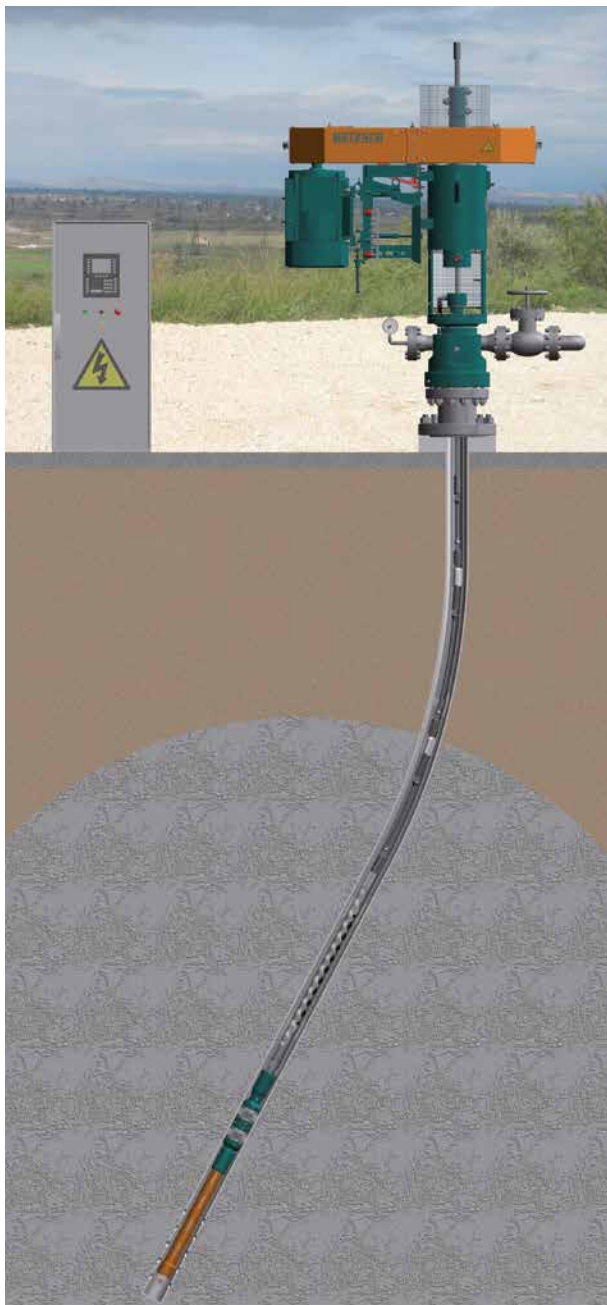


# Optimum UPSTREAM Solutions

## for Oil Water and Gas Production

The Progressing Cavity Pump System – the perfect solution when you face difficult media in the oilfield



### Pump Equipment

- PC Pump
- Insertable Pump
- Torque Anchor
- Gas Separator
- Accessories

### Drive Head Equipment

- Drive Head
- Three Phase Motor
- Control Panel
- Accessories

### Rod String Equipment

- Sucker Rod
- Pony Rod and Polished Rod
- Non Rotating Centralizer
- Accessories

### Well Head Equipment

- FBOP and SBOP
- Flow Tee
- Spool and Well Head Adapter

#### Further information

Product Catalogue  
Brochure NPS · 501

Application Range

CONVENTIONAL  
OIL PRODUCTION

HEAVY OIL  
PRODUCTION

DEWATERING  
OF GAS WELLS



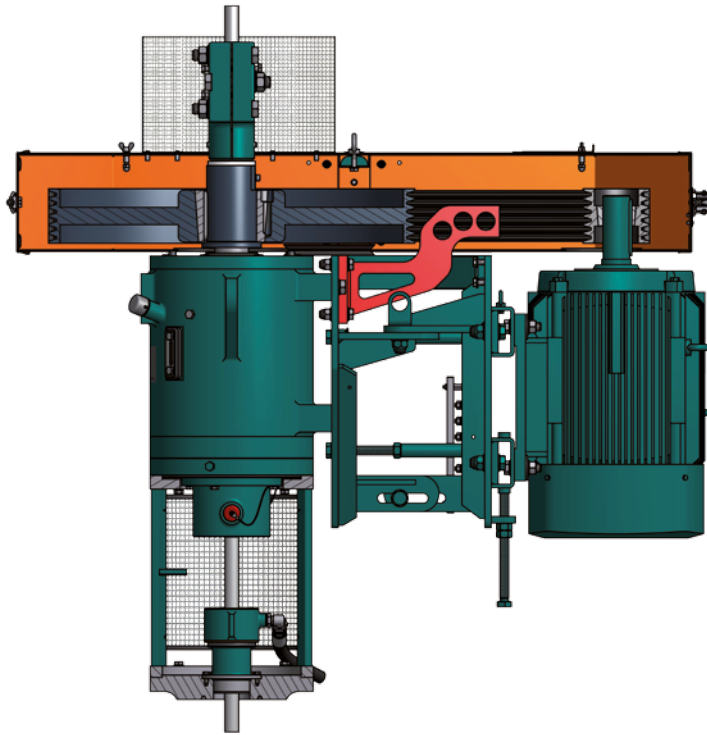
THERMAL WATER  
PRODUCTION

COAL BED METHANE/  
COAL SEAM GAS



# NETZSCH Drive Heads

APPLICATIONS HAVE PROVED THEIR RELIABILITY OVER DECADES



## General features

- Different polished rod velocities can be achieved by changing the pulleys or by using a variable speed drive
- All drive head types can be supplied for the polished rod sizes 1 1/4 and 1 1/2
- Axial load: 9 to 33 klb
- Sealing system: stuffing box, mechanical seal or lip seal system
- Flow tee connection: flange API Spec. 6A type 6B/thread API 5B

NETZSCH Drive Heads – model ATEX – are approved in compliance with directive 94/9/EC for use in zone 1 (compared to name plate zone II 2G EEx c,k II T3 classification and the conformity declaration).

The drive head is designed for commercial plant and in conformity to the following regulations and norms:

- Conformity to the Machinery Directive 2006/42/EC
- Conformity to pertinent provisions of ATEX Directive 94/9/EC
- Conformity to pertinent provisions of directives:
  - DIN EN 13463-1
  - DIN EN 13463-5
  - DIN EN 13463-8
  - DIN EN ISO 12100
  - DIN EN 1127-1
  - ISO 15136-2

## Drive Head Accessories

Very often small accessories can be decisive for the safety of the service people and for the lifetime of the equipment. Based on the service experience for more than 20 years of PCP downhole pump installations and start ups NETZSCH offers a wide range of special tools.

## Benefits and special features

- Operation in explosive atmospheres (CE II 2G EEX c, k IIB T3)
- Integrated overload protection
- Integrated hydraulic brake
- Integrated safety clamp
- Exchangeable sealing box
- Exchangeable flange connections

## Spare part sets

on special request

## Vertical Drive Head GH

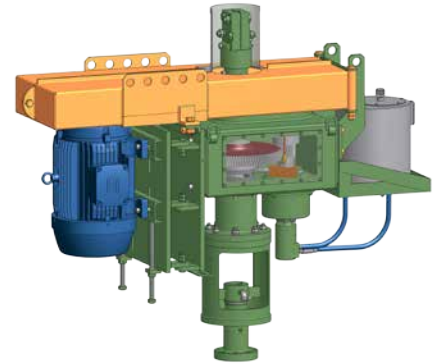
Integrated Gear Box GH – Hollow Shaft

### Features

- Used especially for high load (motor power)
- Integrated reduction allows a rotation reduction ratio of 1:4.

### Specifications

- Power: 20 to 100 hp
- Speed range: 60 to 400 rpm
- Maximum torque: 3400 Nm
- Brake system: hydraulic Motor
- Transmission: gear box, pulleys and belts



## Right Angle Drive Head RH

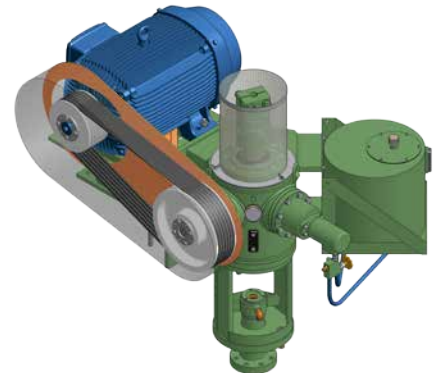
Angle Drive with Gearbox RH – Hollow Shaft

### Features

- Used especially for very low polished rod speed
- The drive head has an integrated gear reduction
- The geometry of the angle drive head allows the alternative use of a combustion motor or hydraulic motor.

