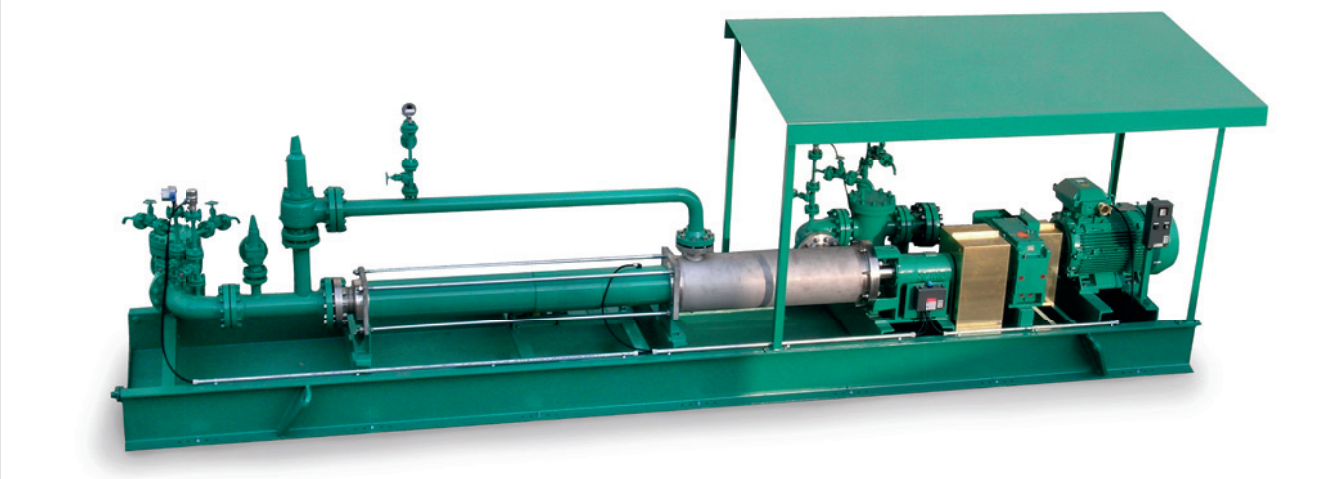
NETZSCH

Pumps & Systems

Crude Oil Transfer and Multiphase Boosting Solutions

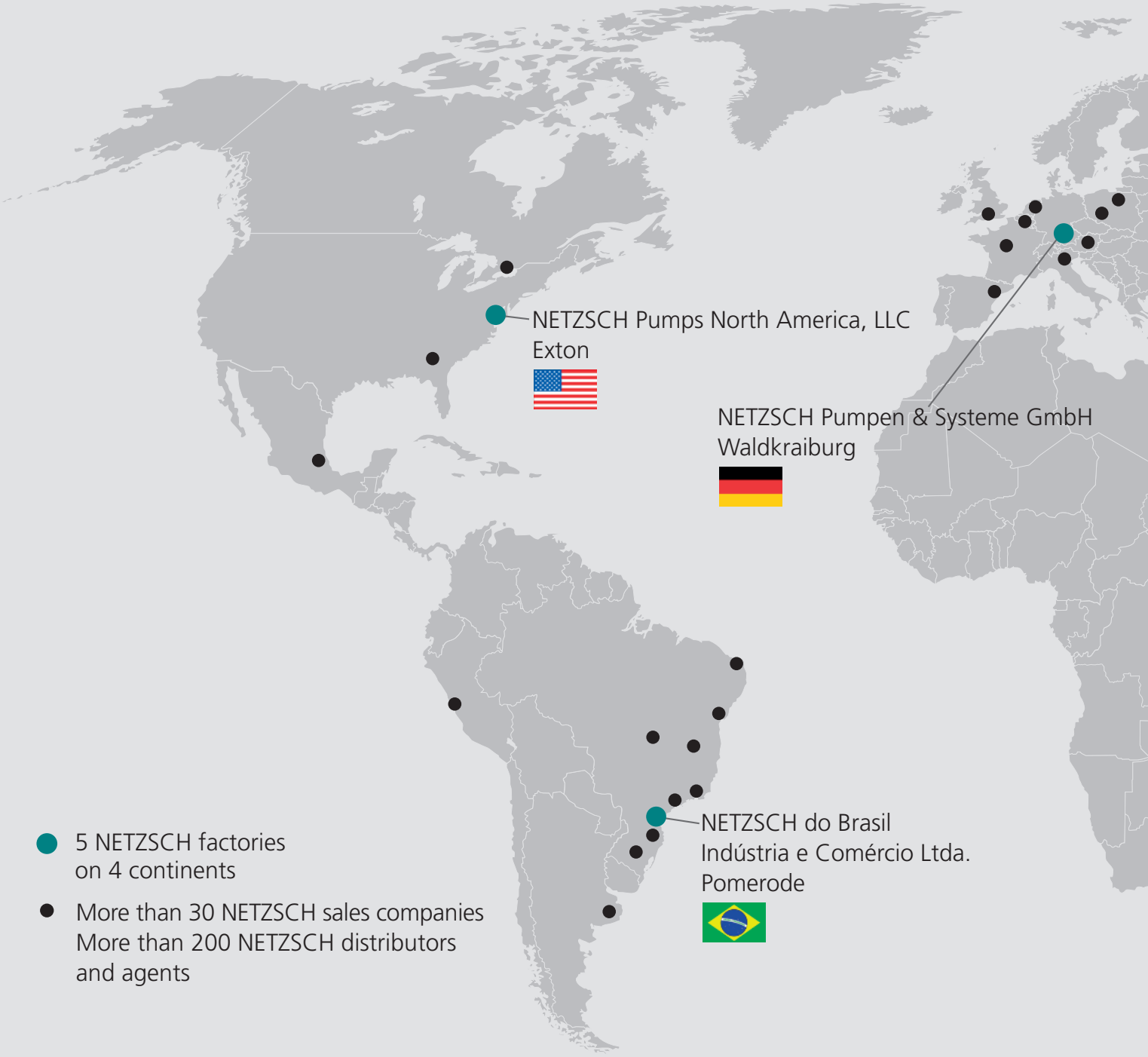
Delivering increased oil recovery at lower costs

