wepuko PAHNKE

We perform under high pressure.

Process Pumps

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www.wepuko.com

Follow this link to get more detailed information on the solutions and products of Wepuko PAHNKE.

Dear Reader,

The “Process Pumps” division is an important business sector for Wepuko PAHNKE. With sophisticated technology, specialized knowledge and skills of our engineers and the fast response of our service team, we consistently find the best solution to meet even the most challenging customer requirements.

Our high-pressure plunger pumps distinguish themselves with high durability and reliability. We establish the basis for trouble-free operation of process technology systems focusing on safety, reliability and economic efficiency. Wepuko PAHNKE is among the leading partners for customers in the oil and gas industry, power plants and other users with process technology systems.

The following pages will provide more information about our product portfolio and the numerous typical applications.

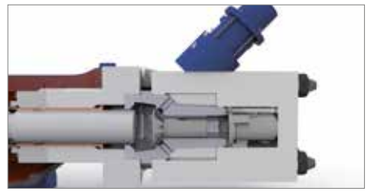
Typical media in the processing industry:

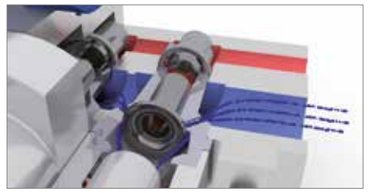
- Methanol
- Ethanol
- Glycol (MEG, DEG, TEG)
- Hydrocarbons
- Diesel
- Crude oil
- Supercritical carbon dioxide
- Propane, butane (liquid)
- Seawater
- Brine
- Contaminated water
- Ammonia
- Acids and bases
- Boric acid solutions
- Phosphates
- Liquefied natural gas (LNG)
- Mixtures of media

DP 212 pump unit for produced water injecton.

Productivity made by Wepuko PAHNKE: Pumps and units

Robust and low-maintenance: Our process pumps are used in processing technology, the onshore and offshore industry and in power plant engineering. Whether pumps for all high-pressure applications or complete custom hydraulic units – we are the right partner for you.





High-pressure plunger pumps

Three models for diverse applications: The DP series of Wepuko PAHNKE pumps are horizontal triplex plunger pumps. They can be configured for just about any pumpable medium. Special materials for the fluid end and plunger seal design are selected to suit the medium. The fluid end can be equipped with cooling, heating or flushing, as required. The drive ends of the machines are designed with an integrated pressure- or wiper lubrication system.

Our pumps are used in chemical plants, in natural gas storage plants, in nuclear power plants, in drilling rigs, on oil platforms, in the food industry, in boiler feed systems, in hydrostatic slide bearing lubrication, in high-pressure cleaning systems, in drives for forging presses, in descaling systems and in press water systems.

