# Global Presence

Addresses of all business partners in 60 countries are available upon request or by visiting:

www.netzsch-pumps.com

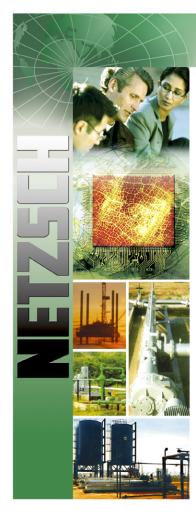




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# NETZSCH The heart of your process

Partnership in the Oilfield Individual Solutions for Pump Systems



# Partnership in the oilfield · · ·

Within business unit PUMPS, the business field of oil in cooperation with the subprocess "special pumps" is specialized in individual solutions for pump systems in various processes of the oil industry.

> It is partnership that counts...

Responsibility for the environment..

The growing awareness of the environment challenged us to develop new solutions for pump systems in the off and on-shore areas.

As oil resources are limited and the global requirements are subject to change we deem t our job to optimize and improve our customers' processes. New, innovative technologies increase productivity and safety.

> Quality comes first...

Our high-quality products for the oilfield are manufactured in our own production plants in Germany, Brazil and

Our contribution to partnership...

· flexibility

· special internal and external trainings for customers

· customized solutions

# It is partnership that counts

As we know, the oil resource is limited and the global requirement is subject to change. We deem that our product can optimize and advance the producing process of our customers. New, innovative technologies increase productivity and

Whether you are moving your fluid from the bottom of the well or from point to point on the surface, the best solution is the NETZSCH progressing cavity pumping system. It is an intelligent and efficient method for a wide range of fluid

On the sea or land, NEMO® pumps can transfer crude oil, heavy oil, viscous oil and oil-gas-sand mixture. In the shipping, the pump can process sewage and muddy oil besides transfering fuel.

NEMO® pumps need no filter in the case of transfering sand-impurity because of anti-abrasion. The two directions of rotation convenient for quite absolute cleaning of sediment in pump.

Special downhole pumps and drive system are widely used in mining cured oil and natural gas effectively and safely.

If you want high efficiency, low capital cost and low maintenance cost ...

If you want short downtimes when failures do occur...

If you want a user friendly pump that does not require high technical capabilities for operation, maintenance and trouleshooting ...

NETZSCH pumps are your best choices.

Contact a NETZSCH representative and let them fill you in on all the facts before you make your next pumping

# We are near you

In many regions, competent and reliable advisers are at your disposal to meet your requirements.

Summaries of Transfer Pumps

# **Efficient handling**

- Abrasive liquids
- Gassy liquids
- Viscous fluids
- · Liquids with solid

# Advantages

- Eliminate hydraulic hammer and intake cavitation
- Eliminate heavy, large mounting areas in confined spaces
- Reduce the potential wear parts inventory to 2 items
- Increase total efficiency and lower power requirements
- Have the ability to accept low pressure high volume pump feeds without adding charger pumps
- Lower capital cost and project investment

# Structure of NTMP NETZSCH Transfer Multi Phase Pumps



# 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 possible). The sclerous rotor is ease to transfer medium with sand.

# 4 Shaft seal

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

### 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 medium including H,S and high temperature.

# 5 Suction and pressure housing

Designed for good flow conditions with flanges acc, to DIN, ANSI, JIS etc. or threads. Materials in Cast Iron, Cast Iron internal rubber-lined, AISI 316 L or TI, Duplex, Super Duplex, 254 SMO, Monel etc. (materials according to NACE possible).

# 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), its feature is high intensity, long-life and steady transmission.

# 6 Bearing house design

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

# NTMP NETZSCH Transfer Multi Phase Pumps

# Advantages

- Low operating and maintenance cost
- . Very low emulsify effect to 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
- Efficient transport medium with high content of gas (special design for 100 % content of gas available)

# **Applications**

- · Pumping of oil, gas or water mixtures with solids
- . Pumping from the well to the collection stations
- . Pumping of drilling sludge
- Pumping of slurries
- · Pumping of cuttings
- \* Unloading of tank-truck (special version for low ambient temperatures)
- Tank cleaning

# Range of capacity and pressure of NTMP pumps

Pump Type	Max. Capacity in m <sup>3</sup> / h	Max. Discharge pressure in bar
NTMP015-063	up to 26	36
NTMP076	up to 40	24
NTMP090	up to 52	24
NTMP105	up to 90	24
NTMP125	up to 140	24
NTMP148	up to 250	18
NTMP180	up to 350	12







