

How Metso's global solutions are changing today's mining industry

Metso continues to stay at the top of the mining equipment business by looking to new technologies and strategies. They have just released a new mill discharge pump range, with enhanced features catering to today's modern mining industry. Pump Engineer spoke with Jim Board, Senior Vice President, Metso Mining Flow Control about what makes Metso such a strong leader.

By Pump Engineer



Metso MDM mill discharge pump.

“Metso is a company with very strong and solid values, that first of all, makes it a great place to work, but also makes it a company that our customers can rely on,” shares Mr. Board. “We take our commitment to the customer to heart and we strongly stand behind that. Many top customers around the world can attest to that fact. We bend over backwards to help make their business more efficient and cost effective.”

Metso's core company values center around four concepts: safety, knowledge, people and solutions. Mr. Board helps to break down each of these essential values: “‘Safety’, for Metso employees, our customers and for the general community at large, is paramount to us. It occupies the forefront in all that we do. We incorporate safety into every action that we undertake. We deal with very large, complex equipment in many different

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industries and safety must come first before we attempt to perform any task. ‘Knowledge’ means that we know a lot about our customers’ business and the environment they work in, along with the processes and challenges they deal with every day. We are experts in figuring out how our equipment, processes and services can assist our customers to optimize their production and minimize their operational costs. ‘People’ because we are absolutely committed to employing highly competent people that will make a difference to our customers. And from the ‘solutions’ standpoint, we create technology and services that are required to support and meet our customers’ needs on a global basis. Metso helps their customers improve their overall operational efficiency, reduce their risk and increase their profitability. That is our value proposition. We do this using knowledge, experience and solutions for our customers, underpinned by a strong safety culture.”

Worldwide reach

Metso’s headquarters is located in Helsinki, Finland, but they have operations all over the world in every major geographical area. There are 51 countries that have Metso operations in 192 locations. There are also several distribution and service centers globally.

“Metso is a global company which allows us to change our business focus depending on the economics of particular regions in the world,” adds Mr. Board. “If one economy is doing better than the other, for example, we have the ability to refocus into that area.”

An industry essential

Metso consists of several businesses that primarily address the mining and oil & gas industries. They are also applicable in the pulp & paper industry, along with aggregates, recycling and other process industries.

Mr. Board expands on Metso’s involvement in the post-processing part of mining that occurs after the materials have been removed from the earth. “After the materials are ground up, the desired minerals then need to be extracted, while the valuable minerals need to be separated from the waste product. After the waste is put back into the disposal site, then the final product is ready. We manufacture all of the processing equipment involved in mining processing, which includes grinding mills, ball mills, flotation cells, conveyors, slurry pumps, slurry valves and hose, classifiers, along with a multitude of other specialty types of equipment,” clarifies Mr. Board.

Raising the bar with their new mill discharge pump range

While Metso has had a slurry pump line for years, the new MDM and MDR, or hard metal and rubber lined pumps, are the newest additions to their complete range of heavy duty slurry pumps and it is the first line that is specifically designed for mill discharge services and applications. “The new MD pump, or mill discharge pump, incorporates features and benefits that address the most aggressive applications in a mining mill circuit, which is the most concentrated, heaviest abrasion application in a mine for a pump. At the discharge of the mill, the slurry is the most abrasive and is usually at its highest concentration and volume. High wear is normal for this service and it requires a very large and robust



Metso MDR mill discharge pump.





pump, making it a big power consumer. It's the heart of the mill circuit in the mine. If that pump goes down, the processes of the refining of the ore goes down because you can't move the crushed material from the beginning of the process any further along."

Mr. Board further explains that while the pump can be used for any heavy duty slurry applications, it is designed primarily for mining applications at the downstream side of the mills, where the primary crushing of the ore takes place. For this reason, the MD pump is specifically designed to handle high abrasion. It is large in size in order to handle large volumes of slurry and keep rotating speed as low as possible.

