NETZSCH

Proven Excellence.

Biogas with NETZSCH

Fit for the future with technology from the professionals

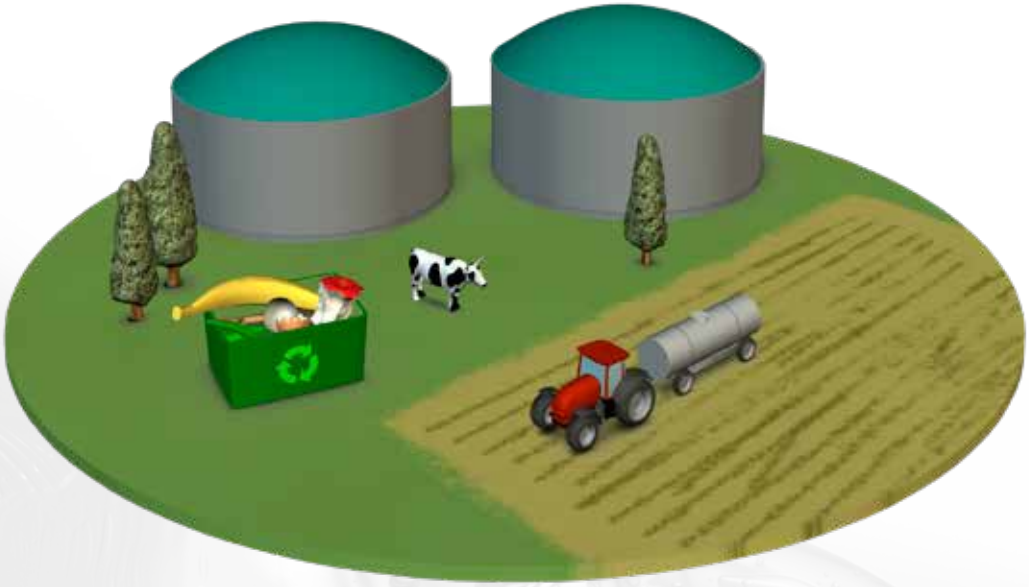
Pumps & Systems

OPTIMIZATION OF BIOGAS PRODUCTION WITH special NETZSCH products

INCREASING THE GAS YIELD
NEMO® B.MAX® MIXING PUMPS, PG. 6

HIGH LEVEL OF AVAILABILITY
NEMO® PROGRESSING CAVITY PUMPS, PG. 8

COMPACT, USER-FRIENDLY
TORNADO® ROTARY LOBE PUMPS, PG. 10



LOW ENERGY REQUIREMENT
NETZSCH GRINDING SYSTEMS, PG. 12

ON SITE FAST
SERVICE AND SPARE PARTS, PG. 15

Trusted Partner for Renewable Energy

Today's trend is to harness the energy from various waste streams. The source of this waste comes in many different forms. NETZSCH has the experience and capability to handle and help you process wastes in to productive and efficient energy. As your expert in biogas technology, we can provide specific mixing, particle size reduction, and conveyance solutions for all process steps. With more than 20 years being a critical partner to biogas plants throughout Europe, NETZSCH is positioned to assist with the integrating the latest technology into your process.

A multitude of substrates

Many operators are looking for reasonably priced, ecological alternatives to maize. Grass silage and sugar beets have already been though practical testing in this area, but the range of liquid substrates is also constantly being extended. The use of food waste is experiencing progress as the second method of biogas production (cofermentation). This extension of input materials means feeding technology needs to be adjusted. With the NEMO® B.Max® mixing pump, the M-Ovas® cutting plate macerator or with an N.Mac® twin shaft grinder, NETZSCH offers appropriate products enabling the use of existing plants for new substrates.

Feeding technology

Feeding substrate often causes problems; is time-consuming for the operator and causes downtime for the plant. It also includes an increase in maintenance. Switching to combined dry and liquid feeding using the NEMO® B.Max® mixing pump can contribute to a significant improvement in consistency, the operator's uptime and increased production.

The NEMO® B.Max® mixing pump combines substrate feeding with liquid media in defined proportions to thoroughly mix by means of the special mixing auger to ensure a homogeneous substrate.

