ABEL®
Pump Technology

Since 1947

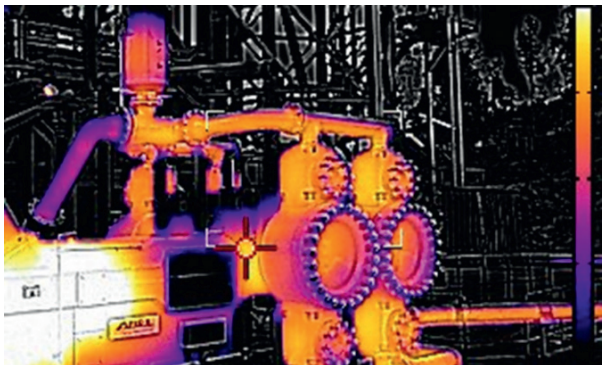
Mine Dewatering

Made in Germany

Diaphragm Pumps
Solids Handling Pumps
High Pressure Pumps
Marine Pumps

www.abelpumps.com

Complete Rheological Analyses



Optimisation of Materials

ABEL Lab

Optimisation of Materials and Rheology

ABEL can count on its facilities, which are equipped with the most modern technologies and allow a complete analysis of the product to be pumped to be performed, whatever its nature and other properties: concentrated mineral, thickened tailings, paste tailings, chemical products, mine water, etc.

Our facilities are provided with equipment which can determine:

- The best material to be used for the pump and those parts which come into contact with the product;
- The most suitable material from a mechanical point of view for pumping abrasive slurry;
- The optimal solid concentration for a transfer over a long distance;
- Slump test and tests for making the paste more liquid;
- Pump yield stress.

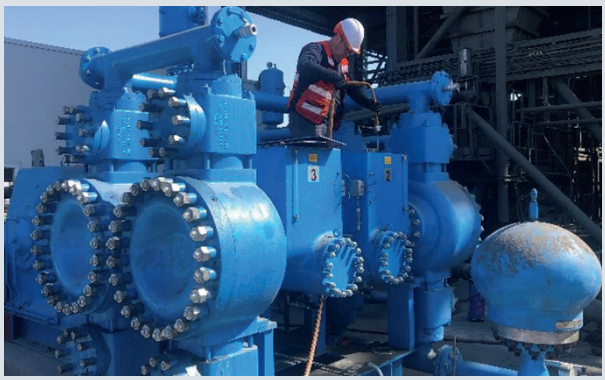
ABEL Customer Service

Full Trust in Production Processes

ABEL's after-sales solutions are customer-oriented and designed based on many years' experience in mining. The technical service can be put together according to the specific requirements of the application and customer. This includes:

- Training in the factory
- Training and commissioning
- Preventative maintenance
- Optimization of pumping systems
- Creation of maintenance plans
- Comprehensive maintenance contracts
- Online monitoring

The technical service offered by ABEL allows the customer to achieve his mining work in an optimal and efficient manner because he can rely on a team of service engineers which monitors the pumps in operation continuously.



Global preventive Maintenance

ABEL Smart Pump Assistant

Comprehensive remote Service

Pump operators reduce their operating expenses in quite an intelligent manner.

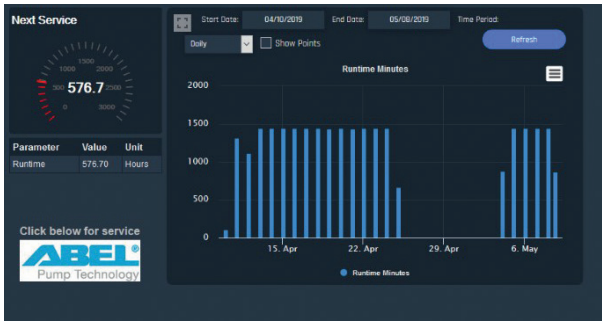
ABEL Smart Pump Assistant provides a continuous view, 24 hours a day, 7 days a week, on positive displacement pump's operating values. The Smart Pump Assistant ensures that the pumps remain available and functional in the long term

The intelligent monitoring solution by ABEL allows significant optimisation potential for clients using diaphragm pumps to be identified and to be translated into a performance increase.