### Specifications

- Power: 20 to 60 hp
- Speed range: 60 to 400 rpm
- Maximum torque: 2500 Nm
- Brake system: hydraulic, hydraulic motor or mechanical
- Transmission: gear box, pulleys and belts



## Vertical Drive Head DH

Direct Drive DH – Hollow Shaft

### Features

- Used for applications with higher rotations
- Economical and reliable

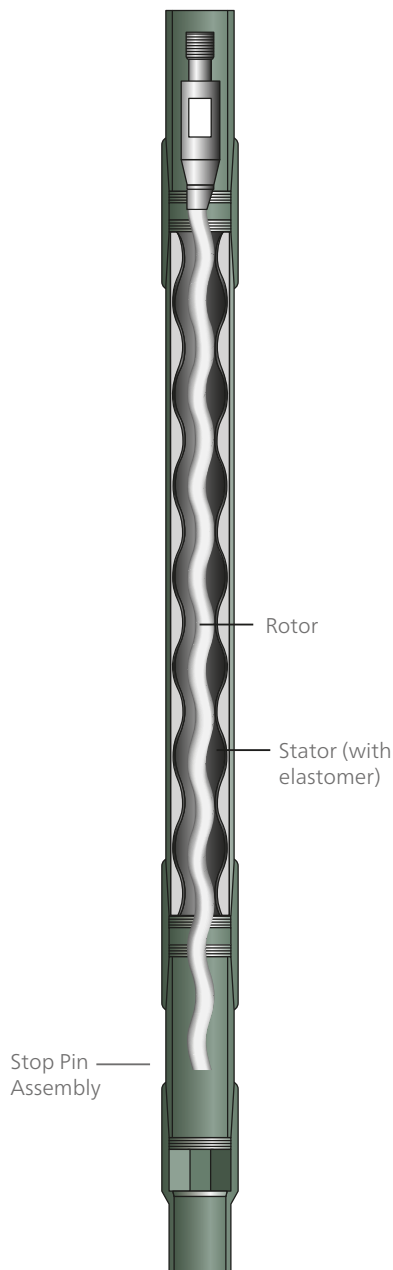
### Specifications

- Power: 20 to 75 hp
- Speed range: 100 to 500 rpm
- Maximum torque: 2000 Nm
- Brake system: hydraulic or hydraulic motor
- Transmission: pulleys and belts



# PCP Pump Types

MAKE THE RIGHT CHOICE FOR THE RIGHT APPLICATION



NTZ-DT Geometry



NTZ-ST Geometry

## NTZ Rubber-metal Progressing Cavity Pumps

### Efficient handling of fluid

- High viscosity oil – more than 50.000 cP at the well head
- High sand content – up to 40% at the suction side
- High gas content – app. 40% free gas at the suction side
- Water cut – up to 100%
- Density – up to 0.82 kg/dm<sup>3</sup> (45° API)
- Temperature – up to max. 160°C
- Pressure – up to 300 bar
- Production – up to 300 m<sup>3</sup>/day (1900 bpd)

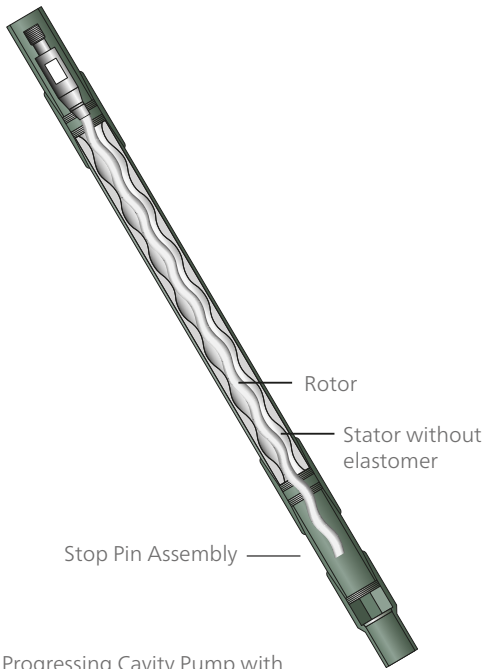
### Advantages

- Low life cycle cost
- Easy installation and transport
- Less number of wear parts

Pump Type	Various types				
	nominal production rate [m <sup>3</sup> /d]	nominal production rate [bpd]	max. differential pressure [bar]	minimum tubing size	minimum casing size
NTZ 166*	0,5 to 4,5	3 to 30	240	1,66"	3 1/2"
NTZ 238*	1,3 to 15	8 to 80	240	2 3/8"	3 1/2"
NTZ 278*	3 to 130	20 to 800	300	2 3/8"	4 1/2"
NTZ 350*	13 to 140	80 to 880	300	2 7/8"	5 1/2"
NTZ 400*	25 to 475	160 to 3000	240	2 7/8"	5 1/2"
NTZ 450*	60 to 390	375 to 2450	240	3 1/2"	6 5/8"
NTZ 500*	110 to 475	695 to 3000	200	4 1/2"	6 5/8"

## NTZ Metal-metal Progressing Cavity Pumps

- Maximum flexibility in the perspective of viscosity and temperature
- No elastomer: no risk caused by chemically aggressive fluids
- Perfectly suited for thermal treatment of the wells



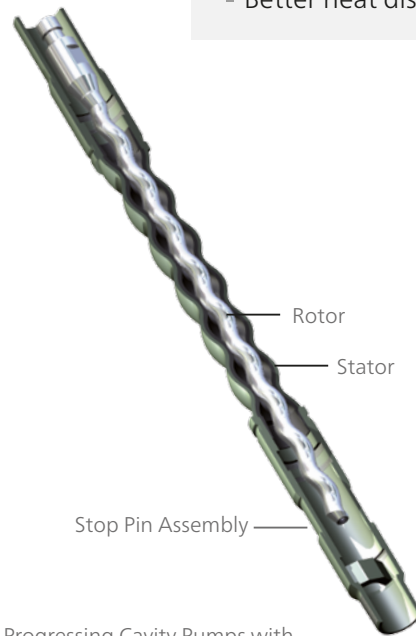
Progressing Cavity Pump with full metal stator – NTM

## NTU Even wall Progressing Cavity Pumps

Produced with steel tube corresponding to the internal geometry of the stator (helical). Thus the elastomer has a uniform wall thickness featuring a lower operational and starting torque due to its lower swelling when exposed to temperature varying and chemically aggressive fluids.

### Advantages

- Short pump length
- Lower starting and operational torque
- Longer run life under severe fluid conditions
- Less influence due to temperature and chemicals
- Easier to assemble in wells with deviations
- Lower hysteresis
- Better heat distribution



Progressing Cavity Pumps with Uniform Elastomer Wall – NTU



NTZ-DTM Geometry



NTZ-STM Geometry



NTU-DT Geometry



NTU-ST Geometry



# Special Pumps

## AND SPECIAL PUMP SYSTEMS

### NSPCP® – NETZSCH Submersible Progressing Cavity Pump

#### Applications

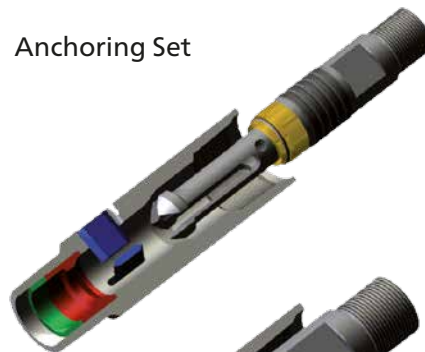
The main feature of the Submersible Progressing Cavity Pumps (rotor & stator) is their assembly inside the tubing. Thus, the pump is not connected to the production line but assembled inside it. Therefore it is ideal for:

- Wells with low flow – the cost of the intervention makes the use of a normal pump economically not suitable
- Wells with a high frequency of interventions (independent of the flow)
- Flow range 1,3 to 491 bpd at 100 rpm
- Pressure range 100 to 240 bar
- Pump with downhole sensors

#### Advantages

- Minimal time of intervention
- Minimal costs of rig
- Minimal rig's costs in workover services
- Minimal production losses
- Pump change without removing it from the tubing
- Pump change with flushby equipment
- Up to 60 % savings in pump replacement
- No removal of downhole sensors and cable

#### Anchoring Set

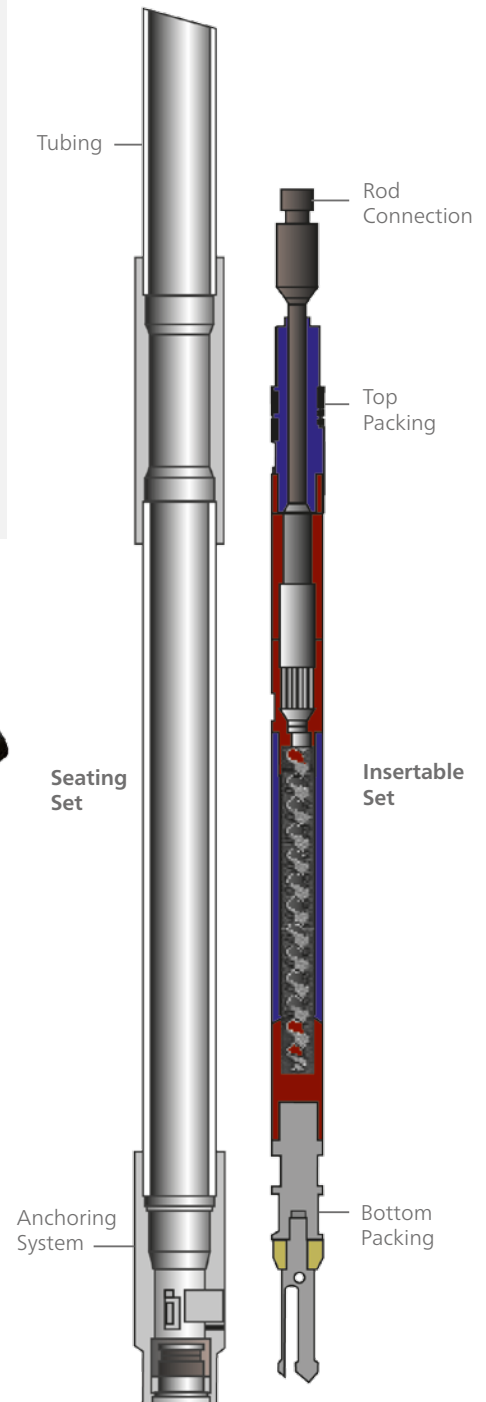


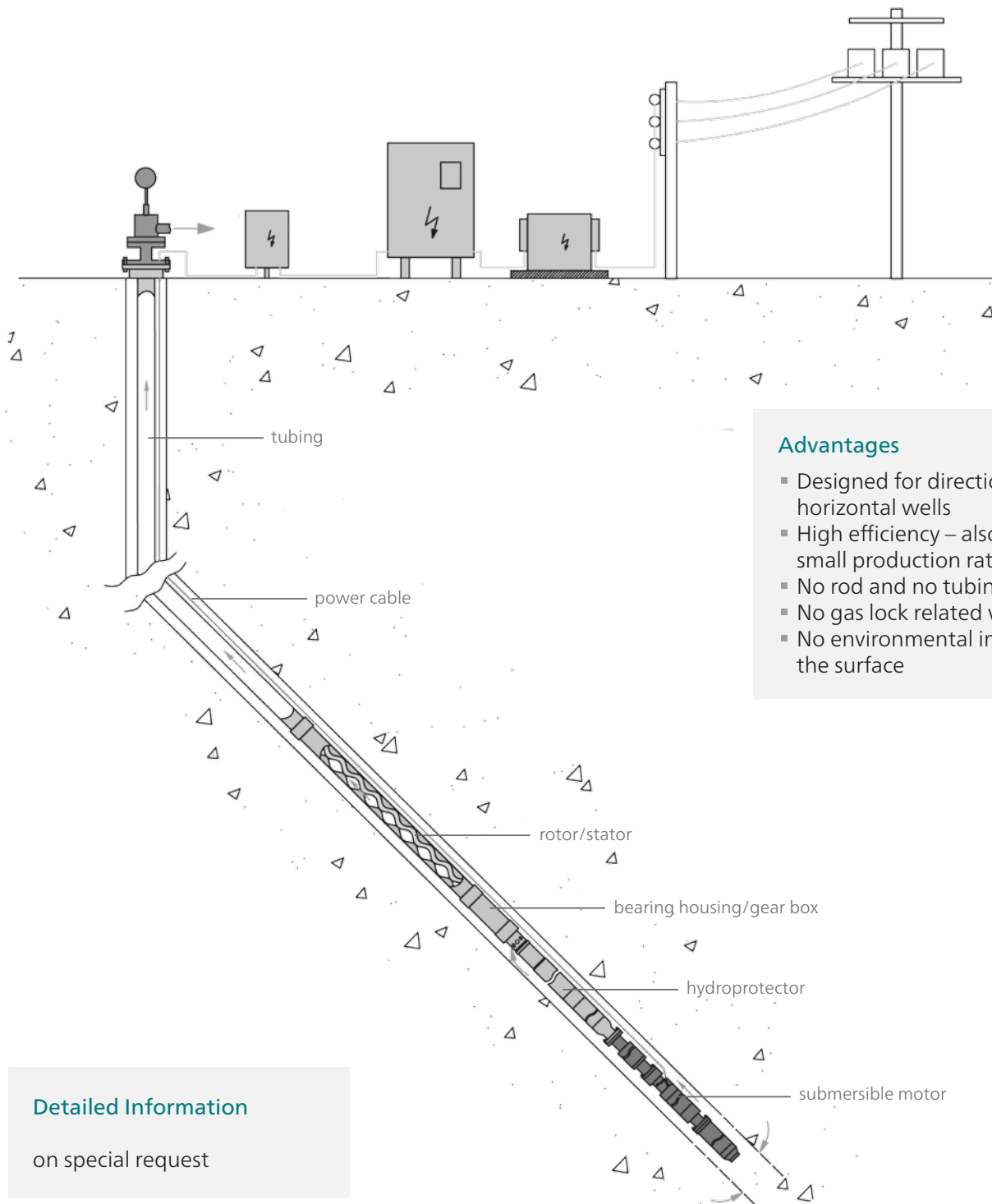
Not Anchored

Anchored

#### Detailed Information

on special request





### Advantages

- Designed for directional and horizontal wells
- High efficiency – also with small production rates
- No rod and no tubing wear
- No gas lock related with ESP
- No environmental impact on the surface

### Detailed Information

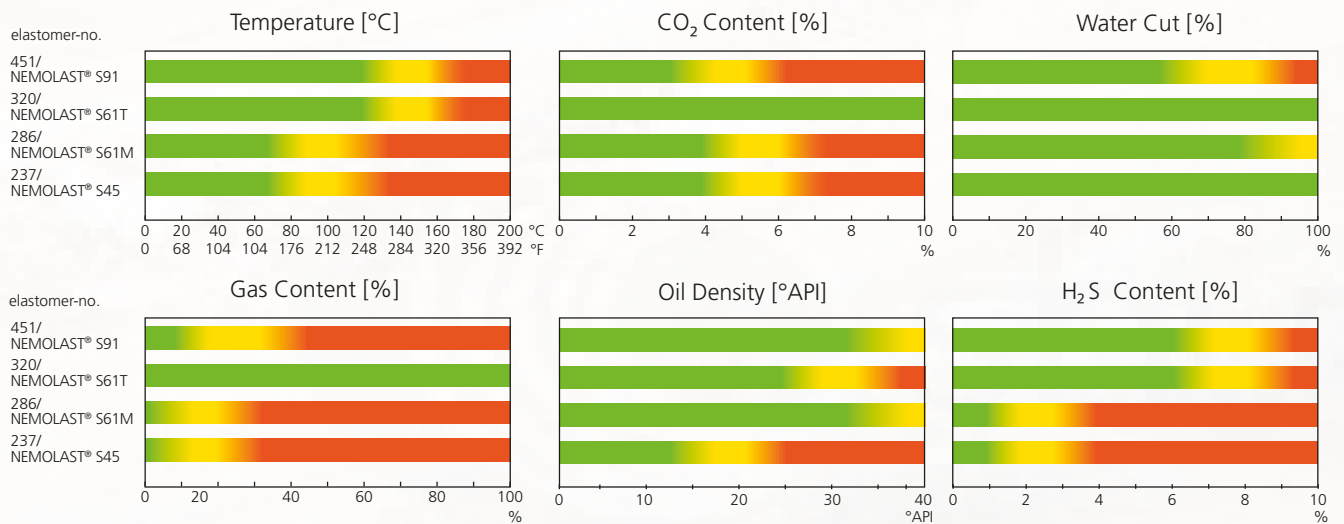
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# Technical Features