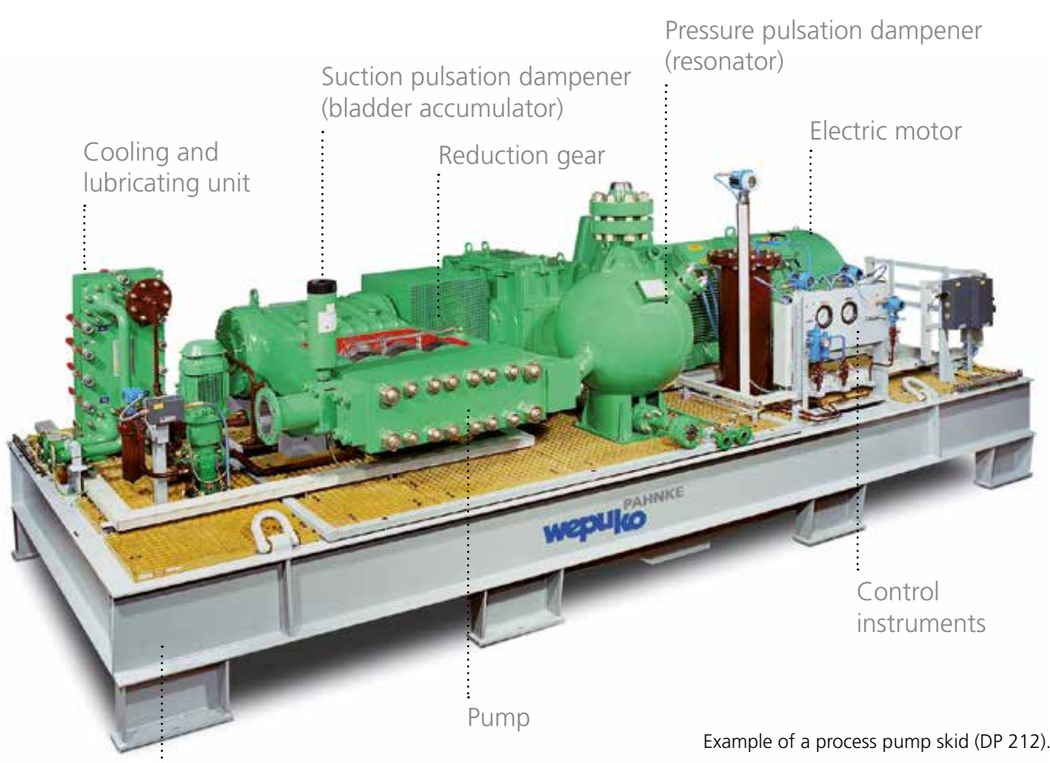
Our DP series pumps have flow rates ranging from approx. 4 to 5000 l/min, pressures of up to 1500 bar, a performance range of 5 to 1600 kW and a fluid temperature range of -196 °C to +280 °C. Higher performances and special designs are available on request.

Pump units from a single source

Wepuko PAHNKE pump units are complete solutions for your special application. Customer specifications are precisely implemented for direct integration of the unit into the process system.

The illustration below depicts a typical pump unit for the oil and gas industry. Every unit is built upon a skid, onto which all other components are installed. The heart of the unit is the Wepuko high-pressure plunger pump, which is connected to the drive (motor/transmission) by flexible couplings. The pump is integrated by pipeline connections into the system. The fluid is fed through a suction pulsation dampener, if requested by the customer, into the liquid head of the pump. Hence it is pressed by the oscillating motion of the plungers through the pressure pulsation dampener into the high-pressure pipe.

Components such as oil pressure lubrication, safety mechanisms and the monitoring and control electronics that are also mounted onto the skid complete the unit. We offer various special paint coatings to suit the conditions on site.



Example of a process pump skid (DP 212).

Accepting challenges: New development and improvement for all industries

Almost every industry is continuously looking for plant components that perform better and operate more safely while decreasing in weight and size. We fulfill our customers' high expectations by constantly developing new pumps and improving our existing designs.

Oil and gas

Whether on an offshore platform in the North Sea, the icy tundra of Siberia or in the desert of the Persian Gulf, our pump units run 24 hours a day for nearly 365 days a year.

The oil and gas industry is probably the most demanding industry on this type of equipment. All units have to withstand harsh conditions and must be designed for high availability. Unforeseen downtimes can cause enormous costs. Our customers are looking for a smooth production and process flow. This is exactly what we focus on, when it comes to the selection of our pumps and components.

Pumping oil and gas also demands custom system designs developed specifically for each individual case. Standard requirements are optimum efficiency, compact design, quick and easy maintenance and excellent control dynamics. We meet all these requirements to precision.

Our products are in accordance with international standards, such as API (American Petroleum Institute), Hydraulic Institute (HI) and certainly customer specifications.

Refineries and petrochemicals

In the downstream sector certain processes are predestined for the use of high-pressure pumps. Wepuko PAHNKE high-pressure plunger pumps are a great choice for hydrocracking in the petrochemicals industry, for wash water pumps or even for feed water pumps.

In our designs we particularly pay attention to special explosion protection and to API 674 / ISO 13710 requirements.

