NETZSCH

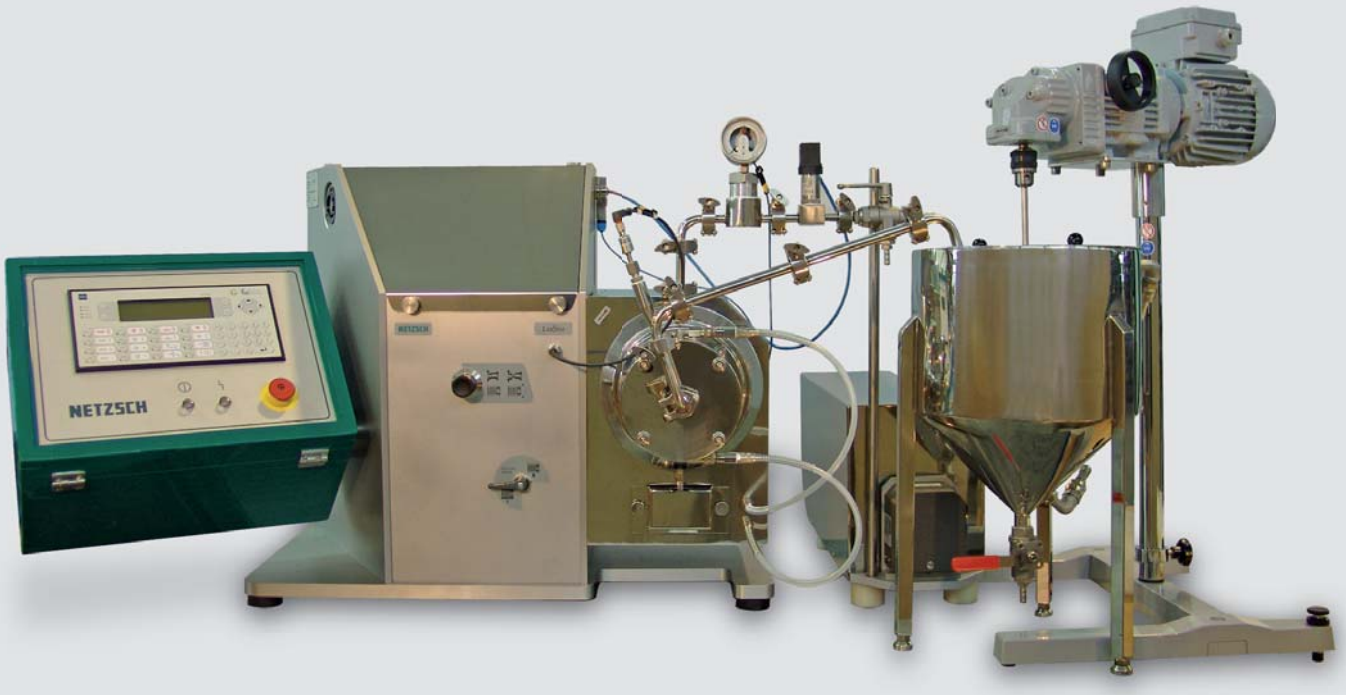
Grinding & Dispersing

Laboratory agitator bead mill *LabStar*

Test with the best!

our technology
YOUR SUCCESS

The Machine



For the Laboratory of Today

The *LabStar* enables you to work scientifically and professionally on challenging research and development tasks and, at the same time, is easy to operate. The grinding results with finenesses down to the nanometer range allow an exact scale-up to production size machines.

- You seek precision and know-how.
- Achieved results shall be exactly reproducible.
- You want to be totally flexible and not restricted in your exploratory spirit.

… our *LabStar* is an extremely flexible laboratory mill that will make you workaday life easier.