## Material and Efficiency Information

### Elastomer Overview

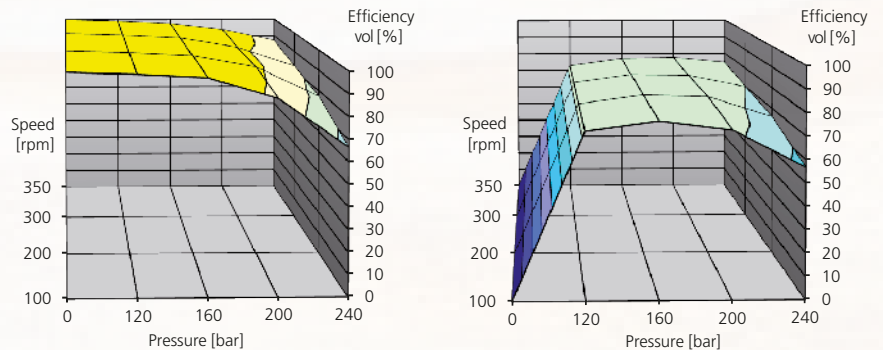


Please take into consideration that the given material limits are a guideline. The final selection has to be based on a detailed analysis (e.g. swelling test).

■ recommended range    ■ caution range  
■ not recommended

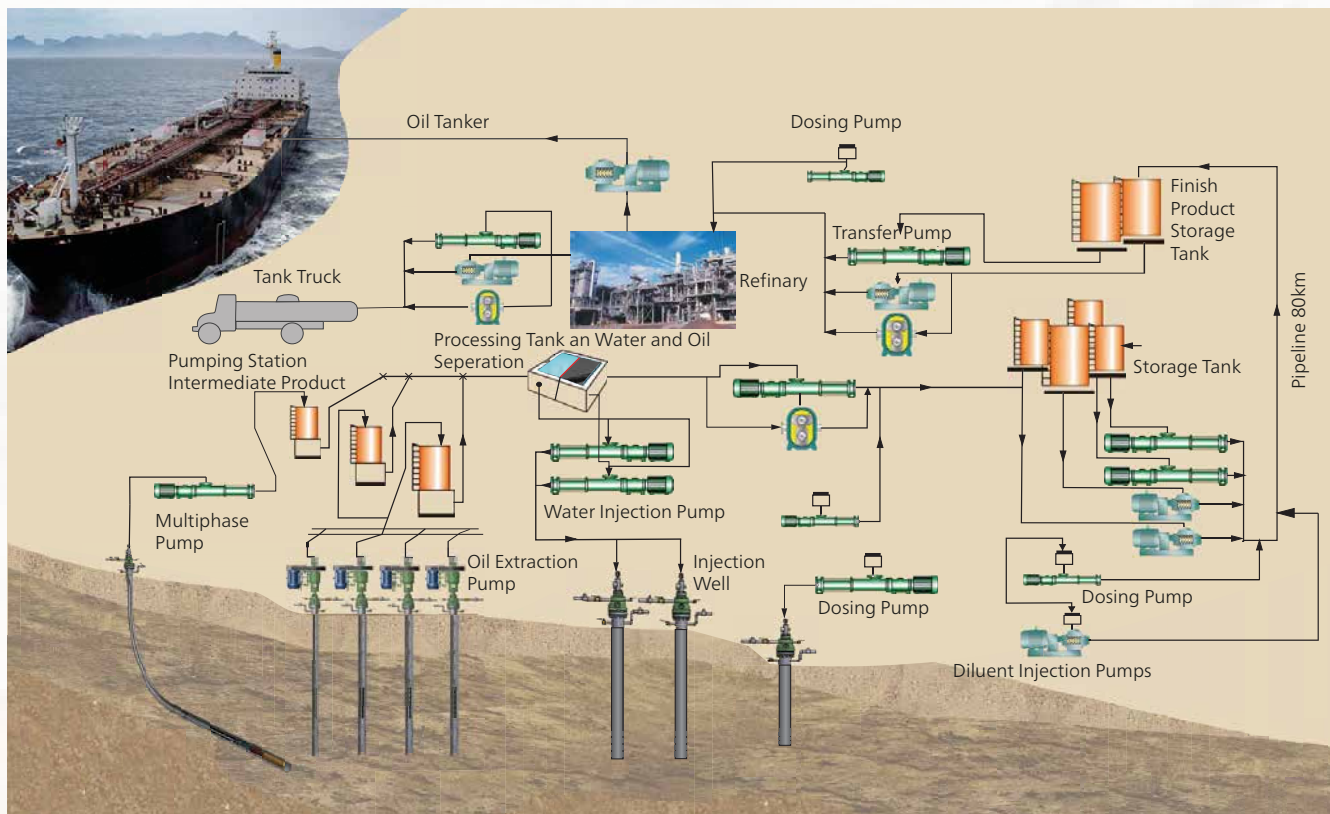
### Efficiency of Oil Production

The general efficiency is normally between 40 % and 70 %, compared to a 30 % efficiency for plunger pumping units and 35 % for electrical submerged centrifugal pumps. The range of volumetric efficiency of NETZSCH down-hole PC pump systems is 75 % – 95 %.





## Application Process Flow Chart in Oil Field


From Upstream through Midstream and Downstream Application, the wide product range of NETZSCH Pumps and Systems for the Oil & Gas Industry provides the optimum solution for you.





 NEMO® Progressing Cavity Pumps

 NEMO® Progressing Cavity Pumps, lubricant

 TORNADO® Rotary Lobe Pumps

 Submersible Driven Downhole PC Pumps

 Top Driven Downhole PC Pumps

 NOTOS® Multiple Screw Pump

# Optimum NETZSCH Products

## For mid-/downstream applications

The highest standards for equipment and safety are a basic requirement for oil field work to ensure that processes remain safe and reliable. NEMO®, TORNADO® and NOTOS pumps contribute to such safety and reliability. The complexity of pump media ranges from highly viscous to low-viscous, from shear-sensitive to heavily laden with solid matter. The sophisticated and reliable design meets the particular pump job requirements and contributes to efficient process control. These pumps meet the requirements of API 676 3<sup>rd</sup> edition and also NACE MR-0-175.

### **NEMO® Progressing Cavity Pumps**

Standard pumps  
Hopper pumps  
Immersible pumps  
High pressure pumps  
(injection pumps)  
L.Cap® High performance pumps  
Custom built pumps

### **TORNADO® Rotary Lobe Pumps**

Standard pumps  
Custom built pumps

### **NOTOS Multiple Screw Pumps**

2 Screw Pump: 2 NS  
3 Screw Pump: 3 NS  
4 Screw Pump: 4 NS

### **NETZSCH Engineering**

Testing and quality control  
Inspection and certification  
Special documentation

### **NETZSCH Accessories**

Protection devices  
Flushing/Sealing pressure devices  
Control systems  
Trolley assemblies  
Tools  
Skids  
Valves

### **Wide Range of Applications**

NEMO® progressing cavity pumps are normally used for fluids having the following properties:

- Shear-sensitive
- Low to high viscosity
- With or without solids
- Dilatant or thixotropic
- Abrasive
- Adhesive

### **Quality and choice**

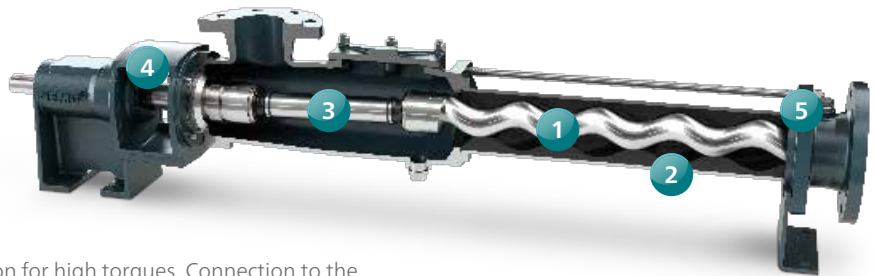
We manufacture according to international standards and are certified according to DIN EN 9001: 2000. We weld in accordance with ASME IX and use materials such as Chromium-Nickel steels, Duplex and Super Duplex steels, Hastelloy, Titanium, as well as synthetic and ceramic materials. NBR, HNBR and Viton are employed as elastomers. Materials are coated with corresponding products.

