

**NETZSCH**

Proven Excellence.



## NEMO® FSIP® Design Progressing Cavity Pumps

The only true Full Service-in-Place (FSIP®) Progressing Cavity Pump

Pumps & Systems

NETZSCH is the worlds largest Progressing Cavity pump manufacturer and has manufactured over 1,000,000 progressing cavity pumps. NETZSCH has added this new service in place features for new installations as well as support the existing installed base with this upgrade.

# Good reasons

for choosing NEMO® FSIP® Design Progressing Cavity Pumps

## Benefit to the customer

Always focused on benefit to the customer, the NETZSCH product range covers everything from the smallest metering pumps with flow rates of a few ounces (milliliters) per minute to high-performance pumps that pump up to 2,500 gpm (550 m<sup>3</sup>/h). We also supply grinders and a comprehensive range of accessories. We supply everything in and around the pump to suit your application perfectly, because we understand your needs.

## Proximity to our customers

We guarantee proximity to our customers with more than 30 branches and 130 agencies around the world. Our application-oriented organizational structure across six business fields ensures that each of your contacts at NETZSCH® has detailed knowledge of the application, that national and international standards are complied with, and that contact routes are short, delivery is fast and on-site service is knowledgeable.



*Optional IFD-Stator®  
upgrade shown*

### Individual pump selection

Each pump is precisely tuned to the requirements of the application to deliver optimum performance, service life and reliability. Our pumps are available with conveying elements in four different rotor/stator geometries, so that the right solution can always be found for your application.

Another benefit from our continued investment in product development is a range of joints selected to suit each and every application no matter how demanding.

Lastly, we supply a comprehensive range of options and accessories, as well as expert service. We want you to stay in close contact with NETZSCH even after your pump has been commissioned.

Contact us and see for yourself.

### Large size, capacity and pressure range

- In sizes NM 045 and up
- Flow rates from 8 to 2,500 gpm / 2 to 550 m<sup>3</sup>/h
- Number of stages ranging from 1 to 8 for pressures up to 720 psi / 48 bar

### Broad range of applications

NETZSCH pumps are primarily used with product that has the following features:

- Free of solids to containing solids (max. solid size up to 6" / 150 mm)
- Low to high viscosity (1 cst to 10 million cst)
- Thixotropic and dilatant
- Shear sensitive or not
- Abrasive or non abrasive
- Non lubricating and lubricating
- Corrosive (pH 0 – 14)
- Adhesive
- Toxic

### Wide range of materials

Our range of metallic materials extends from cast iron and 316 stainless steel to highly acid-resistant materials such as Duplex, Hastelloy and Titanium for different conveying tasks. Ceramics and plastics are offered for aggressive and abrasive applications. Our elastomers range from highly abrasion-resistant natural rubber, to oil-, acid- and alkali-resistant elastomers as well as Aflas and Viton. For products in which elastomers cannot be used because of high temperatures or for reasons of durability, a substantial number of solid-based stators made from PTFE or metallic materials are available.

### Various conveying elements

Four different rotor/stator geometries are available (S, L, D and P) to ensure the design is optimally adapted to your specific task.