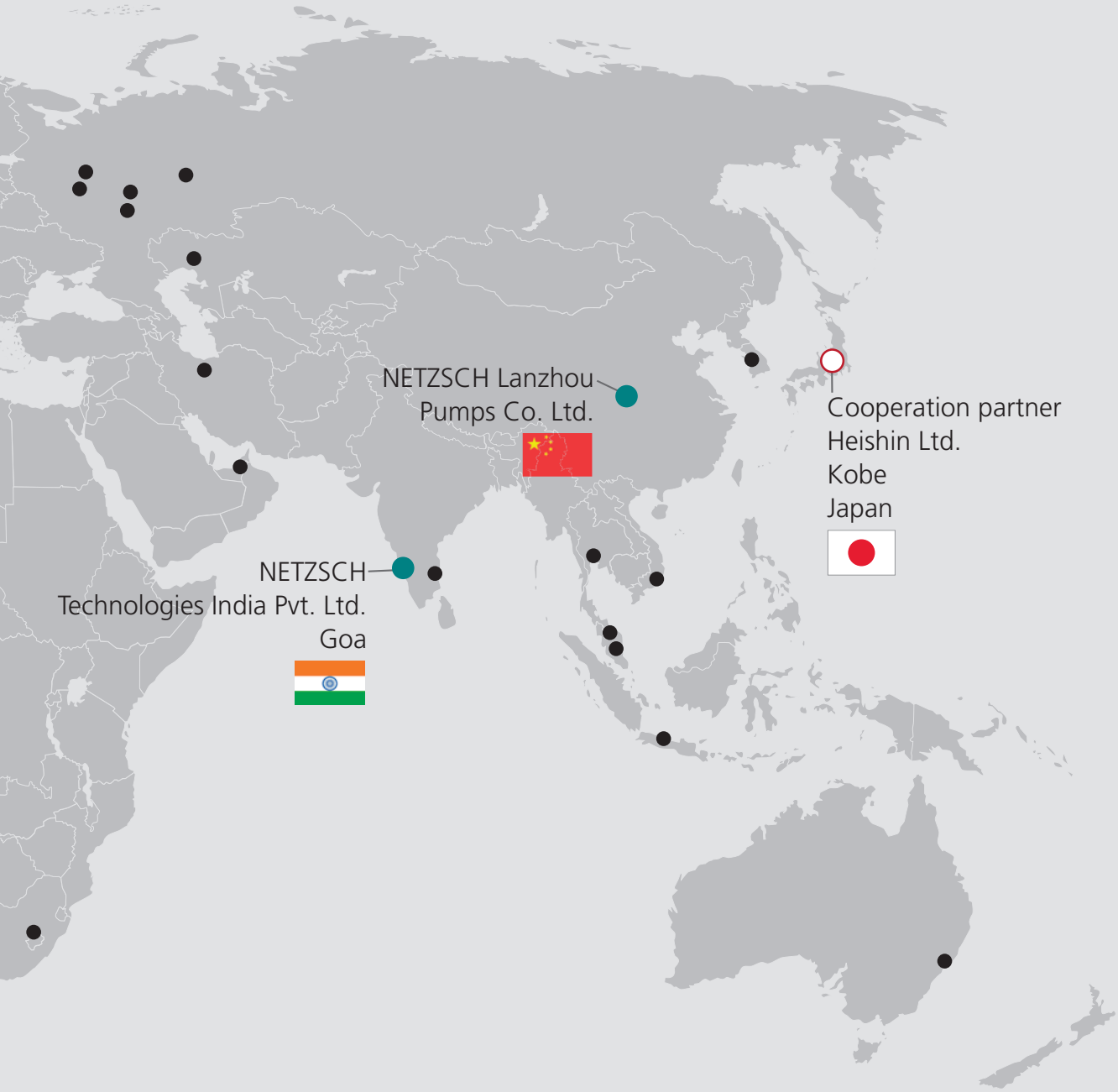


NETZSCH Pumps & Systems – Solutions you can trust

From Canada to Russia, from Latin America to Indonesia
Where there is heavy oil, there is a hot spot for NETZSCH pumps

NETZSCH progressing cavity pumps are first choice when API grades are below 25°.




NETZSCH Lanzhou
Pumps Co. Ltd.
Cooperation partner
Heishin Ltd.
Kobe
Japan
NETZSCH
Technologies India Pvt. Ltd.
Goa

Products and Components

NEMO® Progressing Cavity Pumps
- Standard pumps
- Hopper pumps
- Immersible pumps
- High pressure pumps (injection pumps)
- Custom built pumps

TORNADO® Rotary Lobe Pumps
- Standard pumps

NETZSCH Engineering
- Testing and quality control
- Inspection and certification
- Special documentation

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

The highest standards for equipment and safety are a basic requirement for oil field work to ensure that processes remain safe and reliable. NEMO® and TORNADO® pumps contribute to such safety and reliability. The complexity of pump media ranges from highly viscous to low-viscous, from shearing-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 3rd edition and also NACE MR-0-175.

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

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.