# NTLP NETZSCH Transfer Low Pressure Pumps



# Advantage

- · Low operational cost
- . Efficient handling of viscous mediums
- $\bullet$  Transfer with high metering, repeated precision up to  $\pm 1\,\%$
- . Only low emulsion of oil / water mixtures

# **Applications**

- · Transfer viscous polymer in tank to the polymer stations
- . Transfer dilute polymer to well
- . Transfer crude oil to unite station from well
- Pumping exhausted polymer
- · Transfer sewage and muddy oil

# Range of capacity and pressure of NTLP pumps

Pump	Max. capacity	Max. discharge pressure
Туре	in m <sup>3</sup> / h	in bar
NTLP005-011	up to 0.33	36
NTLP015-038	up to 1.0	36
NTLP045-063	up to 20	24
NTLP076	up to 40	24
NTLP090	up to 60	24
NTLP105	up to 90	24
NTLP125	up to 140	24
NTLP148	up to 250	18
NTLP180	up to 350	12

NTLP = NETZSCH Transfer Low pressure Pumps

# NTHP NETZSCH Transfer High Pressure Pumps



### Advantage

- · Lowest operational cost
- . Efficient handling of high viscous oil
- Efficient handling of multi phase fluids
- Reduce maintenance cost
- . Installation in any position and saving space

# **Applications**

- · Transfer salty water
- . Transfer crude oil to collecting stations
- Pumping mud
- . Pumping muddy oil and sewage in collect pool
- Long-distance transfer
- Transfer polymer into well
- \* Very low emulsify effect to oil / water mixtures

# Range of capacity and pressure of NTHP pumps

Pump	Max. capacity	Max. discharge pressure
Туре	in m³ / h	in bar
NTHP045	up tp 5.0	48
NTHP053	up tp 15	48
NTHP063	up tp 20	48
NTHP076	up tp 40	48
NTHP090	up tp 60	48
NTHP105	up tp 90	48
NTHP125	up tp 140	48
NTHP148	up tp 250	36
NTHP180	up tp 350	24







# **NTIP NETZSCH Transfer Injection Pumps**



# Advantage

- · Low operating and maintenance cost
- . Low amount of wearing parts
- · Efficient conveyance of highly viscous products
- · Almost pulsation-free conveyance
- · Installation in any position

# **Applications**

- . Injecting water and slurry into oil well
- · Injecting polymer into oil well
- Chemical treatment of oil well
- · Conveyance over long distances
- . Conveyance at high systems pressure

# Range of capacity and pressure of NTIP pumps

Pump Type	Max capacity in m <sup>3</sup> / day	Max. discharge pressure in bar
NTIP090-166 / 238 / 278 / 350	up to 33	up to 240
NTIP105-400	up to 84	up to 200
NTIP105-400	up to 112	up to 150
NTIP105-400	up to 145	up to 120
NTIP125-450	up to 152	up to 150
NTIP148-500	up to 226	up to 90

NTIP = NETZSCH Transfer Injection Pumps

# **NTVP NETZSCH Transfer Vertical Pumps**



# Advantage

- Compact equipment
- · High efficiency
- Transfer viscous medium with solid
- \* Avoiding dry-running because of medium directly into pump house
- Convenient installation

# Applications

- · Handling of reclaimed oil
- Oil-seawater
- Mud-seawater
- · Emptying of crude oil wagon
- Emptying tanks

# Range of capacity and pressure of NTVP pumps

Pump Type	Max. capacity in m <sup>3</sup> / h	Max. discharge pressure in bar
NTVP045	up to 5.0	24
NTVP053	up to 15	24
NTVP063	up to 20	24
NTVP076	up to 40	24
NTVP090	up to 60	24
NTVP105	up to 90	24
NTVP125	up to 140	24
NTVP148	up to 250	18







# **PCP Downhole Pumps**

The progress cavity pump ( PCP ) is the artificial lift pump of choice. Whether it be for higher efficiencies (lower horsepower requirements), efficient handling of high viscosity production fluids, better handling of sand and other abrasive contaminants, the PCP pump will maximize production volume, while minimizing costs

## Efficient handling

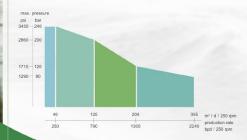
· High viscosity

· High water contents

- · High solids contents
- · H.S contents
- . High gas contents (high GOR)

# The perfect solution for the shallow to medium setting depths for fluid volumes from 1 B / D to over 4000 B / D.

- . Produce more sand by volume than ESP and sucker rod pumps
- · Produce high GOR fluids without adding rotary and static gas separators
- · Produce heavy, viscous liquids without degrading pump performance and increasing
- · Have the ability to produce corrosive liquids without having to utilize internal parts made from costly special alloys and ceramics
- · Increase total efficiency and lower power requirements
- · Lower capita cost and project investment
- · Lower rig and personnel cost from a shortened workover procedure
- · Convenient operation



