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**NETZSCH**

Proven Excellence.



## NOTOS® Sanitary Twin Screw Pump

NOTOS® 2NSH – Exclusive Full Service-in-Place

Pumps & Systems

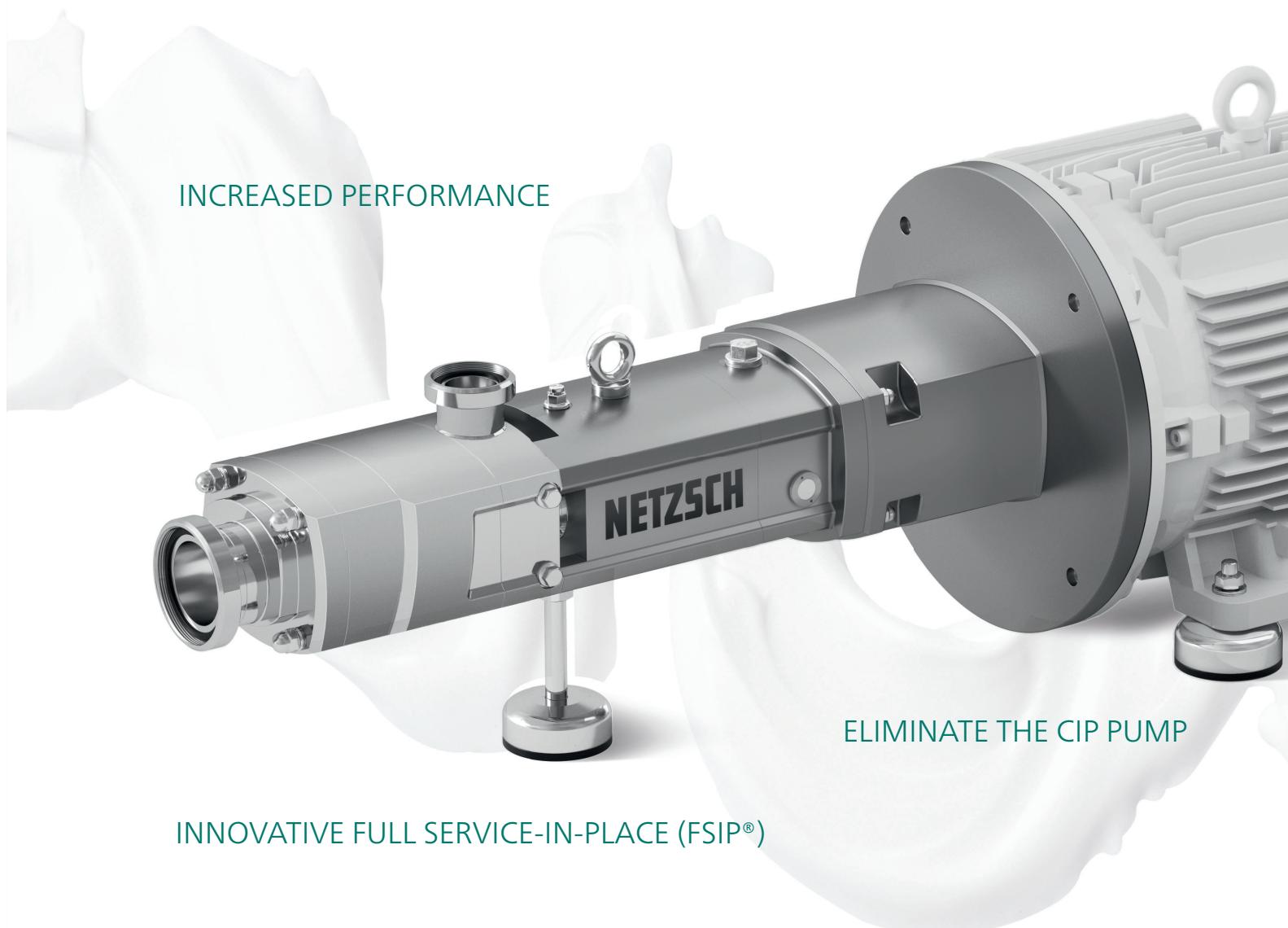
# NOTOS® 2NSH

## SANITARY TWIN SCREW PUMP

### The benefit to the customer

Keeping its commitment to developing innovative and efficient solutions for the most demanding industries, NETZSCH presents the NOTOS® Sanitary 2NSH Twin Screw Pump with exclusive full service-in-place. Designed to optimize the transfer at low and high working pressures (up to 230 psi / 16 bar) of fluids with low and higher viscosity, such as chocolate, fruit, yogurt, juices, and pumping them while keeping the integrity and natural properties, without any quality loss. This pump is a practical solution that adds more efficiency and technology to the process.