Advantages

- Clean working
- Easy operation
- Minimum product amounts
- Versatile applications
- Information gathering
- High reproducibility
- Exact scale-up

be efficient

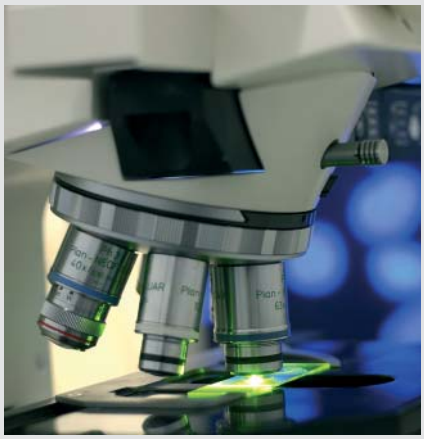
Grinding with this Mill is Fun

It supplies the information you need today with results which are talked about tomorrow. The mill is designed as a table model and is thus very user-friendly. One operating position and maintenance positions make preparation work and cleaning simple. The bearings of the mill are protected by a double-acting cassette-type mechanical seal. The drive of the agitator is infinitely adjustable directly via a frequency-controlled three-phase motor. The patented rotor slotted pipe separation system keeps the grinding beads in the grinding chamber and allows the use of smallest beads (micro beads). The modular system enables a simple conversion to different grinding systems. The machine can therefore be used in single or multi pass operation, circulation operation, pendulum operation or in discontinuous operation. Different materials like PU-linings, ceramic and special steels guarantee product compatibility in a very wide-ranged field of application.

Operating Controls

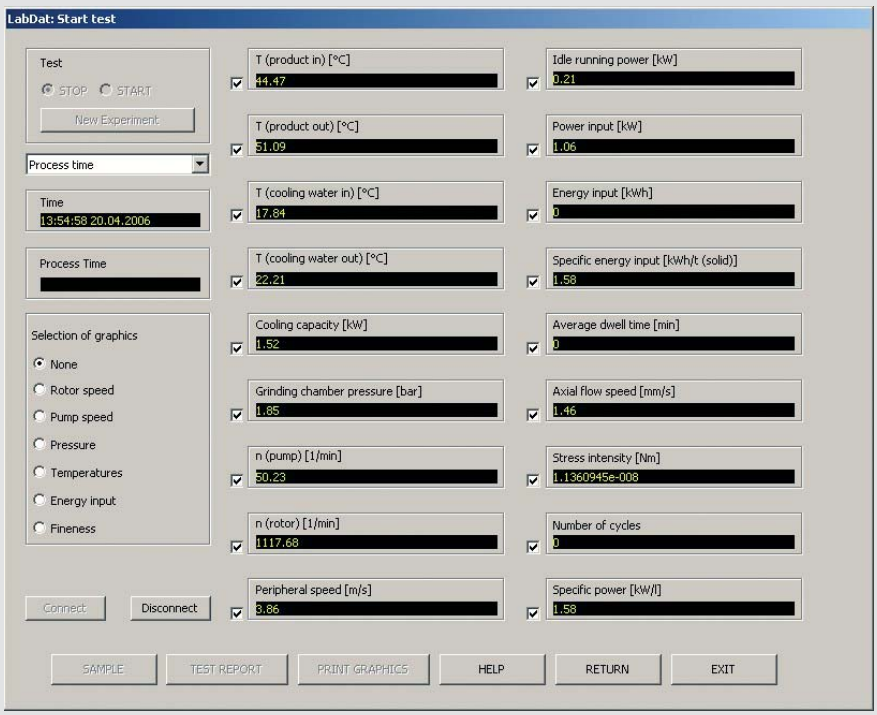
Scientific Academic Working ...

The basic equipment of the *LabStar* is a lab machine ready for operation. It has a wide safety system which switches off the machine in case of failure and avoids any damage of product and machine.
An enlarged version of the monitoring/ control system gathers all process relevant technical data by additional measuring points and supplies all information for a scientific/academic working. The achieved process data is capable of scale-up in connection with the determined grinding chamber geometry and can be applied to production machines.



