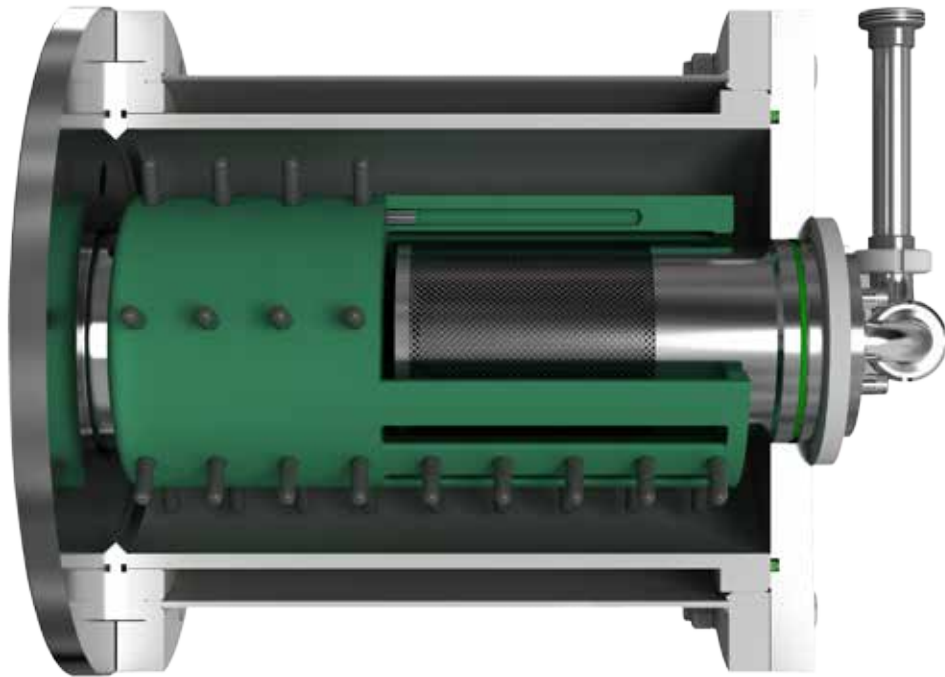


ZETA[®] Grinding System

The Grinding System for Circulation and Multi-pass Operation

NETZSCH ZETA[®] Grinding System

The Grinding System for Circulation and



With this technology, which is suitable for any viscosity and almost every product, you will achieve the highest product qualities using a wide variety of grinding media from 0.3 mm to 3 mm in diameter.

The ergonomic design and easy product change and cleaning facilitate daily operation of the machine – the good accessibility simplifies service and maintenance work.

Your Benefits

- Peg grinding system with the highest grinding intensity
- Finenesses into the nanometer range
- Very narrow particle size distribution
- Maximum economic efficiency
- Exact reproducibility
- Effective centrifugal separation system
- Logical design for the highest throughput rates
- Ideal for circulation/multi-pass operation
- Optimum energy input with efficient cooling
- Ideal temperature control
- Universally applicable for any product
- Possible to scale-up from laboratory to production machine
- Reliable use of a wide variety of grinding media from 0.3 mm to 3 mm
- Use of extremely small grinding media from 0.1 mm possible (product dependent)
- Achieve the best product qualities with maximum output and optimum energy efficiency
- Additional product-optimized grinding chamber configurations available upon request

Multi-pass Operation

Machine sizes – from the laboratory to large-scale production

The ZETA® grinding system is available in sizes ranging from the *MINI/MICROSERIES* laboratory mills with grinding chamber volumes of 0.08 l to production machines with grinding chamber volumes of 400 l.

Full scale-up of the results achieved on the laboratory scale is possible.

Model	Grinding chamber volume [l]	Batch size [l]	Drive [kW]	Throughput in circulation mode [kg/h]
<i>MINI/MICRO SERIE</i>	0.08 - 0.16	0.14 - 0,5	0.94	10 - 50
<i>LABSTAR</i> <i>ALPHALAB</i>	0.6	1 - 5	3	10 - 50
ZETA® 2	1.6	10 - 50	7,5	40 - 200
ZETA® 4	4	20 - 200	13.5 - 15	100 - 500
ZETA® 10	10	100 - 1000	18.5 - 30	250 - 1000
ZETA® 25	25	500 - 2000	37 - 45	500 - 2500
ZETA® 60	60	> 2000	75 - 90	1000 - 6000
ZETA® 150	150	> 4000	160 - 250	2000 - 15000
ZETA® 400	400	> 8000	315 - 500	3000 - 28000

NETZSCH ZETA[®] – The high-performance

Functionality and Efficiency

The ZETA[®] grinding system represents the systematic progression from the John system combined with the rotor-slotted pipe separation device. The enclosed horizontal bead mill is designed for the highest product throughput rates and has an extremely high-intensity peg grinding system.