Power plants

Safety does not allow a second chance – which is why Wepuko PAHNKE high-pressure plunger pumps are used not only in German nuclear power plants, but also in China, India and Russia. The reliability of our pumps is greatly valued – for example as cooling or feed pumps for the mechanical seals of emergency pumps or as boric acid injection pumps for the safety systems in pressurized-water reactors. Our quality assurance conforms to KTA 1401 and AVS D 100 / 50.

Our pumps are not only used in nuclear power plants, however: In conventional power plants, they are used as boiler feed water pumps, while in solar power plants, our pumps serve as feed water and recirculation pumps or condensate pumps. Operating temperatures in these applications reach up to 270 °C.

Other industries

Since our pumps are built to customer specifications, they can be used in countless other industries, such as the pharmaceutical, cryotechnology and the food industry. There, they are often used as feed pumps for liquid CO_2. Liquid CO_2 is used in extraction plants to obtain seasonings, aromas and other substances.

Responsibility and perspectives: Our pumps in use

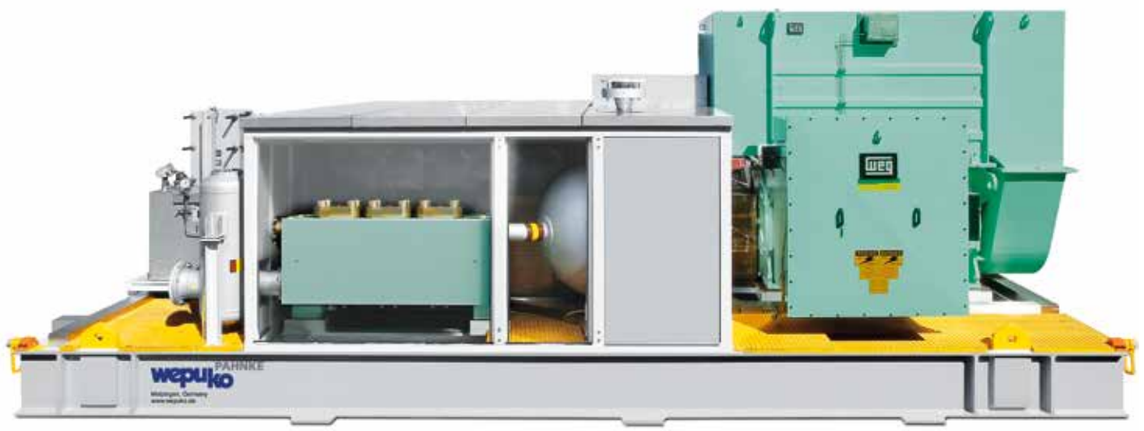
Whether for fracking, gas drying, as injection pumps or for well service: Wepuko PAHNKE pumps are in continuous operation onshore and offshore. They guarantee a smooth production flow under all circumstances.

Well Service (onshore and offshore)

For well service operations, pipeline pigs are pushed through the inside of pipelines and risers. This is where our pumps step in. The medium pumped for this hydraulic task is typically diesel. Pigs can be used for various purposes. Mainly they serve for inspection for corrosion and cracks, cleaning the pipeline or to seal it off during repairs and maintenance.

Another well service application for our pumps is hydrostatic pressure testing of risers and pipelines, on platforms and FPSOs. The typical medium used in these cases is water, seawater or a water-glycol mixture.

DP 410-125 pump skid for well service (driven by a diesel engine).



DP 532-250 pump skid for well service.

Injection pumps (onshore and offshore)

As a precautionary measure, additives are injected into transportation conduits and pipelines. In such cases, our pumps inject methanol, ethanol or glycol in order to counteract hydrate formation and blockages.

Another application is to inject immediately before commencing the actual transportation operation; this prevents any water being present in the oil or gas and freezing onto the walls of the pipeline.

Additionally our pump units are designed to execute other functions such as hydrostatic pressure tests or hydraulic opening and closing of large valves.

