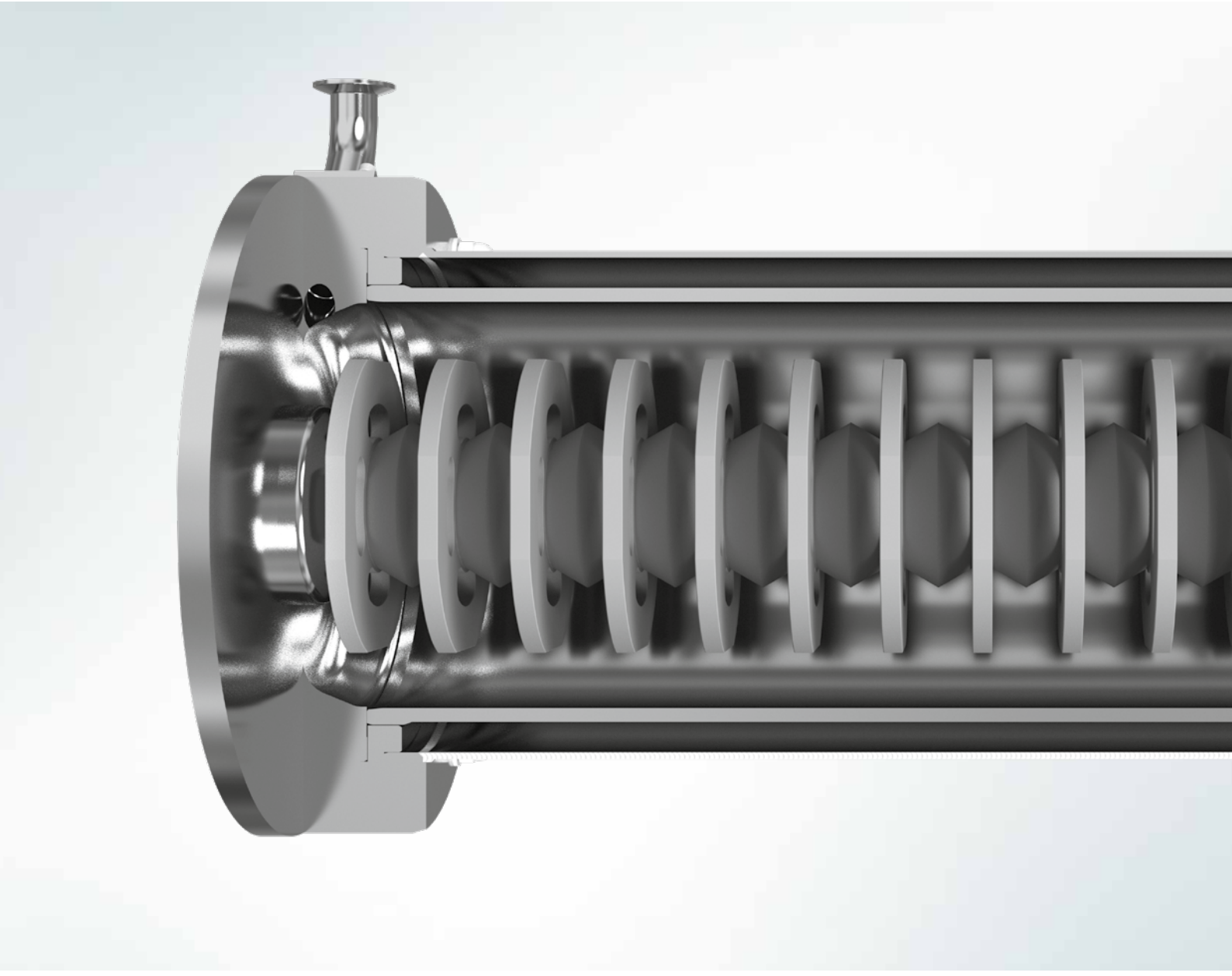
NETZSCH

Proven Excellence.



