White Paper

GRACO INC.
P.O. Box 1441
Minneapolis, MN
55440-1441
NYSE: GGG

FOR FURTHER INFORMATION:
Capri Jin, +86 13 817 940756
capri_jin@graco.com

Mining Makeover: How a Workhorse Mining Pump is Reimagining Safety and Productivity in the Industry

The mining industry is currently in a stage of paradox. Productivity worldwide has fallen 30-35% over the last decade. Commodity prices have dropped. Safety has improved but isn't perfect; still far from the ultimate goal of zero fatalities and injuries. In 2016, 7,045 mining accidents were recorded in the United States, of which 26 were fatal[1]. However, it's not all bad news, and there's reason to be optimistic about the industry. New technologies and products are making mining operations more efficient, profitable and safe. Innovation and technology are no longer being seen as a luxury for mining companies but are viewed as critical for running a smooth, efficient operation.
Here are some current challenges in the mining industry that are being solved with a clever combination of innovation and industry know-how right now.

Needs air not electricity
Beneath the earth's surface where mines are located are hot, dangerous and explosive places. Coal dust can ignite if it reaches 163 degrees so avoiding anything that could potentially combust is crucial. With an air-operated pump, the Graco Husky doesn't need electricity but is powered entirely by compressed air. Without the need for electricity, the Graco Husky is designed to go into hazardous zones where an electricity supply is forbidden or areas where electricity is simply not available.

De-watering, a complex and costly job
Whether it's water that accumulates from seeping or water that is used during operations, the water that collects in the underground mine must be removed, otherwise there is a dangerous potential for flooding.

[1] Source: U.S. Mine Safety & Health Administration, updated December 2017

“De-watering” - both in underground and open-pit operations - is a major concern for mining companies. For most pumps, the water itself is a challenge. That’s because mine water is full of grit and solids, leading to numerous maintenance issues. That’s where the Graco Husky comes in. The shock-absorbing polyurethane screen base is perfect for absorbing the impact from solid particles. The pump is built to deal with any solids in the water of any mining operation.

High pressure or low pressure? You decide

Conditions on mining sites are harsh and unforgiving. There’s a lot of work going on up high, a lot of work on the ground, a lot of work underground. There’s a lot of hot work, there’s sparks flying and it’s often a dusty environment. Everyone has to be equipped with the right tools, at the right time in the right place. Sometimes you need a high pressure pump but other times, low pressure will do just fine. That’s where the Graco Husky excels. It is the first air operated double diaphragm (AODD) pump on the market to allow users to choose between low pressure and high pressure operating modes. Switching to the low pressure mode reduces air consumption by up to 50% - which has a significant impact on operational costs. In an industry where fractional changes make huge differences across enormous operations, these efficiencies are massively improving outcomes and increasing profitability for mining companies.

Long distance transfer

Mines can be as much as 15 kilometers under the earth’s surface. But that’s just the beginning of the journey. There may be another equally long distance to reach the work area or rock face. This can be a challenge for pumps, leading to a need for multi-stage pumping systems. With the innovative high pressure mode of the Graco Husky 1050HP, pumping fluid over longer distances is no longer a problem.

Say good-bye to expensive downtime

One of the most common complaints in the mining industry is when existing pumps fail and the high cost of bringing in replacement parts. The replacement parts are sometimes being manufactured thousands of kilometers away from the mining site. The unplanned downtime of a failed pump on a mining operation can lead to costly delays, an inconvenient waste of time and overall disruption of operations.

Thanks to the high reliability of the Graco Husky, unplanned downtime due to a failed pump will be a lot more unlikely. The high reliability comes from having fewer moving parts and a limited number of components that can wear out. The main working parts are the valves, valve seats and diaphragms. Should maintenance be necessary, for example for a diaphragm replacement, an AODD pump is easy to dismantle and to put back together.

Pollution free

Oil mist from traditional mining pumps becomes inadvertently pumped into the air leading to nasty pollution for the environment. But the Graco Husky’s innovative oil-free compressed air for the pump means pollution-free operations which is great news for an industry that is slowly trying to clean itself up.

Safety comes first

The Graco Husky is submersible, intrinsically safe and lube-free. The pump is self-priming so it can run dry, and has outstanding anti-freezing properties. It has a maximum fluid flow at high pressure mode of 50 gpm (189 l/min), and a maximum fluid discharge pressure of 125 psi (17.2 bars, 1.72 MPa). It is capable of pumping solids of size up to 1/8 inch (3.2 mm), and offers a fluid displacement per cycle of 0.2 g (0.76 liters).

Equipped to handle a wide range of solids, abrasives and particulate-ridden liquids, some of the major applications of the Graco Husky include raw material transfer, bulk liquid-chemical transfer, onsite bulk-fuel transfer, oil-separation processes, transfer and treatment of mine tailings, above- and below-ground dewatering, froth flotation, water recirculation, wash bays for large-scale machinery and vehicles, water/land reclamation. The total cost of ownership for the Graco Husky after the initial purchase should be considered with fewer maintenance costs, minimal installation costs, low spare part costs and lower energy costs.

With the future of mining being more productive and easier on the environment, the Graco Husky will be part of the new growth trend of driving efficiencies in a tough industry. The trend bodes well for mining companies that can expect better, easier-to-maintain products for their operations. Mine operators are

increasingly gravitating to products like the Graco Husky that help ensure their mines are being operated and maintained in a profitable manner. And that's great news for the whole mining industry!

ABOUT GRACO

Graco Inc. supplies technology and expertise for the management of fluids and coatings in both industrial and commercial applications. It designs, manufactures and markets systems and equipment to move, measure, control, dispense and spray fluid and powder materials. A recognized leader in its specialties, Minneapolis-based Graco serves customers around the world in the manufacturing, processing, construction and maintenance industries. For additional information about Graco Inc., please visit us at www.graco.com.