

# NETZSCH

Proven Excellence.



## Grinding Systems

Product Overview, Technology and Applications

Pumps & Systems

# Grinding Systems protect your process

## Universal Use

Grinding systems are used to effectively protect your complete installation including the pumping equipment. They ensure that over-size solids are reliably reduced to a desired size therefore safely processing through the rest of your system.

Grinders and macerators are designed for the most arduous of industrial applications to prevent pipe blockage or damage to downstream equipment by reliably reducing the size of solid matter in pumped product. The extensive selection of macerating systems provides an ideal solution for many industries and processes.

The robust design of the grinding systems from NETZSCH ensures a high performance coupled with trouble free operation.

## Primary Applications

- Waste water treatment
- Agriculture
- Biogas plants
- Slaughterhouses
- Recycling plants
- Canning/tinning factories
- Industrial kitchens
- Sugar factories
- Pump stations
- Prisons

## Advantages

- Optimum price/performance ratio
- Low running costs through high operating efficiency
- High operational reliability
- Simple maintenance
- Comprehensive range of accessories available for almost every application
- Worldwide service network and weekend emergency support



# *... and are so easy to maintain:*

## *FSIP® Full Service-in-Place*

### The Right Model for Every Application

#### M-Ovas® Cutting Plate Macerator

The special shape of the housing directs solid particles in the waste water toward the cutting plate, where they are held and chopped by the rotating blades.

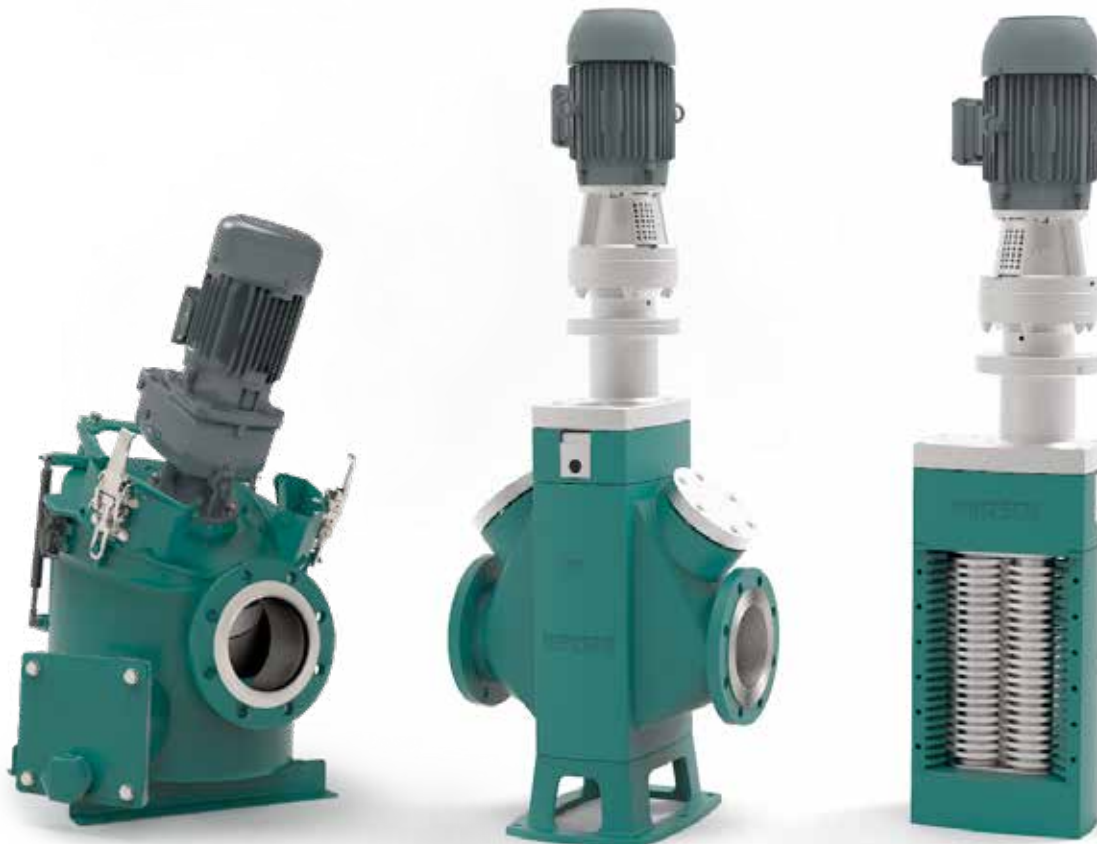
#### N.Mac® Twin Shaft Grinder

The twin shaft grinders have been designed for applications where the medium contains large solid objects.