Discus Grinding System

The universal Grinding System

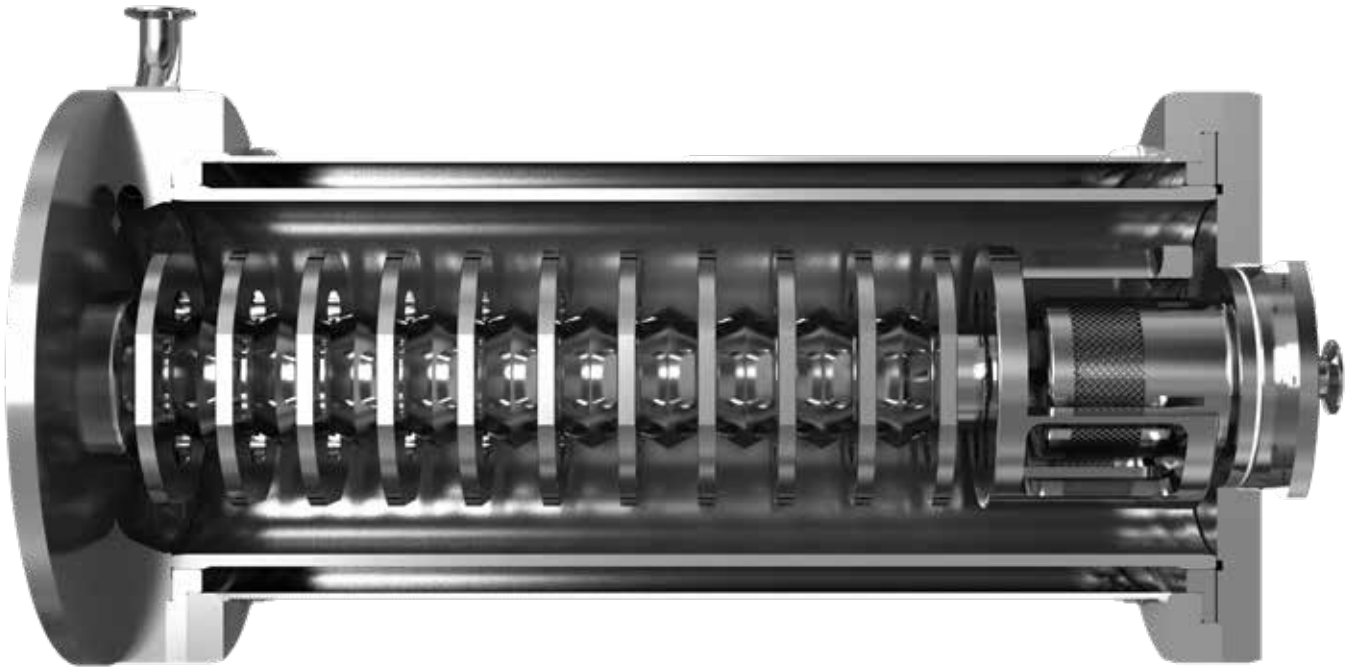
CHEMICAL INDUSTRY | a Business Field of NETZSCH Grinding & Dispersing

NETZSCH *Discus* Grinding System
The universal Grinding System

Discus is the byword for high-performance agitator bead mills with disk agitator. The high length/diameter ratio, the different grinding disk geometries, the various material options, as well as the highly-efficient grinding bead separation system facilitate an application-specific design of this machine for your particular task.

The highest throughput rates with significantly narrower residence time distributions and therefore more intensive grinding with consistent stress intensity are guaranteed with the optimized *Discus* disk agitator combined with the NETZSCH DCC® separation system.

The *Discus* grinding system optimizes the movement of the grinding media so that higher power input and production output are achieved with a simultaneous increase in grinding efficiency.