### Great variety of shaft seals

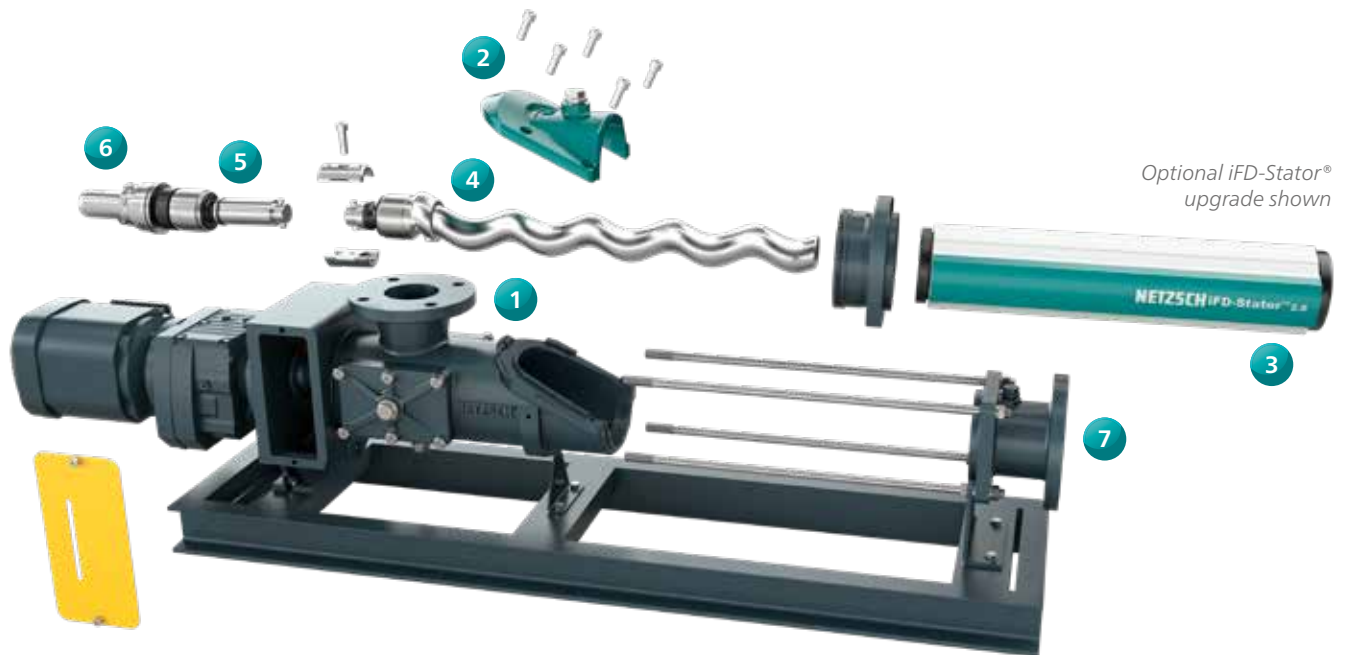
The range of mechanical shaft seals includes simple seals with and without quench, double-acting seals arranged back to back or in tandem, and cartridge seals. For specific applications, stuffing-box packing, lip seals and special seals are available. A pump with magnetic coupling is available for use with toxic product – for the greatest assurance there are no leaks.

### Additional features

- High suction capacity - up to 30 ftwc / 9 mwc
- Direction of rotation and flow can be reversed
- Can be installed in any position
- Quiet, smooth running
- Temperatures from -5 °F to 570 °F / - 20 °C to + 300 °C

# „Full Service-in-Place“

Pump service without removing the pump from the system



Optional iFD-Stator®  
upgrade shown

## 1 Housing, FSIP.1 Ready design with inspection cover

The inspection cover of the FSIP® design of the suction housing is the main difference from the standard design, but the housing dimensions remain unchanged.

- Most installed NEMO® BY/SY (flanged) pumps in the sizes NM045 and up can be easily upgraded.
- After upgrading you can fully service the pump while it is installed.
- Replace all wear parts in less than half the time.
- All wetted parts are immediately accessible.
- Oversized suction port for lower NPSHr.
- Two hand size cleanout/inspection ports 180° apart for access to the drive joint.
- Multiple drain ports, ability to rotate housing in 90° increments.
- Extra foot support to maintain housing position and account for any pipe stress for easier reassembly.
- No need to remove suction piping or electrical during servicing.
- Pump can operate in either direction for flow.

## 2 Inspection cover

The inspection cover is fixed by only 5 screws which can be easily removed without special tools.

- Access to rotor joint and split coupling rod

- Inspect joint without mess or spills
- Upper vent hole for suction gauge or priming.
- Allows for clean out as needed

## 3 Stator technology

The standard conventional stator is vulcanized inside metal tubes with integrated seals on both ends. Available for all sizes, materials, and stages.

- Uses standard stator parts/inventory (same existing parts if upgrading).
- No loss of flow, pressure, or cavity size when upgrading.
- Available in a wide variety of NEMOLAST® elastomers and metals.
- Stator inlet with tapered opening to improve product feeding into the cavity.
- Upgrade to Classic adjustable stator.

The iFD-Stator® consists of a two-part reusable housing with a polygonal profile and the NEMOLAST® elastomer housed within. Used for 1 and 2 stage rotors.

- Upgrade with no loss of flow, pressure, or cavity size.
- Solid one-piece removable stator with integral seal, no leak paths.
- Available in Buna and EPDM.
- Higher efficiency.



## Stator technology continued

- Increase life due to precise sealing line.
- Stator inlet with tapered opening to improve product feeding into the cavity.
- Exact stator compression is set when assembled to ensure longest service life.
- Simple and quick replacement (compression is removed during replacement).
- Environmental friendliness by recycling rubber and reuse of clam shell housing.
- Upgrade to xLC stator adjustment (available on some models).
- iFD-Stator® technology is available for sizes NM045 to 090 sizes in 01L and 02S geometries.



Upgrade to NEMO® xLC - adjustable iFD-Stator®, See xLC brochure for more details NPS-345-02-02/20-03

## 4 Rotor

Long lasting corrosion-resistant designs; various geometries, stages, and materials available.