The product flows horizontally through the agitator mill from the inlet on the bearing side and exits via the slotted pipe at the bottom of the tank. The forced conveyance of the product through the grind-intensive grinding media fill guarantees a uniform load inside the mill. The dynamic separation system reliably retains the grinding media in the grinding zone. This enables extremely high flow rates without pressure build-up in the grinding chamber and creates ideal conditions for circulation or multi-pass operation.

For exact temperature control, the agitator mill is equipped with a targeted multi-zone cooling system. In the basic model, the grinding tank, complete agitator shaft and product outlet are coolable and prevent overheating of the product. As an option, the slotted agitator shaft component can also be cooled. The complete flow through the slotted agitator shaft area increases not only the cooling surface area, but the heat transfer efficiency as well.

Grinding chamber designs in various materials and new control concepts expand the potential applications.

Focus on your benefit

- Peg grinding system with the highest grinding intensity
- Finenesses into the nanometer range
- Narrowest particle size distribution
- Greatest cost efficiency
- Exact reproducibility
- Effective centrifugal separation system
- Use of extremely small grinding beads from 90 µm
- Logical design for the highest throughput rates
- Ideal for circulation/multi-pass operation
- Optimal energy input with efficient cooling
- Ideal temperature control through targeted multi-zone cooling

grinding system

Unlimited versatility

The *ZETA*® high-performance circulation system is an extremely versatile grinding system. It is equally suitable for everything from the processing of very low-viscosity products to the grinding of products with high concentrations of solids and correspondingly high viscosities. NETZSCH *BEADS*® are grinding media ideally tailored to the *ZETA*® grinding system and are available in a variety of applicable materials and sizes ranging from 0.09 mm to 3 mm in diameter. The product-wetted components of the grinding system are available in various materials.

Depending on the application, materials such as NElast, ceramic, wear-resistant special steels and stainless steel are available. A pharmaceutical version of the grinding system is another option. The targeted multi-zone cooling allows the processing of products at very low temperatures.



Standard design

optionally available in highly wear-resistant special steel for the processing of products containing solvents or in stainless steel for water-based products.



Ceramic design

for iron-free grinding of abrasive, contamination-sensitive solvent-based products. The product-wetted grinding chamber components are available in NETZSCH *CERAM Z*, NETZSCH *CERAM N* or NETZSCH *CERAM C*.



NElast design

all product-wetted parts have a coating of NElast for "iron-free" processing of contamination-sensitive water-based products.



Pharmaceutical design

the *DELTA VITA*® series in a polished stainless steel design free of dead space, easy to clean and sterilize.

NETZSCH ZETA[®] – The high-performance

The ZETA[®] grinding system is in every aspect a very user-friendly, reliable, low-maintenance system. The many advantages start with the structural design of the agitator mill: the horizontal orientation guarantees uniform filling of the grinding media into the grinding tank. Start-up of the mill with product is therefore unproblematic. Very high flow rates can be set without pressure build-up. The double-acting cassette-type mechanical seal is mounted in the reduced-flow area of the grinding chamber. The mechanical stress from grinding media is minimal. The product outlet is located directly at the bottom of the grinding tank, making it easily accessible.

The maintenance-free slotted pipe within the grinding chamber prevents the loss of grinding media when the machine is idle. During operation, the grinding media are kept away from the slotted pipe by the rotor of the separation system. This prevents flow-induced bead compression and obstructions. A displacer in the slotted pipe increases the flow rate in the outlet area and, in conjunction with short pipelines, prevents product entrainment. Optional cooling of the displacer lowers the product discharge temperature after it passes through the intensive grinding zone, while still inside the agitator mill.

Cleaning made easy

The optimized cleaning concept with a wash cycle system allows almost residue-free cleaning with very little cleaning agent, and without emptying the grinding tank.

