

NETZSCH North America

Overview, Capabilities and Commitment



Technology fascinates

NETZSCH Group



Selb, Germany

The Gebrüder NETZSCH Maschinenfabrik (NETZSCH Brothers Machine Works), founded in 1873, was the starting point for today's NETZSCH Group still head-quartered in Selb, Germany, which has since become an international enterprise with 130 locations in 23 countries on four continents.

The three Business Units, Analyzing & Testing, Grinding & Dispersing and

Pumps & Systems, operate independently with the goal to offer the customer the best solution for his particular application. The result of over 130 years of engineering experience is both technological and market leadership.

Under the umbrella of the Erich NETZSCH GmbH & Co. Holding KG, the synergies between the Business Units are ensured through worldwide communication.

Our Company

We are a mid-sized, family-owned German company engaging in the manufacture of machinery and instrumentation with worldwide production, sales, and service branches. We are conscious of the responsibilities we bear for the regions in which we are active, as well as for our environment. We are dedicated to respect the interests of the common good.

Our products and services are held in high regard by our customers. We view it as our foremost duty to uphold and cultivate this esteem. NETZSCH works with the utmost respect for the confidentiality of your proprietary process.

Our employees are an important factor in our success and they are a veritable

pool of knowledge and expertise. We encourage and nurture their professional growth in order to help master the dynamic challenges faced in our international competitive arena. This in turn enables us to provide our entire staff with stable and secure employment.

We are a reliable partner to our suppliers and strive to cultivate longterm collaborative relationships. We abide by the respective laws across the world and avow ourselves to the practice of fair and just competition.

Our systematic, continuous improvement of our resources and processes ensures that the growing needs of our business partners, employees and social environment will continue to be addressed and met into the future.

Business Unit Analyzing & Testing

- Thermal Analysis
- Adiabatic Reaction Calorimetry
- Determination of Thermophysical Properties

Business Unit Grinding & Dispersing

- Wet and Dry Grinding
- Mixing and Kneading
- Dispersing
- De-aeration
- Classifying
- NETZSCH-BEADS®

Business Unit Pumps & Systems

- NEMO[®] Progressing Cavity Pumps
- TORNADO® Rotary Lobe Pumps
- Dosing Systems
- Barrel Emptying Units
- Macerators
- Accessories

NETZSCH Group

Company Performance

As a family-owned company, we place great importance on the crisis-resistance of the NETZSCH Group.

Our primary objective is to increase the value of the company through fair, professional and trusting cooperative effort. This is our means of securing long-term, sustainable success.

Through the attractive employee incentive scheme, our employees can also participate directly in the financial success of NETZSCH. **Founded** 1873 by Thomas and Christian Netzsch in Selb, Germany

Sales approximately 483 MIL US\$ (consolidated)

Employees approximately 2,500 worldwide

NETZSCH subsidiaries More than 50 worldwide in 23 countries





Business Fields Matrix

Industries and Applications	A&T	G&D	P&S
Aerospace	✓	✓	-
Agricultural/Crop protection	-	✓	✓
Automobile, train, aircraft and ship manufacturing	✓	✓	✓
Beverage and breweries/Wine	-	✓	✓
Bio fuels	✓	✓	✓
Building/Construction	✓	✓	✓
Cell disruption	-	✓	-
Ceramic and glass	✓	✓	✓
Chemical/Biochemical/Chemical additives	✓	✓	✓
Chemical mechanical polishing	-	✓	-
Coal bed methane (Upstream)	-	-	✓
Dyes and paints/Coatings/Colorants/Pigments/Ink jet inks	✓	✓	✓
Environmental technology	✓	✓	✓
Electronic industry	✓	✓	✓
Emulsions	-	✓	✓
Energy/Battery materials/Fuel cells	✓	✓	✓
Food/Dairy/Fish/Vegetables/Fruit/Food additives	✓	✓	✓
Galvanic/Electro-plating	-	-	✓
Industrial minerals	√	✓	✓
Marine equipment	-	✓	✓
Mining	-	✓	✓
Nuclear	✓	✓	-
Oil production On-/Offshore (Upstream, Downstream)	-	✓	✓
Paste/Fillers	-	✓	✓
Petrochemical/Refineries	✓	✓	✓
Pharmaceutical/Cosmetic	✓	✓	✓
Polymer manufacturing and processing	✓	✓	-
Pulp and paper/Wood processing/Cellulose	✓	✓	✓
Renewable Energies (Biogas, Solar, Windpower, Hydropower)	✓	✓	✓
Rust Inhibitors	✓	✓	✓
Sugar and starch	✓	✓	✓
Thermal water/Geothermal energy (Upstream)	-	-	✓
Textile/Leather/Tanneries	-	✓	✓
Water treatment (Potable water, waste water, desalination, etc.)	-	~	✓