- Shaft seals are available according to API 682 with installation space API 610.
- Stuffing-box packing, lip seals, single-acting mechanical seals with and without quenching, dual-acting mechanical seals (back-to-back or tandem) as well as shaft seal-free designs with magnetic coupling.
- Thermosyphon systems according to API designs.



### NEMO® BY block construction pump

Compact design with flanged drive; low investment, operating and maintenance costs. Four rotor/stator geometries for optimised performance.



### NEMO® SY bearing housing pump

Bare shaft pumps with double bearing in cast iron for high torques. Connection to the drive through flexible couplings, spacer couplings according to DIN or API.

#### 1 Rotor

Wear and corrosion resistant design in all usual materials, as well as Duplex, Super Duplex, 254 SMO, Monel etc. (materials acc. to NACE available), hardened rotors to transfer medium with sand.

#### 2 Stator

Vulcanised into a tube, with integrated seals on both ends in a variety of elastomers, plastics or metals. Stators with equal wall thickness for high temperature variations. We also supply special materials HSB, HNBR for products including H<sub>2</sub>S and high temperature.

#### 3 Drive Chain

Drive shaft and connecting shaft with coupling rod and two universal joints for power transmission from the drive to the rotor in all usual materials, as well as Duplex, Super Duplex, 254 SMO, Monel etc. (materials

according to NACE possible). For high volume and high pressure applications double seal pivot joints are available. It features high intensity, long-life and steady transmission.

#### 4 Shaft Seal

Standard design with single acting, wear resistant mechanical seal independent of the direction of rotation; on request different types of single/double acting mechanical seals by various manufacturers, cartridge and special seals with circulation systems.

#### 5 Suction and Pressure Housing

Flanges acc. to DIN, ANSI, JIS etc. or threads. Materials as cast iron, cast iron internal rubber-lined, Halar® coated, AISI 316 L or Ti, Duplex, Super Duplex, 254 SMO, Monel etc. (materials according to NACE available).

# NETZSCH Multiphase Pumps

SUBSTITUTE THE EXPENSIVE ON-SITE SEPARATION

## NETZSCH Multiphase Pump

### Large Range of Capacities and Pressures

- Flow rate from a few m<sup>3</sup>/h up to 600 m<sup>3</sup>/h (91,000 bpd)
- Pressure up to 60 bar
- NEMO L. Cap<sup>®</sup> high performance pumps in single and twin design cover flow rates up to 1000 m<sup>3</sup>/h (151,000 bpd)

### Applications

- Pumping of oil, gas or water mixtures with solids
- Pumping from the well to the manifolds or gathering stations

NM105SY  
Capacity: 44-94 m<sup>3</sup>/h  
Pressure: 18 bar  
Medium: multiphase water,  
gas, crude oil, H<sub>2</sub>S  
Gas rate: 85%

NM090SY  
Capacity: 11,5-50-55 m<sup>3</sup>/h  
Pressure: 23-30-35 bar  
Medium: oil, water, gas  
Gas rate: 35%







NM053SY

Capacity: 2-12 m<sup>3</sup>/h

Pressure: 28-40 bar

Medium: oil, water, gas 20-30%

Gas rate: 32%

#### Advantages

- High content of sand and/or gas
- Low operating and maintenance cost
- Very low emulsifying effect on oil/ water mixtures
- Efficient transport of oil/water mixtures with a very high content of sand and/or gas
- Efficient transport of highly viscous products
- Almost pulsation-free pumping
- Installation in any position
- Near to no shear rate

#### Further information

NETZSCH Multiphase Pumps  
Brochure NPS · 409





# NETZSCH Transfer Pump

IDEAL FOR LOW PRESSURE APPLICATIONS

## Transfer with NEMO® Progressing Cavity Pumps

### Large Range of Capacities and Pressures

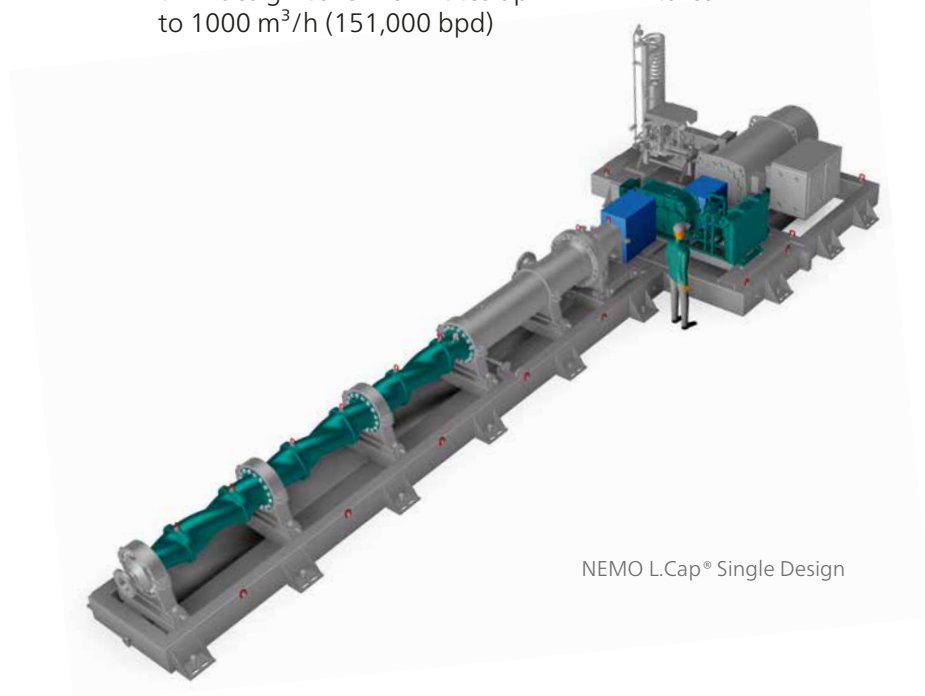
- Flow rate from a few m<sup>3</sup>/h up to 1000 m<sup>3</sup>/h (91,000 bpd)
- Pressure up to 36 bar
- The NEMO L. Cap® high performance pumps in single or twin design cover flow rates up to 1000 m<sup>3</sup>/h (151,000 bpd)

### Advantages

- Low operational cost
- Efficient handling of viscous medium
- Transfer with high metering, repeated precision up to ±1 %
- Low emulsion of oil/water mixtures

### Applications

- Transfer of viscous polymers from storage-tank to polymer stations
- Transfer of dilute polymer to well
- Transfer of crude oil from well to gathering station
- Pumping of exhausted polymers
- Transfer of sewage and mud
- Pumping of drilling sludge
- Pumping of slurries
- Pumping of cuttings
- Unloading of tank-trucks (special version for low ambient temperatures)
- Tank cleaning



NEMO L.Cap® Single Design



## Transfer with TORNADO® Rotary Lobe Pumps

The TORNADO® rotary lobe pumps are self priming, valveless and offer high performance. They are designed for intermittent or continuous operation and provide gentle pumping of the media are ideally suited to transfer, process and dosing applications. They are selected and configured for the individual requirements of each application.