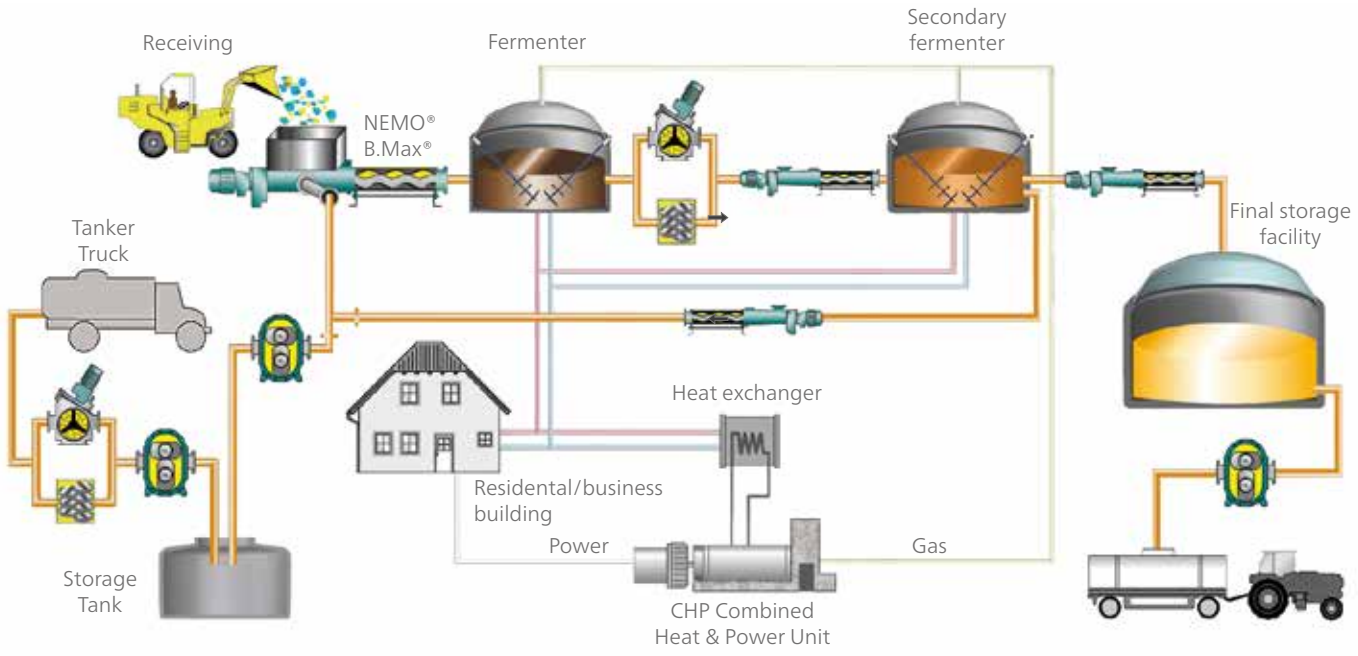
Increase yields

The NEMO® B.Max® mixing pump prepares the substrate that are fed in to create a homogeneous mass, which produces a higher level of gas yield in fermentation. Use of the M-Ovas® macerator or an N.Mac® twin shaft grinder in the process further increases the homogenization of the mass and so the gas yield. The NEMO® progressing cavity pump and the TORNADO® rotary lobe pump convey recirculated substances for further fermentation in a way that ensures process reliability and these pumps can even do this over greater distances or on different levels.

NETZSCH PRODUCTS SUPPORT BIOGAS PROCESSES

Mixing-Conveying-Grinding

Operation using agricultural substrates (renewable raw materials)