These grinders are available in two different housing designs: the inline version for installation in pipelines and the channel version for installation into effluent channels or for horizontal, gravity-fed applications.

Depending on the particle size reduction required, there is a choice of different tooth combinations.

For maintenance these macerators and grinders do not have to be removed from the pipeline/from the channel: NETZSCH offers "Full Service-in-Place".



M-Ovas® cutting plate macerator, N.Mac® twin shaft grinders in inline and channel versions

# M-Ovas<sup>®</sup>

## CUTTING PLATE MACERATOR

The M-Ovas<sup>®</sup> macerator for coarse materials is ideally suited for use in waste water treatment plants where impurities in the medium reduce process reliability. The solids in the medium are reliably macerated or separated from the medium (e.g. stones), to prevent pipes getting blocked or damage to downstream equipment.

### Broad range of applications

The M-Ovas<sup>®</sup> should preferably be used to macerate the following media:

- Fibers and solids in waste water
- Liquid manure
- Substrates

### High flow rates

- Throughput rates of up to 300 m<sup>3</sup>/h with water

### 1 Housing

Hydrodynamic design with integrated stone trap for solids, and a clean-out port. The sediment can easily be removed by opening the cover plate. Available in stainless steel (optional).

### 2 Housing Cover

Cutting unit integrated into housing cover fitted with gas struts to assist with opening the cover.

### 2a Trap and Cleanout Port

This port allows for easy cleaning of solids in the stone trap.

### 3 Draining Connection

### 4 Cutting Unit

The optimum performance of the cutting unit results from the spring support of the cutting plate. The cutting plate is made of wear resistant, hardened steel. Optimum cutting performance through cutting unit with a fixed cutting mechanism. Cutting head and cutting blades made from wear resistant hardened steel. The flywheel effect of the cutting head supports the cutting process and reduces the drive power. Easy exchange of cutting plate and cutting blades without disassembling the pipework. No manual adjustment needed because the knife blades are spring loaded against the shear plate.

### 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 rock trap 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
- Draining connection for easy liquid emptying

### Controller

Controller is available with automatic starting direction to ensure even wear of the knives and shear plate. The controller also can detect jammed media and run through a sequence or auto reversal three times to free the unit before shutting down and setting off alarm.

### 5 Shaft Seal

Single mechanical seal made of hard metal with oil quench to prevent product leakage.

### 6 Drive

The standard drive unit has reinforced bearings.

### 7 Inline Version

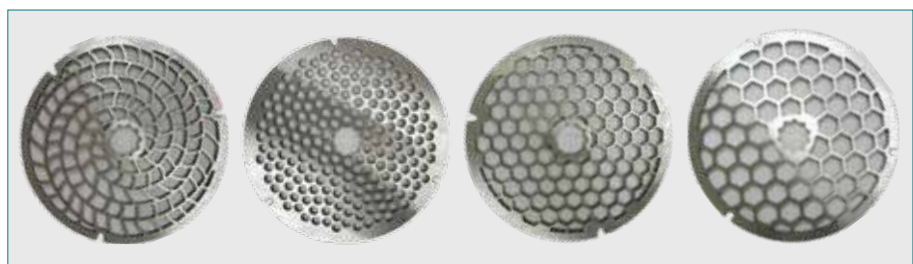
Product inlet and outlet are positioned on the same level. The M-Ovas® can be directly connected to a horizontal pipeline, to a TORNADO® pump inlet, or to a NEMO® pump inlet where the flange is set at 90°.



## Various Shear Plates available for optimal results

### Features

- Wear resistant hardened steel shear plates.
- Reversible shear plate.
- Multiple shear plate configurations for different size cutting options.
- Auto compression knives maintain precise contact, no maintenance needed.
- Easily replaceable knives for faster servicing.
- Auto reversing on startup to wear blades evenly.



