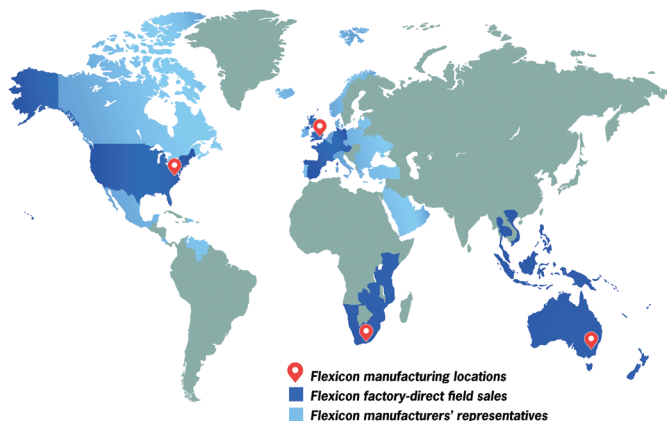




Aussie Logistics Leader Fills up to 10 Bulk Bags/h for Abrasive Minerals Customer

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WEST PERTH, AUSTRALIA — Qube Bulk, a division of Australia's largest provider of import and export logistics services, manages more than 22 million tons (20 million mt) of bulk product shipments per year, which now includes filling of bulk bags with three abrasive mineral sands for Cristal Mining Australia, Ltd. using a Flexicon Bulk Bag Filling System.

When Cristal decommissioned its in-house bagging operation, Qube Bulk's Picton facility seized the opportunity to improve bagging of the sands by devising a bulk bag filling solution in concert with Flexicon Corporation (Australia) PTY Ltd.

The result is a mobile system that fills up to 80 bulk bags, or 352,000 lb (160,000 kg), with the abrasive materials per eight hour shift — automatically, accurately and dust-free.

Quick turnaround demands mobility

Bulk truck shipments from Cristal's mineral separation plant are delivered to storage sheds at Qube Bulk's Picton facility. With limited lead time for outgoing orders, productivity is key to the bulk bagging process, according to Jos Pascoe, Qube Bulk regional manager. "Often, due to market situations, we receive orders fairly late and need to bag the product in a short time span to get the shipping containers loaded with bulk bags and to the port on schedule," he says. "The need to respond to orders for any combination of the three materials stored in different sheds demanded a mobile solution."

Flexicon proposed a skid-mounted mobile bulk bag filling station having a 88 ft³ (2.5 m³) capacity hopper and a 8.6 in. (220 mm) diameter, 3.3 ft (3 m) long rigid tube screw conveyor moving materials to the bulk bag fill head. It delivers 706 ft³ (20 m³) per hour, filling bulk bags weighing 2,200 lb or 4,400 lb (1,000 kg or 2,000 kg). The skid measures 13 ft by 7.4 ft (4 m by 2.25 m), and the unit stands 11 ft (3.4 m) high.

A forklift moves the mobile filler between storage sheds, depending on which material needs to be loaded. Pascoe reports that the system, including its 9 ft (2.75 m) long offload roller conveyor, can be set up and running at a new location in 20 minutes or less.

From bulk to bag in three minutes

Once an order is received and the filling station is positioned in the appropriate storage shed, Pascoe's crew can fill up to 80 bags per eight-hour shift. He says about half that time is actual material filling and half is spent



The automated bulk bag filling station fills bulk bags with up to 352,000 lb (160,000 kg) of abrasive materials per eight-hour shift.



Skid-steer loader deposits mineral sands into the 88 ft³ (2.5 m³) capacity hopper while the screw conveyor moves the material to the bulk bag fill head.



placing pallets, hanging empty bags and conveying filled bags out of the station. “Obviously, filling larger bags takes a bit longer,” he says, “but that’s still only about three minutes per 4,400 lb (2,000 kg) bag.”

A skid-steer loader empties bulk material into the feed hopper. The bottom of the hopper funnels the granular mineral into the steel tube screw conveyor inclined at 45°. The conveyor is equipped with a heavy-duty stainless steel spiral to handle the free-flowing but abrasive mineral sands, which range in density from 136 lb/ft³ (2200 kg/m³) to 170 lb/ft³ (2750 kg/m³). The design of the conveyor itself does not include any bearings or rotating seals at all, and the drive motor is mounted above the discharge point, preventing abrasive minerals from grinding on bearings or seals at the drive shaft. A pneumatically-operated product sampler automatically captures a 4.3 oz (142 g) specimen from the material stream during the fill cycle, for product quality documentation.