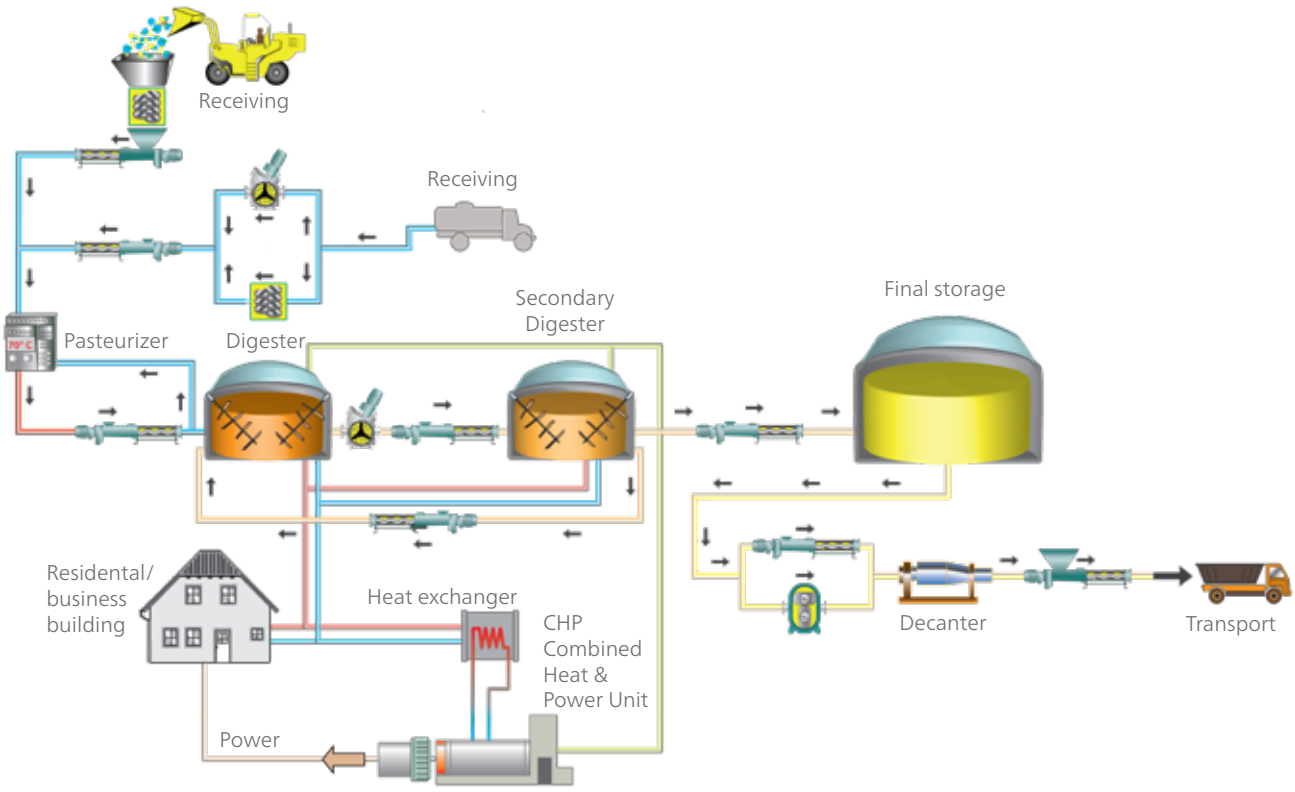


The above diagram shows a multi-stage biogas plant. This can be newly designed by the plant manufacturer or be converted to wet fermentation by appropriate retrofitting and upgrading and extended by including secondary fermentation. The possibilities for using NEMO® progressing cavity pumps, TORNADO® rotary lobe pumps and M-Ovas® macerator and N.Mac® twin shaft grinders range from mixing and conveying to grinding.

At the start of the process, the B.Max® mixing pump feeds the fermenter with a mix of dry and liquid substrates. Fermentation takes place with a dry matter content of approx. 5 - 15 %. The pre-fermented substrate is then conveyed to the secondary fermenter which allows the output of additional biogas in the process thanks to the longer dwell time. The NEMO® progressing cavity pump can contribute to the flexibility of the plant thereby reversing the direction of conveyance.

It conveys substrates and recirculated substances reliably between the various containers, even with higher solid contents. An upstream grinding system enables an even higher gas yield to be achieved. The methane gas obtained is, for example, fed into a cogeneration plant to generate power or thermal energy. The remaining biomass, which still has a residue of organic contents, is dewatered. The substrates obtained find further reuse in agriculture.

Operation with organic waste



This diagram shows a biogas plant where the range of processable raw materials has been extended to include waste from the food industry, from meat processing and also from supermarkets, hotels, etc.

Operators of these kinds of plants are greater energy generators than farmers, but upgrading their plants for cost reasons or to increase capacity utilization is possible by extending the feed systems using NETZSCH pumps and macerators. M-Ovas® macerators and N.Mac® grinders can make a significant contribution to process reliability and to the protection of both pumps and plants.

The M-Ovas® itself serves both as a cutting tool and a stone separator and makes a positive contribution to the plant's operating performance through better homogenization of the medium. The biogas production process then runs as previously described. It is only at the end of the process that dewatering of the residues is necessary as an additional step before disposal. NETZSCH pumps and macerators can again make worthwhile contributions here, too.