Standard (5-30 mm)

Fine (18 mm)

Rough (30 mm)

Rough (38 mm)

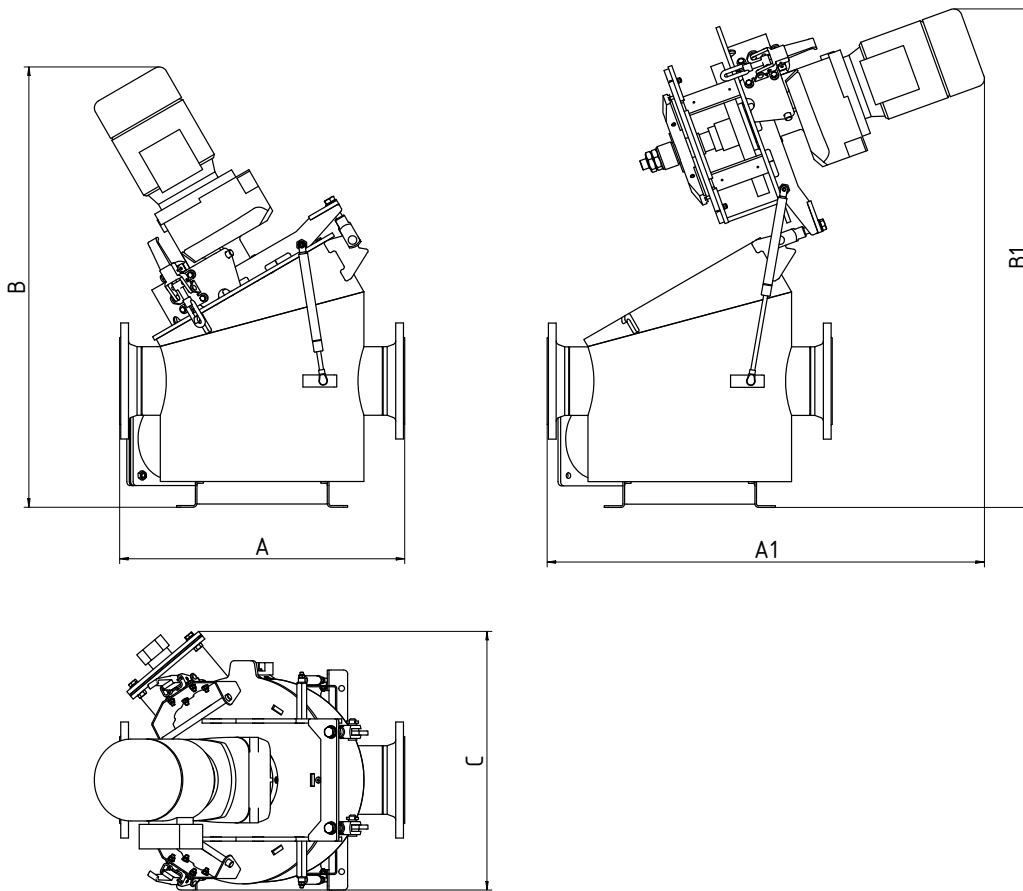
## Functionality

With the cutting plate macerator the crushable parts are either pressed to the cutting plate or partially drawn into the holes of the cutting plate by the flow. Larger particles jam in front of the cutting plate and are crushed by the cutting head until they can be flushed through the openings of the cutting plate.

## Wear resistance

The cutting plate consists of a wear-resistant special alloy. It is hardened and finely polished on the contact surface to the cutter head.

The cutter head is made of steel with positively shaped carbide cutting edges. In case of wear the cutting plate can be turned.



## Flow rates and dimensions

Sizes	Flow rate (m <sup>3</sup> /h)	Pressure drop (bar)	Max pressure (bar)	Approx. weight (kg)	Flanges (ANSI/DIN)	Dimensions (mm)				
						A	A1	B	B1	C
S 2.2/50	50	0.05	1	120	100	500	790	840	850	400
S 4.0/300	300	0.12	1	195	150	700	1,100	1,080	1,230	640