Synergy Among Markets

We collect and structure applications knowledge and make it available within our organization. The resulting ability to carry out a differentiated applications analysis and to tailor the design of our machines and instruments to our customers' needs is what sets us apart from our competitors.

A&T – Analyzing & Testing G&D – Grinding & Dispersing P&S – Pumps & Systems

Business Unit Analyzing & Testing



Burlington, MA Facility

Experts in Thermal Analysis for over 50 Years

NETZSCH Instruments North America, LLC (NIB) is the US subsidiary of NETZSCH's worldwide Thermal Analysis business. NIB's headquarters is located in Burlington, MA, (near Boston on the "technology highway"). NETZSCH Instruments North America was built through the merger of NETZSCH Instruments, Inc and Holometrix-Micromet (Bedford, MA) in 2001, and the acquisition of the Calorimetry business of TIAX (Cambridge, MA) in 2009. The Analyzing and Testing business of NETZSCH was created in 1952 and has established itself as one of the world's best-known suppliers of high-performance thermo

analytical instruments. The Business Unit "Analyzing & Testing" offers a complete high-precision instrument line for thermal analysis, thermophysical properties measurement, adiabatic calorimetry, as well as offering world class commercial testing services, seminars, training and consulting. Our instrumentation is employed for research and quality control in the polymer sector, the chemical industry, the nuclear industry, in the areas of metals, ceramics, inorganics and building materials, and environmental analysis. Cutting edge technology, premium service, and high quality standards make NETZSCH a leading manufacturer.

Facts

NETZSCH Instruments North America is responsible for sales, service and support of NETZSCH thermal analysis products in the United States, Canada and Mexico. NETZSCH Instruments North America is proud to support its large instrument-installed base customers with a well-trained team of Customer Support engineers solely dedicated to the product line, and covering the entire territory. Application lab engineers and technicians located in Burlington, MA are offering advanced training and application support to customer, as well as paid contract testing with the full suite of instruments. The sales offices are spread throughout the United States. Highly technical sales engineers provide the best adapted (sometimes customized) solutions to the customers. Four product lines are manufactured in Burlington, MA: LFA (Thermal conductivity), HFM (Heat Flow Meter), DEA (Dielectric measurement) and ARC (Calorimeters). The US headquarters also hosts the North American R&D team.

Customer Testimonial

I have purchased several NETZSCH thermal analysis and calorimetric instruments over the years and they continue to run accurately giving us the precision needed in our applications. We value the design of NETZSCH equipment. These instruments allow for robust student use enabling hands on learning all the while giving us the ability to conduct state of the art measurements and analyses. Our colleagues at NETZSCH don't simply provide the equipment... they are collaborators allowing us to push the envelope associated with the technology and the methodology for high temperature thermal analysis.

Linda Ellen Jones, Ph.D.

Assoc. V.P. of Statutory Affairs at Alfred University, Head of the New York State College of Ceramics, Professor of Materials Engineering





Business Unit Analyzing & Testing Key Products for the US Market

DSC 204 F1 Phoenix®

A Differential Scanning Calorimeter for all Requirements

The versatile premium DSC 204 **F1** *Phoenix®* is based on a unique concept: all of the essential functional modules are integrated into the instrument, and any desired extensions can be added on location at any time.

Advantages

- Three-dimensional symmetrical construction with homogeneous heating
- Sensors with high calorimetric sensitivity, short time constants and a condensation-free sample chamber in the DSC cell guarantee high detection sensitivity
- Ease of use

Additional information: www.netzsch.com/dsc

LFA 457 MicroFlash®

Laser Flash Apparatus State-of-the-art technology for Thermophysical Properties

The LFA 457 *MicroFlash*[®] is the most modern and versatile Laser Flash System for the characterization of basic and high-performance materials in automotive engineering, the aerospace industry and energy management.