The pump is made of AISI 316L stainless steel and polished according to international standards, making it easy to clean (CIP) and to sterilize (SIP) in place. As there is no contact between the rotating parts, the pump speed can be increased. Therefore, cleaning fluid (CIP fluid) and the main product can be carried out by the 2NSH itself without the need for an auxiliary system or a separate CIP pump.



INCREASED PERFORMANCE

ELIMINATE THE CIP PUMP

INNOVATIVE FULL SERVICE-IN-PLACE (FSIP®)

## General characteristics

NOTOS® 2NSH meets the high requirements of food, beverage, chemical, pharmaceutical and cosmetic industries:

- Metal parts in contact with the fluid are made of 316L stainless steel
- High suction capability (low NPSH<sub>r</sub>)
- No contact between the rotating parts
- Reversible flow
- Low pulsation
- No dead spaces
- Smooth feeding of the pumped product



## Large capacity and pressure range

This pump covers a wide performance range and so offers wide flexibility of use.

- Flow rate up to 880 gpm / 200 m<sup>3</sup>/h
- Pressure up to 230 psi / 16 bar

## Compact design

Small space requirements due to the compact design, having two options for mounting: with foot or flange.

## Broad range of application examples:

- Food industry: dairy products, delicacies, ketchup, sauces, confectionery, baby food.
- Beverage industry: fruit juices, syrups, concentrates, breweries.
- Cosmetic and pharmaceutical industry: creams, lotions, ingredients.
- Chemical industry: adhesives, solvents, paints, varnishes and resins.

## Your benefits

- Versatile use eliminating the need for a CIP pump
- Easy maintenance: simple assembly/disassembly
- Flexibility: use the same equipment for pumping fluids with low or high temperature/viscosity
- No damage to the pumped product

## Four Different Pitch Screw Options

Stainless steel screws with high efficiency profile that allow more flow per revolution and low fluid shear:

- Balanced with high suction capability
- All screw pitches are the same diameter and are interchangeable
- Simple replacement without disassembly of bearings
- Pitch change allows change of flow, pressure range and solid size with the same pump.



Pitch 1



Pitch 3

Pitch 2

Pitch 4

## Product flexibility

Due to the operation principle and the design of this positive displacement pump, fluids with the following properties can be conveyed:

- Low to high viscosity
- With/without solids
- Shear sensitive and shear-stable

All sizes meet FDA requirements  
Pump sizes 1, 2, and 3 meet 3A and EHEDG requirements

# NOTOS® 2NSH

## Several applications with many advantages

With a robust, compact body and efficient design, the NOTOS® 2NSH Sanitary Twin Screw Pump is ideal for industries that prioritize high quality, maximum productivity, and excellence in the process: a reliable, customized solution for each customer.

### NOTOS® 2NSH Sanitary Twin Screw Pump – Operating Parameters

Parameters	Pump Sizes		
	1	2	3
Max. flow rate*	up to 48 gpm / 11 m <sup>3</sup> /h	up to 110 gpm / 25 m <sup>3</sup> /h	up to 285 gpm / 65 m <sup>3</sup> /h
Operating rotational speed	up to 1,800 rpm	up to 1,800 rpm	up to 1,800 rpm
Cleaning rotational speed	up to 3,600 rpm	up to 3,600 rpm	up to 3,600 rpm
Max. differential pressure	230 psi / 16 bar **	230 psi / 16 bar **	230 psi / 16 bar **
Viscosity	from 1 to 1,000,000 cP †	from 1 to 1,000,000 cP †	from 1 to 1,000,000 cP †
Temperature of the pumped fluid	from -4 to 265 °F / from -20 to 130 °C	from -4 to 265 °F / from -20 to 130 °C	from -4 to 265 °F / from -20 to 130 °C
Suction nozzle	1.5" up to 2.5"	2" up to 4.0"	3" up to 4"
Discharge nozzle	1.5" up to 2.0"	2" up to 3.0"	2.5" up to 4"
Installation position	Horizontal / Vertical	Horizontal / Vertical	Horizontal / Vertical
Wetted parts materials	AISI 316L (standard)	AISI 316L (standard)	AISI 316L (standard)
Certification	3A, FDA and EHEDG	3A, FDA and EHEDG	3A, FDA and EHEDG