Hydrocarbon condensate injection is another use for Wepuko PAHNKE pumps. The fluids are then re-injected into the well or directed back into the process.

DP 406-080 pump skid for HC condensate injection.

MEG injection pump skid (DP 408-100 A/B).

Produced water

Produced water is re-injected in order to enhance and stabilize the production of the well or simply for the disposal of water. Extremely salty water which has been separated by an upstream process is most often continuously pumped under high pressure into wells. Again, our high-pressure plunger pumps prove their quality in this application. Designed in accordance with API 674 / ISO 13710, they fulfill the high standards of the petrochemical industry.

DP 410-125 pump skid for produced water injection (in service at OAO Tatneft).

Air cooled DP 212 pump skid with redundand lubrication oil system for produced water injection.

Fracking & well stimulation (onshore and offshore)

Our high-pressure plunger pumps are also used for fracking and well stimulation. In these processes, they pump mixtures of water and chemicals as well as acids and polymers with abrasive components into the well.

Under high pressures this fluid fractures the rock formations in order to expand the well and to optimize the yield. The process requires pressures of up to 1000 bar (about 14500 psi) and high flow rates. Our pumps have been successfully employed in these fields for many years – for example as offshore scale squeeze pumps on intervention vessels.

For well stimulation, several different methods are used to increase the production of an oil or gas well. This method is primarily used in the later life of a well, in order to avoid and delay a decline in production efficiency. In this matter Wepuko PAHNKE pumps ensure an increased recovery of the resources.

DP 212 pump skid for well stimulation.

Gas dehydration (Onshore and offshore)

For gas dehydration, our pump units are used for processing cold or hot glycol in a gas dehydration system.

Produced natural gas has a relatively high content of dissolved water and therefore a low calorific value. In the process dry glycol “rains” through the natural gas stream (like in a shower) and draws out the humidity. Due to its hygroscopic structure, the glycol absorbs the dissolved water. The saturated glycol is then dried and will be fed back into our pumps.

DP 403-035 pump unit in compact design for pumping glycol for gas dehydration.

Boric acid pumps

In nuclear power plants using a pressurized-water reactor, our pumps are used to inject boric acid into the reactor in emergency situations.

High reliability of the equipment is essential for such an application: Should any primary safety systems fail, such as the retraction or hydraulic drive of the control rods, then the pump injects a boron solution into the reactor. The boron, like the control rods, serves to absorb neutrons to stop the chain reaction.

DP 408-100 pump unit for the injection of boric acid. This unit is employed at the nuclear power plant Leningrad 2.

Boiler feed water pumps

Our plunger pumps are used in conventional power plants as primary pumps and as emergency backup feed water pumps. In smaller scale solar power plants they are installed as feed water and recirculation condensate pumps. Temperatures in these applications reach up to 270 °C, placing high demands on the material, seals and connecting elements.

Aside from the classical use as boiler feed water pumps, our pumps are used for other related applications such as enhanced oil recovery, for example. This is where various gas types are injected in order to force the oil to the surface and to minimize the viscosity of the crude oil.

DP 207 boiler feed water pump unit.

CO_2 applications

In the food industry, our plunger pumps are used for high-pressure extraction using supercritical carbon dioxide (CO_2). This carbon dioxide is used as a solvent that does not harm the product nor burdens the environment.

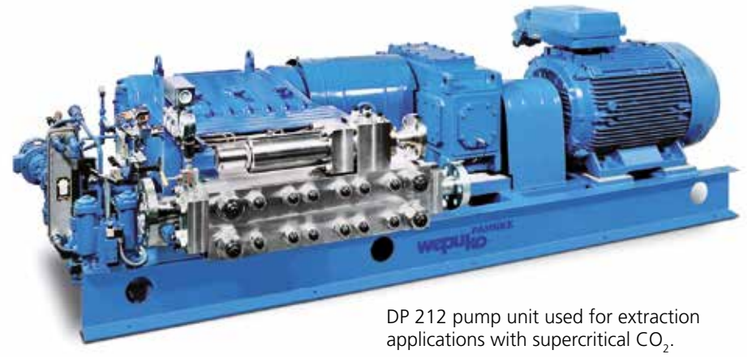
Environmental requirements in the refinery and power plant industry are becoming more stringent, making the compression of CO_2 increasingly more attractive.