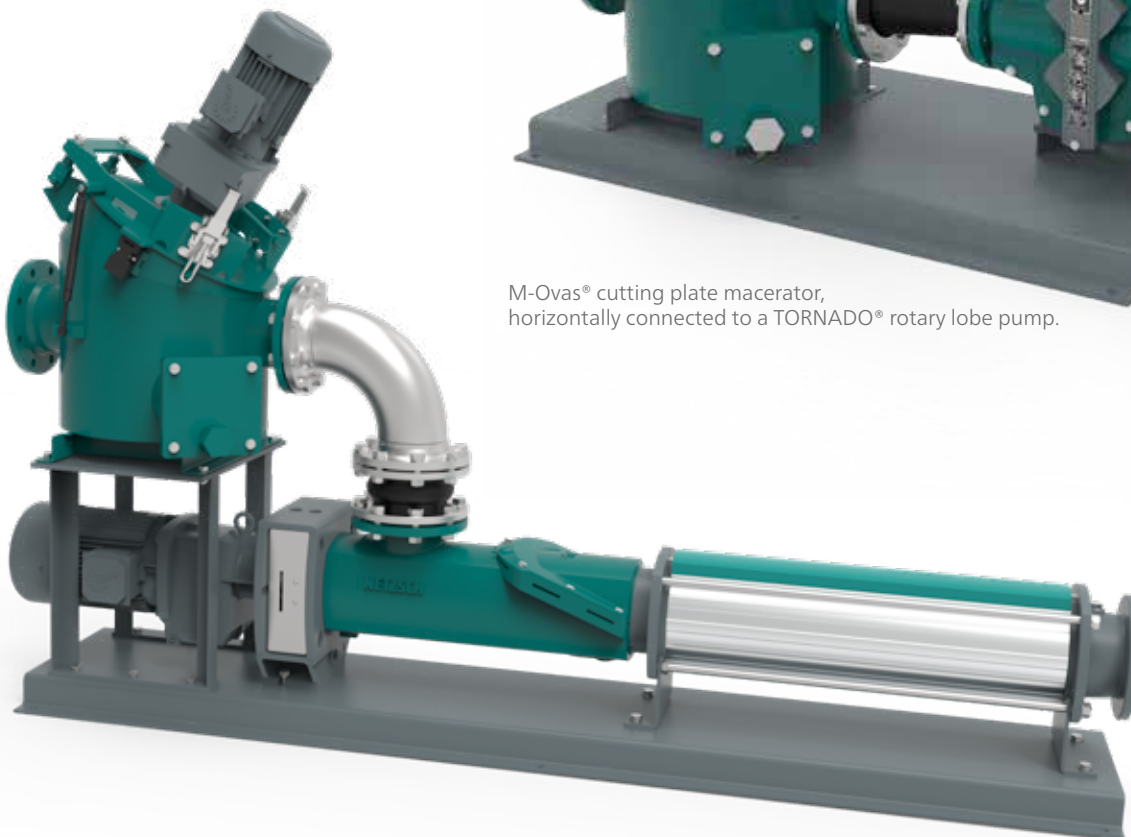
# Combinations

## MANY OPTIONS POSSIBLE

The medium with solid or fibrous parts is continuously drawn into the M-Ovas® by a self-priming NEMO® progressing cavity pump or TORNADO® rotary lobe pump arranged behind the macerator. The solids are crushed or remain in the stone trap below the cutting unit. This protects all downstream units.



M-Ovas® cutting plate macerator, horizontally connected to a TORNADO® rotary lobe pump.



M-Ovas® cutting plate macerator connected to a NEMO® pump inlet with the flange set at 90°.

# N.Mac® Inline

## TWIN SHAFT GRINDER FOR

The N.Mac® twin-shaft grinder is capable of fragmenting large and solid objects in a liquid media. It is the ideal equipment to suit different applications such as waste water treatment, substrates or food and fruit scraps for biogas plants. The inline housing has flanges that allow installation in piping systems to protect downstream equipment, such as pumps.