Sizes – from the Lab to large-scale Production

Models	Capacity Factor	Batch size [l]	Drive power [kW]	Typical throughput rate [kg/h]
LabStar	0.07	1,5 - 5	2.2 - 3	5 - 50
Discus 4	0.25	10 - 100	5.5 - 7.5	18 - 180
Discus 20/30	1 / 1.2	100 - 500	18.5 - 22	70 - 750
Discus 60	2.0	200 - 1 000	37	140 - 1 500
Discus 150	4	500 - 2 500	75	250 - 2 500
Discus 200	6	1 000 - 10 000	75 - 90	420 - 4 200
Discus 300	8	> 2 000	90 - 132	560 - 5 600
Discus 500	12	-	160 - 200	840 - 8 400
Discus 1000	20	-	315 - 355	1 400 - 14 000

Your Benefits

- Reliable scale-up
- Variety of sizes
- High length/diameter ratio
- Highly-efficient grinding media separation system
- Optimum cooling water flow
- Inner pipe of grinding tank made of NETZSCH-*Ceram C*
- Highest throughput rates
- Significantly narrower residence time distribution
- Intensive grinding with consistent stress intensity
- Highest power input
- Low specific energy requirement

NETZSCH *Discus* Grinding System

Increase your Power Input

Variable Power Density

With the variable disk geometries of the new Discus grinding system, the power density in the grinding chamber can always be adjusted to the requirements of the product.

Maximum Volume Throughput

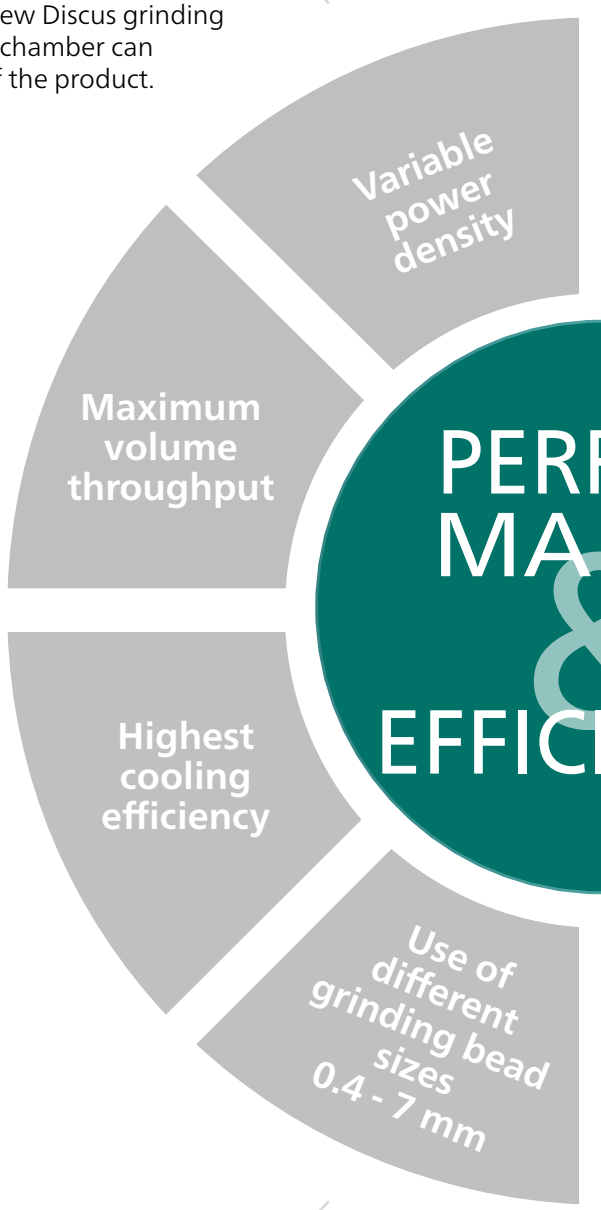
In circulation mode, the required number of circuits is achieved very quickly due to the extremely high volume throughput.