Cryotechnology

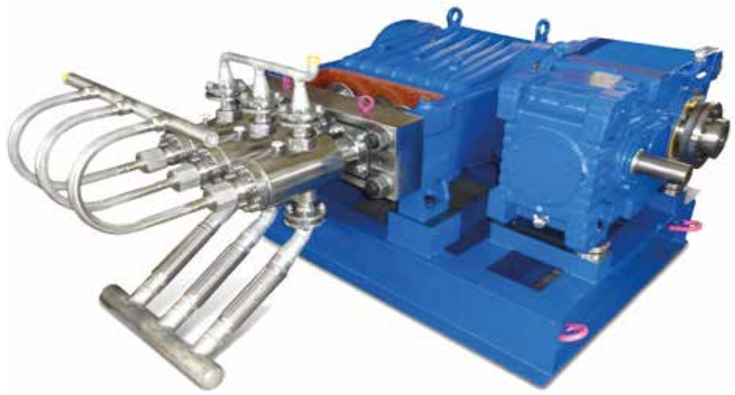
In cooperation with the low temperature specialist KRYTEM, we manufacture high-pressure plunger pumps for cryogenic liquids. The particular challenge in this technology is the selection of the materials for the components getting in contact with the fluid at -196 °C.

Other applications

Have we not mentioned your application? There are many, many other applications for our process pumps other than those presented here. We would be happy to advise you!



DP 212 pump unit used for extraction applications with supercritical CO_2.



Pump unit for cryotechnology, developed in cooperation with KRYTEM.

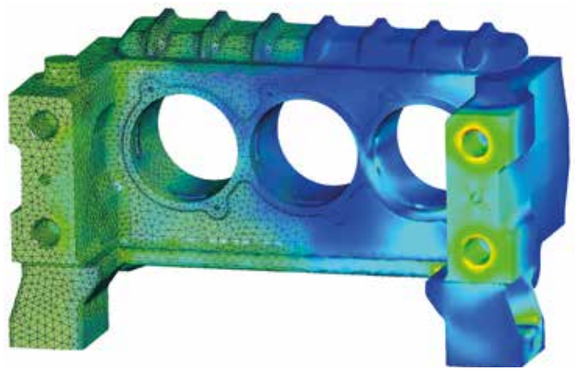
Supported by:

Federal Ministry for Economic Affairs and Energy

on the basis of a decision by the German Bundestag

Close to the market: Research and development

What does the market need? This question excites the developers at Wepuko PAHNKE. Their work involves creating solutions for special customer requirements and opening up new fields of application. Research and development, design and the entire production are located in Metzingen. This means all our competency is consolidated on one site.



Modern simulation tools such as FEM and CFD support the design process at Wepuko PAHNKE.

Innovation on-site

Research and development is of high priority for us. This is the only way to achieve our goal: reliable, sturdy and precise machinery.

Wepuko PAHNKE GmbH combines the knowledge and experience of two great companies: the history of Wepuko with over 80 years of experience with high-pressure plunger pumps and the history of PAHNKE Engineering with over 40 years of experience with hydraulic forging presses. The development team also benefits from the short and quick communication channels at the headquarters, when dealing with the challenges of tomorrow.

Presses and pumps are developed separately due to their product-specific properties. Nevertheless we focus on an intensive exchange of ideas and concepts between the departments. The result: coherent, optimized solutions for our customers.

All of our tests and development take place on our site in Metzingen. This is how we protect our unique knowledge and save time.

Quality standards

Our presses and pumps fulfill extreme requirements when it comes to load capacity and reliability. Many of our products are custom-made, designed precisely to fit the requirements of the customer.

