**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

<table>
<thead>
<tr>
<th>Models</th>
<th>Capacity Factor</th>
<th>Batch size [l]</th>
<th>Drive power [kW]</th>
<th>Typical throughput rate [kg/h]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabStar</td>
<td>0.07</td>
<td>1.5 - 5</td>
<td>2.2 - 3</td>
<td>5 - 50</td>
</tr>
<tr>
<td>Discus 4</td>
<td>0.25</td>
<td>10 - 100</td>
<td>5.5 - 7.5</td>
<td>18 - 180</td>
</tr>
<tr>
<td>Discus 20/30</td>
<td>1 / 1.2</td>
<td>100 - 500</td>
<td>18.5 - 22</td>
<td>70 - 750</td>
</tr>
<tr>
<td>Discus 60</td>
<td>2.0</td>
<td>200 - 1000</td>
<td>37</td>
<td>140 - 1500</td>
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<tr>
<td>Discus 150</td>
<td>4</td>
<td>500 - 2500</td>
<td>75</td>
<td>250 - 2500</td>
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<tr>
<td>Discus 200</td>
<td>6</td>
<td>1000 - 10000</td>
<td>75 - 90</td>
<td>420 - 4200</td>
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<tr>
<td>Discus 300</td>
<td>8</td>
<td>&gt; 2000</td>
<td>90 - 132</td>
<td>560 - 5600</td>
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<td>Discus 500</td>
<td>12</td>
<td>-</td>
<td>160 - 200</td>
<td>840 - 8400</td>
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<tr>
<td>Discus 1000</td>
<td>20</td>
<td>-</td>
<td>315 - 355</td>
<td>1400 - 14000</td>
</tr>
</tbody>
</table>

### 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 D isc us 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.
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 high efficiency, 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
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
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
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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

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