### Features

- Twin shaft technology with internal rotation for size reduction of solids
- Energy efficient motors, from 2.2 - 4 kW
- Low speed cutters with high torque
- Cartridge style cutters make for easy maintenance and load dispersion
- Optional control unit to reverse direction of rotation in case of blockages
- Five different cutting teeth for various applications
- Dual recessed and self-collapsing lifing tabs for simple pull-out for servicing
- Submersible/immersible XP motor options

### Your benefits

- Unique shock absorption system
- Mechanical seals with quench
- Optional cleaning combs for fibrous materials
- Cutting devices in cartridge system
- Patented bearing and mechanical seal cartridges

### Main Applications

- Waste water treatment plants
- Wet wells / pump stations
- Biogas plants
- Agriculture
- Slaughterhouses and recycling plants
- Food waste
- Crushing of foreign matter, such as plastic, bags and bottles, shoes, textiles, aluminum cans, tin scrap, lids, and fats, oils, and grease (FOG)



N.Mac® 50l Horizontal design

N.Mac® 50l

N.Mac® 150l

N.Mac® 350l



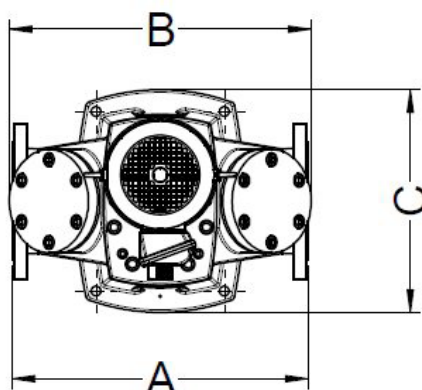
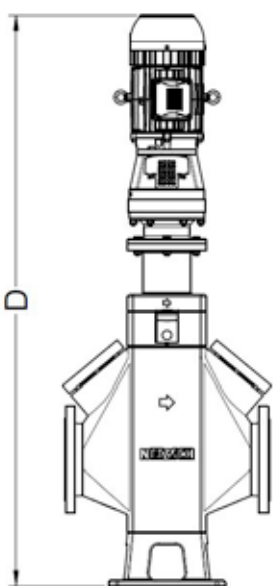
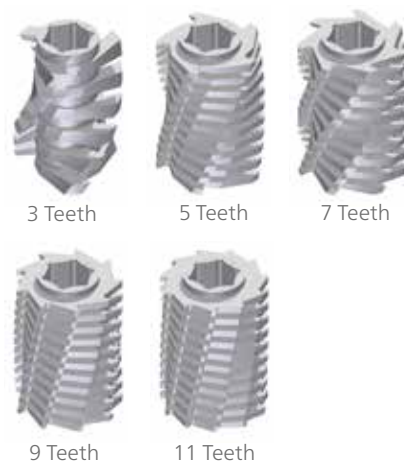
# INLINE INSTALLATION

## Cutter cartridges

Specific cutter geometries for each type of solids facilitate the particle reduction process. To reach the required particle size the different cutters with 3 to 11 teeth may be combined accordingly.

## Wear resistance

The cutters are thermally hardened to increase resistance and maintain sharpness assuring reliable grinding of the toughest solids.



## Controller

Controller is available with automatic starting direction to ensure even wear of the knives and shear plate. The controller also can detect jammed media and run through a sequence or auto reversal three times to free the unit before shutting down and setting off alarm.

## Flow rates and dimensions

Sizes	Flow rate (m <sup>3</sup> /h)	Pressure drop (bar)	Maximum pressure (bar)	Approximate weight (kg)	Flanges (DIN)	Dimensions (mm)			
						A flange to flange	B max width	C	D
N.Mac® 50I Horizontal	50	0.05	6.0	220	100	340	340	1,085	384
N.Mac® 50I	50	0.05	6.0	220	100	340	350	445	1,155
N.Mac® 150I	150	0.12	6.0	360	150	545	555	410	1,525
N.Mac® 350I	350	0.08	6.0	780	250	830	830	425	1,780

# N.Mac<sup>®</sup> Channel

## TWIN SHAFT GRINDER FOR

Also in the channel version, the N.Mac<sup>®</sup> twin-shaft grinder is ideal for fragmenting large and solid objects in a liquid media and suits various applications such as waste water treatment or grinding of food and fruit scraps. This housing design allows installation in sewers to avoid blockages and by crushing foreign substances. It can be mounted horizontally for gravity-fed solids. Optional mounting above an open hopper pump is available.