For our prototypes and small series the planning and simulation phase is key. At Wepuko PAHNKE, we constantly reinvent our products for the needs of our customers.

Even small changes, for example in the dimensions, often have major effects on the occurring forces and material stresses. With fluid flow in complex geometries, avoiding cavitation is essential.

Virtual development processes are increasingly gaining importance; they secure high quality with short development times. They offer our customers transparency and security: In many cases, our customers actually receive an initial feasibility study and test calculations with their offer.

It goes without saying; our quality management system is certified in accordance with ISO 9001:2015.

Development with FEM

In order for the development to lead quickly and efficiently to a result, we use the latest simulation tools, the FEM (finite element method) to analyze mechanical stability and CFD (computational fluid dynamics) to inspect the fluid mechanics of components.

This allows us to calculate the mechanical and fluidic properties of individual components from the very first design step, to an optimized final design, leading to a highly efficient product.

Our test bench subjects the end product to an extensive test procedure allowing us to guarantee the requested product properties and total customer satisfaction.

We perform under high pressure... and we perform peerlessly!

There's no one like us! Wepuko PAHNKE is the merger of two market leading, traditional companies: Wepuko, the specialist for high-pressure pumps and PAHNKE the pioneer in the field of hydraulic forging presses. This mixture makes us unique and gives us significant advantages over the competition.

Wepuko PAHNKE GmbH in Metzingen, Germany.

Wepuko PAHNKE is a German mechanical and systems engineering company, specialized in the design and manufacturing of high-pressure pumps and hydraulic forging presses, including their drives and controls. The company is a global leader in these fields. The range of pumps includes triplex plunger pumps and radial piston pumps with variable and constant displacement. Wepuko PAHNKE also develops and builds units and systems according to customer specifications. Furthermore, the company offers complete descaling systems.

Our solutions can be found in the oil and gas industry, chemical plants, power plants, heavy industry, steel mills and many other applications. Customers include: Otto Fuchs and Citic Heavy Industries in the Hydraulic Forging Presses and Oil Hydraulics sectors, SMS Meer, Vallourec & Mannesmann, Robert Bosch and ArcelorMittal in the Water Hydraulics sector and Shell, Petrobras, Petronas, Statoil, Gaz de France and Hyundai Heavy Industries in the Process Pumps sector.

The company was founded in 1932 by Fritz Thumm in Metzingen, South-West Germany. One of the company's many innovations was the introduction of large radial piston pumps with a very flexible control system and rapid flow direction reversal (1966).

After the takeover of Wepuko by the Pahnke family in 1996, the company was able to introduce the know-how of Hans-Joachim Pahnke and his son Michael Pahnke, both pioneers in the field of open die forging presses. The outstanding innovations that Hans-Joachim Pahnke developed, include the first underfloor open die forging press featuring a two-pillar design (1956) and the **P**AHNKE **M**odified **S**inusoidal **D**irect drive (PMSD drive) in 1975. The largest hydraulic system in the world went into operation at Norheinco in China in 2009, and the world's strongest open die forging press by PAHNKE went into operation in 2011 at Citic Heavy Industries in China. Both using a Wepuko PAHNKE PMSD drive.

Today, the company is managed by Tanja Pahnke and remains a strong innovator in its fields. The Wepuko PAHNKE group includes companies in the USA, China and Russia. Wepuko PAHNKE also has a global presence with representatives in more than 70 countries.

Milestones

1932 Wepuko founded in Metzingen by Fritz Thumm

1973 PAHNKE Engineering is founded in Düsseldorf by Hans-Joachim Pahnke, Fritz Thumm Jr. and Eric Koik

1996 Wepuko is taken over by the Pahnke family

2002 The products of the two companies are consolidated into one company

2011 Renamed to Wepuko PAHNKE

We perform under high pressure.

At home the world over: with our representatives in more than 70 countries

Process Pumps

Hydraulic Forging Presses

Oil Hydraulics

Water Hydraulics

Service

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