Advantages

- Fast testing times
- Broadest measurement range
- High accuracy and repeatability
- Standardized technique

Additional information: www.netzsch.com/lfa

STA 449 F1 Jupiter®

Simultaneous TGA-DSC, Fascinating Flexibility in Thermal Analysis

The STA 449 *F1* Jupiter[®] unites extreme flexibility and outstanding performance in one instrument.

Advantages

- Vertical top-loading design with detachable sample carrier hoist for free and safe access to crucible
- Exceptionally precise nanobalance allows detection of smallest mass changes with high reproducibility
- Specific heat measurements: accurate cp data (700°C ±1%, 1400°C ± 2.5%, 1500°C ± 3.5%)
- OTS[®] Oxygen Trap System allows reduction of the oxygen concentration at the sample to below 1 ppm

Additional information: www.netzsch.com/sta449f1







HFM 436 Lambda

Heat Flow Meter Accurate Thermal Conductivity Testing of Insulation Materials

With the HFM 436 *Lambda*, the thermal conductivity of large-sized, plate-formed insulators is investigated at a fixed or adjustable temperature gradient.

Advantages

- Patented plate temperature control yields unmatched testing speeds and highly accurate results
- The instrument is stable within 0.10 to 0.25% over the course of several days, providing excellent repeatability
- Ideal for QC/QA
- Meets all required industrial standards

Additional information: www.netzsch.com/hfm436

MMC 274 Nexus®

Multiple Module Calorimeter Various Modules in One Calorimeter

The MMC 274 *Nexus*[®] is comprised of two components: the base instrument with integrated electronics and the easy-to-exchange calorimeter module. this configuration guarantees maximum flexibility.

Advantages

- Multiple testing modes in one instrument for wide application coverage
- Exchangeable calorimeter modules in one table-top instrument
- Wide temperature range up to 500°C
- Wide pressure range up to 100 bar (10 MPa)

Additional information: www.netzsch.com/mmc274

Service/Support

All over the world, the name NETZSCH stands for comprehensive support and competent, reliable service, before and after sale. Our vision is to offer you the best possible support at all times, wherever you may be.

Technical Service

Study our comprehensive service spectrum and select from: Installation and commissioning, hotline service, preventive maintenance, calibration service, on-site repair, emergency service for NETZSCH components, moving service, technical information service, spare parts and exchange service.

- Applications Measurements
- Training & Seminars
- Service in Regulated Areas (Compliance)
- Consulting Service
- Contract Testing Service

Additional information: www.netzsch-thermal-analysis.com/ us/service/





Business Unit Grinding & Dispersing



Exton, PA Facility

Experts in Grinding and Dispersing for over 40 Years

NETZSCH Premier Technologies LLC., located in Exton, PA, USA is part of the Business Unit Grinding & Dispersing of the NETZSCH Group. It was founded in 1969 to provide wet grinding and dispersing equipment to the growing US market. The NETZSCH Business Unit Grinding & Dispersing is the world's leader in wet and dry grinding, classifying, mixing and kneading with headquarters in Selb, Germany.

NETZSCH Premier Technologies also supplies dry grinding and classifying machines and systems from NETZSCH-CONDUX Mahltechnik GmbH, the world's leader in the processing of dry materials. The product line spans machines and plants for fine grinding and fine classification of solids of any hardness, for any required end fineness. NETZSCH-CONDUX is located in Hanau, Germany.

Until 2010 the US operating unit was known as NETZSCH Fine Particle Technology. In May of that year the company acquired Premier Mill and merged the product lines to become NETZSCH Premier Technologies, LLC.

The products of the former Premier Mill are now fully incorporated into the NETZSCH family.

NETZSCH Premier Technologies is the specialist within the Business Unit for Pharmaceutical applications. The US based sales and engineering group meets the highly detailed specifications of the pharmaceutical industry, from machine design, manufacturing and assembly, factory acceptance and site acceptance tests (FAT and SAT), including all validation protocols.