The 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.

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Further Options

Safety Valves and Bypass System

- Safety valves and bypass system equipped between the inlet and outlet can protect the system.
- When pressure exceeds the maximum allowable limit, relief valves protect pump and pipe systems from damage

Control Panel

- Frequency inverter
- Complete instrumentation
- PLC controlled

Diaphragm Pressure Gauge and Over Pressure Protection

- Gauge internals are 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

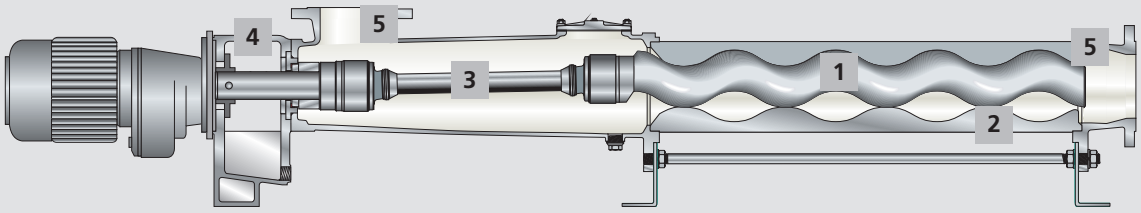
After Sales

- Commissioning
- Start-up assistance
- Maintenance at site
- Training at site and inhouse

Heating Jacketed Pump Housing and Dry Running Protection

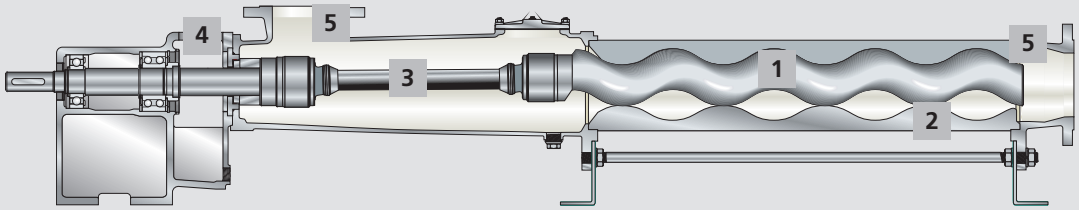
When the temperature of the medium in the pump exceeds the set value or no medium passes through, the NEMO® pumps equipped with STP-2A dry running protective system will stop operation automatically. For special applications, such as the pumps are installed in cold region, we provide the pumps with a heating jacket. When the hot water is introduced in the jacket, the whole pump will be heated, ensuring that the pumped media is kept in a flowable condition.