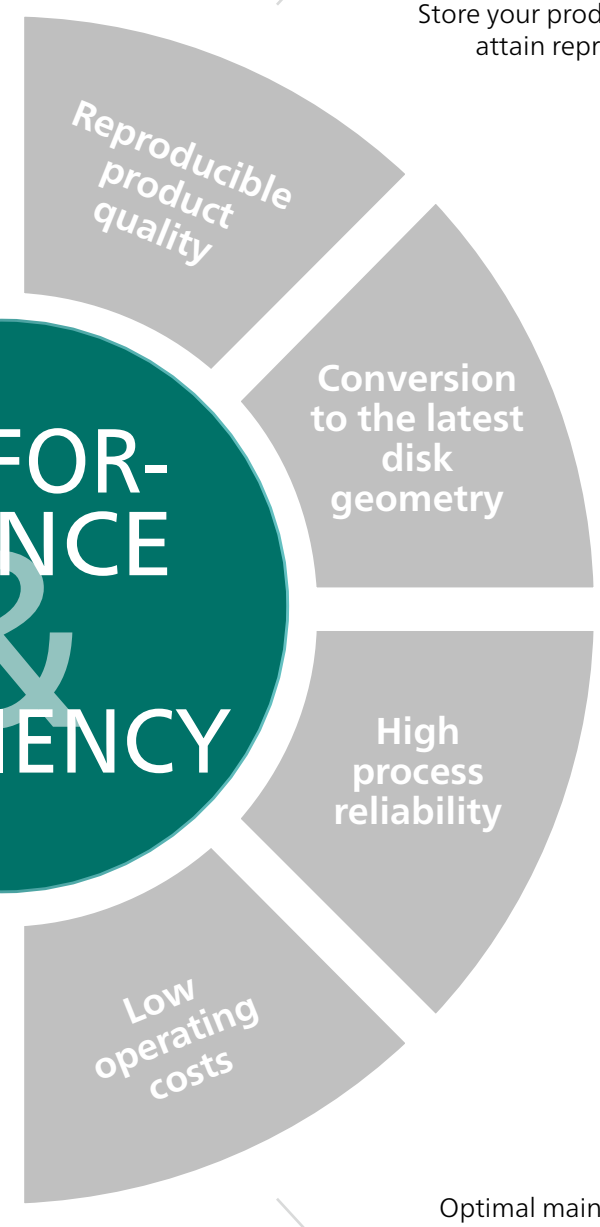
Optimized Cooling

The highest cooling efficiency is obtained through the use of new materials and optimum utilization of the available cooling surface.

Various Grinding Bead Sizes

Select the right size NETZSCH *Zeta*®-*BeadsPlus* for your process.





Reproducible Product Quality

Store your product formulations in the control system and attain reproducible quality in the production process.

Upgrade *TriNex®* → *TetraNex®*

You want to keep your existing Discus machine but also take advantage of the new *TetraNex®* disk geometry? We offer upgrades for various Discus models.