### Features

- Twin shaft technology with internal rotation for size reduction of solids
- Energy efficient motors, from 2.2 - 4 kW
- Low speed cutters at high torque
- Cartridge style cutters make for easy maintenance and load dispersion
- Optional control unit to reverse direction of rotation in case of blockages
- Five different cutting teeth for various applications
- Dual recessed and self-collapsing lifing tabs for simple pull-out for servicing
- Submersible/immersible XP motor options
- Grinder rail mounting systems for easy removal and servicing

### Your benefits

- Unique shock absorption technology
- Mechanical seal with quench
- Optional cleaning combs for fibrous materials
- Patented side rails
- Cutting devices in cartridge system
- Patented bearing and mechanical seal cartridges

### Main applications

- Waste water treatment plants
- Wet wells / pump stations
- Slaughterhouses and recycling centers
- Food waste
- Crushing of foreign matter such as plastic, bags and bottles, shoes, textiles, aluminum cans, tin scrap and lids



N.Mac<sup>®</sup> 50C



N.Mac<sup>®</sup> 120C



N.Mac<sup>®</sup> 250C



N.Mac<sup>®</sup> 400C

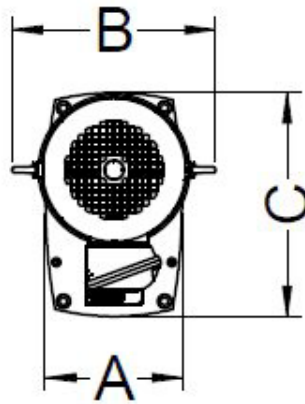
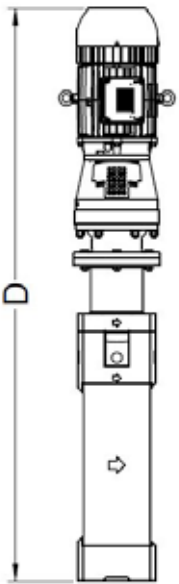
# CHANNEL INSTALLATION

## Cutters

Specific cutter geometries for each type of solids facilitate the particle reduction process. To reach the required particle size the different cutters with 3 to 11 teeth may be combined accordingly.

## Wear resistance

The cutters are thermally hardened to increase resistance and maintain sharpness assuring reliable grinding of the toughest solids.




## Controller

Controller is available with automatic starting direction to ensure even wear of the knives and shear plate. The controller also can detect jammed media and run through a sequence or auto reversal three times to free the unit before shutting down and setting off alarm.

## Flow rates and dimensions

Sizes	Flow rate (m <sup>3</sup> /h)	Approximate weight (kg)	Dimensions (mm)			
			A	B	C	D
N.Mac® 50C	50	170	190	290	310	1,225
N.Mac® 120C	120	200	190	290	310	1,400
N.Mac® 250C	250	260	190	290	310	1,750
N.Mac® 400C	400	320	190	290	310	2,095



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® screw pumps, PERIPRO™ peristaltic pumps, macerators/grinders, metering technology and equipment custom built for challenging solutions for different applications globally.

## Proven Excellence.

NETZSCH Pumpen  
& Systeme GmbH  
Geretsrieder Straße 1  
84478 Waldkraiburg  
Deutschland  
Tel.: +49 8638 63-0  
info.nps@netzsch.com

NETZSCH Asia Pacific Pte. Ltd.  
Singapore  
Tel.: +65 6863 4453  
info.nap@netzsch.com

PT. NETZSCH Indonesia  
Jakarta, Indonesia  
Tel.: +62 21 296 75 385  
info.nij@netzsch.com

NETZSCH Thailand Ltd.  
Bangkok, Thailand  
Tel.: +66 2 152 7325  
info.ntb@netzsch.com

NETZSCH (Malaysia) Sdn Bhd  
Shah Alam, Malaysia  
Tel.: +60 3 5885 9201  
info.nmk@netzsch.com

NETZSCH Vietnam Limited  
Ho Chi Minh City, Vietnam  
Tel.: +84 28 6281 1042  
info.nvh@netzsch.com

NETZSCH Australia Pty Ltd  
Head Office Brisbane  
Tel.: +61 7 3488 8183  
Regional Office Sydney  
Tel.: +61 2 9641 2840  
nas@netzsch.com

**BLUECOMPETENCE**  
Alliance Member

Partner der Nachhaltigkeitsinitiative  
des Maschinen- und Anlagenbaus

**NETZSCH®**

[pumps-systems.netzsch.com](http://pumps-systems.netzsch.com)