Design of NETZSCH Progressing Cavity Pump



NEMO® block construction pump

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



NEMO® bearing housing pump

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.

1 Rotor

Wear and corrosion resistant designs available in a wide variety of metal alloys as well as Duplex, Super Duplex, 254 SMO, Monel etc. (materials acc. to NACE possible). Surface hardening is used to transfer medium with sand for better component life.

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 Viton, HNBR for products including H_2S and high temperature.

3 Drive Train

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 application double seal pivot joint available. Its feature is high intergrity, 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 in 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 possible).

NETZSCH Multiphase Pumps

Why would you need multiphase fluid boosting solutions?

In the past many oil fields were considered as unprofitable due to unpredictable flow rates, not any more:
Multiphase pumps can handle these conditions and make exploitation profitable.

When the quality of an oil field decreases, with increasing gas friction, more water or sand mixed with the oil:
Multiphase pumps keep exploitation profitable.

When you have to support the force of the natural well pressure:
Multiphase fluid boosting solutions take the pressure off the well and support the transfer over long distances.

When you don't want to waste any natural resources, avoid flaring in the fields:
Use multiphase pumps to make the exploitation of the oil field even more profitable.

NETZSCH Multiphase Pump

Applications

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

Large Range of Capacities and Pressures

- Flow rate from a few m³/h up to 600 m³/h (91,000 bpd)
- Pressure up to 60 bar

NM105SY
Capacity: 44-94 m³/h
Pressure: 18 bar
Medium: multiphase water, gas, crude oil, H_2S
Gas rate: 85%

NM090SY
Capacity: 11,5-50-55 m³/h
Pressure: 23-30-35 bar
Medium: oil, water, gas
Gas rate: 35%

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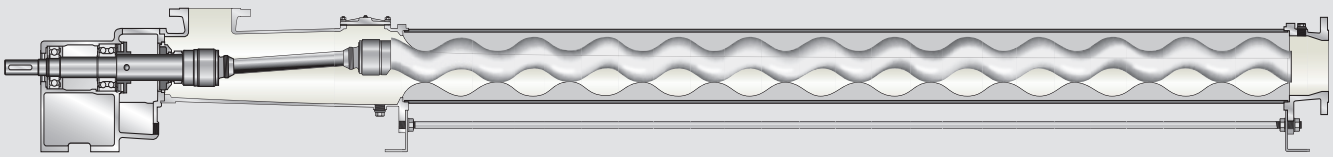
Advantages

- Can handle high content of sand
- 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
- Efficient transport medium with high content of gas
- Near to no shear rate – lowest shear of any pump design

