

## PUMPS FOR MINING APPLICATIONS

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### OPTIMIZING PUMP PERFORMANCE FOR DEWATERING AND DUST SUPPRESSION.

According to Precedence Research, the global market for mining and metals reached \$1.19 trillion in 2025. Market analysts predict a sustained 5% compound annual growth rate (CAGR) over the next decade, which could bring the overall market close to \$2 trillion by 2035.

Growth in the mining industry is driven by the requirements of a modern economy. AI data centers, satellites, electric vehicles, mobile phones, solar panels, military applications and thousands of medical and industrial products require silver, copper, lithium, lead, zinc and numerous rare earth minerals in ever-increasing quantities.

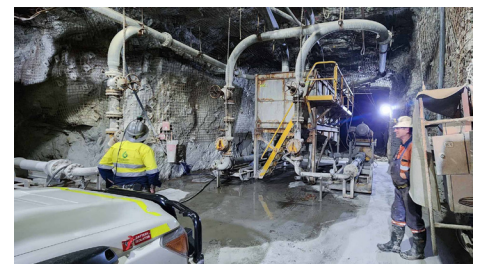
For many metals, industrial demand exceeds production capacity. Short-term supply deficits can be addressed

by exhausting above-ground stockpiles. But addressing long-term supply deficits requires a wide range of mining investments — many of which require hydraulic equipment.

#### WATER FLOWS CONTINUOUSLY THROUGH MINING APPLICATIONS

It is difficult to think about mining without thinking about water. The deeper a mine extends, the more groundwater must be pumped to the surface before the mine can be excavated further. After water is stored in settling ponds, it can be reused to suppress dust, which swirls around the mine and creates hazards for workers and equipment. In both dewatering and dust suppression, pumps play a critical role.

#### PUMPS FOR DEWATERING APPLICATIONS



*Dewatering pumps are designed to deliver high flow and high head*

Water enters mines from aquifers or from seepage through rock formations. Dewatering removes groundwater so mining operations can proceed safely. For copper, gold or silver mines, dewatering requires significant investments in pump purchases, pump maintenance, electricity consumption and water treatment. But effective

dewatering pays for itself through increased ore production, reduced downtime, improved slope stability and enhanced worker safety.

Some mines are required to pump water hundreds or even thousands of vertical feet up to the surface. The water pumped often contains suspended solids, dissolved metals, acidity and process chemicals. For these reasons, pumps used must not only deliver extremely high pressure/head, but they must also be constructed of materials that can withstand impurities in the water.

## Low NPSHa Impacts Dewatering Systems

Net positive suction head available (NPSHa) is the amount of pressure available at the pump suction above the liquid's vapor pressure. When NPSHa falls below the pump's net positive suction head required (NPSHr), liquid can flash into vapor bubbles inside the pump and cause cavitation. Decreased pressure at a pump's impeller not only causes vibration but can also reduce flow and lower efficiency.

A wide range of factors reduce NPSHa in mines. As mines reach deeper depths, the vertical distance between the water and the pump increases. Longer suction lines create friction losses. Every foot of suction pipe, elbow or valve reduces available NPSH. High elevation mines feature lower atmospheric pressures, which lowers NPSHa. Underground geothermal conditions increase water temperature and vapor pressure, which also reduces NPSHa. These are just some of the reasons why operators selecting pumps for dewatering applications seek low NPSHr capabilities.

## PUMPS FOR DUST SUPPRESSION

Drilling, blasting and cutting applications unearth dust, which damages equipment, impacts worker safety and hinders production efficiency. In any mining site, dust infiltrates equipment, accelerating wear on bearings, motors, filters and sensors. Over time, dust increases maintenance costs, shortens equipment life and can result in downtime.

Protecting workers from airborne dust is an even bigger priority for operators. Respiratory diseases, such as asthma, lung cancer or chronic obstructive pulmonary disease (COPD), can result from dust particles penetrating a worker's lungs.

When it comes to environmental compliance, excessive dust emissions can bring fines, permit violations and production restrictions. Mining companies must meet air-quality regulations to protect nearby communities, agriculture, water resources and wildlife habitats.

To suppress dust in longwall mining operations, water is sprayed continuously

at the cutting surface of the drilling machine. In many applications, pumps are mounted directly on the cutting machine, or on an accompanying railcar, to provide high-pressure water via multiple nozzles.



*Pumps used for dust suppression must deliver continuous high-pressure water.*

The requirements for pumps used in these applications include high flow, a small footprint (multistage performance from a single stage pump), generous clearances to withstand particulate in the water and a robust bearing design to allow for high-suction pressure when pulling water from settling ponds on the surface.



*Pumps can be mounted on railcars to accompany cutting machines.*





*High-suction pressures are required to pull water from settling ponds on the surface.*

## EASE OF MAINTENANCE IS A PRIORITY IN REMOTE LOCATIONS

Reliable pumps that deliver maximum uptime and are simple to maintain are recommended for dust suppression and dewatering applications. Most mine operators run with a standby unit to ensure continuous operations. But operators working in harsh and remote locations should place an even higher priority on simplifying maintenance. Many mines are located in dense forests, mountains or arctic regions—far away from suppliers, repair facilities and skilled labor. Spare parts can take days or weeks to arrive. Equipment sitting idle waiting for parts that cost a few thousand dollars can result in millions of dollars in lost production.

As such, operators should choose pumps that can be maintained without special equipment and can be serviced onsite without having to

remove the pump casing from the baseplate. Some centrifugal pumps feature complete preassembled wet-end cartridges containing a new impeller, seals and bearings that can be easily removed and replaced in minutes without requiring realignment or rebalancing. These features make a world of difference in remote deployments that are hard to access—particularly for mining operations that run continuous operations.

## WHY MINING OPERATIONS CONTINUE TO GROW

The mining industry continues to grow because the world needs more metals to build cities, electrify transportation, expand AI data centers and strengthen power grids. Every year technology evolves—and each technological advancement increases the demand for copper, silver, lithium, nickel, graphite and other rare earth elements that must be mined.

The demands placed on hydraulic equipment for dewatering and dust suppression are increasing for both quantitative and qualitative reasons. Not only does the world need more metals and minerals, but declining ore grades make it tougher to recover precious metals. In many geographies, copper mines that once processed 1% copper ore are now processing 0.5% copper ore. Lead, zinc, silver and gold mines may need to move more rock next year to recover the same number of ounces they processed last year. As grades for all metals decline, mining companies are not only expanding operations—they are also placing greater demands on their hydraulic equipment.

Fortunately, pump manufacturers (such as Honeywell Sundyne) offer equipment that can handle these increasing demands. For dewatering and dust suppression deployments, look for pumps with a simple design and a small footprint that are easy to maintain. They should also provide pulsation-free, high-flow/high-suction pressures and low-NPSHr capabilities. With the right pump properly optimized for the application, even challenging tasks like dewatering and dust suppression in mining can be performed safely, efficiently and reliably.

To learn more about pumps for dewatering & dust suppression applications, visit [www.sundyne.com](http://www.sundyne.com).