LabDat©

LabDat© is a software especially developed for the *LabStar* and serves the documentation and analysis of test data. The software enables an automatic collection of data and calculates at the same time a lot of scientific values which are helpful for principal research and scale-up. The complete data record can be saved or printed as protocol. If changes resp. additional notes are necessary the saved data can be input again.



Operating interface of the *LabDat©* software

Operation Terminals

Standard terminal

The following information is captured with the standard terminal:

- Power input in kW
- Agitator speed
- Pump speed

Version: Standard terminal

Alternative

With the enhanced terminal you will be able to capture the relevant data for your specific application.

Special terminal

The following information is captured with the special terminal:

Actual values

- Agitator speed
- Pump speed
- Product pressure
- Product temperature
- Power input of the main drive in kW
- Sum of energy input in kWh (circulation operation)
- Pre-select value of the total energy input (circulation operation)

Nominal values

- Product pressure MAX
- Product temperature MAX
- Pre-select values energy input (circulation operation)

Failure indication

- Sealing fluid level MIN
- Sealing fluid pressure MIN
- Grinding chamber MAX
- Product temperature MAX

Version: Special terminal

Alternative

Alternatively a color graphic terminal can be supplied with which you will be able to store and call up additional formulations.

Alternative Specifications

The Grinding Systems

The *LabStar* has no limits regarding application possibilities. All known NETZSCH grinding systems can be fitted to the *LabStar*.

System *Zeta*®

World-wide, a synonym for high speed circulation - our agitator bead mill LMZ can be provided as a laboratory machine. The circulation operation enables processes achieving high reproducible product qualities.
Also for this system a ceramic version is available not only for metal-free grinding.

Circulation grinding system *Zeta*®

System *TriNex*®

Disk grinding system *TriNex*®

The further development of the improved *MoliNex* grinding system is a triple concentrically mounted system, which enables a higher energy density per ltr. of grinding chamber volume. In connection with the classifying rotor a development which is based on the rotor slotted pipe system - this grinding system allows the use of micro beads in a diameter range of 0.3 up to 2.4 mm.
The system *TriNex*® can also be supplied in grinding chamber design PU for working of abrasive materials.

Materials

The grinding systems *TriNex*® and *Zeta*® at a glance:

Grinding chamber	Agitator shaft/ Floor/ Flange
Cr-Ni-steel	
Polyurethane	
Polyamide	
Zirconium oxide	
Zirconium oxide	Polyurethane
Zirconium oxide	Polyamide
Silicon carbide	Silicon nitride
Silicon carbide	Polyurethane

Pharma Design

For pharmaceutical applications ultimate demands are made on the selection of materials, the surface conditions as well as the process monitoring and control. The Pharma *LabStar* offers the best solution for such comprehensive requirements. The complete module in GMP-design is made of stainless steel AISI 304. It is cavity-free and sterilizable and all product-wetted parts are made of AISI 316 L with R_a 0.5 µm. Of course, you can opt for either the *Zeta*® or the *TriNex*® grinding system. During the grinding process all process relevant data are captured and shown on an integrated color graphic display. The comprehensive monitoring and control of the individual process steps, like for example the sterilization process of the grinding process, guarantee highest reproducibility and safety in operation.

Pharma design-*LabStar*

Handling & Technical Data

Very Simple Handling

The *LabStar* is very versatile in its design. Considerable thought has gone into the operational functions from an operator's point of view. The *LabStar* is designed with a three position swivel mode. The upright position to enable quick efficient bead loading, the horizontal operating position and the declined downward position for simple and residue free discharge of the grinding beads.

All fittings can be removed simply and quickly by the operator without the need of an engineer or the use of specialist tools.