Key products for the US market are the new *D*_{ELTA}*V*_{ITA}® System, designed in the US specifically for the pharmaceutical industry. For industrial markets the *Z*_{ETA}® Mill and *Z*_{ETA}® *RS* are the state of the art small media mills to achieve particle sizes in the nanometer range. Mixing technology is also important in the product line with the Ψ -*M*_{IX}® Inline Disperser, a revolutionary system for dispersing solids in liquids; the PMH/PML Planetary Mixers and Kneading machines for high viscosity products, and the PMD Mixer series for high volume production. Premier Mill products include Model 50 laboratory disperser, and the *MASTERMILL* Basket Mill.

Key dry powder processing products for the US market included the CGS Fluidized Bed Jet Mill for production of powders in the low micron range and the *s*-J*ET*[®] Steam Jet Mill for production of powders in the submicron range. The jet mills are supplemented by impact mills such as the *CONDUX*[®] Impact Mill, CSM Classifier Mill, CFS/HD-S High Dispersion Classifier, and the *SECOMY*TM Fine Cutting Mill.

All equipment is available in small scale laboratory versions. The company has a modern applications laboratory to conduct small scale bench top trials to moderately sized production testing. NETZSCH grinding machines are used in markets including pharmaceutical, cosmetic, ceramic, electronic materials, industrial minerals, paints and coatings, ink jet inks, battery materials, renewable energy, and many others.

Customer Testimonial

As a contract manufacturing company, Custom Processing Services, Inc requires both high performance and flexibility. We have chosen to work with NETZSCH Premier Technologies to install NETZSCH mills that fulfill both our dry grinding and wet media milling needs. The reliability and consistent results from the NETZSCH mills and the ability to configure the equipment for a variety of applications have enabled our firm to excel in providing particle size reduction services.

Gregg Shemanski President, Custom Processing Services, Inc.

Business Unit Grinding & Dispersing Key Products for the US Market

DeltaVita®

Agitator Bead Mills for Pharmaceutical Applications

Advantages

- The DELTAVITA[®] line is designed specifically for pharmaceutical applications and can be scaled up from drug discovery to clinical trials to full scale production
- Mild dispersion or grinding to particle sizes less than 100 nm with a narrow particle size distribution with grinding media sizes from 50 µm to 2 mm
- Grinding chamber volumes from 15 ml to 60,000 ml for batch sizes as small as 50 ml up to 4,000 liters
- Wetted parts can be stainless steel with a surface finish of R_a = 0.4 µm or high tech ceramic materials such as yttrium stabilized zirconium oxide or silicon carbide. All product contact parts can autoclaved or sterilized in place depending on machine size
- The DeLTAVITA[®] line offers a completely reproducible, scalable and validated process for all pharmaceutical applications



System ZETA® Type LMZ

High Performance Mill

Advantages

- Continuously operating, horizontal high performance agitator bead mill with intensive peg grinding system
- The small ratio of grinding chamber length to diameter in combination with the highly effective centrifugal separator system and the large cooling surface predestines this grinding system for circulation and multi-pass operation into the nano meter range
- Wear and corrosion resistant materials are available to suit the application
- Safe use of various grinding media from 0.05 mm to 3 mm in diameter

MASTERMILL

Basket Mill

Advantages

- Basket mill that incorporates a milling chamber with independently powdered variable speed milling and mixing shafts providing exceptional flexibility in production
- Due to independent variable speed mixing shafts, *MASTERMILL* can process a wide range of batch sizes and product viscosity
- Side walls and bottom of the processing tank are jacketed along with the top of the milling chamber for efficient control of product temperature





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Inline Disperser

Advantages

- Revolutionary inline mixing system that wets finely-powdered solids with liquid components within a controlled, emission free process under vacuum and microcavitation
- Ideal for processing both low and high viscosity suspensions, covering the entire spectrum of applications for dispersion technology
- Easy integration into fully automatic production plants

CGS

Fluidized Bed Jet Mill

Advantages

- Jet mill with integrated dynamic air classifier for accurate and reproducible particle size control
- Size reduction via particle to particle collisions, for materials of any hardness
- Contamination free processing
- Designs include e-Jet® low energy jet milling and s-Jet® using superheated steam
- Finenesses from d₉₇ 2.0 μm to 120 μm with air and d₉₇ 0.4 μm to 20 μm with steam