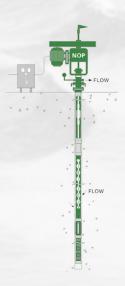
# Feature of NETZSCH downhole pump

. Pump fluid with high viscosity, wax-bearing and high water contents density: 0.8251 ~ 1.0789 (API15 - 47)

max viscosity: 50000 cp

Max water content: 100 %

- \* Pump fluid with solid and sand contents, max sands contents: 15 %
- . No valves to gas lock, foul up and gum up
- . High efficiency, few moving parts, no valves and complex channels, low hydraulic loss, steady flow rate
- Wide production range, convenient adjustable production rate: 0.2 ~ 750 m³ / d
- PCP pumps system will have a typical efficiency of 70 % ~ 98 %. Comparable beam pumping efficiencies are 50 % ~ 60 %, and electrical submersible pumping efficiencies are 40 % ~ 50 %



# DRIVE HEAD EQUIPMENT-DHE

-Drive Head -Three Phase Motor

-Control Pane

# WELL HEAD EQUIPMENT-WHE

-Flow Tee -Blow Out Preventor

-Wellhead Adapter

### ROD STRING EQUIPMENT-RSE

-Sucker Rod -Centralizer

-Sucker Rod Coupling

### NETZSCH PUMP EQUIPMENT-NP

-Pump (Rotor/Stator)

-Torque Anchor

-Gas Separator







# **Drive Head for PCP Downhole Pumps**

Generically, drive heads are required in conventional PC Pumps Systems to transfer power from prime mover to the pump, which is conveyed by the sucker rod string. In addition, the Drive Head has to accomplish with other requirements and functions such as:

- \* Provide sealing from the well fluid on tubing head and polished rod
- Support the weight of the rod string and the associated axial load
- . Determined by the pumping action of a downhole PC Pump
- . Provide the proper means to avoid backspin of the rod string

# System Advantages

- · All drives heads with a back spin brake
- · Suitable for high sucker rod load
- . Special brake systems for high volume pumps
- Capability to 150 hp (150 hp = 110 kW) Axial load up to 50.000 l bs (222, 400 N)

## Design of the NETZSCH Drive Head

- · Hollow Shaft
- · Solid Shaft

# Potency transmission

- · Direct drive · Gear box
- · Right angle

### Potency transmission

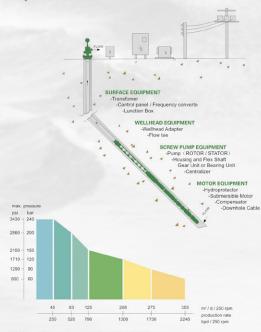
- Mechanical
- Hvdraulic
- Mechanical together with hydraulic



# **NSPCP Pumps**

# System Advantages

- . No rod and tubing wear in deviated wells
- . Can be used with a standard 2-pole motor (most efficient and least costly)
- . Pump size is not limited by the tubing size . No environmental impact on the surface
- · Transfer nature gas contents
- · No gas-lock associated with ESP



NSPCP = NETZSCH Submersible Progressing Cavity Pumps

### Transfer

Calc. Hydr. Suspension

Chem. Products

Clean oil

Crude oil

Crude oil emptying

Crude oil emulsion

Crude oil sludge

Detergent

Diesel oil

Drilling mud

Flocculants Glycol

Crude oil with H<sub>2</sub>S content

High temperature crude oil

Hot water-detergents-mixture

Hydrocarbo

NTLP076-2S pump drawing crude oil for processing from the sedimentation tank and delivering it to the buffer tanks. Delivery is approximately 20 m³/h and pressure approximately 4 bar. Electric motor with V belt drive.



Two NTLP090-2S pumps drawing procossed crude oil from the accumulator tank and delivering it to the filling depot for road tankers. Each pressure line is fitted with a by-pass and relief valve. Delivery performance approximately 50 m³/h at 3 bar. Electric motor and V belt drive.



This NTLP076-25 pump on a pontoon is delivering oil sludge via hose lines from a large collecting lagoon to a distant purgative installation. Suction and pumping are provided by a single pump in a single process. Delivery performance and pressure can be matched to the specific local requirements by selecting a pump from our standard range.



Performance test of NTVP063 vertical pump (immersion depth 10.3 m )in the production plant. The pump belongs to a series of aggregates for an offshore platform in Northern Europe. They are provided to build into tanks to convey seawater and crude oil.