\* Considering 3,600 rpm and Pitch 4

\*\* Dependent on the screw pitch

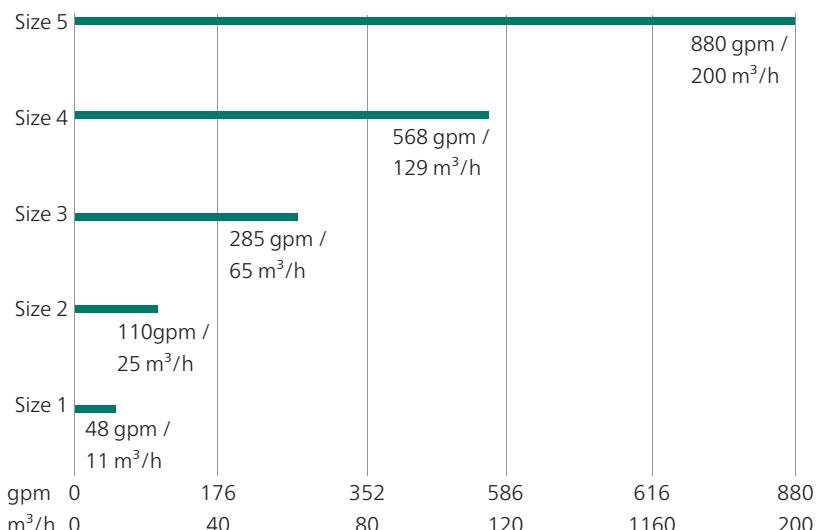
† Dependent on the pump speed and size



4	5
up to 568 gpm / 129 m <sup>3</sup> /h	up to 880 gpm / 200 m <sup>3</sup> /h
up to 1,800 rpm	up to 1,800 rpm
up to 3,600 rpm	up to 3,600 rpm
230 psi / 16 bar **	230 psi / 16 bar **
from 1 to 1,000,000 cP †	from 1 to 1,000,000 cP †
from -4 to 265 °F / from -20 to 130 °C	from -4 to 265 °F / from -20 to 130 °C
3" up to 4"	4" up to 6"
3" up to 4"	4" up to 6"
Horizontal	Horizontal
AISI 316L (standard)	AISI 316L (standard)
3A, FDA and EHEDG	3A, FDA and EHEDG

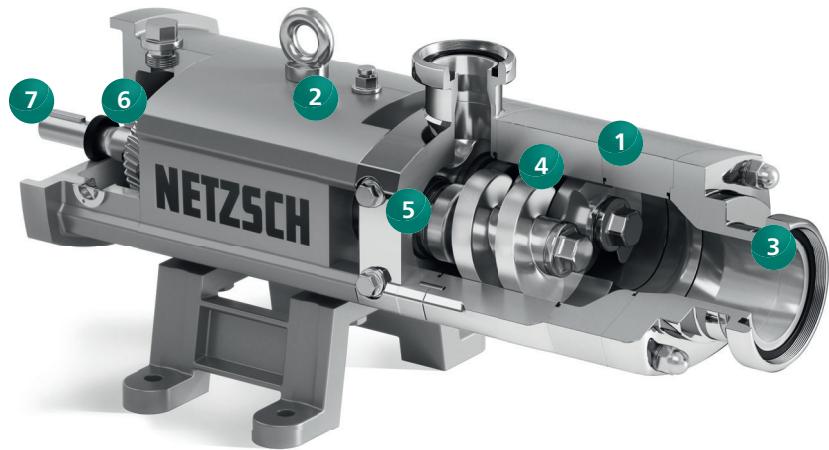
The NOTOS® 2NSH is a sanitary pump family composed of five sizes with four different pitches for each size. In total, there are 20 different combinations covering a wide range of flowrates and applications. The 2NSH will meet the needs of the food, beverage, cosmetic, and chemical industry.

Maximum flowrate of each pump series [gpm / m<sup>3</sup>/h]



# Perfection down to the last detail for outstanding results in your production

The pump shows superior performance and excellent results in day-to-day production because every pump feature is perfectly designed. The NOTOS® 2NSH Sanitary Twin Screw Pump is an efficient combination of excellence and quality that results in a unique solution to the market with a significantly compact design. Smooth pumping, low pulsation, easy maintenance, and ease of use in the process are your advantages.