ABEL Smart Pump Assistant allows online monitoring to be ensured remotely. The possibility to monitor pumps remotely represents a great advantage from an operating point of view, in particular when the equipment used for dewatering is installed inside underground mines. This system allows to know exactly and at any times the conditions in which the equipment is operated and its parameters without the need to keep a dedicated worker next to the plant.

This technology by ABEL helps clients to intervene efficiently and timely and even to prevent unforeseen events during the pump's operation. This allows reaction time and consequent downtime to be reduced significantly.

Furthermore, data collected by the monitoring system allow the operating conditions and the evacuated flow rates along the entire useful life of the equipment to be tracked at any time.



Online Monitoring System

Why ABEL? Experts in Mining:

ABEL Piston Diaphragm Pumps provide...

Durability

One important advantage over other positive displacement pumps is the hermetical separation between the media pumped and the hydraulic side of the pump. The diaphragms safely separate the abrasive media from the piston of the pump. Furthermore, by means of regulation devices and safety valves, the service life of our pumps is extended and the perfect condition of the equipment is protected and maintained.

Flexibility

Suitable for different pressure ranges. All of our high-pressure pumps are equipped with API-compliant cone valves (a reversing valve design is available as well for the transfer of slurries with a high sedimentation rate). When low pressures are needed, the pumps are equipped with ball valves which stand out as having a long useful life even when the media pumped has a high content of coarse solid particles.

Resiliency

The robust HM pumps incorporate preformed diaphragms that do not stretch during stroking. Consequently, the useful life of these diaphragms is increased.

Safety

Our pumps' safety is directly attributable to their innovative design. ABEL pumps are able to run dry as well as at low speed without interruptions. Their construction features make them best suited for a reliable and low-wear transfer of mineral slurries at high pressures.

Reliability

For critical processes. The HM pumps feature truly effective preformed diaphragm technology. They are ideal for intensive operations that demand maximum 24/7 operational availability.

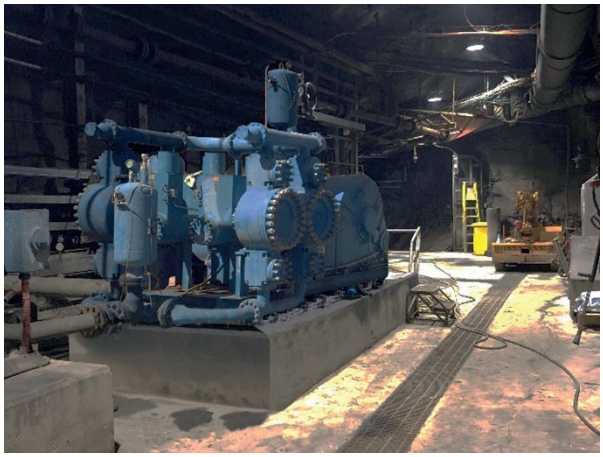
Mine Dewatering

Experts in Piston Diaphragm Pump Solutions

There is no doubt that mine dewatering is a high-risk and crucial task, since, in the case of underground mines, a failure in the water pumping system has irreversible consequences.

For ABEL HMQ piston-diaphragm systems designed for high-density pulp handling, mine water is a light slurry with a solid content far below the limits of this technology and therefore, it is not necessary to filter or sediment it before pumping.

The service factor and design of the gear units installed on ABEL HMQ pumps allow the pumping process to be carried out in one single step. Particularly in the case of deep mines, this translates as a huge saving in terms of time and resources.