Performance test of NTHP105-6S. The test was effected at a liquid temperature of -5 °C in practice also possible which was artificially produced by using of liquefied nitrogen (as agent for the reducing of the temperature) and ethyl alcohol (to avoid freezing during the test). The pump is installed on an offshore platform to convey spent-mud, diesel /seawater mix or cuttings, fines, diesel-mix at a pressure of 28 bar.



NTLP148-4S pump injecting water into an oil separator.



The NTHP105-8S high pressure pump being used alternately to pump low viscosity petroleum down at 10 pipeline destination over 125 miles away. Delivery pressure varies between 8.5 and 20 bar when delivering between 47 m²/h and 54 m²/h depending on distance and oil viscosity. Drive is provided a diesel engine with appropriate step down gearing.



The four NTLP076-2S pumps delivering crude oil of normal consistency and containing solid particles from the oil depot reservoir to the processing station. Quantity and pressure can be matched to requirement.



NTIP090 pump injecting polymer into well in northeast oil field of Brazil.

### Transfer

Mud-seawater-mixture

Oilbased mud

Oily produced water

Oil sludge

Oil tank cleaning

Petroleum-crude oil mixture

Polymer

Produced-salt water mixture

Reclaimed oil

Slurry-heavy oil mixture

Tri-ethylene-glycol

Viscous oil sludge

Waste oil

Waste oil content

Waste water with 4 % solid

- Type: NTLP105SY02S12Z • Transfer distance: 5 ~ 15 km
- Capacity: 30 ~ 150 m³ / h
- Pressure: 0.6 ~ 2.4 MPa

NEMO® pump transfer polymer into tank station in Chinese North east oil field



- . Type: NTLP125SY02S08B
- Capacity: 140 m³ / h
- Pressure: 0.7 MPa

NEMO® pump is used in Chinese northeast oil field



- Type: NTLP053BY01L06V
- . Capacity: 15 m3 / h
- · Pressure: 0.4 MPa

NEMO® pump is used in sewage processing in west part of China oil field



- Type: NTLP125SY04S18Z
- · Capacity: 130 m3/h
- Pressure: 1.5 MPa
- · Inlet constant pressure autocontrol system

NEMO® pump is used in a Russia oil field



- . Leading type: NTMP076SY08S48Z
- . Capacity of gas-oil mixture up to 100 %
- Assistant type: NTLP008SY03S12B
- . Supply lubricate oil to prevent dry-work for leading Pump

NEMO® pump transfer gas in northern Europe





- Type: NTMP148SY02S12Z
- · Capacity: 165 m3/h
- · Pressure: 0.8 MPa
- · Inlet constant pressure autocontrol system

NEMO® pump transfer gas-oil mixture in Kazakhstan oil field



- Type: NTLP076BY03S18V
- · Capacity: 24 m3/h
- Pressure: 1.6 MPa

NEMO® pump is used in Chinese off-shore platform



- Type: NTVP148BT02S12Z
- . Capacity: 150 m3 / h
- Pressure: 1.0 MPa
- NEMO® vertical pump in store transport station of Europe is pumping fuel oil to tank truck

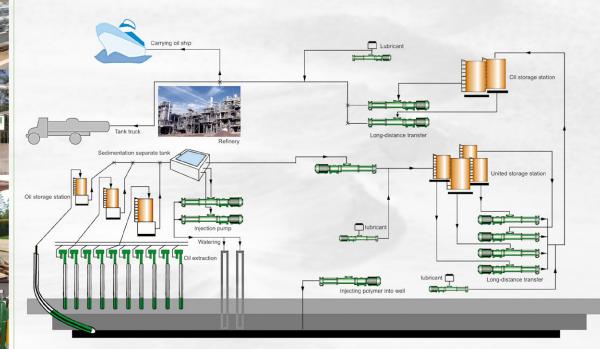


- Type: NTLP125SY02S12Z
- · Capacity: 115 m3/h
- Pressure: 1.2 MPa
- NEMO® pump transport slurry-heavy oil in middle China oil field



- Type: NTHP105SY08S48Z
- · Capacity: 60 m3/h
- Pressure: 4.8 MPa
- NEMO® pump will be shipped to a Russia oil field

# Application process flow chart in oil field







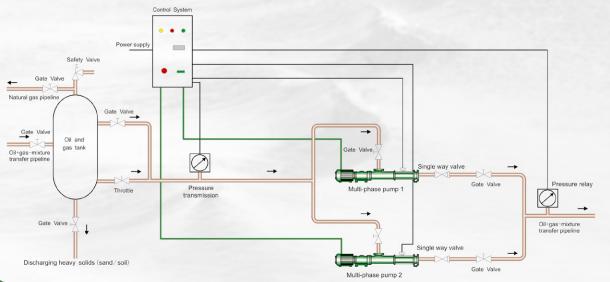
# System Chart of Pumping Blended Oil and Gases

# Advantage

- . Reducing investment cost for saving a pipeline for transfer gases
- Prolong the service life and raise efficiency for mitigating the operating load of oil pump and saving maintenance cost.
- Realize a stable and high output of oilfields for reducing the backpressure at the mouth of the well and the leakage.