Pascoe plans for greater productivity as his crew becomes acclimated to the new system. “We’re targeting 100 bags in an 8-hour shift,” he says. “That will allow us to fulfill a typical 40-container order in about five working shifts.” The short turnaround is critical because Pascoe’s biggest scheduling concern is the time between releasing of shipping containers for pick-up and packing of containers to meet shipping deadlines.

Ergonomic features protect workers, boost productivity

In keeping with Australia’s focus on workplace health and safety, Pascoe required operation that was ergonomic as well as efficient. To this end, the pivot-down fill head allows safe, rapid connection of the bag loops to the filler latches without standing on the roller conveyor, straining to reach overhead bag connection points or inserting hands between fill head components.

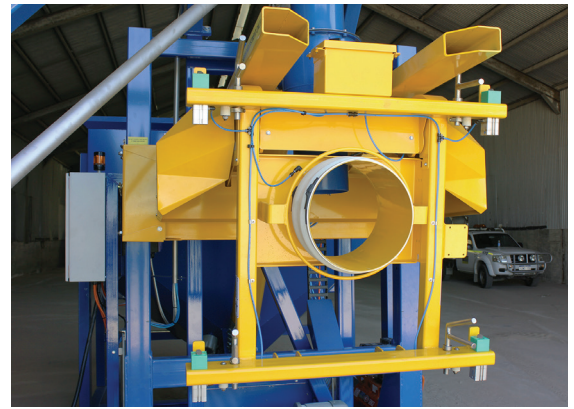
Dust is contained by an inflatable bag spout seal and a telescoping discharge chute between the conveyor outlet and filler inlet, and by venting displaced air and dust to a filter sock.

Once a bag is filled, the latches automatically release the bag loops and the roller conveyor moves the bag out of the filling area for tagging and transfer to the shipping container.

“Features like easy bag attachment and no manual handling of loaded bags or pallets minimize worker exposure to potential injuries,” Pascoe says. “We were concerned about workers being exposed to dust in the storage sheds, but the filler discharge chute contains all dust.”

Automated control delivers precise measurement

The unit’s PLC automates everything except connecting of the bag straps to the latches and pulling the bag spout over the deflated spout seal. “It’s all programmed, and its accuracy has been impressive,” Pascoe reports. “All you have to do is set the PLC for 2,200 lb or 4,400 lb (1,000 kg or 2,000 kg) bags. Once the bag is in position, you press the start button,



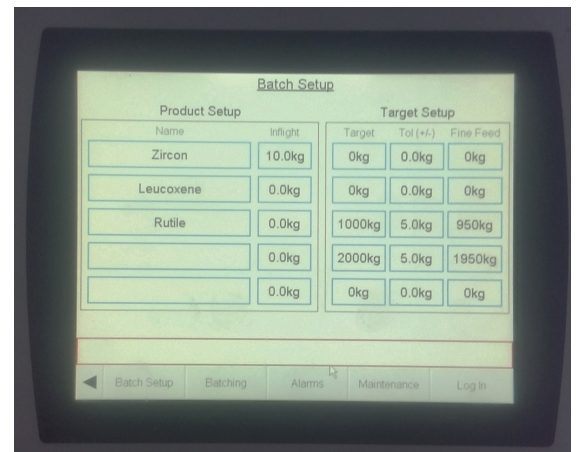
The Swing-Down® fill head pivots to a vertical position, allowing the operator to safely and rapidly attach bag straps to filler latches while standing on the plant floor. Pushing one button inflates the material inlet against the bag spout, and initiates all automatic bag filling functions.



The filled bag and pallet move out on the roller conveyor and are removed for shipment.

the inflator for the bag spout starts automatically and the product starts flowing.” Load cells under the filler send signals to the PLC to stop the conveyor when the bag gains the desired target weight.

The PLC also automates other aspects of the process including activating the powered roller conveyor and product sampler and other actions based on feedback from sensors.



A touch-screen interface on the PLC allows program setup and activation of filling cycles.



A pneumatically-operated product sampler captures a 4.3 oz (142 g) specimen from the material stream for product quality documentation.

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