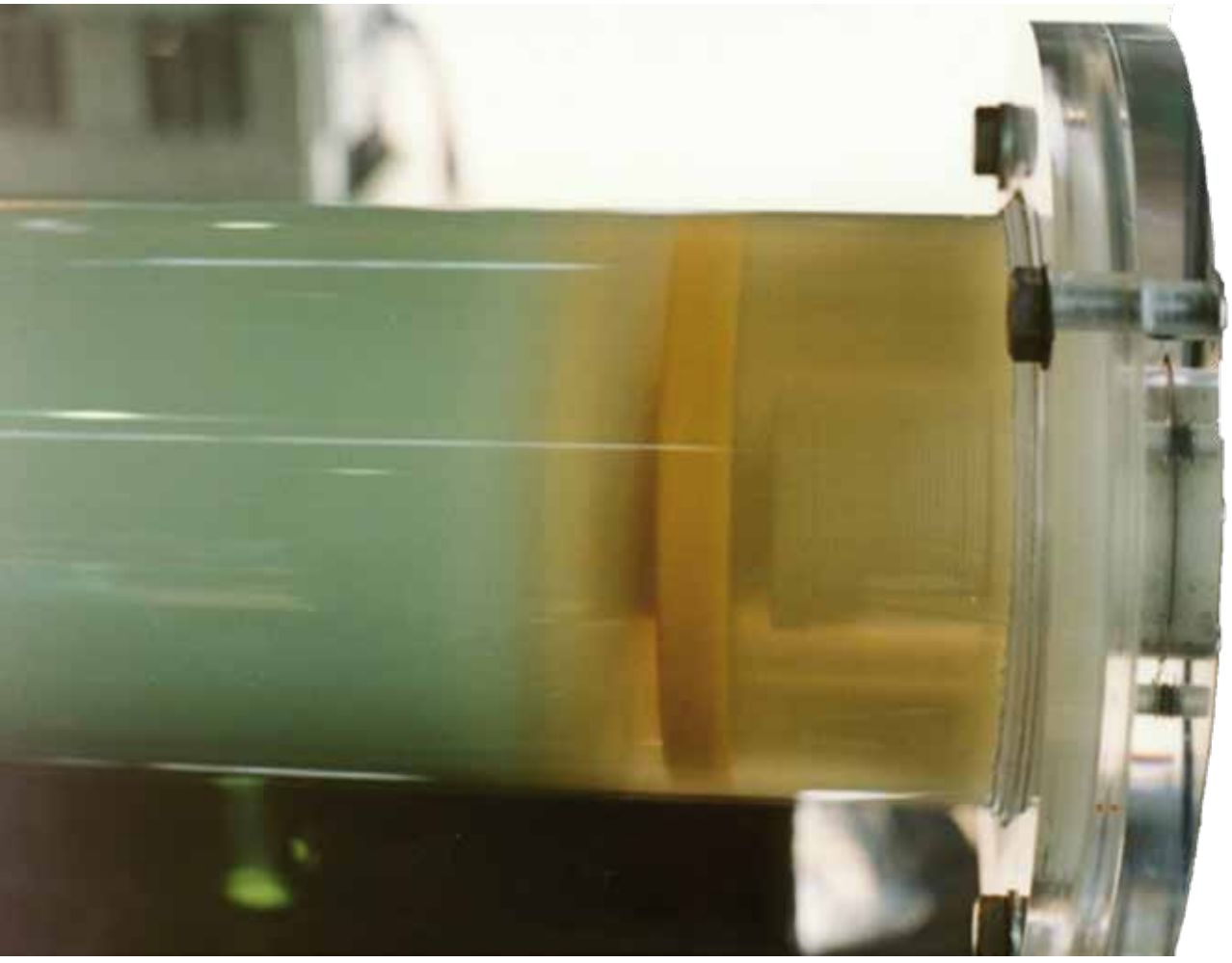
Stable Production Process

Optimum grinding media separation and maximum slotted pipe surface area mean that the grinding process remains stable, even with small changes in process conditions (temperature fluctuations, formulation variations, viscosity fluctuations, etc.).

NETZSCH Preventive Service

Optimal maintenance along with analysis of system and machine data by our NETZSCH service team increases productivity and availability of the machine.

NETZSCH *Discus* Grinding System
The Separation System is the Key



Mode of operation of the DCC preclassifying separation system in an horizontal bead mill with disk agitator with 0.3 mm glass grinding beads at a water flow rate of 600 l/h

The Model DCC Preclassification System

The highly efficient, dynamic centrifugal separation system facilitates the use of grinding beads of various densities, matched to the application. In addition, it allows the use of grinding beads up to 0.4 mm in diameter. The separation system ensures that the mill can be operated far below the critical point of grinding bead compression, even for products with challenging rheological properties.

This means that operational performance is extremely stable, shutdown due to overpressure and exceeding the permitted temperature limits is avoided and grinding media wear is minimized. The classifying rotor increases the service life of the separation screen and thus minimizes maintenance work and downtimes.

How it works

- Product enters the preclassification area through the axial gaps in the last grinding disk
- Entrained grinding beads are centrifuged outward in this area, while the product enters the separation chamber axially through the openings in the pre-classifier disk
- Formation of a circulation flow through the rotor, which counteracts the axial flow of the material being processed

Focus on your Benefit

- Use of very small grinding media even with high product viscosities and throughput rates
- Maximum relief of load on the screen through the provision of a pre-classifier disk

NETZSCH *Discus* Grinding System
Optimum Grinding Bead Activation

TetraNex® – The grinding system for optimum energy input

The NETZSCH *Discus* agitator bead mills are equipped with the *TetraNex*® grinding system. The *TetraNex*® grinding disk, which replaces the familiar *TriNex*® grinding disk, is available in the standard design and in the *TetraNex*® Plus version. While the front side of the standard version is smooth, just like the *TriNex*® version, the *TetraNex*® Plus disk has special activation elements. These activate the grinding beads reciprocally in the axial direction, which leads to increased contact between the grinding beads and thus to more effective grinding processes.