NEMO® progressing cavity pump


TORNADO® rotary lobe pump


NETZSCH M-Ovas® cutting plate macerator


N.Mac® twin shaft grinders*

NEMO® B.MAX®

A BENCHMARK IN MIXING TECHNOLOGY

Features and design

The NEMO® B.Max® mixing pump sets new standards through optimum mixing and conveyance of your bio-substrates. It is a perfectly tailored feeding technology for your biogas application.

Broad range of applications

The NEMO® B.Max® is particularly well suited to the following media:

- Renewable organic materials
- Manure
- Liquid manure
- Process water
- Bio waste
- Food waste
- Spoiled/Grocery waste
- Pre-processed slaughter waste
- Co-substrates
- Concentrated substrate
- Sillage
- Others

Large capacity and pressure range

- Capacities up to 308 gpm / 70 m^3/h
- Pressures up to 680 psi / 48 bar

Additional features

- Optimum feeding and mixing of substrates into the biomass through optimally positioned feed tubes in the hopper housing
- Pump housing with large, rectangular feed hopper with inspection opening
- Coupling rod with patented, horizontally positioned conveying screw for optimum product feed into the conveying elements and for mixing
- Removable, conically shaped compression chamber with inspection openings
- Eliminate dewatering build up

Advantages

- Maximum homogenization of the substrates
- Increased gas production
- Continuous, low-pulsation conveyance irrespective of pressure and viscosity
- High pressure capacity
- Robust shaft sealing
- Low investment and operating costs
- High operational reliability
- Wide range of organics handling

The length of the hopper is customizable depending upon the installation situation.

For improved substrate mixing, the entry of the liquid is from the opposite direction of the solids to insure the lengthiest mixing time.

Easy maintenance through large inspection ports.

NEMO® B.Max®

in block design with directly flanged drive or with bearing housing and free shaft end

1 Rotor

In wear and corrosion-resistant models.

2 Stator

Vulcanized into the tubes with seals on both sides in a wide variety of elastomers. Stator inlet with funnel-shaped opening to improve product infeed into the conveying chamber.

3 Mixing and screw conveyor

The reinforced and offset spiral lobes of the mixing and screw conveyor ensure maximum mixing and homogenization of the media. The patented, horizontally positioned feeding screw guarantees an optimum fill level for the conveying chamber. As an option, metal protection sleeves and joints provide further safeguards.

3a Two-part screw conveyor

The feeding screw is in two parts to be able to replace the part on the pressure side, which is exposed to the most stress, separately. This saves costs and facilitates the service work.

4 Shaft seal

Use of a single-acting, robust mechanical face seal for the highest operational reliability requirements.

5 Feed tube

Optimum positioning of the feed tube counter to the direction of conveyance delivers maximum mixing of the substrates.

6 Inspection openings

Large, easily accessible inspection openings for easy cleaning and maintenance.

7 Drive

The compact block design with directly flanged drive make it stand out due to low investment, operating and maintenance costs.

NEMO® progressing cavity pumps

FOR TRANSFERRING A WIDE VARIETY OF PRODUCT

Reliable technology – Flexible direction of rotation – Robust design

NEMO® BY progressing cavity pump

in block design, and with joint protection sleeves as an option,
or NEMO® SY with bearing housing and free shaft end

FSIP® design

Compact design with directly flanged drive. Its low investment, operating and maintenance costs really make it stand out. Four rotor/stator geometries for optimum performance with every kind of application.

The FSIP® design

The FSIP® design enables a particularly service-friendly maintenance without dis-assembling of the pump from the pipeline. By easier access to all rotating parts through cartridge joint and mechanical seals the maintenance is reduced.

The downtime and the associated costs are reduced. In addition, this design reduces the required installation space, since the stator is removed laterally.
The FSIP® design is offered in modification sets. You can also upgrade existing pumps in stages to better manage your costs.