Preparation

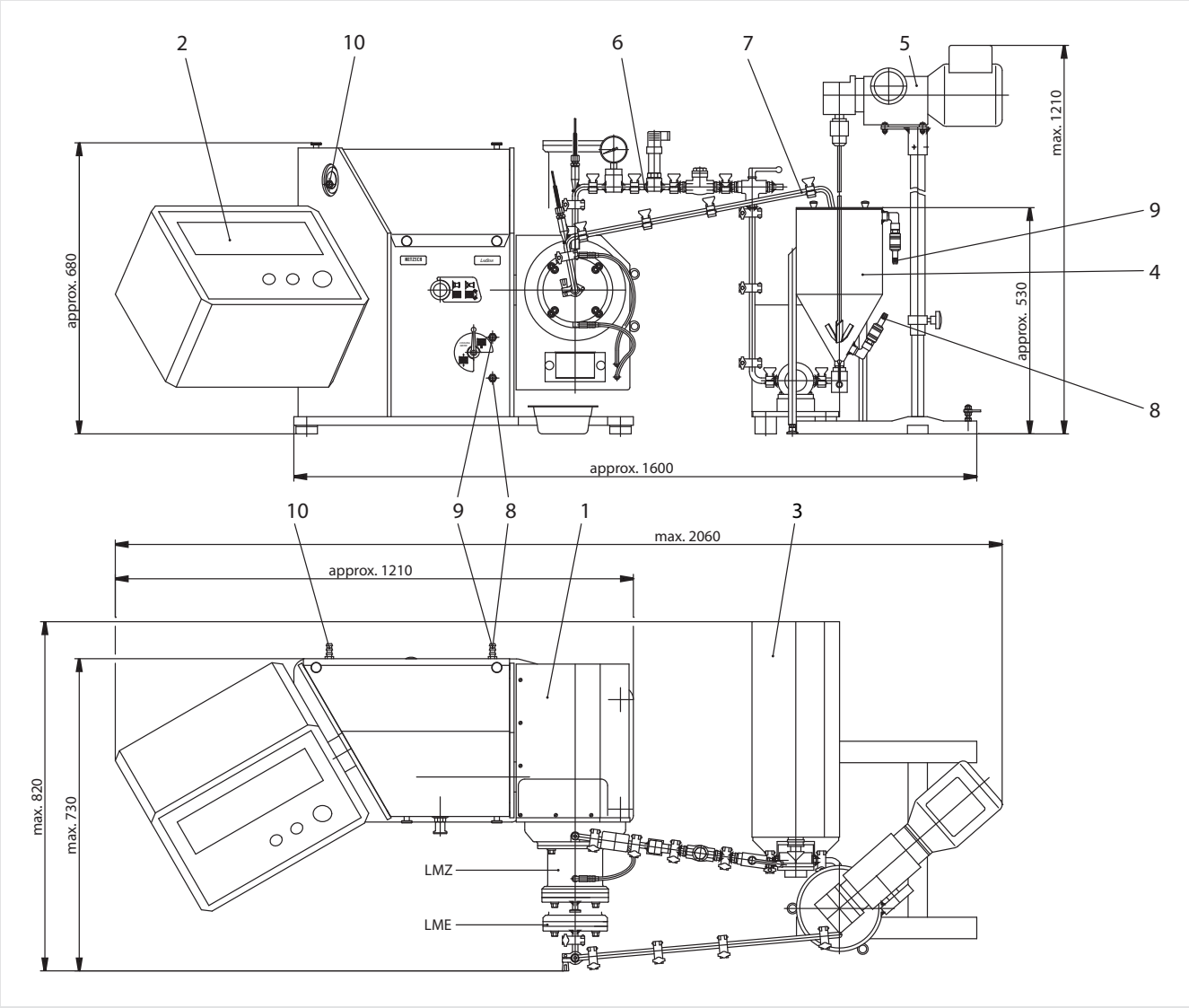
Grinding and sampling

Discharging and cleaning

Technical Data

Type	*LabStar*		*MiniSeries*	*MicroSeries*
	Zeta®	*TriNex*®		
Speed range [min^{-1}]	1 000 - 4 500		1 000 - 4 500	1 000 - 4 500
Grinding media diameter [mm]	0.1 - 2.0	0.3 - 2.4	0.05 - 2.0	0.05 - 0.8
Grinding media volume (100%) [ml]	530	660	200	100
Grinding chamber volume [ml]	620	910	240	120
Batch size circulation operation [l]	1.2 - 7.0 (15)	1.5 - 7.0 (15)	0.5 - 7.0	0.4 - 7.0
Batch size discontinuous operation [ml] (*)	410	625	148	74

