Wirth™ Heavy Duty Slurry Pumps

About Wirth™ Piston Diaphragm Slurry Pumps

For more than 60 years, HMH has been manufacturing Wirth piston diaphragm slurry pumps and numerous positive displacement pumps, becoming an industry leader. Our full line of high-pressure slurry pumps can cover every type of slurry application and have power ratings of up to 3,000 kW.

About HMH

HMH was constituted in October 2021, through the merger of Baker Hughes' Subsea and Surface Drilling Systems business and Akastor ASA's wholly owned subsidiary MHWirth AS. Although the HMH name is new, HMH has been manufacturing industry-leading equipment for more than 130 years. Building on the legacy of our historical brands and with an eye towards innovation, HMH has created one of the mining industry's most comprehensive portfolio of products, systems, and services for subsea and onshore mining, onshore and offshore drilling, and construction applications.

With a global span that covers five continents, HMH is embracing new opportunities in other industries and innovative digital solutions with the same commitment to quality, safety and value. In even the most demanding environments, you can count on HMH to deliver advanced performance and products, integrated delivery capabilities, and renowned industry expertise to meet your needs.

Our Expertise for Your Project

At HMH, we closely assist our clients all the way through the project. We provide continuous support during the complete lifetime of the slurry pump to allow you to complete your project on schedule and on cost.

Feasibility Studies and Concepts → Tender and Project Phase → Manufac-turing and Testing → Delivery → Installation, Commission-ing & Training → Lifetime Services

Feasibility Studies and Concepts

- Assessment of customer requirements and expectations
- Analysis of site conditions and infrastructure
- Conceptual design and layout of the pump system

Tender and Project Phase

- Preparation of detailed technical and commercial proposals
- Tailor-made solutions
- Detailed calculation and simulations

Manufacturing and Testing

- First-class manufacturing made in Germany
- Factory Acceptance Test (FAT)
- 3rd party verification

Delivery

- Coordination of logistics and transportation
- Sea and air freight

Installation, Commissioning & Training

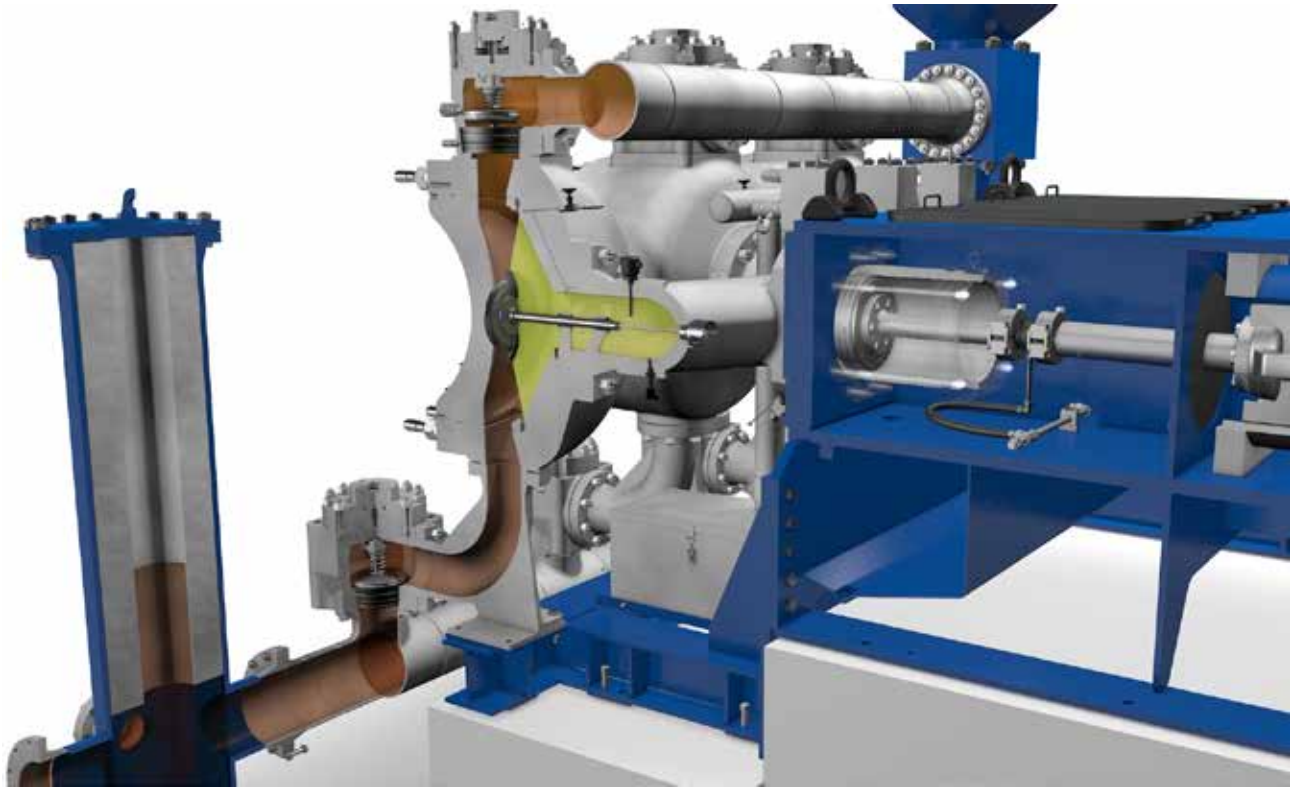
- On-site installation by experienced specialists
- Start-up and commissioning
- Crew and operator training (on-site, classroom or online)