### Characteristics

- Adopt an automatic constant pressure control system of inlet in the process of pumping blended oil and gases: a
  pressure transducer installed at the inlet can regulate the rate of flow of NEMO® pumps through the automatic
  constant pressure control system to reach a constant pressure at the inlet.
- Overpressure guard installed at the outlet will alarm or stop pumping when the pressure at the outlet exceeds the
  pressure set.
- The temperature sensor installed at the stator can avoid the damage of the stator resulted from dry running.
- One of the two parallel-connected pumps is equipped with a transducer; they employ one control system and the control of the flows ranges from zero to the sum of the maximum flows of the two pumps.





# Accessories

# Safety valves and bypass system

- · Safety valves and bypass system equipped between the inlet and outlet can protect the system.
- ·When pressure exceeds the rated pressure, safety valve is opening up and the mediums of outlet flew into pump house through bypass system.





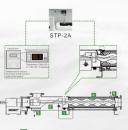
# Diaphragma pressure gauge and over pressure protection

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

# 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 are installed in cold region, we provide the pumps with a heat preservation jacket. When the hot water introduced into the jacket, the whole pump will be heated, hence the original temperature, viscosity, and # fluidness of the medium will be ensured. At the same time, the pump equipped with packing having flushing fluid will guarantee the suitable lubrication at starting.



- 1 Medium discharging of suction 2 Heating jacket pump house
- 3 Heating outlet
- 4 Stator heating jacket
- 5 Heating inlet

# **Data Sheet**

# NETZSCH NTMP / NTIP / NTIP / NTHP / NTVP

* = compulsory	, ,
Personal Data	
* Company	
Department	
Name of the oilfield	
* Name	
* Street / POB	
* Postal code / city	
* Country	
* Phone	
* Fax	
E-mail	
Project Name	
Project Number	
* Please send a quotation forur	
riease seriu a quotation foi ui	iits
Fluid Data	
* Medium	
* Fluid Temperature	(°C or°F)
* Oil Gravity	(°API,g/cm³ or kg/m³)
* Viscosity	
* GOR	(m <sup>3</sup> /m <sup>3</sup> , m <sup>3</sup> /t or scft/b)
Bubble Point Pressure	(bar or psi)
Water cut	
* Solid Content	76
* H <sub>2</sub> S Content	(% or onm)
* Chloride Content	(% or ppm)
* CO <sub>2</sub> Content	
Patricle Size	

System Data	
* Production Rate	(m³/hour,m³/day,bpd or gpm)
* Suction Pressure	(bar,psi,Mpa or atm)
* Discharge Pressure	(bar,psi,Mps ot atm)
* Ambient Temperature	(°C or°F)

Stamp of company

\*Signature and date



* Operating voltage	yes no
* Cycles	V
	, EExe, EExd or EExde)
riotocion (IP ,Exr	, EEAC, EEAG OF EEXGE)
Or	
Pneumatic or gas Data	yes no
* Air or gas pressure	(bar,psi or atm)
* Air or gas consumption	m³/min
* Gas structiure	
or	
Hydraulic Data	yes no
* oil pressure	(bar or psi)
* oil consumption	l/min
Options	
and the same of th	
pump bare shaft	
base plate or moving device	
coupling	
control Panel	
Protection(IP, Exn	, EExe, EExd, or EExde)
	, EExe, EExd, or EExde)
Protection(IP, Exn	, EExe, EExd, or EExde)
Protection(IP, Exn	, EExe, EExd, or EExde)
Protection (IP , Exn Requirements  VSD (Variable Speed Drive)	
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Protection (P , Exn Requirements  VSD (Variable Speed Drive) (nechanics shut off valves   relief valves  *Shipping Data  EXW  FCA  FOB	ex works (defined location) free caterior (defined location) free caterior (defined location) free on board (defined port of shymers)
Protection (IP , Exm Requirements  VSD (Variable Speed Drive) (mechanical shut off valves relief valves  *Shipping Data  EXW  FCA  FOB  CFR	ex works  ex works  (defined location)  free carrier  (defined boation)

☐ CIP

Comments

(defined port of destination)

(defined port of destination)

cost insurance paid