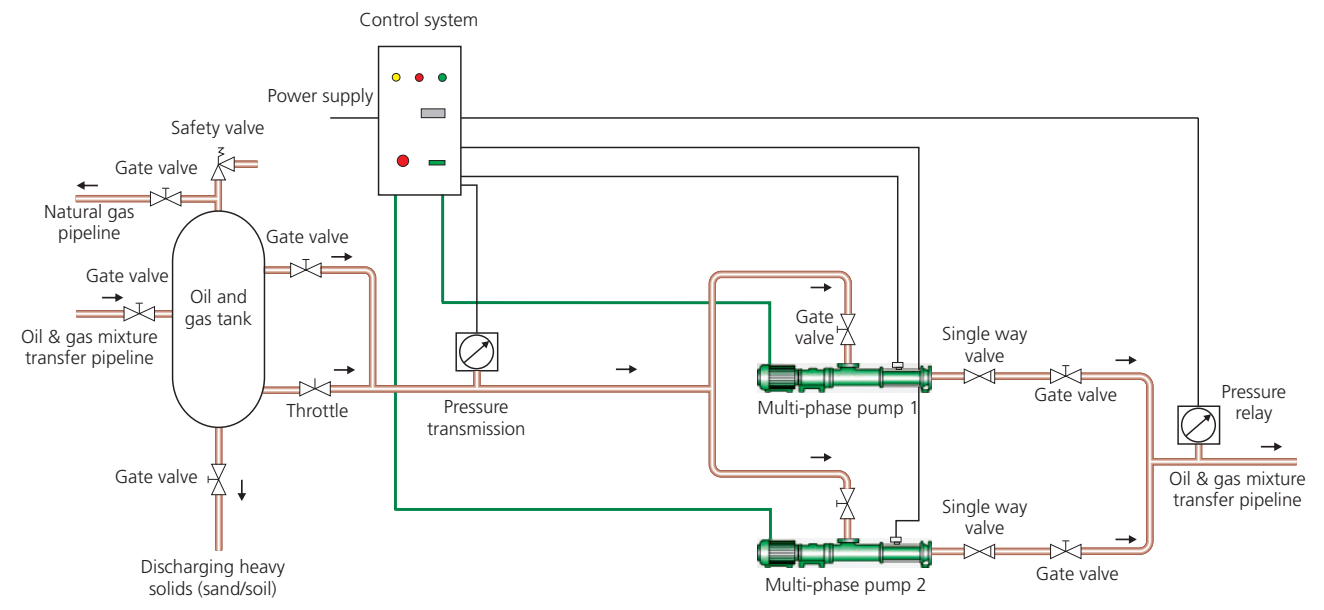
NM053SY
Capacity: 2-12 m³/h
Pressure: 28-40 bar
Medium: oil, water, gas 20-30%
Gas rate: 32%



NETZSCH Transfer- and Multiphase pump

Benefits compared to Low Pressure Separation

System Chart of Pumping Multiphase



Advantages

- Reducing investment cost by reducing the need for separate pipelines for gas and oil
- Increase 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

Characteristcs

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 set pressure.

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.

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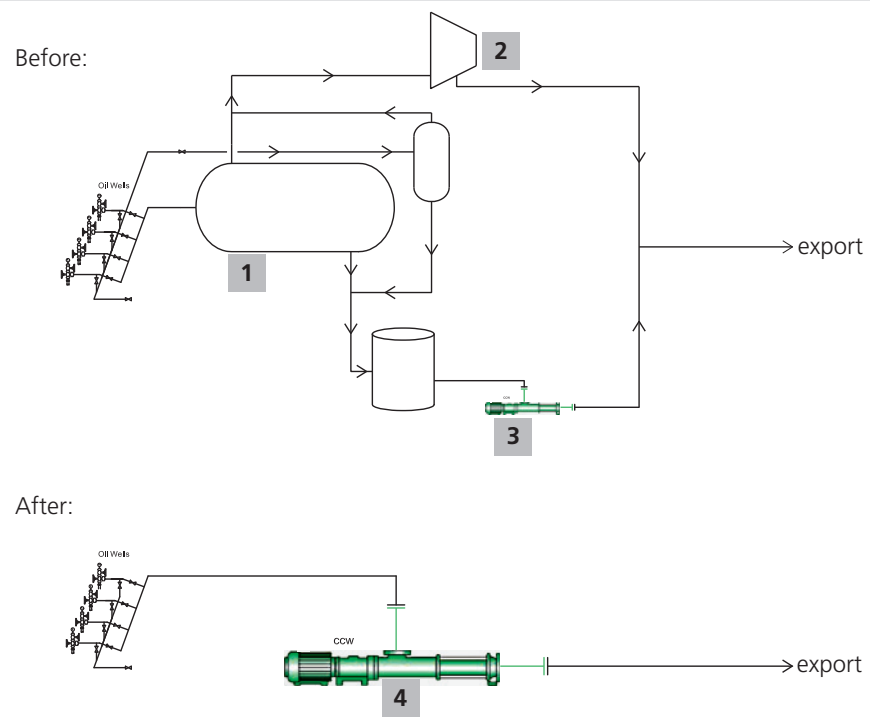
Why should you decide for NETZSCH multiphase fluid boosting and transfer solutions?

NETZSCH multiphase solutions give the Oil & Gas industry the flexibility to challenge traditional field process systems.

Low Pressure Separation (LPS) requiring separation vessel **1** ,export compressor **2** and oil export pump **3** can be replaced with the simpler multiphase pump **4** .