Lifetime Services

- Maintenance, repair and overhaul services
- Supply of spare parts and accessories
- Technical support and remote monitoring

About Piston Diaphragm Positive Displacement Pumps

HMH's Wirth™ positive displacement pumps have been supporting customers for more than 60 years in different applications, transferring abrasive slurries with high solid concentration against high pressures.



How Do Positive Displacement Pumps Work?

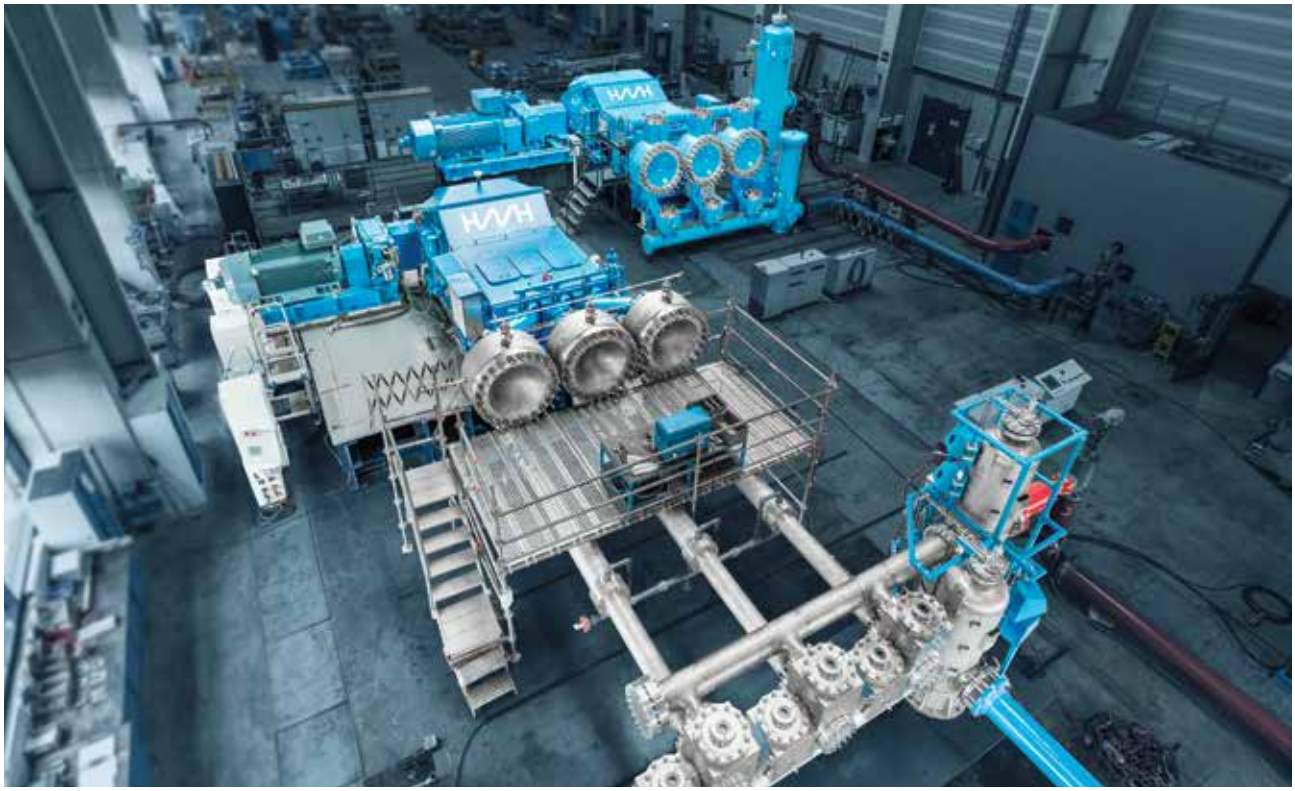
An electric motor driven crank mechanism is connected via connecting rods and crossheads to the pistons. At each forward stroke, hydraulic oil is pumped into housings which are equipped with a flexible diaphragm. The diaphragm separates and protects the hydraulic oil and the moving parts behind it from the slurry which is in front of the diaphragm.