- Uses standard rotor and stator parts/inventory (same existing parts if upgrading).

## 5 Drive train and Joint

Removing the inspection cover from the FSIP® pump you gain access to rotor joint for servicing.

- Longer connecting rod reduces angularity (<1%) of joint movement, increasing joint life.
- Robust joints with multiple joint design options depending on application or preference: pin, gear, pinion, etc.
- 316 SS sleeves or housings to protect joint.
- Single or double seal options.
- Abrasion and puncture resistant options available.

### FSIP.2 Advanced two-piece coupling rod.

- Removing the inspection cover from the FSIP® pump you gain access to two-piece coupling rod joined by two coupling halves.
- Precision pins or hex head to transfer torque, not threaded bolts.
- One screw disconnects coupling rod and rotor joint.
- Remove part of coupling rod and rotor/stator as a cartridge assembly or as individual components.
- No small pieces to lose or break.

## 6 Mechanical Seal

Standard for the FSIP® version is a NETZSCH universal slurry seal (uNS) single acting mechanical seal with rubber bellows and knife edge silicon carbon (SIC) seal faces. Specifically designed for sludge's and slurries.

- No need to remove gearbox or piping to service seal.
- Seal is positioned under the suction flange in the flow path for constant lubrication, not in dead zone.
- Optional quench and flush options available.
- Compatible with other seal manufacturers: component seals, single or double cartridge seals, packing and other seal options are available.

### FSIP.3 Pro with Cartridge style mechanical seal

- Cartridge style mechanical seal easily removed, no additional hardware needed.
- Completely remove rest of drivetrain for servicing (only housing remains)
- Easily remove uNS seal through the large inspection opening with use of the two side hand holes.
- Seal faces never exposed or put at risk during assembly or disassembly.

## 7 Flange

End stud flange (normally discharge flange) compresses stator to pump housing with the used of the tiebar bolts.

- Port for Pressure Gauge or vent, or turned downward to act as a drain.
- Different connection sizes are available.
- No need to remove discharge piping during servicing.

# NEMO® Progressing Cavity Pump in FSIP® Industrial Pumps

FSIP.Ready, FSIP.Advanced and FSIP.Pro

## Technology

The FSIP® design is fully compatible with the existing BY and SY series. The concept consists of three levels, FSIP.Ready, FSIP.Advanced and FSIP.Pro, which are designed to upgrade already installed pumps step by step, or which are available for new installations according to the individual needs of the customer and requirements of the application.



### FSIP.1 Ready

The FSIP.1 Ready version has a new housing design with a large inspection cover to easy access and inspection of oth joints. This pump can have various seals, drives, and connections options for a wide range of pumpable products.



### FSIP.2 Advanced

Has all the benefits of FSIP.Ready and a split coupling rod that allows for the rotor and stator to be serviced in place. No need to disconnect the piping or electrical to service.



### FSIP.3 Pro

Has all the benefits of FSIP.Advanced and a cartridge-design mechanical seal for true "Full Service-In-Place". No need to disconnect the piping, electrical, gear box, or motor to service. Drive shaft and seal can be removed as one assembly.

# NEMO® FSIP® Industrial Flanged Pumps

NEMO® FSIP® progressing cavity BY/SY flanged pumps include the new designed housing with the larger inspection cover, upgradable two coupling, and cartridge style mechanical seal for easy FSIP® maintenance.

## NEMO® BY FSIP®

block design (direct coupled) with standard stator



## NEMO® SY FSIP® in Stainless Steel

bearing housing design or as NEMO® BY block design



### Performance

Flow rates from 8 to 2,500 gpm / 2 to 550 m<sup>3</sup>/h at pressures up to 360 psi / 24 bar. Pump sizes NM045 and up.

### Fields of application

Water/wastewater treatment, chemical, oil & gas, or anywhere a pump is needed for non viscous to viscous fluids with or without solids.

### Features

This is the entry model of our FSIP® line. It includes the basic NEMO® BY features and compact design but has the revised housing configuration with large inspection cover, standard drive train, various seal arrangements and a standard stator. This model can be upgraded to the FSIP. Advanced or FSIP.Pro. It is available in cast iron or AISI 316 SS.

# NEMO® FSIP® Industrial Flanged Pumps

NEMO® FSIP® progressing cavity BY/SY flanged pumps include the new designed housing with the larger inspection cover, upgradable two coupling, and cartridge style mechanical seal for easy FSIP® maintenance.