## 1 Pump housing

Pump housing with a unique design for FSIP® – Full Service-in-Place, allowing the easy and quick pump disassembly, without having to disconnect it from the piping. Available in foot or self-aligned flange design. FDA-approved sealing, without dead spaces.

## 2 Bearing housing

Bearings designed for high load capacity with housing in stainless steel allowing external cleaning of the pump. Reverse rotation is possible and allows flexibility during the process.

## 3 Ports

Internally polished ports as per sanitary standards to ensure complete pump cleaning [ $Ra < 0.8 \mu\text{m}$ ]. Various sanitary connection options available such as TC, SMS, RJT, DIN and others.

## 4 Screws

Stainless steel screws with high efficiency profile, allowing higher flow rates with low fluid shear. Four pitch options available, all balanced and with high suction capability. Easy replacement of the screws without disassembly of the bearings. Screws with the same diameter are changeable so just by changing the pitch which allow you to change the flow and pressure range with a simple change of the screw geometry.



## 5 Shaft sealing

Available with single or double seals, both with modular cartridge design and interchangeable from one to another. Connections for flushing or quench are provided.

## 6 Synchronization gears

Helical gears provide smooth torque transmission between the screws and ensure the contactless operation of the pumping elements.

## 7 Shafts

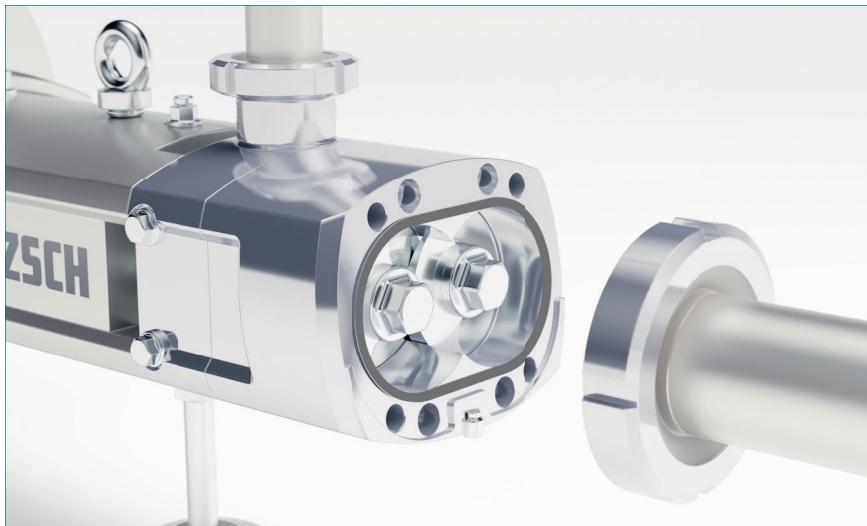
Stainless steel shafts designed for high torque, with the option to rotate in both directions.

## Innovative Full Service-in-Place (FSIP®) design for simplified maintenance

NETZSCH implemented FSIP® as a design concept in many products. It simplifies maintenance and the life of service staff. Thus it is possible to fully disassemble and assemble the screws and the mechanical seal without removing the pump from the processing line. As a result, servicing downtimes are significantly reduced. FSIP® is an intelligent technological solution that brings even more confidence and reliability to your processes.



NOTOS®  
FSIP® Design



All sizes meet FDA requirements  
Pump sizes 1, 2, and 3 also meet 3A and EHEDG requirements

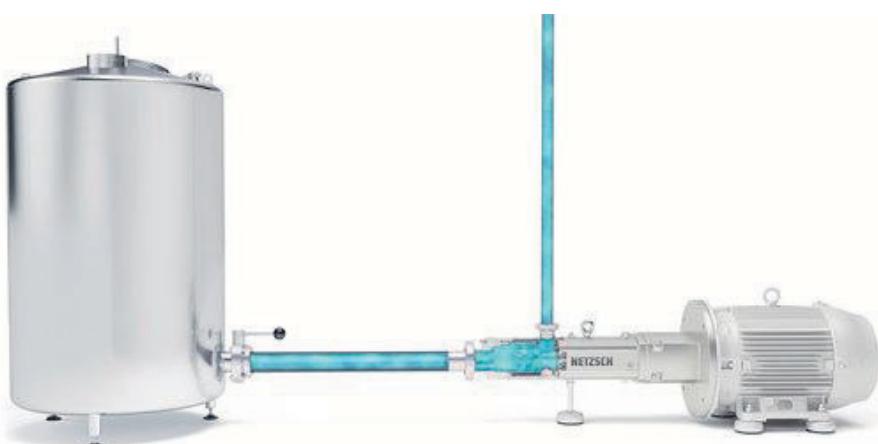
## Simplify your CIP cleaning process with NOTOS® 2NSH