Product characteristics

- Exceptionally dry matter content
- Highly abrasive
- Low to high viscosity
- Lubricating and non-lubricating
- Corrosive (pH 0 -14)
- Heated and unheated
- Dilatant, thixotropic or shear thinning
- Toxic

Additional features

- Great suction capacity – up to 29.5 feet / 9 meter water column
- Direction of rotation and therefore of conveyance is reversible
- Can be installed anywhere
- Quiet, low-noise running
- Temperatures: - 4 °F to + 395 °F / - 20 °C to + 200 °C

Advantages

- Continuous, low-pulsation conveyance irrespective of pressure and viscosity
- High suction and pressure capacity
- Low investment and operating costs
- High operational reliability
- Various installation options

Broad range of applications

The pumps should preferably be used for conveying:

- Fermented, renewable raw materials
- Liquid manure
- Process water
- Macerated and fermented bio waste, leftover food and slaughter waste
- Co-substrates
- Condensed substrate
- Stillage

Wide capacity and pressure range

- Capacities up to 1,760 gpm / 400 m^3/h
- Pressures up to 680 psi / 48 bar

Options

- With protective sleeve
- With inspection opening

The NEMO® progressing cavity pump: an energy-efficient solution for high pressure ranges

B.Max® liquid feeding for a reliable and flexible substrate supply

A strong team offers process reliability and efficiency: M-Ovas® and NEMO® progressing cavity pump

TORNADO® rotary lobe pumps

FOR ALL LIQUID SUBSTRATES

High-performance technology – Compact design

TORNADO® T2

TORNADO® T1

NETZSCH TORNADO® self priming, valveless positive displacement pumps are high performance and are optimally tailored to individual requirements. They are used for continuous and smooth conveyance of almost all media, along with their dosing in proportion to speed.

Broad range of applications

The pumps are primarily used with media that have the following features:

- With and without solids
- Low viscosity
- Thixotropic and dilatant
- Shear sensitive
- Abrasive
- Non-lubricating and lubricating

Large capacity and pressure range

- Capacities up to 4,400 gpm / 1,000 m^3/h
- Pressures up to 120 to 145 psi / 8 to 10 bar

Further information

TORNADO®
Brochure NPA · 081

Guaranteed customer benefit thanks to state-of-the-art technology

Their major advantages are limited space requirements due to their compact design, high power and maximum operational reliability. Thanks to the unique physical separation between pump and gear chambers, TORNADO® rotary lobe pumps are particularly service and maintenance friendly. All wetted parts are immediately accessible without dismantling any pipework or the drive.

TORNADO® T2 rotary lobe pump: "Full Service in Place" (FSIP®) instead of "Maintenance in Place"

Servicing is easy, because no special tools are required. You have quick and easy access to the pump chamber right up to the flange mounting because you can open the whole front on the TORNADO® T2. The rotary lobes can be replaced in no time at all because the lobes are fixed with easily accessible taper lock ringsets. The simple geometry of the rotary lobes allows for each lobe to be fitted and removed independently of one another. It is child's play to do this with our setting and installation gauge for positioning the rotary lobes, which is integrated into the front cover. The preset mechanical seals (cartridge design) are fitted onto the shaft, along with the rotary lobes. For the first time, different seal designs can be fitted without changing the mechanical seal housing: "Plug and Play"

The service-friendly design of the belt drive makes belt replacement easy, taking no time at all. Premium-quality features of both the belt and pulleys ensure the best accuracy of fit and synchronization of the belt drive, along with exceptionally smooth running.

Advantages

- Great suction capacity – up to 26 ft / 8 mWC
- Highly resistant to dry running
- Direction of rotation and of conveyance reversible
- Can be installed in any position
- Quiet, low-noise running
- Low life cycle costs
- Service without pump removal
- Particular features of the TORNADO® T2 rotary lobe pump:
  - Full Service-in-Place,
  - Oil-free gear box,
  - Drive synchronization via the belt drive

Substrate conveyance to the final storage facility

Emptying a final storage facility at a capacity of 88 gpm / 20 m^3/h

Pumping liquid manure in a biogas plant

NETZSCH Grinding systems

FSIP®—FULL SERVICE-IN-PLACE HOLDS

NETZSCH M-Ovas® cutting plate macerator

The NETZSCH M-Ovas® macerator for coarse materials is perfectly suited for use in biogas plants where impurities in the product can reduce process reliability. The solids in the product are dependably macerated or separated from the product (e.g. stones), to prevent pipes getting blocked or to prevent damage to downstream equipment.