(*) grinding media volume (85%)



① *LabStar*

② Operating terminal

③ Pump (hose pump, gear pump, diaphragm pump or eccentric screw pump)

④ Batch tank

⑤ Agitator on support

⑥ Product inlet Ø 9.5

⑦ Product outlet Ø 9.5

⑧ Cooling water inlet Ø 13

⑨ Cooling water outlet Ø 13

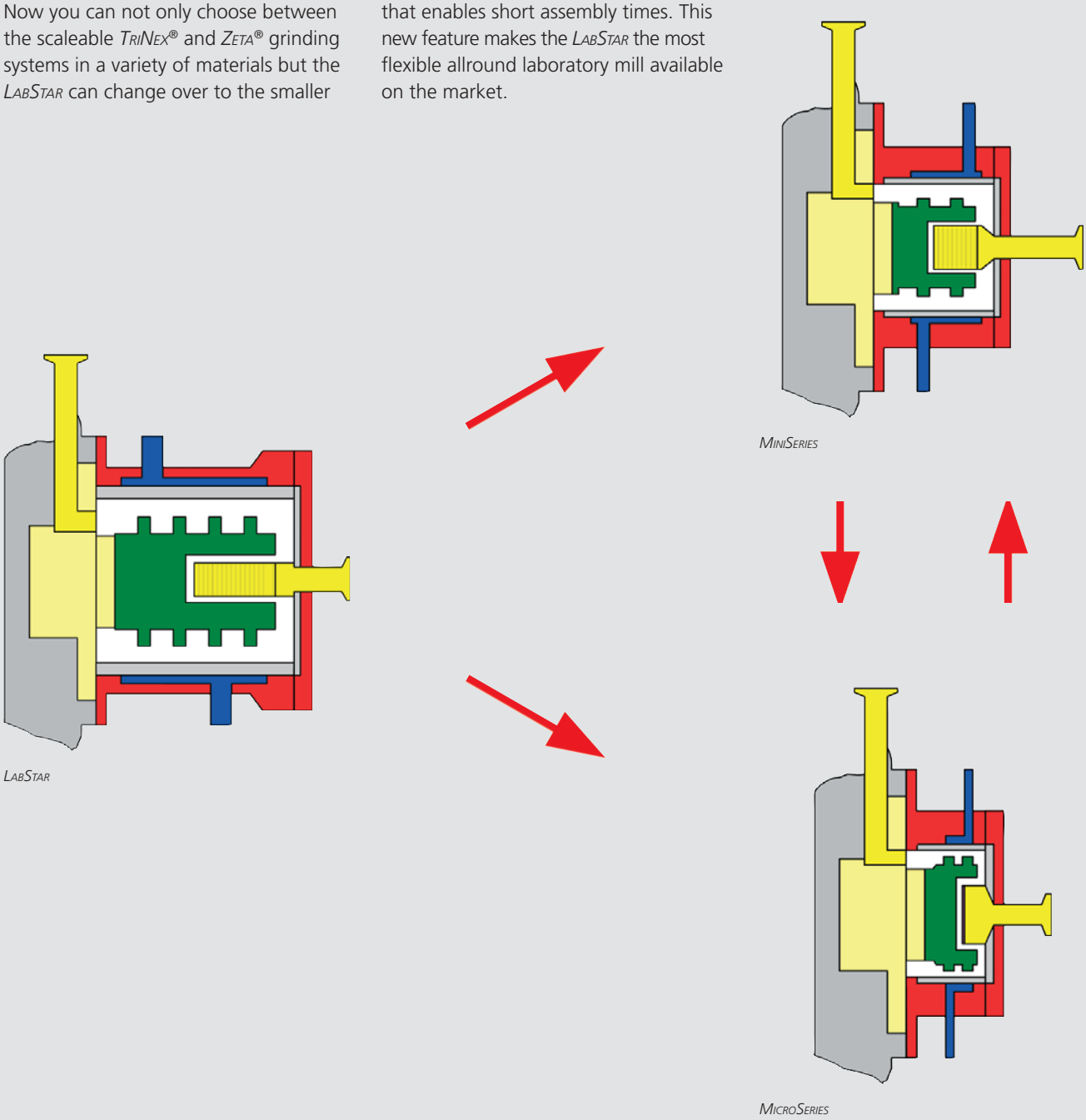
⑩ Compressed air connection Ø 13

- Weight of the *LabStar* approx. 150 kg
- Weight of the pump approx. 45 kg
- Drive 3.0 kW 400 V 50 Hz 3 phases
- Pump motor 0.37 kW 400 V 50 Hz 3 phases
- Switchbox (not shown) for separate assembly (1 000 x 1 200 x 350 mm)

Variation Possibilities
The Applications

Flexibility without Limits

The range of variation of the multifunctional laboratory mill *LabStar* has been extended by a further development. Now you can not only choose between the scaleable *TriNex*® and *Zeta*® grinding systems in a variety of materials but the *LabStar* can change over to the smaller *MiniSeries* grinding chamber designs with 230 ml and the *MicroSeries* with 110 ml. A special conversion kit was developed that enables short assembly times. This new feature makes the *LabStar* the most flexible allround laboratory mill available on the market.



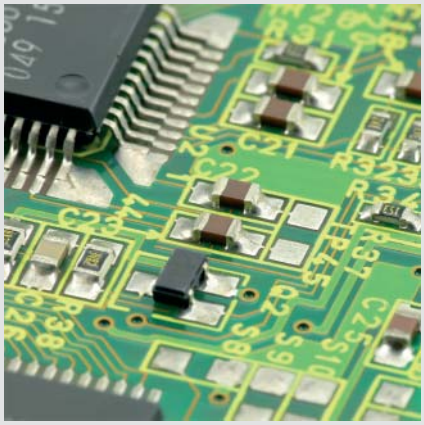
LabStar

MiniSeries

MicroSeries

Applications

- Printing inks
- Paints
- Pigments, dyes (textile, plastic, film)
- Pigment preparations
- Pigment production (phthalo blue conversion)
- Filler and coatings of plastics
