FOUR QUESTIONS FOR STEEL AND METAL OPERATIONS TO ASK ABOUT ELECTRIC FORKLIFTS

The right forklift can thrive in the harsh conditions routinely found in the metals industry, from expansive outdoor yards to furnaces that melt more than 76,000 pounds of scrap per hour. The question now is, can that forklift be an electric-powered machine, rather than the traditional, diesel-powered machine? And will operations be able to get the job done with electric-powered material handling equipment? Although steel and other metal operations are still in the early phases of adopting electric-powered machines, electric has penetrated materials handling operations to varying degrees in a range of intense industries. Here are answers to four common questions to help your metal operation get a better understanding of the progress that must be made and which industry sectors are best positioned to pursue electrification today.

1 // WHAT ARE THE BIGGEST CONCERNS WITH ELECTRIFICATION IN METAL OPERATIONS?

The uptime requirements and harsh environments of mill applications are chief factors for businesses in the metals industry that are considering a shift to electric forklifts. Steel mills are demanding, 24/7 operations where unexpected downtime is not an option for the forklifts and high-capacity "big trucks" that keep raw materials and finished goods moving.

During the busy three-shift days at mills, trucks rarely stop moving, so any suitable electric power source must keep equipment running nearly non-stop the way that diesel does, with consistent performance and minimal downtime to refuel or recharge. For lithium-ion powered forklifts, opportunity charging to top off periodically can help extend runtimes, with fast charging speeds requiring as little as 11 minutes of plug-in time for up to an hour's worth of truck use for certain high-capacity models. However, certain trucks at mills must cover tremendous distances, with some sites resting on more than 1,000 acres. For such expansive mills, charging is an important consideration because the truck could be miles away from a charging station when the battery pack is running low. Another electric power source, hydrogen, offers refueling times similar to those of diesel equipment, but there are limits on the environments where hydrogen can be safely used, considering the very high temperatures that are commonplace in steel applications.

Charging a fleet of electric trucks can place a significant demand on the electric grid, so the local utility infrastructure needs to be sufficiently sound to prevent brownouts that could compromise equipment uptime.

The impact of metallic dust also must be accounted for, as this magnetic material can cause electrically controlled componentry to malfunction or behave erratically. For electric power options to work in these types of environments, components that would be susceptible to metallic dust exposure need to be sealed, such as the electric motors, system controllers, electronic boards and cabin filter.

Some mill trucks average 15,000 miles annually, whereas comparable trucks in non-mill applications typically average less than 750 miles on the odometer per year.

2 // SO WHERE ARE THE GREATEST OPPORTUNITIES, AND TO WHAT EXTENT HAS THE INDUSTRY ADOPTED ELECTRIC THUS FAR?

Applications with high-capacity trucks moving metal products that have cooled to near-ambient temperatures have the greatest potential for electrification and are where metal operations are most likely to consider implementing electric-powered machines. In fact, one global manufacturer of steel products already uses electric forklifts in indoor storage and distribution facilities. Likewise, a manufacturer of prefabricated metal buildings is exploring the opportunity to use electric trucks to move coils and beams around paved lots in their assembly operations, where there isn't the same level of dust or heat as a mill environment.

Applications in freight and rail yards are also strong candidates for electrification. Cooled, finished products that must be transported for loading into shipping containers or rail cars can be handled with electric heavy-duty forklifts. A ReachStacker equipped with a specialized attachment like a coil grab or coil hook, or a slab magnet or tong, can also be a powerful solution for steel distribution. While the market for electric ReachStackers is largely still in the product development phase, the electrification team at Hyster® welcomes opportunities to collaborate closely with customers to create these solutions, and there is demand from other industries helping to drive development, too. A pilot of a Hyster ReachStacker powered by a hydrogen fuel cell is underway at the Port of Valencia in Spain.

3 // WHAT ARE THE CLEAREST BENEFITS?

While all forklifts require maintenance, electric drivetrains have fewer serviceable parts than internal combustion engines (ICE), which can help reduce the downtime required for maintenance. This characteristic of electric equipment can be particularly valuable for steel and metal operations where minimizing downtime is so critical that even taking a truck out of service for a short maintenance task like an oil change must be carefully scheduled.

Mills, by their very nature, are normally dirty, dusty and noisy places. Electric material handling equipment alone won't completely change that, but there is an appetite within the industry to make a move toward greater sustainability, and there is a potential synergy with another shift that some mills are making. Mills traditionally power their blast furnaces using coke, natural gas, or electricity from either the power grid, on-site production or both.

But some mills are evolving to use hydrogen to power their furnaces instead. In the future, it could be possible for mills to refuel hydrogen-powered material handling equipment using a supply of liquid hydrogen they already have on-site for their furnaces. While safety concerns preclude the use of hydrogen in environments with a hot furnace, it could be a very useful power option in other settings like the yard. A handful of mills have even started to replace diesel-powered internal transport vehicles with electric transporters handling ambient materials in less dusty conditions. This concept of electrifying an entire industry, known as industrial electrification, involves adopting electricity as the primary power source across a wide range of activities and equipment. Although electrifying an entire industry is complex and beyond the scope of what a single operation can do, electrifying certain forklifts is a step that businesses in the metals industry can begin to take now.

At a recent North American Steel Alliance conference, representatives from the major mills focused the first 90 minutes of the town hall on what can be done to go green.

4 // WHAT CONSIDERATIONS DOES THE INDUSTRY NEED TO ADDRESS IN THE NEAR TERM?

The equipment available across the industry as a whole doesn't yet cover the full spectrum of trucks that mills are using, but electric trucks are being designed to provide performance comparable to traditional diesel power and are reaching higher and higher load capacities. There are several steps that operations can take to better prepare for expanded electric options in the future. For one, work to understand the current fuel usage of your forklift fleet. Mills don't typically monitor the diesel fuel and diesel exhaust fluid (DEF) usage of their trucks, and this consumption is an important part of the equation for quantifying the potential savings of electric relative to ICE.

As metal operations contemplate trials of electric material handling equipment, the most pervasive questions will revolve around whether electric equipment is durable enough to work productively at mills. To validate electric trucks in these settings, operations must work closely with equipment manufacturers and local dealers on a comprehensive understanding of the conditions and requirements that the trucks will face. This picture informs the most appropriate choice of equipment and power, along with the associated infrastructure and scheduling for charging or refueling. A good place to begin piloting electric options is in applications where trucks with lighter capacities are used, before scaling to higher capacities or additional units within a fleet.

For more information on electrifying your fleet, talk to your local Hyster® dealer or contact an electrification expert.