Broad range of applications

The NETZSCH M-Ovas® should preferably be used to macerate the following product:

- Fermented, renewable raw materials
- Slurry
- Bio waste
- Slaughter waste
- Manure

High flow rates

- Throughput rates of up to 308 gpm / 70 m^3/h for substrates of up to 12 % dry solid content

Advantages

- Compact design with high throughput rate
- Simple, easy disassembly of the cutting plate
- Low energy requirement with high throughput rate
- Integrated separator vessel with separate cleaning and drainage aperture
- Effortless disposal of the sedimented materials through easy access
- Shaft sealing using mechanical seal with lubrication
- Particularly maintenance friendly
- Cutting plate usable on both sides
- Different perforated plates depending on the application

Additional information

Grinding Systems
Brochure NPA · 040

TRUE FOR OUR GRINDERS, TOO

N.Mac® Twin Shaft Grinder

Capable of fragmenting large and solid particles, the N.Mac® Twin Shaft Grinder is the ideal equipment for different applications such as wastewater treatment, biomass substrate handling, food and fruit scraps. Its various housing designs in channel and inline versions allow installation into effluent channels or flange assembly to prevent pipe clogging and to protect downstream equipment, such as pumps.

Broad range of applications

The twin shaft macerators should preferably be used with product in the following industries:

- Biogas plants
- Agriculture
- Slaughterhouses and recycling plants
- Canning factories
- Industrial kitchens
- Sugar factories

High flow rates

Flow rates up to 1,760 gpm / 400 m^3/h with a solid content of up to 10 %.

Design Details

- Housing for inline or channel installations
- Double shaft technology for reduction of solid particles
- Low power installation at 3hp (and 5 hp)
- Low rotation of the cutters at high torque (1:29 reduction)
- Hexagonal shaft in hardened steel
- Standard cutter arrangement 7/7 teeth
- Optional control unit to reverse direction of rotation in case of blockage
- Optional extended shaft for channel version

Advantages

- Shock absorption system
- Mechanical seals with quench
- Modular design of the cutting units
- Easy maintenance in place
- Optional cleaning comb for fibrous materials
- Efficiency increasing side rails (flow and cutting)

Inline Design

Channel Design


01-04-21
01-04-22

Service, training and short delivery times for spares

NETZSCH – the right partner for biogas

With production sites and branches in many countries we are the ideal partner for biogas plant operators. We ensure global spare parts availability.

Our specialists are happy to provide consultation and support with troubleshooting and part identification for all our pump and grinder models. We are committed to servicing or repairing your pump as quickly as possible.

The benefit for you

- High warehouse availability
- Shorter time for repairs and maintenance
- Original spare parts with NETZSCH manufacturing quality
- Ensuring warranty claims
- Procuring spare parts for old pumps

Spare parts service for parts orders

Mon–Fri: 8:00 am – 5:00 pm

If you order your spare parts by 12:00 o'clock, they will be ready for shipment on the same day! We have the standard parts in stock at our central warehouse in Exton. A highly-motivated team of experienced experts is available to answer your questions and take care of your spare parts orders.

Fast delivery of spare parts

Standard spare parts can be delivered in the US within 24 hours. We want to service or repair your pump as quickly as possible. We have the standard parts in stock at our central warehouse in Exton, PA.

Emergency service for spare parts

In urgent cases you can order spare parts and have them shipped immediately, even outside business hours.

Customer advice on site

Spare parts service

You can contact our spare parts service at
610-280-1248
or at
spares.npa@netzsch.com

Spare parts emergency service and technical support

On workdays and on the weekend, 24 hours a day we can be contacted at
484-986-8480

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 4,000 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.

The NETZSCH Business Unit Pumps & Systems offers NEMO® progressing cavity pumps, TORNADO® rotary lobe pumps, NOTOS® multi screw pumps. PERIPRO™ peristaltic pumps, macerators/grinders, metering technology and equipment custom built for challenging solutions for different applications globally.

Proven Excellence.

NETZSCH Pumps USA
119 Pickering Way
Exton, PA 19341
Tel.: 610 363-8010
Fax: 610 363-0971
npa@netzsch.com

NETZSCH Pumps USA
1511 FM 1960 Road
Houston, TX 77073
Tel.: 346 445-2400
npa@netzsch.com

NETZSCH Canada, Incorporated
500 Welham Road
Barrie, ON L4N 8Z7
Tel.: 705 797-8426
Fax: 705 797-8427
ntc@netzsch.com

BLUEcompetence Alliance Member
Partner of the Engineering Industry Sustainability Initiative

We are members of the German Biogas Association.

NETZSCH®

pumps-systems.netzsch.com