During the discharge stroke of the piston, hydraulic oil will move the flexible diaphragm forward and slurry, which is present at the other side of the diaphragm, is discharged through the discharge non-return valve. When the piston moves backwards, the suction pressure on the other side of the diaphragm will push the diaphragm backwards, suction pressure will fill the diaphragm housing with slurry through the non-return suction valves.

Watch our videos to learn more about functionalities of different Wirth slurry pump variants

Wirth™ Slurry Pumps – Field-Proven Efficiency

More than 1,000 positive displacement pumps have been supplied for a broad range of applications. All Wirth™ slurry pumps are designed, manufactured and tested in Erkelenz, Germany.



Key Features

- Rugged, heavy-duty design
- Minimized number of wear parts with long lifetime
- Equipped with internal lubrication and pressure relief system
- Suitable for high temperature applications
- Fluid end can be supplied in stainless steel for corrosive slurries
- High pressure capability
- Lowest suction and discharge pulsation

Benefits

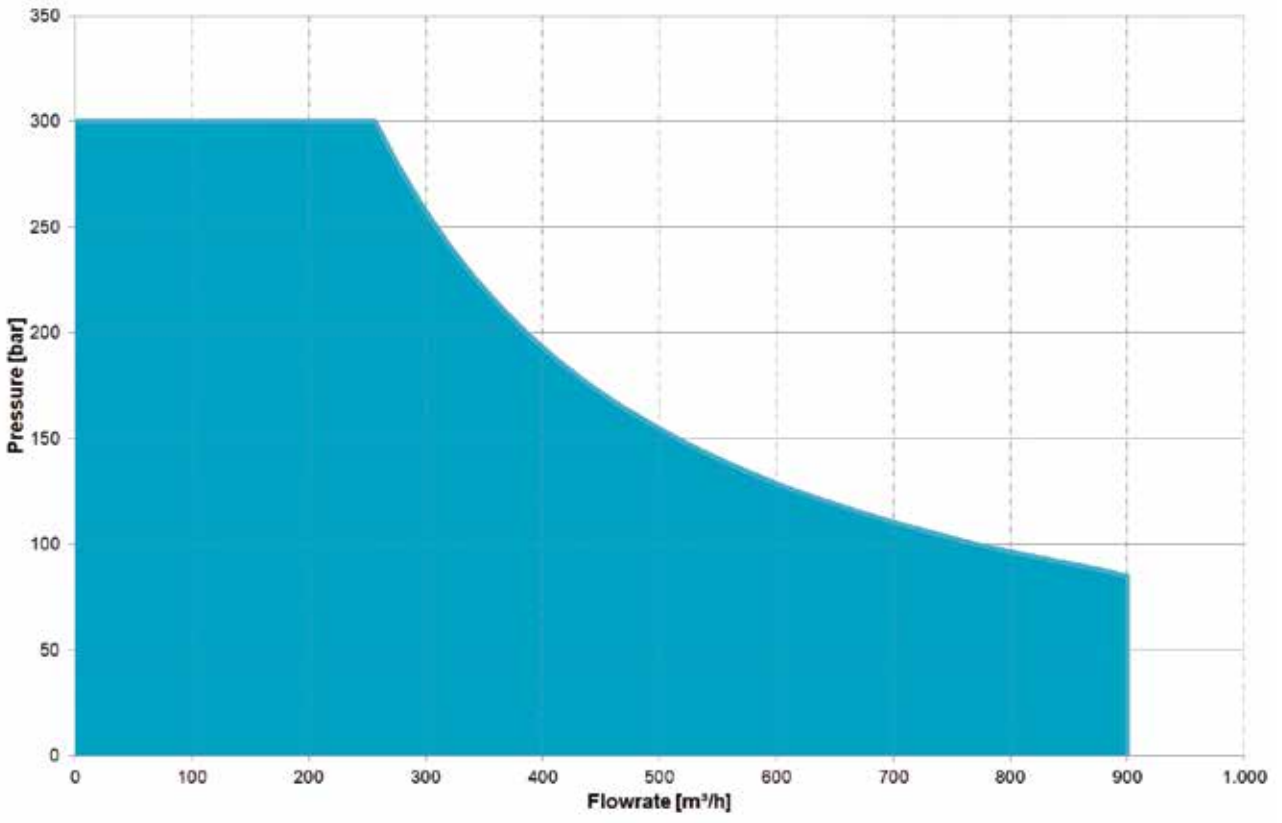
- Low operating cost (OPEX) and total cost of ownership
- Availability above 97%
- Efficiency above 90%
- Low CO_2 emissions
- Operational lifetime above 30 years
- Low water consumption for slurry transportation

Broad Range of Applications

Pipeline Transportation	Metallurgical Industry	Underground Mining	Oil Industry	Power Industry
■ Tailings transfer ■ Concentrate transfer ■ Mineral sands ■ REA gypsum ■ Fertilizer transport ■ Red mud	■ Autoclave feed (HPAL) ■ Reactor feed ■ Digester feed ■ Pressure Oxidation (POX)	■ Mine dewatering ■ Mine backfill ■ Hydraulic ore hoisting	■ Oil sand refining ■ Frac sands ■ Tailings disposal	■ Ash (fly/bottom/ HCSD) ■ Coal slurry ■ Long distance transport

Our Wirth™ Piston Diaphragm Pumps

	TPM	DPM	TPK
Flowrate per pump	900 m³/h	750 m³/h	201 m³/h
Discharge Pressure	300 bar	200 bar	500 bar
Max. Power	3,000 kW	2,500 kW	1,650 kW
Cylinder	Triplex	Duplex	Triplex
Acting	Single	Double	Single
Diaphragm	Yes	Yes	No
Possible Applications	High volumes High pressure High abrasivity	High volumes High pressure High abrasivity	High volumes High pressure Low abrasivity