## NEMO® SY FSIP®

bearing housing design



## NEMO® SY FSIP® in Stainless Steel

bearing housing design or as NEMO® BY block design



### Performance

Flow rates from 8 to 2,500 gpm / 2 to 550 m<sup>3</sup>/h at pressures up to 720 psi / 48 bar.  
Pump sizes NM045 and up.

### Fields of application

Water/wastewater treatment, chemical, oil & gas or anywhere a pump is needed for non viscous to viscous fluids with or without solids.

### Features

It includes the basic NEMO® SY features and flexibility of different types of drives, but also includes the revised housing configuration with large inspection cover, standard drive train, various seal arrangements and a standard stator. This model can be upgraded to FSIP.Advanced or FSIP.Pro. It is available in cast iron or AISI 316 SS.



# NEMO® FSIP® Industrial Hopper Pumps

For product with a very dry material content, such as de-watered sludge are available either for different designs of the NEMO® hopper pumps with screw conveyors or also with our aBP Module® to prevent bridging.

## NEMO® BO FSIP® Design

block design with rectangular open hopper and force feed chamber or as NEMO® SO with bearing housing design

### Performance

Flow rates from up to 700 gpm /  
160 m<sup>3</sup>/h at pressures up to 720 psi/ 48 bar.

### Fields of application

Industrial applications in environmental technology and in the food, oil and chemical industries for fluid with high consistency, with and without solids.

### Features

Design includes direct flange drive, housing with rectangular feed hopper and large inspection cover, coupling rod with conveying screw and a compression chamber that provides improved product feeding into the conveying elements. This model can be upgraded to the FSIP.advanced or FSIP.pro. Available in carbon steel and AISI 316 SS.



## NEMO® BF in FSIP® Design

block design with open hopper and force feed chamber or as NEMO® SF with bearing housing

### Performance

Flow rates up to 400 gpm / 90 m<sup>3</sup>/h  
at pressures up to 720 psi / 48 bar.

### Fields of application

Industrial applications in environmental technology, the food industry and the chemical industry for fluids with high consistency, with or without solids.

### Features

Housing design with enlarged, rectangular feed hopper has a removable, cone-shaped compression chamber. The design includes a coupling rod with patented, horizontally positioned conveying screw for optimum product feeding into the conveying elements. The maintenance-friendly design with discharge flange extension facilitates stator and rotating parts change out without the need to remove the discharge pipeline. Available in carbon steel and AISI 316 SS.



# FSIP® Pump Applications

## NEMO® FSIP® progressing cavity pumps

- Application: polymer pumps for wastewater treatment
- NEMO® Pump NM045 BY, 1 stage
- Fluid: blended polymer
- Flow: 60 gpm / 14 m<sup>3</sup>/h
- Pressure: up to 25 psi / 1.5 bar
- Temperature ambient



## NEMO® FSIP® progressing cavity pump and N.Mac® grinder

- Application: wastewater treatment
- NEMO® Pump NM63 BY, 1 stage
- Fluid: 3% primary sludge
- Flow: 120 gpm / 27 m<sup>3</sup>/h
- Pressure: up to 30 psi / 2 bar
- Temperature ambient



## NEMO® FSIP® progressing cavity pump

- Application: wastewater treatment
- NEMO® Pump NM90 BY, 1 stage
- Fluid: Blended sludge up to 4% solids
- Flow: 250 gpm / 57 m<sup>3</sup>/h
- Pressure: up to 58 psi / 4 bar
- Temperature ambient



## NEMO® FSIP® Open Hopper progressing cavity pump

- Application: wastewater treatment
- NEMO® Pump NM105 BO, 1 stage
- Fluid: 6% thickened sludge
- Flow: 180 gpm / 41 m<sup>3</sup>/h
- Pressure: up to 90 psi / 6 bar
- Temperature ambient



## NEMO® FSIP® progressing cavity pump


- Application: Industrial - chemical
- NEMO® NM031SY, 12 stage
- Fluid: Ethanol with glass fines
- Flow: 6 gpm / 1.4 m<sup>3</sup>/h
- Pressure: 1,000 psi / 70 bar
- Temperature: 68°F to 104°F / 20 to 40°C



## NEMO® FSIP® progressing cavity pump

- Application: wastewater treatment
- NEMO® Pump NM090BY, 2 stage
- Flow: 135 gpm / 31 m<sup>3</sup>/h
- Fluid: 3% sludge
- Discharge Pressure: 120 psi / 8 bar
- Temperature: ambient





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 3,800 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 with NEMO® progressing cavity pumps, TORNADO® rotary lobe pumps, NOTOS® multi screw pumps, macerators/grinders, metering technology and equipment custom built for challenging solutions for different applications globally.

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