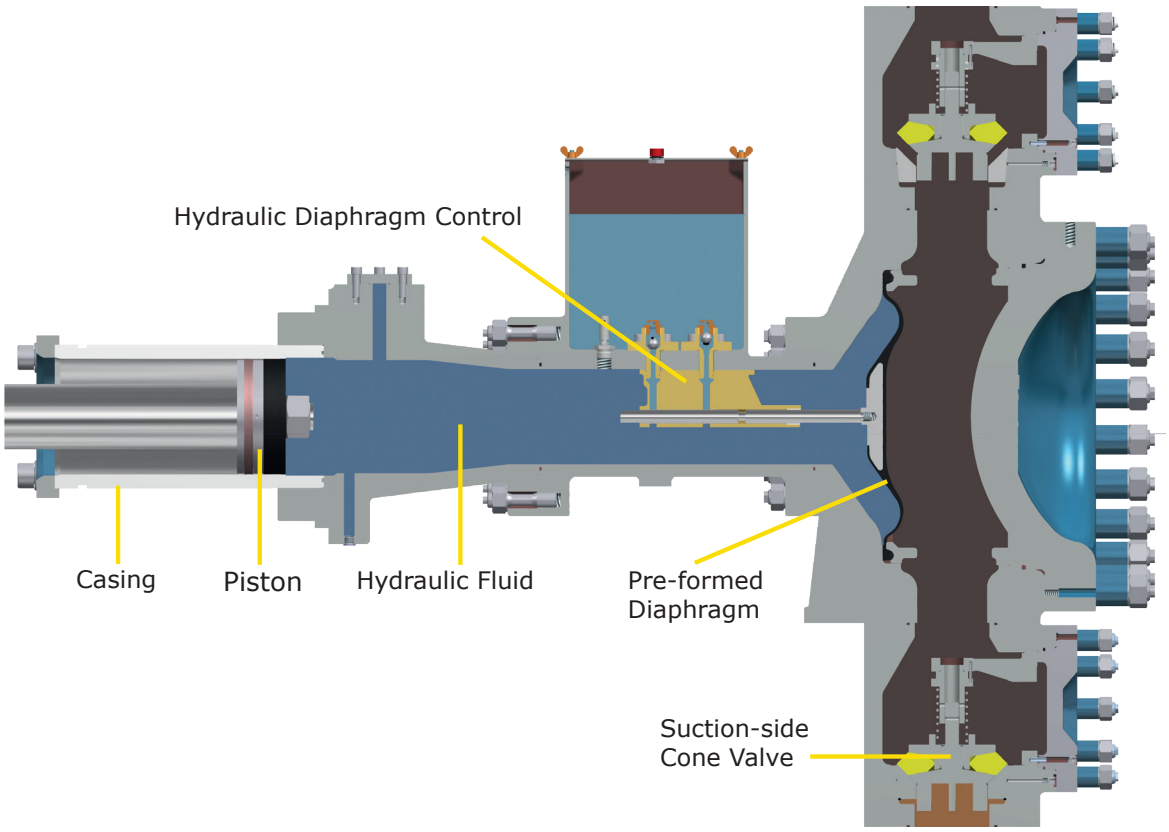
ABEL HMQ with Cone Valves

Main characteristics:

- Flow rates up to 410 m³/h (1805 GPM)
- Pressures up to 250 bar (3625 psi)

Advantages:

- Pumping in one single step
- Mine water with suspended solids
- Pump synchronisation



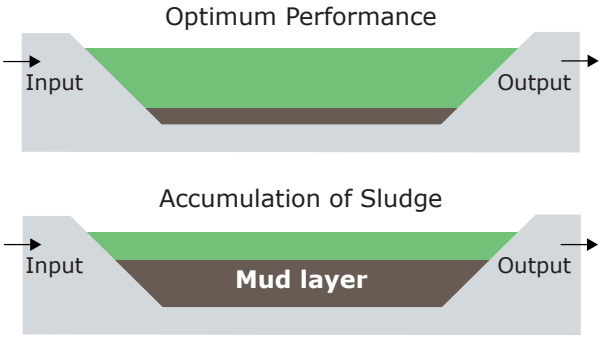
Mine Dewatering

ABEL HMQ without Room for Failure

Mining and water mostly go together, this is the reason why a process taking care of draining water from the bottom of the mine is often required.

In mines equipped with dewatering systems, water is channelled to the different pumping stations and extracted from the mine. By flowing through the different mine chambers, chutes, tunnels and drain holes, water carries away solid particles and generally reaches solid contents of about 10%.