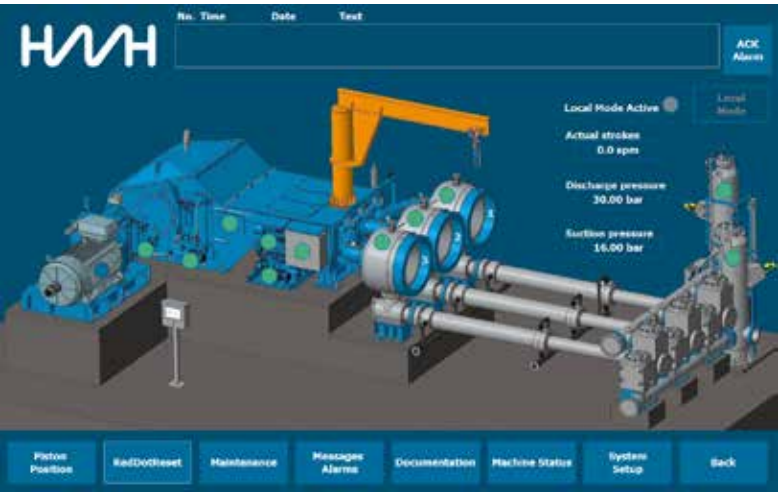


Digital Solutions

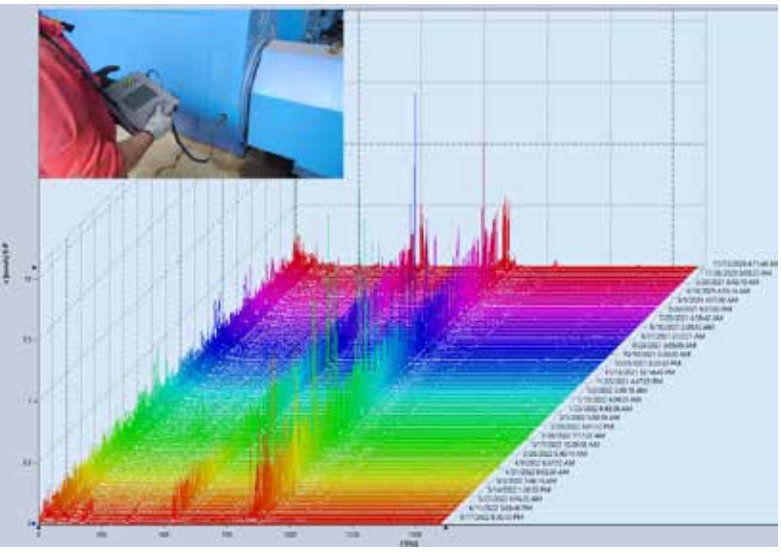
Just like a human heart, our Wirth™ PD pump is the core component that keeps your complex production system running smoothly. And just as we monitor our own health to keep human hearts functioning optimally, it's equally important to monitor the performance and health of the pump. Therefore, we have developed advanced digital features to ensure it operates at peak efficiency and longevity. The gained data allow you to proactively identify and resolve issues, reduce downtime and extend the life of your PD pump. And in the unlikely event of a failure, the pump can automatically send alerts, allowing you to respond quickly and minimize any disruption to your operations.

Cutting-Edge Pump Control System

- Superior machine control system interface
- Real-time monitoring of pump performance and critical performance indicators, including flow rate, pressure, temperature etc.
- Intuitive step-by-step guidance
- Select desired task with ease
- Precise and accurate results
- Eliminates guesswork and manual errors



HMI Screen



Vibration Analysis

Condition Monitoring

- Early detection of potential issues and predictive maintenance to minimize downtime
- Remote monitoring and data analysis
- Vibration monitoring as well as analysis
- Customizable alerts and notifications

Pump Logger™

- Remote connection to pump
- Cloud-based service
- Historical and real-time data analysis for better decision-making
- Compatible with tablet, PC, and smartphone
- Individual app for user-friendly interface

Condition Based Maintenance

- Maintenance based on actual need instead of a fixed schedule
- Minimized downtime and equipment failure
- Better utilization of resources
- Proactive maintenance strategy
- Improved safety and reduced risk

Vibration Analysis Services

- Comprehensive vibration analysis of pumps
- Early detection of potential problems
- Accurate diagnosis of root causes of issues
- Expert analysis by certified technicians

Our Commitment to HSSE and ESG

At HMH, we deliver leading solutions that aim to reduce our, and our customers' carbon footprint wherever possible, while promoting a diversified workforce and basic human rights.

All HMH facilities around the world hold the group certification of ISO 14001:2015 to enhance our environmental performance and contribute to the environmental pillar of sustainability. UN Sustainability Goals are vested in our product design, supply chain, project management and operations on any customer site.

Wirth™ positive displacement pumps are well known for their very high and continuous efficiency of > 94% (in accordance to the Hydraulic Institute ANSI/HI 6.1-6.5). In addition, all pumps are driven by highly efficient electric motors of market-leading brands. The outstanding system availability of > 98% and very limited wear parts (check valves and diaphragms with high lifetime) not only keep your operating costs at a minimum; they also reduce material consumption significantly. The MTBF/MTTR ratio is very high and our monitoring system helps to detect imminent failures of components to allow for condition based maintenance at the right time.

