

The logo for NETZSCH, consisting of the word "NETZSCH" in a bold, dark green, sans-serif font.

Proven Excellence.



## Highest Reliability throughout the Season

NETZSCH Positive Displacement Pumps for Sugar Manufacturing Process

Pumps & Systems

# FOR SUGAR MANUFACTURING

through all stages

Sugar is produced in more than 120 countries and the global production exceeds 180 Million tons a year. Approximately 78 % is produced from sugar cane, a genus of grasses, which is endemic in tropical countries. The remaining 22 % is produced from sugar beet, a root crop, grown mostly in moderate temperature zones of the northern hemisphere.

NETZSCH positive displacement pumps have been successfully used for decades in nearly every stage of sugar production in different regions of the globe offering the highest level in reliability of operation.

For the applications in sugar manufacturing NEMO® progressing cavity pumps, TORNADO® rotary lobe, NOTOS® multi screw pumps and PERIPRO® peristaltic pumps can all be considered, each of them offering their unique benefits.

As a manufacturer of four distinct pump technologies, NETZSCH is uniquely positioned to provide objective, expert guidance in selecting the pump technology best suited for your application. NETZSCH Pumps USA serves as the company's North American engineering and manufacturing center, based in Pennsylvania. NETZSCH is your holistic solution provider for complex fluid handling.



# NEMO® Progressing Cavity Pumps

## SMOOTH CONVEYANCE AND STRONG PERFORMANCE

NEMO® Progressing Cavity Pumps have a long history in the sugar industry for their continuous, pressure stable, gentle and low-pulsation pumping characteristics.

### Large capacity and pressure range

- Flow rates from just a few ml/h up to 4,400 gpm / 1,000 m<sup>3</sup>/h
- Number of stages ranging from 1 to 8 for pressures from 90 psi to 680 psi / 6 to 48 bar (standard) or up to 4,350 psi / 240 bar (high pressure)

### Broad range of applications

Within the sugar manufacturing process our NEMO® Progressing Cavity Pumps are used for the following applications:

- Mud
- Sugar beet slices/Cosettes
- Lime milk
- Additives/Chemicals
- Thick juice
- Run-off syrups
- Molasses
- Magma
- Massecuite
- Raw sugar melt

### Your benefits

- High suction lift (up to 30 ft. /9 m), vacuum conditions.
- High reliability – well proven in the sugar industry.
- Reliable against abrasive media, such as magma and massecuite.
- Smooth conveyance – gentle on sugar crystals.
- Long process cycles.
- Virtually pulsation-free conveyance.
- Flow rate in proportion to speed.
- High dosing accuracy over a wide speed range.
- Flow rate independent of variances in pressure or viscosity.
- Elastomers according to FDA and EU-VO and 1935/2004 .
- Horizontal or vertical installation.
- Full Service-in-Place (FSIP®) models available.



# TORNADO® Rotary Lobe Pumps

## POWERFUL, ROBUST AND COMPACT

TORNADO® self-priming, valveless positive displacement pumps deliver reliable high-performance pumping tailored to your needs. Compact, robust, and powerful, they handle pressures up to 174 psi / 12 bar and offer a flexible, space-saving alternative to other pumps. Ideal for continuous, smooth transfer and speed-proportional metering of most liquids.

### Performance

Flow rates of 4 up to 6,100 gpm /  
1 up to 1,400 m<sup>3</sup>/h  
Pressures up to 174 psi / 12 bar

### Features

The Full Service-in-Place (FSIP®) concept makes servicing simple and fast. Various configurations are available.

### Broad range of applications

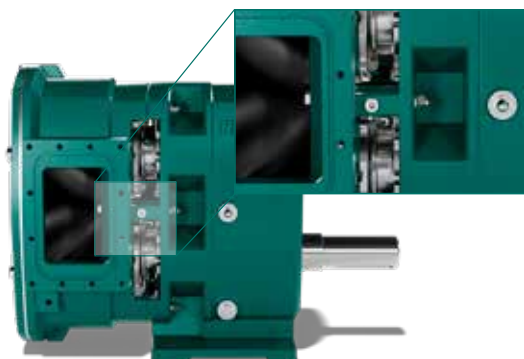
- Thick juice
- Run-off syrup
- Molasses
- Magma
- Masecuite
- Raw sugar melt

### Your benefits

- Valve-free construction.
- Self priming.
- Capable of pumping solids or fibrous matter.
- Compact design.
- Pumping media with high or low viscosity.
- Can pump shear sensitive fluids without degradation.
- Capable of temperatures up to 212 °F / 100 °C.
- Reversible operation.
- Service without disconnecting from pipework.
- Some configurations can run dry.



### NETZSCH GSS TECHNOLOGY



The NETZSCH GSS technology (Gearbox Security System) guarantees the highest level of operating safety due to the physical separation of the pump chamber and the gearbox.