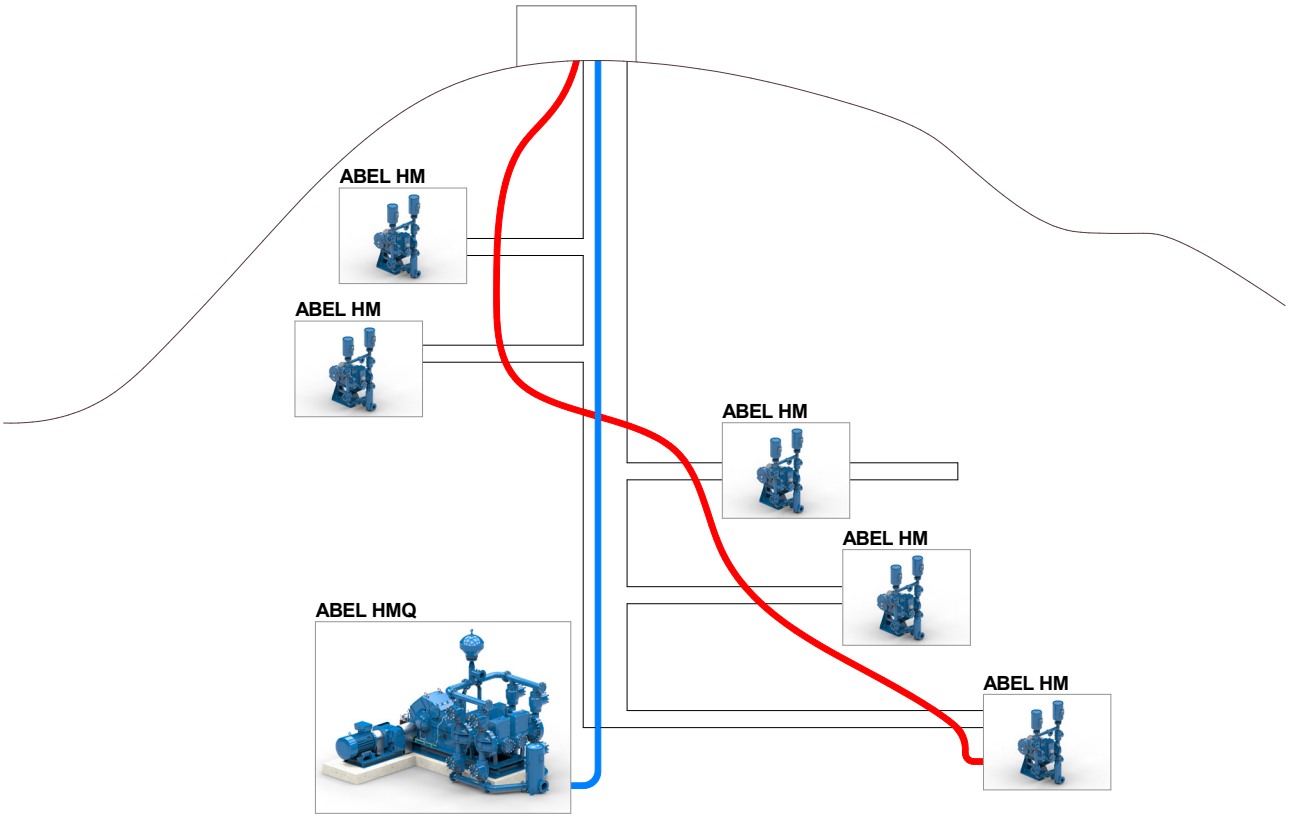
ABEL positive displacement pumps allow solid contents up to 20% to be handled, which reduces the need for sedimentation basins.



ABEL HMQ, the most reliable option

ABEL HMQ piston-diaphragm pumps allow their users to perform their task in the most efficient manner, in one single step, and to reduce the operating expenses of the pumping process significantly at the same time.

The long durability of this series of pumps is attributable to their low operating speed and special design allowing wear and required maintenance tasks to be significantly reduced. These pumps are therefore characterised by high reliability and a long useful life.



Mine Dewatering

ABEL HMQ without Room for Failure

ABEL pumps can be operated in extreme conditions – this makes them perfectly suited for continuous mine dewatering. In unfavourable situations, such as when a diaphragm breaks, this type of pump will be able to continue to work at an optimal speed until the next possible maintenance intervention.

Pumping in one single step

Every mine has its own characteristics which require suitable and customised mining techniques. In every mining project, the water present in mines has specific characteristics. As a consequence, it is absolutely critical to design a suitable pumping system for handling the water which accumulates in mine tunnels and chambers.

Since they allow pumping to be carried out in one single step, pumps of the ABEL HMQ series give maximum flexibility when it comes to designing the most suitable system.