Your Benefits

Thanks to the new geometry and with application-oriented, optimized mounting of *TetraNex*® disks in the standard and *TetraNex*® *Plus* version, the power input of the mill can be increased up to 30%. This leads to a significant increase in production output.

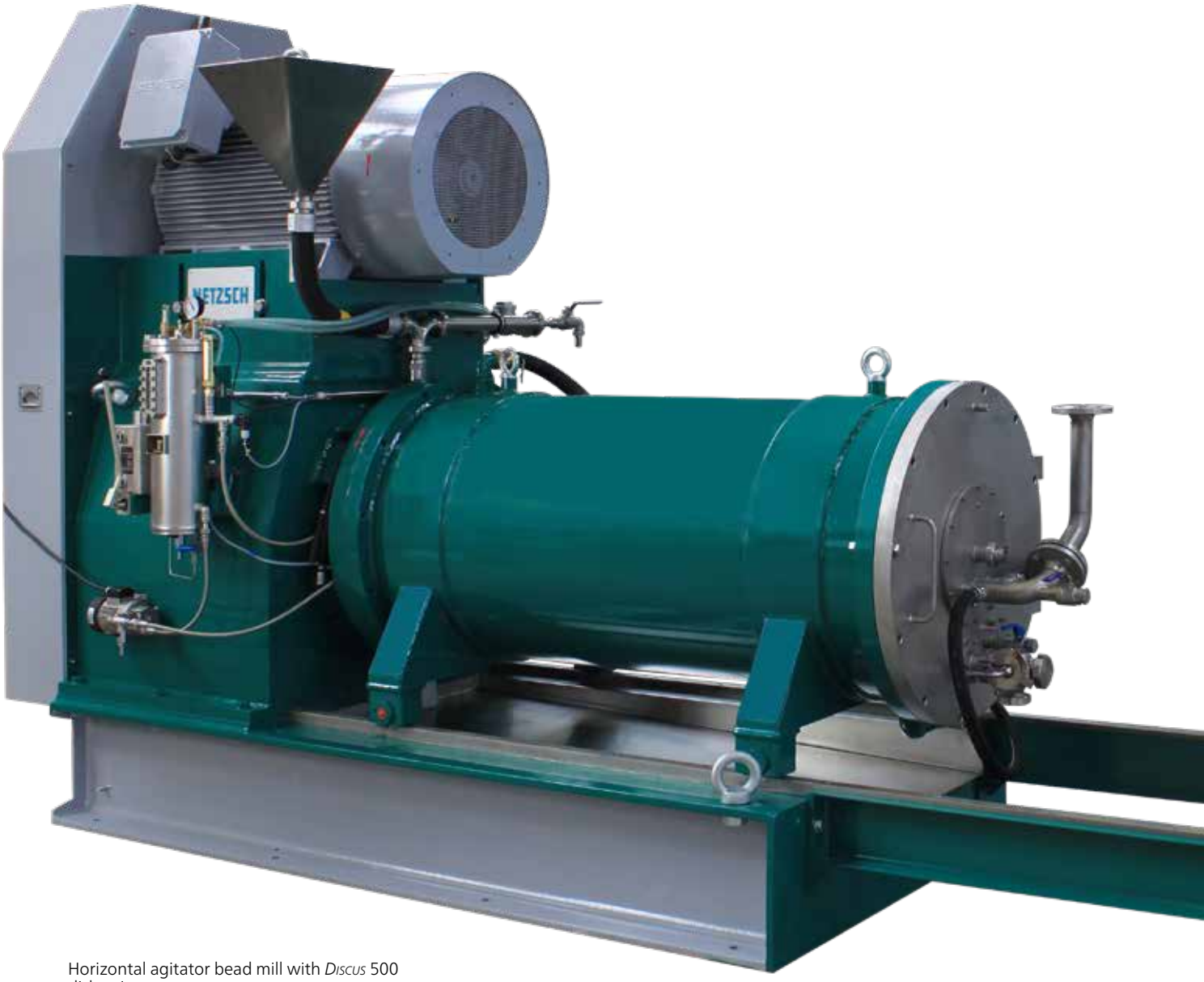
However, because temperature limits often limit an increased power input during processing, NETZSCH also offers the *Cool Plus* package. This package includes a grinding tank with an inner pipe made of NETZSCH *Ceram C*.