### Your benefits

- Maximum operational safety
- No ingress of media into the gearbox
- No ingress of gearbox oil into the pump chamber
- Lubrication/cooling of the seal through easily accessible flushing/sealing water connections
- Visual inspection of the mechanical seals without disassembly

# PERIPRO® Peristaltic Pumps

## HEAVY DUTY CONSTRUCTION FOR DEMANDING APPLICATIONS

PERIPRO® Peristaltic Pumps are widely used in the sugar industry because they handle various fluids gently, cleanly, and reliably. They work by compressing a flexible hose or tube with rotating rollers, so the fluid only contacts the inside of the hose — not the pump mechanism itself.

### Wide capacity and pressure range

Flow rates from 0.05 gpm to 264 gpm / 0.01 m<sup>3</sup>/h to 60 m<sup>3</sup>/h  
Pressures up to 145 PSI / 10 bar  
Suction capacity of up to 13.5 psi (9.5 mWc)

### Broad range of applications

Within the sugar manufacturing process our PERIPRO® Peristaltic Pumps are used for the following applications:

- Lime Milk
- Chemical dosing
- Food grade syrups

### Your benefits

- Excellent resistance to abrasion.
- High suction capability.
- Insensitive to dry running.
- No valves or mechanical seals.
- Low shear and reversible pumping.
- Full metering control.
- Industrial, Chemical and Food versions.
- Metering accuracy of  $\pm 1\%$
- Up to 70 % solids in conveyed product.

### Industrial and Chemical Versions

High level of reliability for metering corrosive product



- Sensor for hose leakage
- Only one part in contact with the product chemical resistant to ETFE coated housing
- Transferring and metering of highly abrasive product like titanium dioxide or resins

### Food Version

Contamination free conveying of food and particularly easy cleaning



- The hinged cover allows for removal of the rollers and even easier cleaning of the pump
- Hose made of food grade FDA-certified nitrile
- Typical applications: transfer of viscous sauces and juices or supplying of filling machines

# NOTOS® Multi Screw Pumps

## FOR EXTENSIVE RANGES OF FLOW AND PRESSURES

NOTOS® Multi Screw Pumps contribute to improved process efficiency, reduced downtime, and consistent production performance in sugar manufacturing plants. They are reliable handling of viscous, abrasive, and shear-sensitive fluids such as molasses, syrups, massecuite, and fuel oils.

### Wide capacity and pressure range

These 4 different pump product models are designed to operate under specific flow rate and pressure conditions. By comparing their respective operating ranges, it becomes easier to identify the most suitable pump for your application.

### Broad range of applications

- Lubricant oil
- Molasses
- Syrups
- Thick Juices
- Magma
- Massecuite
- Raw Sugar Melt

### Your benefits

- Can be both the Product pump and CIP pump in one.
- Front loaded seals for quick and easy maintenance.
- Wide speed range allows for pumping low to high viscosity fluids with the same pump.



### 2 NS – Two Screw Pump

NOTOS® two screw pumps have one drive screw, transferring torque through a hydrodynamic film to the rotating intermeshing driven screw.

- Flow up to 2,860 gpm / 650 m<sup>3</sup>/h
- Pressure up to 230 psi / 16 bar
- Temperature up to 570 °F / 300 °C
- Viscosity up to 100,000 cps



### 3 NS – Three Screw Pump

NOTOS® three screw pumps have one drive screw, transferring torque through a hydrodynamic film to the two rotating intermeshing driven screws.

- Flow up to 1,760 gpm / 400 m<sup>3</sup>/h
- Pressure up to 1,450 psi / 100 bar
- Temperature up to 570 °F / 300 °C
- Viscosity up to 15,000 cps

- Low shear with virtually no pulsations.
- Bi-directional flow with high suction lift.
- Can pump up to 65% entrained air.
- Can run dry when using a double flush seal.

- Metal parts in contact with the fluid are made of 316L stainless steel.
- No contact between the rotating parts.
- Reversible flow.
- No dead ends that can harbor bacteria.



## 4 NS – Geared Twin Screw Pump

NOTOS® geared twin screw pumps have two shafts and four screws. The torque is transferred to the driven shaft via helical gears. The design is hydraulically balanced.

- Flow up to 11,000 gpm / 2,500 m<sup>3</sup>/h
- Pressure up to 1,160 psi / 80 bar
- Temperature up to 570°F / 300°C
- Viscosity up to 200,000 cps



## 2NSH – Sanitary Twin Screw Pump

NOTOS® 2NSH twin screw pump is the option for sanitary syrup transfer. 3A certified and fully FDA compliant. High Pressure and Flow capacity in a small foot print. Can be the process and CIP pump.