### Large Range of Capacities and Pressures

- Flow rate from a few m<sup>3</sup>/h up to 1,000 m<sup>3</sup>/h (151,000 bpd)
- Pressure up to 6 bar

### Advantages

- Variable, modular system
- Robust and space saving design
- Three lobe geometries
- Highly abrasion resistant protection plates or housing liners
- Adjustable housing for long service life
- Standard mechanical seal, fitted for any DIN 24960 seal (optional)
- The patented timing gear on the T1, its separate seals for pump and drive housing prevent ingress of any product leakage
- Bearing shafts on the rotary lobes with polygonal plug-in connection simplify maintenance of the T1
- T2 with Full-Service-In-Place Design



TORNADO® T1



TORNADO® T2

### Further information

TORNADO® T.Proc® Oil & Gas  
Brochure NPS · 088





# NETZSCH Injection Pumps, NETZSCH Sump and Caisson Pumps

FOR HIGH PRESSURE APPLICATIONS  
AND HIGH VISCOUS PRODUCTS

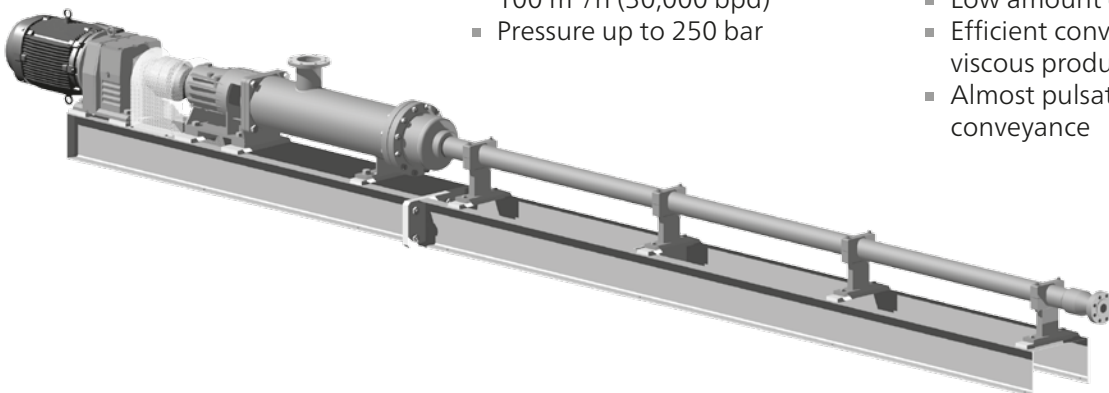
## NETZSCH Injection Pump

### Large Range of Capacities and Pressures

- Flow rate from a few m<sup>3</sup>/h up to 100 m<sup>3</sup>/h (30,000 bpd)
- Pressure up to 250 bar

### Advantages

- Low operating and maintenance cost
- Low amount of wearing parts
- Efficient conveyance of highly viscous products
- Almost pulsation-free conveyance



## NETZSCH Sump and Caisson Pump

### Large Range of Capacities and Pressures

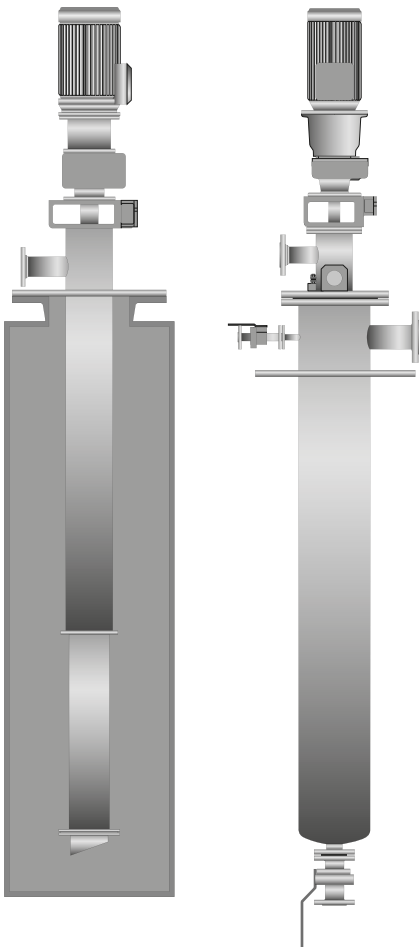
- Flow rate from a few m<sup>3</sup>/h up to 300 m<sup>3</sup>/h (45,000 bpd)
- Pressure up to 24 bar
- Immersible depth up to 12 m
- NEMO L.Cap® in vertical design covers flow rates up to 300 m<sup>3</sup>/h

### Applications

- Handling of reclaimed oil
- Oil-seawater
- Mud-seawater
- Emptying of crude oil wagon
- Emptying tanks
- Pumping of hydrocarbon condensate

### Advantages

- Compact equipment
- High efficiency
- Transfer of viscous medium with solids
- No dry-running
- Convenient installation







# NETZSCH Gas Compressor

PCP GAS COMPRESSORS INCREASE THE WELL'S PRODUCTIVITY

## Goals

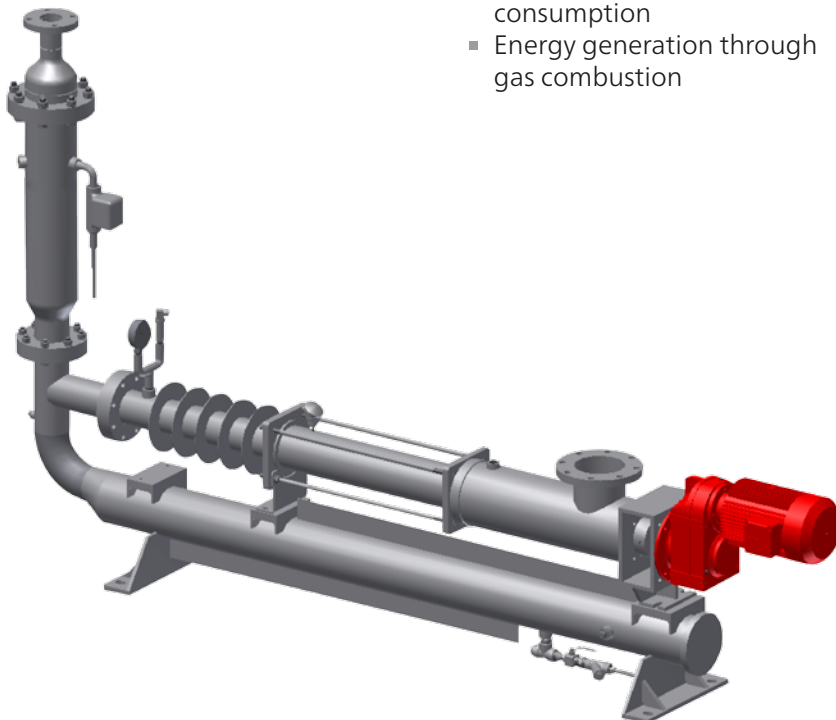
- Reducing backpressure on casing
- Gas canalization for consumption
- Energy generation through gas combustion

## Consequences

- Increases well's productivity
- Increases pump's efficiency, as less gas passes through the pump;
- Creation of self sufficient field: using natural resources to create energy and avoid gas being released into atmosphere

## Advantages

- Managing low and medium volume of gas
- Cheaper than standard compressors
- Managing wet gas and condensates (purge system for condensates)
- Differential pressure up to 7 bar