Mines using ABEL HMQ pumps are equipped with one single pumping system. This allows initial civil work expenses, which are generally required for installing different pumping stages, to be significantly reduced. Having only one pumping station also allows operating expenses to be reduced, both in terms of maintenance costs and power consumption.

High flow rates, parallel solutions

On mining sites located in areas with heavy rains, the flow rates required during rain season can reach 1,000 m³/h.

For such cases, ABEL has developed a comprehensive solution by installing ABEL HMQ pumps in parallel and by running them in an intelligently synchronised manner thanks to control technology entirely developed by ABEL.

This system avoids two pistons carry out the same pumping movement at the same time. This feature - in conjunction with the pulsation dampeners installed on the pumps - ensures an absolutely stable dewatering without pulsations.

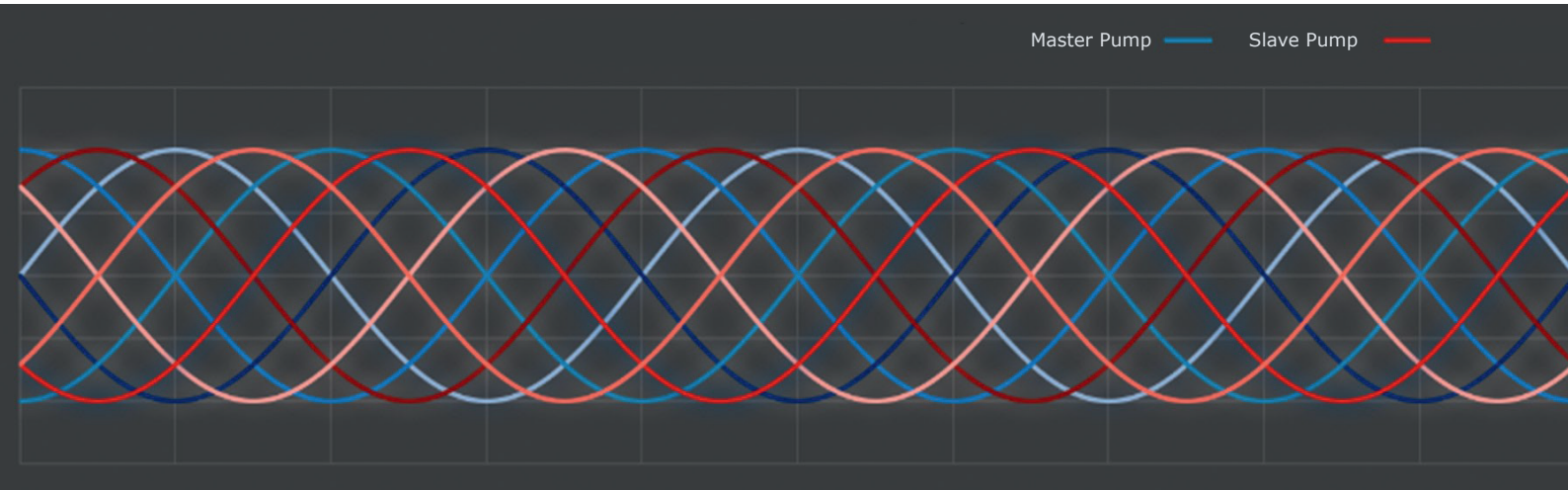
ABEL HMQ with Cone Valves

Large dimensions. Less space

Compared to other conventional technologies used for this multistage task, ABEL HMQ pumps are larger. Beforehand, this could represent a disadvantage compared to conventional pumping equipment.

However, the actual footprint of HMQ pumps inside the mine is much smaller than that of conventional systems, given that ABEL pumps do not require building slurry decantation basins for subsequent dewatering, nor additional equipment for slurry treatment by means of filter presses. The entire solid content being received by the pumping system has one destiny only: evacuation in one single step.

Piston Synchronization System



ABEL®
Pump Technology

The pumping solution for your industry:

- Mining
- Water and Wastewater
- Ceramics
- Chemical
- Oil and Gas
- Energy Industry
- Corrugated Board
- Paint and Varnish
- Petrochemical

Diaphragm Pumps
Solids Handling Pumps
High Pressure Pumps
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