Combined with an optimized cooling water flow, its thermal conductivity, which is several times higher than that of steel, facilitates maximum heat transfer between the product and the cooling water and thus a low product temperature with maximum grinding efficiency.

The combination of the *Discus* grinding system and the *Cool Plus* package facilitates increased production output with optimal cooling, which also guarantees enhanced production reliability with respect to quality and adherence to the permissible temperature limits.

Cool Plus Package

- Grinding tank with inner pipe made of NETZSCH-*Ceram* C
  - Higher thermal conductivity compared to steel
  - High degree of hardness and wear resistance
- Optimized cooling water flow for maximum heat transfer



Horizontal agitator bead mill with *Discus* 500
disk agitator

NETZSCH *Discus* Grinding System
Specifically matched grinding cham

Material options for every product

In order to satisfy the requirements of the broadest array of products and to guarantee product compatibility, we offer grinding tanks and agitator shafts made from a variety of materials. Matching the grinding system material to the product properties facilitates low-wear operation of the mill. Contamination of the product is thereby avoided. This leads to an enormous expansion of potential applications for the machine. The inner pipes of the grinding tank that come in contact with the product can be exchanged quickly and easily on site. This means you incur lower investment and storage costs and you experience the greatest possible flexibility in adapting to new product groups.

Range of grinding tank materials:

- Chilled cast iron
- Wear-resistant steel
- Stainless steel
- Aluminum oxide
- NETZSCH-*Ceram* Z
- NETZSCH-*Ceram* N
- NETZSCH-*Ceram* C
- Silicon carbide
- NElast
- Polyethylene
- Rubber

Focus on your Benefit

- Selection criteria are: resistance to solvents, temperature sensitivity of the product and wear resistance or low-contamination processing
- For every product requirement there is a suitable grinding chamber material or, if necessary, material combination available to you
- It is often possible to convert an existing LME agitator bead mill to a different grinding chamber material and the *Discus* grinding system – speak with our specialists
- Minimal maintenance costs

nber design & applications

Applications

- Printing inks
- Coatings
- Pigments
- Textile dyes
- Magnetic coatings
- Paper coatings
- Fillers
- Pesticides
- Ores
- Minerals
- Technical and consumer ceramics
- Ceramic masses and glazes
- Pharmaceuticals
- Cosmetics
- Foods: e.g. cocoa, chocolate, chocolate compounds
- Biotechnology: cell disruption

The NETZSCH Group is an owner-managed, international technology company with headquarters in Germany. The Business Units Analyzing & Testing, Grinding & Dispersing and Pumps & Systems represent customized solutions at the highest level. More than 3,700 employees in 36 countries and a worldwide sales and service network ensure customer proximity and competent service.

Our performance standards are high. We promise our customers Proven Excellence – exceptional performance in everything we do, proven time and again since 1873.

Proven Excellence.

Business Unit Grinding & Dispersing – The World's Leading Grinding Technology

NETZSCH-Feinmahltechnik – Germany
NETZSCH Trockenmahltechnik – Germany
NETZSCH Vakumix – Germany
NETZSCH Lohnmahltechnik – Germany
NETZSCH Mastermix – Great Britain
NETZSCH FRÈRES – France
NETZSCH España – Spain
ECUTEC – Spain

NETZSCH Machinery and Instruments – China
NETZSCH Technologies India Private – India
NETZSCH Tula – Russia
NETZSCH Makine Sanayi ve Ticaret – Turkey
NETZSCH Korea – Korea
NETZSCH Premier Technologies – USA
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NETZSCH-Feinmahltechnik GmbH
Sedanstraße 70
95100 Selb
Germany
Tel.: +49 9287 797 0
Fax: +49 9287 797 149
info.nft@netzsch.com

NETZSCH®

www.netzsch.com

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