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Keeping Materials Flowing at an Indian Port



As seen in
Dry Cargo International
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Stromag braking system helps Indian port crane keep materials flowing

Port cranes have a difficult and demanding job, unloading thousands of tons of goods from ships around the clock. This is particularly true of a TRF Limited grab and loader crane operating at Paradip Port on the East Coast of India. The crane helps to supply raw materials to one of the largest fertilizer and chemical manufacturing facilities in India. To ensure reliable braking performance for the crane, TRF approached Stromag to provide a complete system package.

Crane needed

The Indian Farmers Fertilizer Cooperative Limited (IFFCO) operates the manufacturing facility in Paradip. Founded in October 2005, the plant produces 2 million tons of fertilizer every year as well as 7,000 tons of sulfuric acid and 2,650 tons of phosphoric acid daily. These large-scale operations require a vast quantity of raw materials, which are delivered by ship via the deep seaport at Paradip. When IFFCO took over the plant, it was clear a large clamshell bucket port crane was required to ensure efficient offloading of the bulk raw materials.

TRF Limited, a TATA enterprise which manufactures a range of handling and processing equipment for multiple industries, was approached by IFFCO to deliver the crane. TRF commissioned Stromag in India to provide a suitable braking system for the hoist and bucket clamping mechanisms.

Stromag is a global manufacturer of braking systems for a wide variety of crane designs, with its systems operational on port cranes worldwide. A leading brand of Altra Industrial Motion Corp., Stromag can deliver complete braking system packages. The business has a proven track record working with crane OEMs, which ensured it could deliver brakes exactly to the TRF specification.



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Safeguarding crane uptime

Akshay Gore, Senior Engineer Customer Care & Sales at Stromag, explains: “The crane was designed to provide an unloading capacity of up to 1,500 tons per hour. To achieve the quantities required by IFFCO, the crane operates between 18 to 24 hours a day. Of course, this means that our braking system needs to provide exceptional reliability.”

“Crane downtime is very undesirable for IFFCO. Any pause in unloading reduces the supply of raw materials to the plant, compromising productivity. A failure in the braking system due to it not opening or closing could result in a 5-hour repair at the very minimum. At Paradip, this translates to around 7,500 tons of lost raw material supply. Furthermore, extra costs would be due to ship operators for any delays; valued on an hourly basis. This would be on top of the cost of carrying out maintenance work.”

Putting the brakes on

To support the crane's bucket hoisting and clamping mechanism, Stromag provided TRF with 1TX-A and 3TB-R spring applied, hydraulically released caliper brakes — both Type T service brake variants. These were combined with two types of SVK400 disc couplings, one with a 705 mm diameter disc and another with a 550 mm diameter.

Stromag Type T service brakes are designed to provide consistent braking force over an entire service life. This ensures that any slippage is avoided, performance is maintained and that the braking torque value doesn't decrease below acceptable levels.

Braking force is provided by a high-quality spring pack, which is subjected to rigorous internal testing by Stromag to ensure reliability over hundreds of thousands of cycles and a high number of duty cycles per hour. Furthermore, an integrated hydraulic system to release the brake reduces the risks of leakage from external piping, maximizing reliability and ensuring a compact design. The arrangement of the brake arms in a V shape provides huge braking force within a reduced footprint. Each brake for the crane was specified with an additional performance margin so that it could operate with extra assurance over a long period.

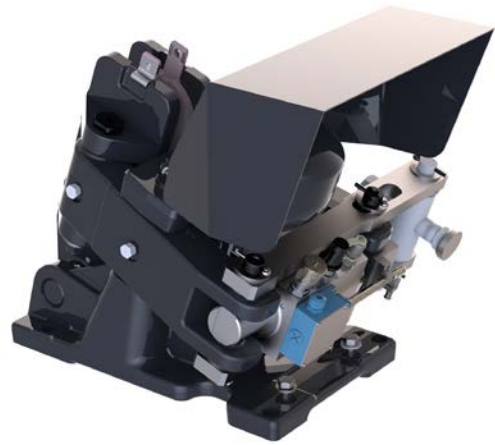
The SVK400 disc couplings feature a ventilated disc to provide improved thermal capacity. Designed to compensate for torque shocks and peaks, the SVK400 is optimized to be a perfect match for the braking system.

The benefits of a complete system

"We are a provider of complete braking systems, which unlocks benefits for our customers," Akshay explains. "A perfect match between brake and disc ensures an optimum friction coefficient of the brake friction material and the surface of the disc. This ensures correct and stable brake torque, providing consistent braking performance and exceptional reliability."

The TRF crane at Paradip harbor also benefits from localized maintenance support. Stromag has a large presence in India, with a manufacturing plant located in Pune, Maharashtra. The facility features its own design and hydraulics teams, as well as highly trained service technicians to provide installation, commissioning and maintenance services.

Akshay concludes: "By providing a complete braking package, we could ensure consistent braking performance for the TRF crane at Paradip harbor despite high duty demands. This was incredibly beneficial, allowing IFFCO to secure its supply of raw materials and safeguard productivity. With routine maintenance and one replacement of the brake linings, the crane braking system has operated trouble free for 16 years."



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About Altra Motion

Altra is a leading global designer and producer of a wide range of electromechanical power transmission and motion control components and systems. Providing the essential control of equipment speed, torque, positioning, and other functions, Altra products can be used in nearly any machine, process or application involving motion. From speed reducers on food processing and packaging lines to precision motors embedded in medical robots to brakes used on offshore wind turbines, Altra has been serving customers around the world for decades.

Altra's leading brands include Ameridrives, Bauer Gear Motor, Bibby Turboflex, Boston Gear, Delevan, Delroyd Worm Gear, Formsprag Clutch, Guardian Couplings, Huco, Kilian, Kollmorgen, Lamiflex Couplings, Marland Clutch, Matrix, Nuttall Gear, Portescap, Stieber, Stromag, Svendborg Brakes, TB Wood's, Thomson, Twiflex, Warner Electric, and Wichita Clutch.



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