### Saving costs with NOTOS®

In a conventional CIP cleaning process usually an additional CIP pump is necessary to ensure the cleanliness of the system. With the 2NSH, there is no need for an extra pump because it also operates as a CIP pump during the cleaning process. By-pass valves and additional pipework are not necessary anymore.

### How is it possible?

By increasing the speed, the pump is able to pump thin fluids like water and viscous products with the same pump. The high precision during the manufacturing process guarantees the high efficiency, low noise and low vibration—even at high speeds—that are necessary



to reach the speed for CIP cleaning. With a flow velocity of at least 4.9 f/s (1.5 m/s), it is possible for the cleaning liquid to ensure efficient cleaning of the pump, pipes, connections and accessories according to current industry standards.

One pump for the product and the CIP fluid.

# NOTOS® 2NSH Standard Design with unique advantages

The NOTOS® 2NSH Sanitary Twin Screw Pumps are also available with a standard, non-FSIP® pump housing. This compact design offers different options and advantages.

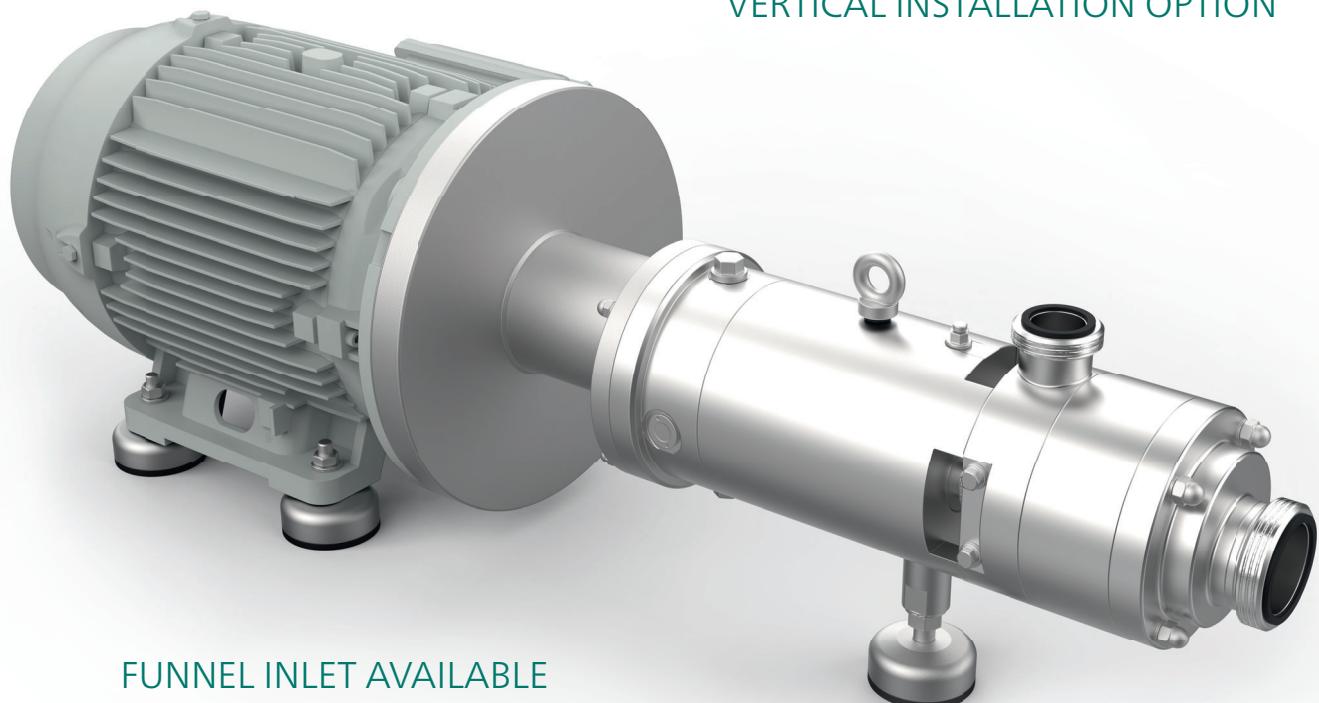
The NOTOS® 2NSH standard pump is more compact than the Full Service-in-Place (FSIP®) model. It is shorter, which facilitates the installation in places with less space. Its surface is polished to  $Ra < 0.8 \mu\text{m}$  in accordance with EHEDG, avoiding the accumulation of residues and simplify the cleaning process.