CONDUX®

Impact Mill

Advantages

- High speed rotor impact mill for grinding various products up to a Mohs hardness of 3 to 3.5
- Grinding takes place between rotor and stator in various designs such as wing beater, blast rotor, pin disks and attrition disks
- Possible end finesses from d₉₇ 30 µm to 1500 µm







Further Information

on our complete product line: www.netzsch-grinding.com

Business Unit Pumps & Systems



Exton, PA Facility

Experts in Pump Solutions for over 60 Years

For more than six decades, NETZSCH has manufactured positive displacement pumps worldwide. Designed specifically for difficult pumping situations, NETZSCH pumps range in size from the industry's smallest metering pumps to high volume pumps. In 1951, the NETZSCH Group acquired the Progressing Cavity Pump license to manufacture and distribute NEMO[®] Progressing Cavity Pumps according to the Moineau pump system. NEMO[®] received its name from this system invented by Professor René Moineau: NEtzsch + MOineau = NEMO[®].



Two Major Product Lines Mold the NETZSCH Product Range: NEMO[®] Progressing Cavity Pumps and TORNADO[®] Rotary Lobe Pumps

Every NETZSCH NEMO® pump can be assembled using a modular system which incorporates a choice of different materials of construction, stators, universal joints, housings and seals.

With a NEMO[®] progressing cavity pump, you can be assured of:

- Low shear rate on fluid being pumped
- Non-pulsating, accurate, reliable metered flow
- Volume practically unaffected by varying solid content
- Flow that is proportional to the pump's operating speed
- High viscosity and solids content pumping capabilities
- Self-priming
- Non-vapor and air locking operation
- Low noise levels
- Flexibility in operation and mounting options
- No valves or close clearances to clog

Our experience in engineering and manufacturing progressing cavity pumps is exemplified in our latest product – the NETZSCH TORNADO® Rotary Lobe Pump. This pump is an ideal addition to our proven positive displacement product line. Ideal for space saving installations and skid/trailer mobile applications, these pumps are compact in design and offer high efficiency pumping capabilities. All NETZSCH pumps are used in a variety of applications including:

- Chemical/Base Chemicals
- Water and Wastewater Treatment
- Pulp and Paper Manufacturing
- Environmental Technology
- Pharmaceutical, Cosmetic Industries
- Offshore Plants and Oil Production
- Paints and Varnishes
- Food and Beverages

Today, NETZSCH pumps are manufactured at the main factory in Germany as well as other production sites in the United States, Brazil, China, and India. Additionally, sales offices in many European countries, Canada, Russia, Singapore, South Africa, Thailand, as well as in the United Arab Emirates and representatives in many other countries market NETZSCH NEMO® Progressing Cavity and TORNADO® Rotary Lobe Pumps.

Customer Testimonial

Our NETZSCH pumps have been operating for over 25 years, without a single problem or repair. Over the years, people ask who supplied our replacement parts. They're always amazed when we say we have never had to purchase any parts. NETZSCH pumps, they just keep running.

Robert Dodson

County Superintendent, City of Durham, NC

Business Unit Pumps & Systems Key Products for the US Market

TORNADO[®] Rotary Lobe Pump

High Performance Rotary Lobe Pump

The TORNADO® Rotary Lobe pump is designed for intermittent or continuous operation and provide gentle pumping of the pumped product and are ideally suited to transfer, process and dosing applications.

Advantages

- Maximum operational reliability: the NETZSCH GSS-Technology
- Small installation and maintenance envelope
- High suction lift capability up to 26 ft wc (8 mwc)
- 12 sizes for flowrates from 5 to 4,400 gpm (1 m³/h to 1,000 m³/h) up to 85 psi (6 bar)

Additional information: Brochure NPA 080

NEMO[®] Progressing Cavity Pumps

For difficult pumping situations

NEMO[®] Progressing cavity pumps are utilized in various industries to pump many types of fluids in a continuous, low pulsating manner, while maintaining an accurate flow.