- Flow up to 1,426 gpm / 324 m<sup>3</sup>/h
- Pressure up to 362 psi / 25 bar
- Temperature up to 265°F / 130°C
- Viscosity up to 1,000,000 cps

# Application Examples

## Magma

### Product Features

- Abrasive / Non corrosive
- Viscosity: high
- Brix: 88 - 90 °Bx
- Density: 93.6 lbs/ft<sup>3</sup> / 1.5 kg/dm<sup>3</sup>
- Temperature: 105 - 140 °F / 40 - 60 °C

### Benefits of the TORNADO® T1 Pump with metal lobes.

- Can handle high viscosity liquids
- Can pump sugar crystals without affecting the Brix concentration
- High suction lift capability
- Proven multi season operation without needing to change lobes.



## Massecuite

### Product Features

- Abrasive / Non corrosive
- Viscosity: high
- Brix: 92 - 105 °Bx
- Density: 93.6 lbs/ft<sup>3</sup> / 1.5 kg/l
- Temperature: 140 °F / 60 °C

### Benefits of the NEMO® Pump

- No damage to sugar crystals
- No special adjustments needed during assembly
- Mechanical seal operates under low pressure
- Operates at low RPMs
- Perfect for shear sensitive products



## Additives

### Product Features

- Non abrasive / Corrosive
- Viscosity: low
- Density: 62.4 - 75 lbs/ft<sup>3</sup> / 1.0 - 1.2 kg/dm<sup>3</sup>
- Temperature: 70 °F / 20 °C

### Benefits of the NEMO® Pump

- High dosing accuracy
- Wide range of material options
- Low pulsation
- No liquid quality degradation



## Food grade syrups

### Product Features

- Non abrasive / Non corrosive
- Viscosity: high
- Solids: 75 - 82 %
- Density: 87.3 lbs/ft<sup>3</sup> / 1.4 kg/l
- Temperature: varies per application

### Benefits of the NOTOS® 2NSH Pump

- Can pump a wide range of viscosities
- Same pump for process and CIP
- Reversible for product recovery
- Compact design
- Minimal maintenance



## Molasses

### Product Features

- Non abrasive / Non corrosive
- Viscosity: high
- Solids: 75 - 82 %
- Density: 87.3 lbs/ft<sup>3</sup> / 1.4 kg/l
- Temperature: varies per application

### Benefits of the TORNADO® T1 Pump with rubber lobes.

- Compact Design
- Easy and Full Service-in-Place maintenance
- Various mechanical seal options
- Wear plates are the only typical replacement items



## Lubricant oil

### Product Features

- Lubricating / Non corrosive
- Viscosity: 5 - 150 cSt
- Temperature: 70 - 140 °F / 20 - 60 °C

### Benefits of the NOTOS® Pump

- Reliable solution for bearing lubrication of steam turbines, generators and gear reducers
- Low maintenance cost
- Flexible design easily adaptable to field conditions
- Dependable for fuel pumping for boilers



# Application Examples

## Lime milk (calcium hydroxide)

### Product Features

- Abrasive
- Lightly corrosive
- Viscosity: Low
- Density: 63 lbs/ft<sup>3</sup> / 1.01 kg/l
- Temperature: 70 - 86 °F / 20 - 30 °C

### Benefits of the PERIPRO® Pump

- Excellent suction capability
- Heavy duty construction
- Reliable service with abrasive media
- Seal less pump technology
- Longer hose life due to the rollers versus shoes
- Capable of dry running



## Thick Juice

### Product Features

- Non abrasive
- Non corrosive
- Viscosity: moderate
- Brix: 70 °Bx
- Density: 64.4 lbs/ft<sup>3</sup> / 1.1 kg/dm<sup>3</sup>
- Temperature: 140 - 175°F / 60 - 80 °C

### Benefits of the NEMO® Pump

- High flow and pressure capabilities
- Gentle conveying
- For dosing applications
- Can pump low to high viscosity liquids
- Full Service-in-Place model option



# PROVEN QUALITY PRODUCTS

## AND FIRST-CLASS SUPPORT

With NEMO® progressing cavity pumps, TORNADO® rotary lobe pumps, NOTOS® multi screw pumps, dosing systems, macerators, and accessories, the Pump & System sector of the NETZSCH Group has been offering customized and sophisticated solutions for applications in all markets at a global level for over 60 years.

### Benefit from the network of a global player – at your location

Beyond consistently high product quality, NETZSCH provides comprehensive service backed by decades of pump expertise and a strong understanding of customer needs. From application-specific pump design and complete operation and maintenance documentation to lifecycle support, we stand by our customers at every step.

Regardless of where your sugar manufacturing site is located, we are there for you:

- Over 2,600 NETZSCH Pumps & Systems employees
- More than 30 sites worldwide.
- More than 200 NETZSCH representatives and service partners worldwide

This global network NETZSCH ensures that internationally operating customers will receive fast and professional help for technical problems on site. We will always find a solution—even for difficult challenges.

#### Our services for you

- Commissioning
- Service contracts
- Maintenance
- Maintenance strategy
- Training and consulting



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. Almost 5,000 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. ■

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