## Unique characteristics

- Heating or cooling jacket (optional)
- Vertical or horizontal installation
- With funnel inlet for highly viscous fluids

## General characteristics

- Compact design
- Reduced length
- Robust construction
- Tri-Clamp connections
- With foot or flange design



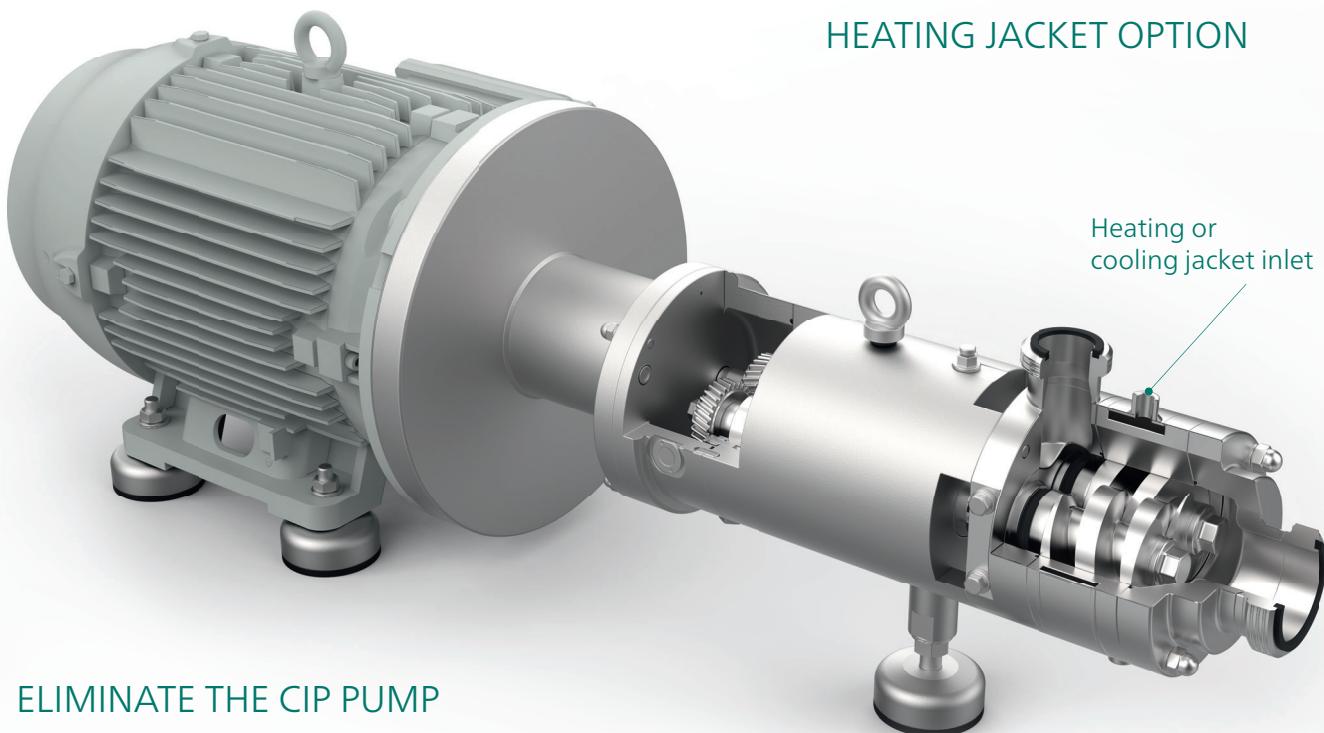


Adding a jacket for heating or cooling allows temperature control of the fluid

The standard version of the NOTOS® 2NSH Sanitary Twin Screw Pump can be equipped with a heating or cooling jacket. The jacket is installed around the entire housing in which the screws are located. An external, independent circuit heats or cools the jacket. This pump is perfect for applications where the pumped fluid tends to harden or requires temperature control to guarantee its quality.