Advantages

- Capacities up to 2,200 gpm (500 m³/h)
- Number of stages ranging from 1 to 8 for pressures from 90 psi up to 720 psi (6 to 48 bar) as standard, up to 3,400 psi (240 bar) as special design
- High suction lift capability up to 30 ft wc (9 mwc)
- High solids content (maximum particle size up to 6") and free of solids
- Low to high viscosity (1cps – 3 million cps)

Additional information: Brochure NPA 300

NEMO[®] Sanitary Pumps

Gentle conveyance of sanitary products

Each component of the NEMO[®] Sanitary Pumps have been designed to strict standards of hygene and cleanability.

Advantages

- Flow rates up to 600 gpm (140 m³/h)
- Pressures up to 270 psi (18 bar)
- Pumps designed, manufactured and tested according to EJEDG, QHD, 3A and GOST-R standards
- FDA-certified elastomers
- High corrosion-resistant, crevice-free, wear-free, and maintenance-free flexible rod
- Product and cleaning temperature up to 302°F (150°C)
- Explosion protection according to ATEX
- CIP and SIP capable

Additional information: Brochure NPA 308







NEMO[®] Downhole Progressing Cavity Pump Systems

Oil & Gas Upstream

These systems are simple in structure, have very few moving parts, low hydraulic losses and high efficiency in performance. Normal overall efficiency is between 40% and 70% as compared to 30% efficiency for plunger pumping units and 35% for electrical submerged centrifugal pumps. The typical volumetric efficiency of a NETZSCH downhole PC pump system is 75% – 95%

Advantages

- Production = up to 80,000 gpd (1,900 bpd) (300 m³/day).
- High sand content up to 40% at the suction side
- High viscosity oil up to 5,000 cP at the well head
- Pressure up to 4,500 psi (300 bar)

Additional information: Brochure NPA 311

NETZSCH Dosing Technology

NEMO® Dosing Systems

NETZSCH belongs to the trend-setting problem solvers for the most difficult applications, from simple dosing to automatic application. Our products integrate seamlessly into your process regardless of whether it is six axis or is linear. We offer customized solutions for your requirements.

Advantages

- Low shear pumping and dosing of high viscosity, highly abrasive and filled products
- Product remaining in barrel after emptying < 1-2% of the total volume</p>
- No pressure or flow hiatus in the system
- Valveless dosing system ideal for filled products

Additional information: Brochure NPA 300





M-Ovas[®] Macerators

Macerator to prevent pipe blockage and damage

The NETZSCH M-Ovas[®] is useful in all industries, where particles in the medium endanger process reliability.

Advantages

- Flow capacities up to 1,300 gpm (300 m³/h) with up to 15% dry solid content
- Simple maintenance
- Easy handling
- High operational reliability
- Compact design
- High energy efficiency especially at high flow rates

Additional information: Brochure NPA 040



NETZSCH Presence in North America

Along with the headquarters of all three Business Units and numerous sales offices in the US and Canada, a large and growing number of distributors help us maintain close customer contact all over North America.

Business Unit Analyzing & Testing

NETZSCH Instruments North America, LLC 129 Middlesex Turnpike Burlington, MA 01803 USA Tel.: 781 272-5353 Fax: 781 272-5225 nib-sales@netzsch.com

HeadquartersSales Office

Service Center

Business Unit Grinding & Dispersing

Headquarters

Sales Office

NETZSCH Premier Technologies, LLC 125 Pickering Way Exton, PA 19341 USA Tel.: 484 879-2020 Fax: 610 280-1299 info.npt@netzsch.com





Business Unit Pumps & Systems

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HeadquartersSales OfficeService Center

NETZSCH Canada, Incorporated 740 Huronia Road, Unit 10 Barrie, ON L4N 6C6 Canada Tel.: 705 797-8426 Fax: 705 797-8427 info@netzsch.ca

HeadquartersSales Office



The NETZSCH Group is an owner-managed, internationally operating technology company headquartered in Germany.

The three Business Units – Analyzing & Testing, Grinding & Dispersing and Pumps & Systems – provide tailored solutions for highest-level needs. Over 2,500 employees at 130 sales and production centers in 23 countries across the globe guarantee that expert service is never far from our customers.

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