Focus on your benefit

- Horizontal construction facilitates maintenance
- Uniform grinding media distribution throughout the grinding chamber
- No grinding media compression
- Double-acting cassette-type mechanical seal in the reduced-flow area of the grinding chamber
- Easy access to the separation system
- Maintenance-free slotted pipe
- Easy, practically residue-free cleaning
- Wash cycle systems with speed adjustment

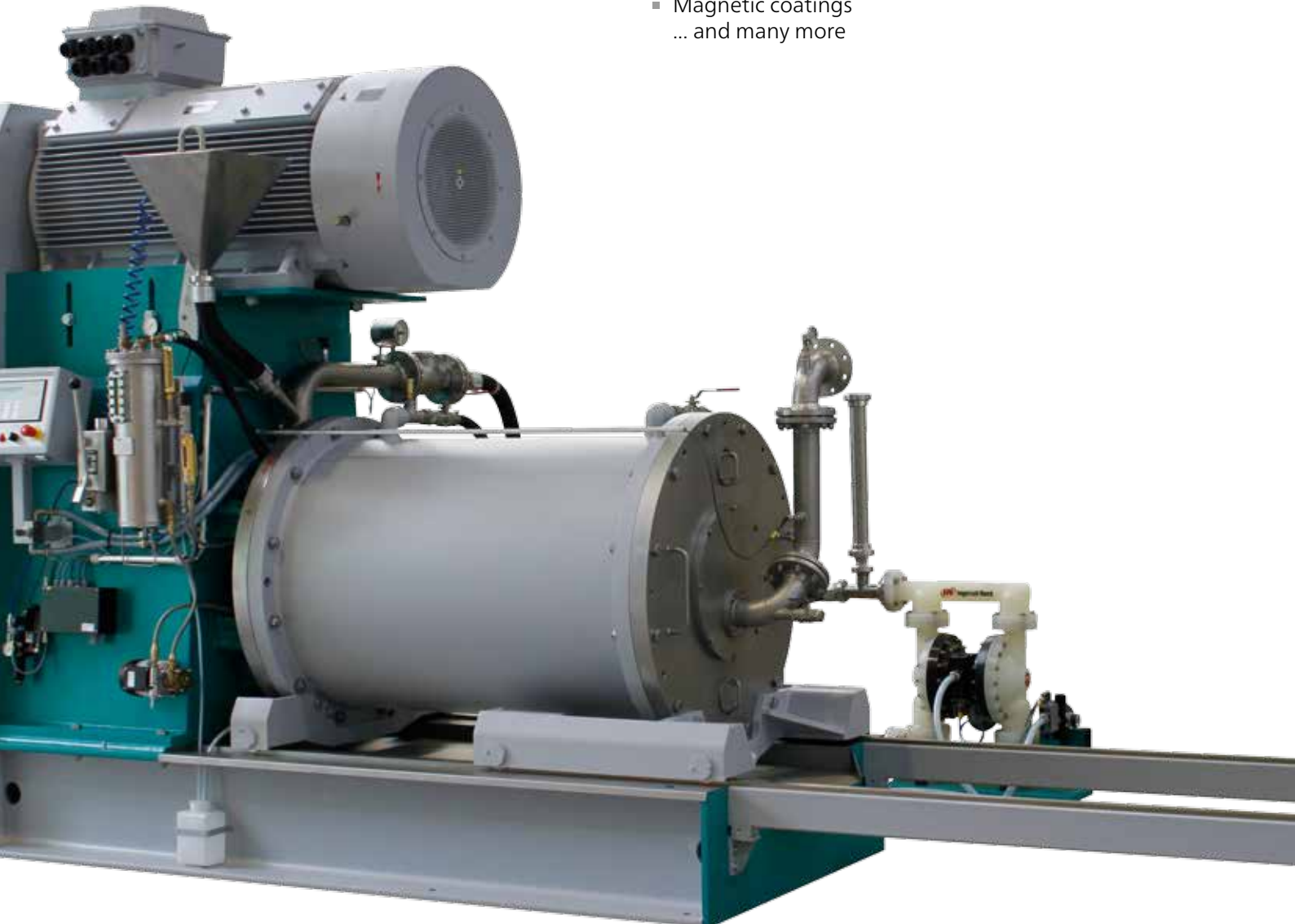


grinding system

Operational Reliability and Convenience

Applications

- Printing inks: e.g. flexo-gravure (chip quality)
- Inkjet ink
- Coatings
- Dyes, color pastes (textile, synthetic)
- Pigment preparations, pigment production, phthalo-blue conversion
- Fillers
- Pesticides
- High-tech products: e.g. color filters, polishing agents for electronic components
- Thermal paper coatings
- Magnetic coatings
- ... and many more



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