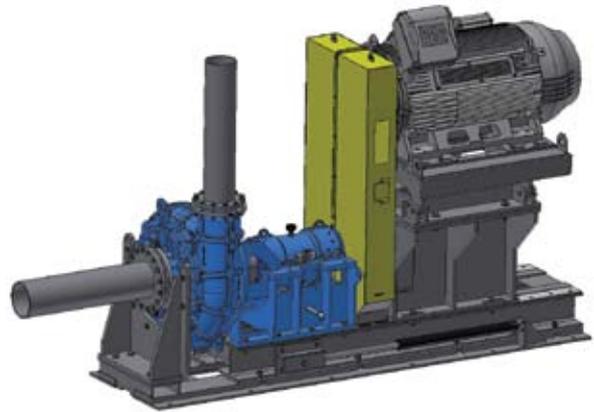
"We've put some very special design parameters in place for this new line. Some of our competition uses 30 – 40 year old designs, which were made when mills were of a certain size range. In today's mining industry the mills and crushers are much larger than they once were because they have to process more of the earth to get the same amount of the desired ore. Consequently, the pumps have to get bigger. Metso's mill discharge line is designed around today's sized mills in order to efficiently accommodate the flows you would typically see."

Mr. Board also explains how the new line features a consistent hydraulic design that is based on a maximum inlet velocity of 5.5 m/s, which helps to reduce the amount of wear on the pumps and gives them a longer operational capability. The new line also has a defined minimum aspect ratio (impeller diameter: suction diameter), which makes the pump slightly larger, slows it down and gives it longer life. "Typically, in slurry applications the wear of the pump will increase by the square of the speed change. The faster it goes, the faster the wear components will fail. So, the slower you can go, the longer the life expectancy of the wear parts. We've put these limitations in ourselves in order to give our customers the best product available."

According to Mr. Board, the Metso discharge pump is set apart from its competitors since it has taken today's design criteria, as opposed to combing and re-releasing technology based on prior designs. "We want to offer our customer something that is more efficient, will last longer and reduce their operational cost. Along with our power savings, we also have a way of sealing the pump shaft which reduces the amount of water consumption. The two highest costs in a mine are water and power. The new MD line is designed to minimize consumption of both of these utilities, thereby lowering the users cost per ton for processing its ore."

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Overall, the MD pump boasts higher overall efficiencies, which results in lower power consumption, longer wear life and greater process uptime for the end user. The customer is provided with a comprehensive operational analysis that takes multiple factors into account in order to give the very best solution possible.

Pump products for more than just mining

Metso has a large diversity in their products across industries. “All of our pump-related products are applicable anywhere that there are particulates in a liquid,” explains Mr. Board. “For example, in a pulp mill, there are difficult to handle slurries and you will find Metso pumps, valves and hoses being used in those services. In addition to slurry pumps, we also manufacture and sell hydrocyclones, slurry knife gate valves and slurry hose.”

Mr. Board further explains that the slurry gate valves are specifically designed for slurries and are designed to withstand the abrasive nature of the product that is being pumped. Metso’s slurry hose is a rugged, heavy duty natural rubber hose that is designed for aggressive environments.

Metso uses hydraulic design parameters and used computational fluid dynamics (CFD), which is a computerized simulation of how the slurry will go through the pump. By adjusting clearances and dimensions, for example, they are able to predict how well the pump will perform and wear. This technology has allowed Metso to optimize the hydraulic design of its products to give the optimal amount of wear life for the customer.

Top quality standards

Metso does extensive engineering and quality reviews of all of their designs, both from a technical stand point as well as with their supply chain. They use a ‘manufacturing lite’ business model that relies on an extensive global supply chain, as opposed to having

large factories. Finished parts that are made to their design, drawings and specifications are then checked by both the vendor and by Metso.

They have extensive testing facilities for their pump products in Sala, Sweden. All of the pumps that they manufacture there can be tested in accordance with both the Hydraulic Institute standards and ISO 9906 for hydraulic performance testing. “We have all of that incorporated into our whole design concept. Quality is a very important part of Metso’s process.”

Strategic planning for an ever-changing market

Metso has been able to address the current downside curve of the oil & gas and mining industries by optimizing the size of their business to match the current market conditions. “We understand that market changes are effecting both the end users and suppliers. Metso is dedicated to ensuring that we provide our customers with continued efficiency in operations and innovative and cost effective solutions for the common goal of optimizing success. In order to maintain our presence in the slurry markets, we have expanded our sales focus into non-mining related applications of our products, for example, the sugar, power industry and pulp & paper industries. We’ve been able to refocus our sales team globally to these other markets,” says Mr. Board.

Metso also continues to look for vertical synergistic and/or horizontal market expansions through our merger and acquisitions activities. “We are always looking for something that’s going to build onto our business, whether it is a vertical business that is synergistic with our existing products, or something that is a horizontal market expansion that will broaden our focus to adjacent markets and might provide us with a little diversity in our product scope. Metso aims to be ahead of the ever-changing market so that it can continue to be the number one provider for our clients.”