Freshwater is a valuable and limited resource. Using Wirth slurry pumps allows transport of highly thickened and paste slurry using only a minimum amount of water. Additionally, Wirth pumps do not consume water for cooling purposes. The amount of oil and lubricants used in the pump is kept to a minimum and our pumps come with a double filter system extending the use of lubricants.

References

More than 1,000 Wirth™ positive displacement pumps have proven to be outstandingly reliable and efficient in numerous projects around the world.

Peru – Antamina Mine

Since 2002, four Wirth TPK pumps are operating at the Antamina copper mine located at an elevation of 4,200 m. They transport copper concentrate through a 300-km-long pipeline, running from the mine site to the port of Huarmey, north of Lima. Each pump has a capacity of 132 m^3/h; the required discharge pressure is 25.2 MPa, while the installed power is 1,300 kW with variable frequency drives being used.

Australia – Century Zinc

Three Wirth TPM 2200 positive displacement pumps are operating at the century mine in Australia, transferring a high density slurry of lead and zinc concentrate through a long distance pipeline.

Century Zinc pipeline is the longest single pump station in the world with 308 km from mine to port.

Chile – Andina and El Soldado Mine

Six Wirth TPM 2200 pumps transport 140 m^3 and 115 m^3 of copper tailings every hour in the Andes Region of Chile. The pumps are in service for Codelco and Anglo American for more than 20 years.

Australia – OZ Minerals Carrapateena

One heavy duty Wirth TPM 2200-20 pump has been installed in 2020 for Copper and Gold Tailings transportation at OZ Minerals South Australia operations.

The pump has an installed power of 2,000 kW and replaces four centrifugal pumps which have been installed in series earlier.

Concentrate Slurry Transfer | Tailings Transfer | Autoclave Feeding | Digester Feeding and Red Mud Disposal

Underground Mine De-watering | Underground Mine Hydraulic Hoisting

Indonesia – Zhejiang Huayou Nickel Cobalt

Eight Wirth TPM 2200-20 HS pumps are used in an autoclave feed operation for Nickel processing at Morowali Industrial Park (IMIP). Further 24 Wirth TPM 2200-20 HS pumps are operating at Weda Bay Industrial Park (IWIP). Slurry temperature is up to 220 °C and each pump has a capacity of up to 550 m^3/h. All pumps are equipped with HMHs unique telescopic expansion joints to cover thermal heat expansion and stroke induced pulsation of the cooling legs.

Australia/Gladstone – Yarwun Alumina Refinery

The Yarwun Alumina Refinery, owned by Rio Tinto Alcan, has an alumina production rate of 1.4 million tons per year (MTPY). 18 Wirth TPM pumps (eight of which were installed in 2004, and the other ten in 2009) are used as digester feed pumps. The pumps transfer respectively 390 and 425 m^3 of caustic bauxite to tube digesters every hour at a pressure of 9.6 MPa.

Australia/New South Wales – Broken Hill Mine

Since 1991, four Wirth TPM pumps transport 100 m^3 of dirty, unsettled, mine water every hour from a depth of 1,065 m to the surface in one stage. The required discharge pressure is 13 MPa.

Canada/ Saskatchewan – McArthur River/Cigar Lake Uranium Mine

The McArthur River mine, owned by Cameco, is the world's first hydraulic ore hoisting operation. Uranium ore is crushed underground, mixed with water and pumped to the surface as slurry where it is further processed. In 1998, two Wirth TPM were installed at McArthur River, each pump with a flow rate of 80 m^3/hr at a pressure of 12.5 MPa. In 2012 two more Wirth TPM pumps were supplied to Cigar Lake, each of these with a flow rate of 80 m^3/hr at a pressure of 9.2 MPa.

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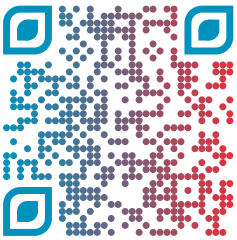

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