# NOTOS® Multi Screw Pumps

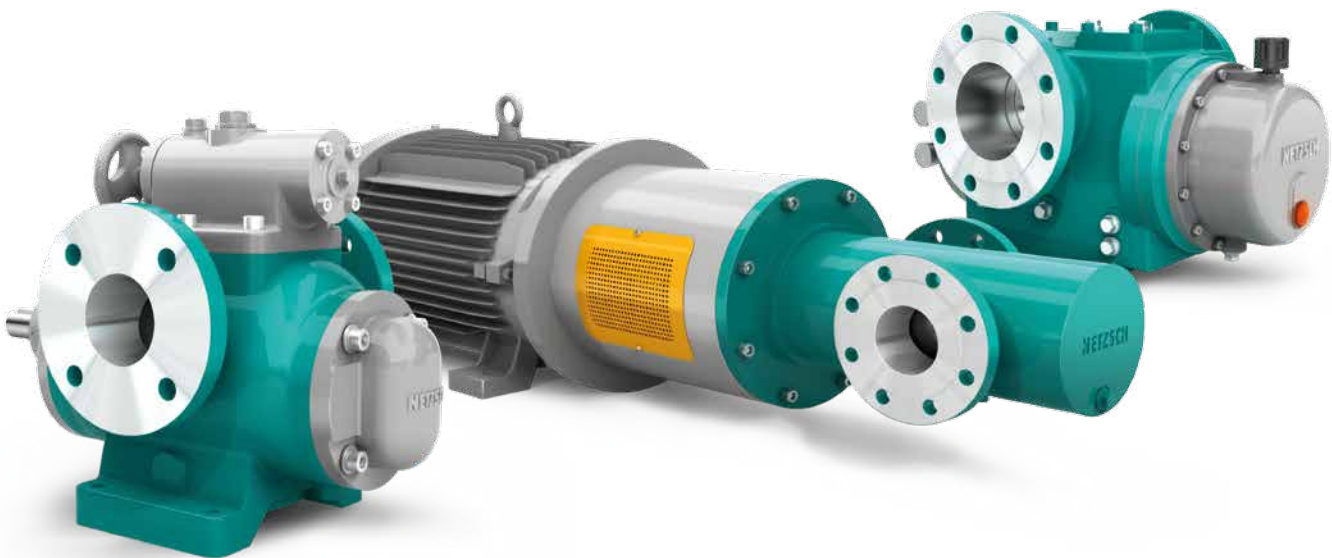
Since 1979 NETZSCH has been manufacturing Multiple Screw Pumps. The most advanced technology is utilized to reach the high precision needed to produce these pumps. Reliability, durability and experience are some reasons why you should choose NETZSCH.

NOTOS® multiple screw pumps are typically used for transfer in the petrochemical industry and refineries for various media:

- Crude Oil
- Lube Oil
- Diesel
- Palm Oil
- Fuel Oil, HFO, LFO
- Asphalt
- Bitumen
- Produced water, oily water
- Vacuum residue

## Advantages

- High efficiency
- Hydraulically balanced
- Low noise emission
- Long service life
- Low pulsation
- Synchronized spindles
- Complies with API 676 3<sup>rd</sup> Ed.



## 2 NS Series

- Flow rate up to 500 m/h<sup>3</sup> (2200 gpm)
- Pressure up to 16 bar (230 psi)
- Temperature up to 300°C (570°F)
- Viscosity up to 10.000 cSt

## 3 NS Series

- Flow rate up to 200 m/h<sup>3</sup> (660 gpm)
- Pressure up to 80 bar (1160 psi)
- Temperature up to 300°C (570°F)
- Viscosity up to 12.000 cSt

## 4 NS Serie

- Flow rate up to 1000 m/h<sup>3</sup> (4500 gpm)
- Pressure up to 80 bar (1160 psi)
- Temperature up to 300°C (570°F)
- Viscosity up to 50.000 cSt



# NOTOS® Multi Screw Pumps

IN OPERATION

## Crude oil production and processing

### Operating Conditions:

- Pump type: NOTOS® 2 NS
- Fluid: Crude Oil
- Flow rate: 250 m<sup>3</sup>/h
- Discharge Pressure: 8 bar
- Viscosity: 100 - 1000 CST
- Operating Temperature: 10 ~ 50 °C



## Offshore

### Operating Conditions:

- Pump type: NOTOS® 3 NS
- Fluid: ISO VG 46
- Flow rate: 3 m<sup>3</sup>/h
- Discharge Pressure: 30 bar



## Cargo Pumps

### Operating Conditions:

- Pump type: NOTOS® 4 NS
- Fluid: Fuel Oil 1 A
- Flow rate: 130 m<sup>3</sup>/h
- Discharge Pressure: 15,1 Kgf/cm<sup>2</sup>
- Viscosity: 605 CST
- Temperature: 20 to 60 °C
- Density: 1024 Kg/cm<sup>3</sup>



# Accessories and Systems

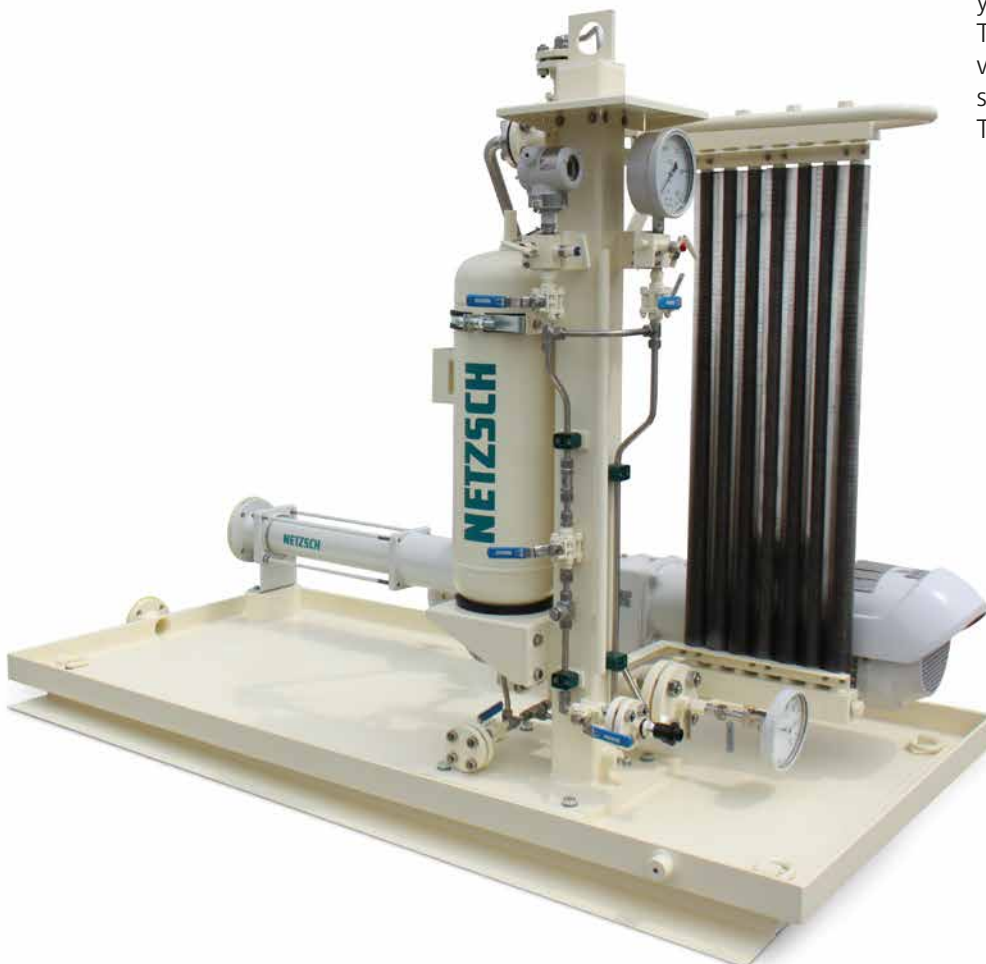
## NETZSCH Seal Support Systems to enhance safety and increase the lifespan of your equipment

### Goal

According to API682 4th edition the pump supplier is responsible for the complete unit including the sealing system. With the design of the NETZSCH system we achieve the integration between seal and the respective support systems. As a result your process will become more efficient and more economical.

### Benefits

The seal support system creates and maintains an optimal fluid environment at the mechanical seal. This provides an important contribution to better and safer plant operation without compromise. Safety is our key requirement. Investing in the seal support system will lead to significant cost savings in the long term: Total cost reduction will arise from immediate savings on installation, savings on maintenance budgets, a decrease in downtime and an extension of your meantime between failure. The seal support system complies with the latest international standards such as API, ASME and TEMA amongst others.



## Accessories and Service for Upstream applications

### Pump System Accessories

- Control line
- Production line

### Pump Accessories

- Pump joints
- Couplings

### Drive Head Accessories

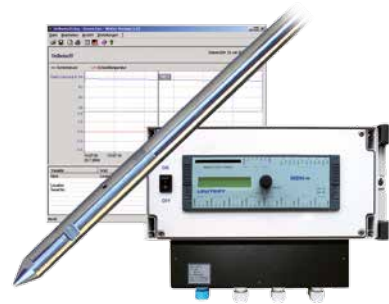
- Power belts/V-belts
- Packings
- Ring joints

### Rod Accessories

- Polished Rod Couplings
- Couplings/Cross Couplings

### Complete Well Production Simulation and Optimisation

### Complete Monitoring System



## Accessories and Service for Mid-/Downstream applications

### Safety Valves and Bypass System

Safety valves and a bypass system installed between the inlet and outlet can protect the system. When the actual pressure exceeds the set pressure, the safety valve is opened and the medium flows by passes the pump housing.