- Plant protectives
- Magnetic coatings
- High tech products: color filter, polishing agents for electronic parts, ITO, ...
- Pharmaceuticals, cosmetics (sun protection)
- Paper coatings
- Nanoapplications
  - LCD (liquid crystal display)
  - MLCC (multi layer ceramic capacitor)



NETZSCH

The World's Leading Grinding Technology

The Companies of the Grinding & Dispersing Business Unit

NETZSCH-Feinmahltechnik GmbH, Selb, Germany

NETZSCH-CONDUX Mahltechnik GmbH, Hanau, Germany

NETZSCH Premier Technologies, LLC., Exton PA, USA

NETZSCH Indústria e Comércio de Equipamentos de Moagem Ltda., Pomerode, Brazil

NETZSCH (Shanghai) Machinery and Instruments Co., Ltd., Shanghai, China

NETZSCH Mastermix Ltd., Lichfield, Great Britain

NETZSCH-España, S.A., Terrassa/Barcelona, Spain

ZAO NETZSCH Tula, Tula, Russia

The Grinding & Dispersing Business Unit is part of the NETZSCH Group.

The NETZSCH Group is an owner-managed, internationally operating technology company headquartered in Germany. Three Business Units – Analyzing & Testing, Grinding & Dispersing, and Pumps & Systems – provide tailored solutions for highest-level needs. Over 2200 employees at 125 sales and production centers in 23 countries across the globe guarantee that expert service is never far from our customers.

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G&D · LabStar / 12 · EN · 500 · 09/10 · LH · Technical specifications are subject to change.