.



EKamold® aerosols are ideal release agents and lubricants for coating small surfaces.

Cost-effective solutions for your coating requirements.

In the case of EKamold®, the powder and binder systems are selected to adjust the applications properties, such as viscosity, adhesion and stability.

EKamold® can be applied by any conventional process.

### Typical Applications

- Casting
- Metal forming
- Plastic shaping
- Glass processing

### EKamold® Product Properties

Custom product design with respect to

- Adhesion to different substrates
- Heat resistance
- Application process
- Viscosity of suspensions
- Release and lubricating properties
- Wetting behavior
- Corrosion resistance to a variety of chemical media

### Your Advantage

- Ready to use and easy to apply
- Excellent lubricating and release properties
- Improved surface quality of workpieces
- Chemically inert
- Permits high service temperatures
- Extended lifetime of tools

# MYCROSINT®

## BORON NITRIDE IN SINTERED FORM



MYCROSINT® break rings for horizontal continuous casting of steel and nonferrous alloys



MYCROSINT® side dams for thin-strip casting of steel and nonferrous alloys



MYCROSINT® casting nozzles for molten metals

### Typical Applications

- Break rings for horizontal continuous casting
- Side dams for thin-strip casting
- Atomization of molten metals
- Insulators for high-temperature furnaces



MYCROSINT® insulators for coating lines

MYCROSINT® boron nitride ceramic is used for its high thermal and chemical resistance and ease of machining. Its main applications are in steel mills and foundries, in furnace construction, the semiconductor industry and in coating.

Homogeneous sintered billets ensure optimum mechanical/technical properties. Excellent cutting properties enable the machining of complex parts with narrow tolerances.

Composite materials combine the outstanding properties of boron nitride with the advantages of other advanced ceramics. Thus, oxides, carbides and nitrides are added to tailor a wide range of physical and chemical properties.

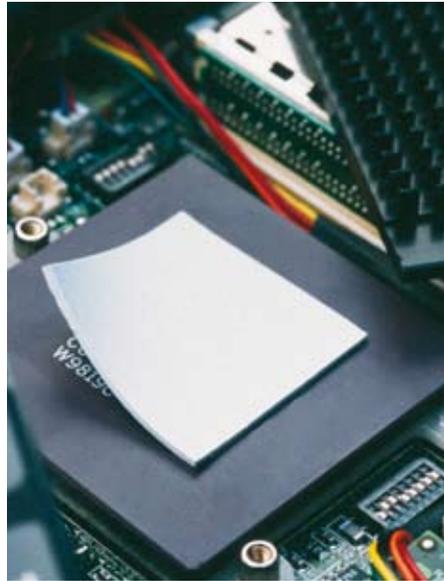
#### MYCROSINT® Product Properties

- Optimum release properties
- Heat resistance
- Excellent corrosion resistance
- Thermal conductivity
- Extreme thermal shock resistance
- High electrical insulation capacity

#### Your Advantage

- High process stability
- Improved service life
- Enables new technologies

# BORON NITRIDE – A MATERIAL FOR CHALLENGING APPLICATIONS IN A WIDE VARIETY



## Aluminum Industry

Extrusion has proved to be the most economic process for the production of aluminum profiles. But aluminum is prone to sticking at process temperatures of about 450 °C. A release agent is therefore introduced between the extrusion die and aluminum block.

EKamold® from ESK resists the high processing temperatures, has excellent release properties and at the same time serves as a lubricant.

## Electronics

Thermal management is essential for ensuring the proper functioning of electronically controlled processes. Ongoing miniaturization of parts requires materials that can quickly and effectively dissipate heat within an extremely small space.

Thanks to its excellent thermal conductivity and electrical insulation properties, BORONID® is an ideal additive for a wide variety of polymer systems. It is neither toxic nor abrasive, and therefore offers a cost-effective, environmentally friendly alternative to the oxide-based fillers used until now.

## Glass Industry

When hot glass comes into contact with processing or forming dies, a suitable release agent must be used to prevent sticking.

BORONID®, EKamold® and MYCROSINT® are non-wettable even at very high temperatures, chemically inert, and offer high heat resistance. That gives them a wide range of applications, from trough coatings to extrusion dies.

# OF INDUSTRIES



Boron nitride from ESK is used in many different industries, either as an indispensable part of the production process or as an essential functional component in industrial systems.

## High-Temperature Applications

With its resistance to temperatures over 3000 °C and electrical insulation properties, boron nitride is ideal for use in high temperature applications.

MYCROSINT® has many different uses in furnace construction, such as insulation sleeves for lead-throughs, supports for graphite heaters or thermocouple protection sheaths.

In coating technology, MYCROSINT® boron nitride ceramic is used as shielding strips for sputter targets.

## Metallurgy

Boron nitride's largely inert behavior towards steel, copper, light metals and noble metal alloys makes it an ideal material for applications in direct contact with molten metals.

Only MYCROSINT® permits new technologies such as horizontal continuous casting and thin-strip casting of steels and non-ferrous metals.

MYCROSINT® breakrings show outstanding corrosion resistance together with excellent thermal shock resistance. Temperature gradients of 1500 °C within the part are possible. As a result, the solidified extrudates show perfect release from the different metals.

MYCROSINT® side-dams seal the roll sides during thin-strip casting, and thereby permit the production of steel strip directly from the molten metal.

# WITH BORON NITRIDE FROM ESK, YOU BENEFIT IN MULTIPLE WAYS

## ■ 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 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.

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose.



ESK Ceramics GmbH & Co. KG  
Max-Schaidhauf-Straße 25  
87437 Kempten, Germany  
[www.esk.com](http://www.esk.com), [info@esk.com](mailto:info@esk.com)

 a ceradyne company