#### General characteristics

- Heating or cooling jacket
- Heating/cooling medium: water 0 - 195 °F / 0 - 90 °C



ELIMINATE THE CIP PUMP

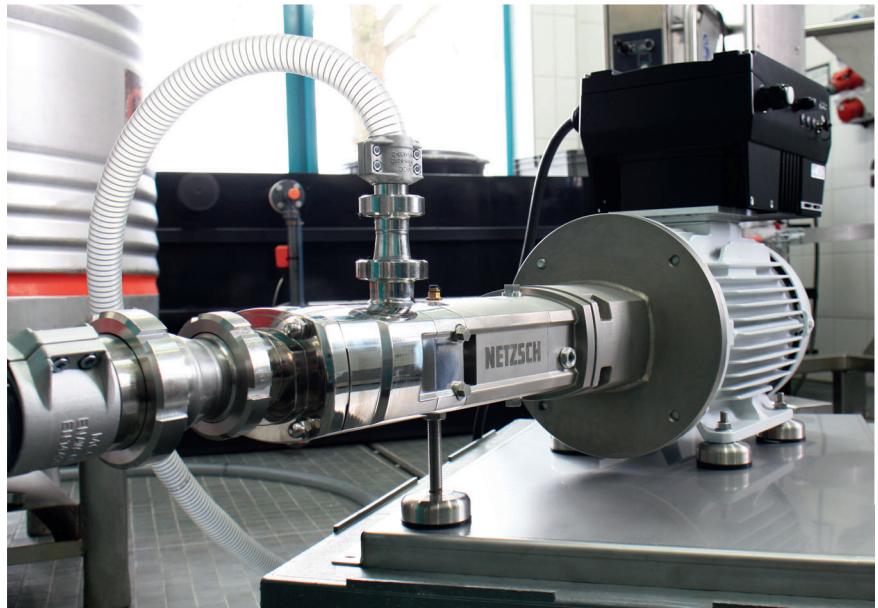
#### HEATING JACKET OPTION

Heating or  
cooling jacket inlet

# APPLICATION EXAMPLES OF 2NSH PUMP

## Juice and beverage industry

- Pump: NOTOS® 2NSH Size 3
- Media: Orange juice concentrate
- Flow rate: 110 gpm / 25 m<sup>3</sup>/h
- Pressure: 116 gpm / 8 bar
- Temperature: 40 °F / 5 °C
- Viscosity: 900 cP
- Self-aligned flanged design



## Chemical and pharmaceutical industry

- Pump: NOTOS® 2NSH Size 1
- Media: Shampoo
- Flow rate: 22 gpm / 5 m<sup>3</sup>/h
- Pressure: 90 psi / 6 bar
- Temperature: 77 °F / 25 °C
- Viscosity: 9,000 cP
- Foot design



# NETZSCH BARREL EMPTYING SYSTEM with NOTOS® 2NSH pump

NETZSCH Barrel Emptying Units pump their way through your products, reaching the bottom of the barrel or container in the food, chemical, and pharmaceutical industry with the absolute minimum waste of product – resulting in less than 1 % residual product in the barrel. The heart of the barrel emptying unit is a NOTOS® 2NSH pump. With positive displacement it creates a low pulsation flow to convey the product without damage. The products are only exposed to friction loss through the discharge piping. The NETZSCH single slide rail system raises and lowers the follower plate safely while providing a simple and easy structure to clean.

## Construction features

NETZSCH Barrel emptying NBE 200 + NOTOS® 2NSH pump. Sanitary connections available, such as TC, SMS, RJT, DIN and others.



## Your benefits

- Smooth and steady pumping
- Low pulsation
- Low shear rate
- Products that contain solids in suspension
- Flow independent of temperature or viscosity
- Almost complete emptying, residual product less than 1%

## NBE characteristics

- Continuous or intermittent emptying
- No pressure or flow interruption
- Low-pressure conditions in the entire system
- Suitable for conical barrels
- Adjustable discharge capacity
- Possible to meter directly from the barrel
- Flow in direct proportion to pump speed
- Equipped with VSD for easy adjustment
- Simple, single-rail design

## Applications

- Low to high viscosity
- Non-Newtonian and pastes
- Shear sensitive product
- Pump can handle product up to 500,000 cp



Barrel Emptying



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.

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