Benefits

- Multiphase pump system has a smaller overall footprint.
- Multiphase pump system has a smaller overall weight.
- You gain greater flexibility in field development.
- Multiphase pump system can be rapidly deployed to the field.



Technical Expertise and Experienced Design

NETZSCH experience from six decades of application knowledge gives you the needed expertise even in harsh conditions

System solutions for overcoming process challenges such as prolonged slugging and high GVF applications are just some of the considerations important for safeguarding the operation of the pump. With a broad range of elastomers whose formulae also benefit from our experiences of downhole pcp supply range, we can very precisely engineer those subtle features that we know make a difference.

Success in the field is demonstrated with the supply of so many pumps to mostly heavy oil regions for boosting oilfield crude oil to gathering stations.

We speak your language

Working towards the successful application of the specification and specific needs of the varied types of oil field we are asked to operate in. Our people know how to speak the language.

Design temperatures of -40°C force instruments indoors. NETZSCH pumps are proven at standing the cold. Proven and practiced solutions for pump protection are available from our engineering and field teams.

Adapting to the ocational challenges: The final pipeline lagging read for a cold winter in a remote Kazakhstan. Commissioning teams are always on hand to help up and cure unforeseen start up challenges.

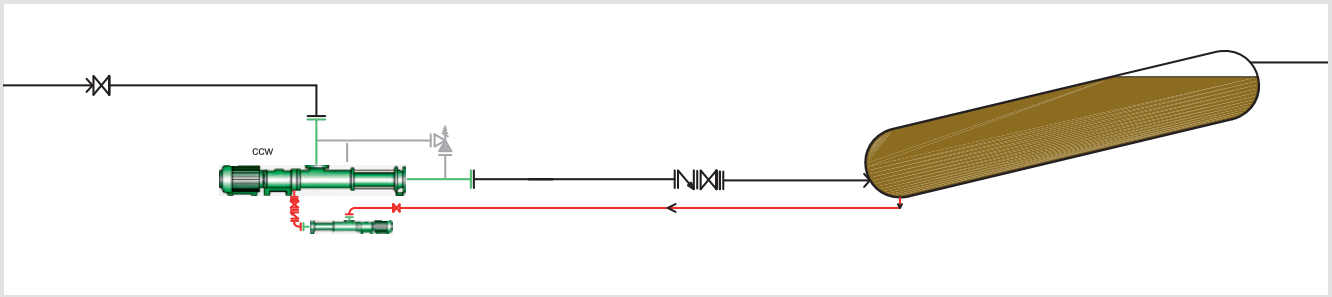
Instrumentation located in a heated cabinet

A small transfer pump operating in the cold winter at a small Russian independent oil producers transferring low volume multiphase fluid from a small well site. Discharging into pipe at 30 to 40 bar (435 to 580 psi).

Adapting to the challenges of extended periods of slugging; Proved quality and on-site support

System design is important to smooth out the lumps, bumps and difficulties that prolonged slugging brings to multiphase pumps. NETZSCH pump system consultants and field engineers have years of practised techniques of injecting liquid with pumps from external sources or by liquid collection and recirculation techniques also involving pumps.

NETZSCH pump operating in remote Russian multiphase crude oil application, with liquid collection



NETZSCH pump operating with 85% GVF at oilfield in Russia. Small injection pump for lubrication working when GVF is high.

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NETZSCH delivered solutions standing the test of time and mother nature

Pumps installed in the field of Sudan's Melut basin over 6 years ago, then and now.

Good maintenance and robust NETZSCH pump skid solutions are still looking good today. Operating in the hot and remote locations in Sudan's Melut basin could not wear them out. Skidable solutions are easily moved to suit the operational needs of the various oil fields in the basin.

Commissioning photo 2005

NETZSCH service team condition monitoring survey photo

Complete package delivered according to local requirements

- Skid
- Control system
- Filters
- Valves
- Instruments

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The NETZSCH Group is an owner-managed, internationally operating technology company headquartered in Germany.

The three Business Units – Analyzing & Testing, Grinding & Dispersing and Pumps & Systems – provide tailored solutions for highest-level needs. Over 2,500 employees at 130 sales and production centers in 23 countries across the globe guarantee that expert service is never far from our customers.

The NETZSCH Business Unit Pumps & Systems offers NEMO® progressing cavity pumps, TORNADO® rotary lobe pumps, screw pumps, macerators/grinders, dosing systems and equipment custom built and challenging solutions for different applications on a global basis.

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