### Control Panel

- Frequency inverter
- Complete instrumentation
- Flow-meter

### Diaphragm Pressure Gauge and Over Pressure Protection

- Gauge isolated from the media by a generously dimensioned diaphragm
- Stainless steel diaphragm
- Display of operation pressure
- For highly clogging fluids
- Shutdown at the pre-selected pump's maximum discharge pressure
- Pressure range of 0 ~10 / 0 ~16 / 0 ~25 / 0 ~ 40 bar

### After Sales

- Commissioning on request
- Start-up on request
- Maintenance at site
- Training at site and in-house

### Heating Jacket Pump House and Dry Running Protection

When the temperature of the medium in the pump exceeds the set value or no medium passes through, the NEMO® pumps equipped with STP-2A dry running protective system will stop operation automatically. For special applications, such as the pumps installed in cold regions, we provide pumps with a heat preservation jacket. By flushing the jacket with hot water the whole pump will be heated, hence the required temperature, viscosity, and fluidness of the medium will be ensured.



# Questionnaire for Oil & Gas Upstream

## Contact

company		address	
name		phone	
telefax		e-mail	

## Well Completion Data

well no.		field name	
vertical depth*	<input type="checkbox"/> [m] <input type="checkbox"/> [ft]	perforation depth	from <input type="checkbox"/> [m] <input type="checkbox"/> [ft] to <input type="checkbox"/> [m] <input type="checkbox"/> [ft]
well information	<input type="checkbox"/> vertical <input type="checkbox"/> deviated <sup>1</sup> <input type="checkbox"/> horizontal <sup>1</sup>	<input type="checkbox"/> existing <input type="checkbox"/> newly drilled <input type="checkbox"/> planned	
well head information	<input type="checkbox"/> 3 1/8" x 2000 psi <input type="checkbox"/> 3 1/8" x 3000 psi <input type="checkbox"/> other <sup>3</sup>		
electrical power	[Volts]	[Hz]	ambient temperature <input type="checkbox"/> [°C] <input type="checkbox"/> [°F]
casing <sup>2</sup>		tubing <sup>2</sup>	
size	<input type="checkbox"/> [inch] <input type="checkbox"/> [mm]	size	<input type="checkbox"/> [inch] <input type="checkbox"/> [mm]
inside dia	<input type="checkbox"/> [inch] <input type="checkbox"/> [mm]	inside dia	<input type="checkbox"/> [inch] <input type="checkbox"/> [mm]
weight	[lbs]	weight	[lbs] thread <input type="checkbox"/> EU <input type="checkbox"/> NU
		sucker rod	
		size	<input type="checkbox"/> [inch] <input type="checkbox"/> [mm]
		material	<input type="checkbox"/> grade D <input type="checkbox"/> grade K <input type="checkbox"/> special

## Production Data

current lift method			
production rate	current <input type="checkbox"/> [bpd] <input type="checkbox"/> [m <sup>3</sup> /d]	planned <input type="checkbox"/> [bpd] <input type="checkbox"/> [m <sup>3</sup> /d]	water cut [%]
pump setting depth*	current <input type="checkbox"/> [m] <input type="checkbox"/> [ft]	planned <input type="checkbox"/> [m] <input type="checkbox"/> [ft]	sand cut [%]
dynamic fluid level*	current <input type="checkbox"/> [m] <input type="checkbox"/> [ft]	planned <input type="checkbox"/> [m] <input type="checkbox"/> [ft]	static fluid level* <input type="checkbox"/> [m] <input type="checkbox"/> [ft]
static BHP (at perf.)	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]	productivity index	<input type="checkbox"/> [b/d/psi] <input type="checkbox"/> [m <sup>3</sup> /d/psi]
dynamic BHP (at perf.)	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]	casing pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]
GOR	<input type="checkbox"/> [m <sup>3</sup> /m <sup>3</sup> ] <input type="checkbox"/> [cuft/bbl]	flow line pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]

## Fluid Data

chemical treatment	<input type="checkbox"/> yes <input type="checkbox"/> no	bubble point pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]
paraffin production	<input type="checkbox"/> yes <input type="checkbox"/> no	CO <sub>2</sub> content	<input type="checkbox"/> [%] <input type="checkbox"/> [ppm]
oil viscosity at surface	[cP]	H <sub>2</sub> S content	<input type="checkbox"/> [%] <input type="checkbox"/> [ppm]
oil viscosity at pump	[cP]	aromatics <sup>4</sup>	[%]
chloride content	[%]	specific oil density <sup>4</sup>	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]
temperature at surface	<input type="checkbox"/> [°C] <input type="checkbox"/> [°F]	temperature at pump	<input type="checkbox"/> [°C] <input type="checkbox"/> [°F]

## Attachments and Comments

<sup>1</sup>well bore geometry  <sup>2</sup>completion details  <sup>3</sup>wellhead drawing  <sup>4</sup>fluid analysis  other \*from surface



# Questionnaire for Oil & Gas Mid-/Downstream

## Contact

company		country	
department		phone	
name of the oilfield		fax	
name		e-mail	
address		project name	
		project number	

Please send a quotation for  units

## Fluid Data

medium		water cut	<input type="checkbox"/> [%]
fluid temperature	<input type="checkbox"/> [°C] <input type="checkbox"/> [°F]	solid content	<input type="checkbox"/> [%]
oil gravity	<input type="checkbox"/> [°API] <input type="checkbox"/> [g/cm³] <input type="checkbox"/> [kg/m³]	H <sub>2</sub> S content	<input type="checkbox"/> [%] <input type="checkbox"/> [ppm]
viscosity	<input type="checkbox"/> [cP] <input type="checkbox"/> [CST] <input type="checkbox"/> [mPas]	chloride content	<input type="checkbox"/> [%] <input type="checkbox"/> [ppm]
GOR	<input type="checkbox"/> [m³/m³] <input type="checkbox"/> [m³/t] <input type="checkbox"/> [scft/b]	CO <sub>2</sub> content	<input type="checkbox"/> [%] <input type="checkbox"/> [ppm]
bubble point pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]	particle size	<input type="checkbox"/> [mm] <input type="checkbox"/> [inch]

## System Data

production rate	<input type="checkbox"/> [m³/d] <input type="checkbox"/> [m³/h] <input type="checkbox"/> [bpd]	discharge pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]
suction pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]	ambient temperature	<input type="checkbox"/> [°C] <input type="checkbox"/> [°F]

## Electric Data or

## Pneumatic or Gas Data or

## Hydraulic Data

operating voltage	V	air or gas pressure	<input type="checkbox"/> [bar] <input type="checkbox"/> [psi]	oil pressure	
cycles	Hz	air or gas consumption	<input type="checkbox"/> [m³/min]	oil consumption	
protection		gas structure			

## Options

<input type="checkbox"/> pump bare shaft	<input type="checkbox"/> base plate or moving device	<input type="checkbox"/> coupling	<input type="checkbox"/> shut off valves	<input type="checkbox"/> relief valves
<input type="checkbox"/> control panel	Protection	Requirements	<input type="checkbox"/> API 676	<input type="checkbox"/> API 682
<input type="checkbox"/> VSD	<input type="checkbox"/> mechanical <input type="checkbox"/> electrical <input type="checkbox"/> frequency			

## Shipping Data

<input type="checkbox"/> EXW	ex works (defined location)	<input type="checkbox"/> FOB	free on board (defined port or shipment)	<input type="checkbox"/> CIF	cost insurance freight (defined port or destination)
<input type="checkbox"/> FCA	free carrier (defined location)	<input type="checkbox"/> CFR	cost and freight (defined port or destination)	<input type="checkbox"/> FIP	cost insurance paid (defined port or destination)

## Signature and date

## Comments

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Please complete as accurately as possible!

