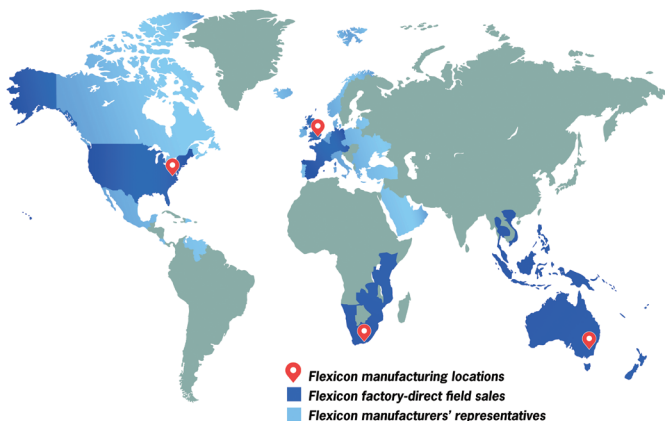




*Bulk Handling System Cuts Dust,
Improves Fill-Weight Accuracy at
Graphite Plant*

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Bulk Handling System Cuts Dust, Improves Fill-Weight Accuracy at Graphite Plant

MAASTRICHT, THE NETHERLANDS — Asbury Graphite & Carbons is one of the largest global processors of graphite and other carbon materials used in the plastics, automotive, lubrication, powder metallurgy, petroleum and coatings industries. Its European installation in the Netherlands opened in 2014 to take in raw graphite from around the world, reduce it into fine particles through a variety of milling and screening processes, and fill 1,000 kg (2,200 lb) bulk bags and smaller bags, based on customer needs.

From the beginning, the plant operators experienced problems with inaccurate fill weights of milled graphite, as well as issues with dust control. “We hadn’t decided what equipment we should go with,” says Marc Stassen, former general manager of European operations. The existing equipment was rudimentary and produced off-weight bags. “We would only find out when the product reached the shipping department that we filled 920 kg (2,024 lb) instead of 1,000 kg (2,200 lb), for example,” Stassen says.

The bulk bag filler frames operated with a poorly designed bag spout seal that wasn’t reliable. “Very often the seal inflated incorrectly or wasn’t strong enough or exploded,” Stassen says. As a result, dust and fine particles escaped, putting the plant’s compliance with Dutch health and safety guidelines at risk. Spills were also occurring with the original bulk bag dischargers. He says, “We had to do something else.”

On the recommendation of Dutch distributor Matec Techniek, the company turned to Flexicon (Europe) Ltd., which specialises in bulk bag filling and discharging systems. “We tried one bulk bag filling station, and that reduced our dust big time,” Stassen explains. “So we chose to go forward with Flexicon for all 11 stations, followed over the years by nine bulk bag dischargers and numerous flexible screw conveyors. They reduced dust tremendously in the plant.”

Clean fills at the target weight

The bulk bag fillers are arranged in pairs beneath bins holding the finished graphite product. An operator inserts the bag loops into the fill head’s four retractable hooks, and pulls the inlet spout of the bulk bag upward over a heavy-duty flexible collar, which inflates to create a dust-tight seal. A filtered air displacement vent at the fill head prevents escape of dust during filling. “Nothing can escape,” Stassen observes.

The operator sets the target weight on the PLC and initiates the filling cycle. A slide gate opens above the filling chute and a rotary valve meters product from the bin above. Load cells beneath the deck are linked to the PLC, which closes the slide gate when the bag reaches the target weight. As the bag fills, a densification/deaeration deck vibrates to stabilise the bag for storage and shipment. The operator deflates the bag spout seal, ties off



Pairs of forklift loaded bulk bag dischargers feed raw graphite into tubular cable and flexible screw conveyors which transport it to silos and the milling process.



A fork truck loads the liftring cradle with bulk bag into receiving cups atop the discharger posts.



the bag, and removes it with a forklift.

Each operator runs two fillers side by side, connecting a second bag while the first one is filling. When the first bag is full, the PLC automatically signals the system to begin filling the empty bag. “The operator is continuously busy hanging new bags and taking away full bags,” Stassen says.

Dust-free bulk bag discharging and conveying, too

Asbury’s plant unloads incoming raw materials with nine BULK-OUT® BFF bulk bag dischargers, designed to eliminate dust during discharging, and the collapse and removal of empty bulk bags, increasing plant safety.

Bulk bags of incoming material are loaded by forklift into the discharger frames. Operators create a dust-free bag/hopper interface by connecting the bag spout to the SPOUT-LOCK® clamp ring which sits atop the TELE-TUBE® telescoping tube. During discharge, the telescoping tube lowers the clamp ring as the bag empties, applying continual downward tension to keep the spout taut.

Promoting evacuation, POP-TOP™ extension arms on the dischargers’ upper frames automatically raise the bulk bag into a steep V shape. FLOW-FLEXER® bulk bag activator plates raise and lower the opposite bottom edges of the bag, directing material toward the bag outlet spout.

“In the past,” Stassen points out, “we hung the bag from a frame and let the material gravity fall. The bag would look empty but still had 20 or 30 kg (44 or 66 lb) inside and, when we removed the bag, the material ended up on the floor. Now no material remains.”

Different conveyors move different materials

From the 140 l (5 cu ft) floor hopper below each bulk bag discharger, a fully-enclosed flexible screw conveyor ranging in length between 8 and 16 metres (26 to 52 ft) moves the material to several silos.

The BEV-CON™ conveyors specified are designed to propel difficult-to-move materials that tend to pack, cake, smear, plug or fluidise — or break and slip in the case of graphite — without crushing or grinding material against the tube wall.

Feeding the jet mill line, a FLEXI-DISC® tubular cable conveyor moves graphite and coke powder from a dedicated bulk bag discharger. The fine particles exiting the bag flow into a rotary valve that meters them into the conveyor, which consists of ultra-high molecular weight polyethylene conveying discs attached to a steel cable and enclosed inside a polymer tube. The convey line is a continuous circuit, kept under tension by a wheel near the inlet end and driven by another wheel at the discharge end. The material rides gently in the spaces between the discs. The convey line makes a 90° turn past the inlet and moves vertically to 9 metres in height before turning 90° again to the discharge point above the feed hopper and downspouting to the jet mill. The gentle movement reduces risk of abrasion, and the enclosed circuit ensures dust-free operation.



From hoppers beneath each bulk bag discharger, flexible screw conveyors introduce raw graphite into a tubular cable conveyor, which gently moves it to a jet mill on the mezzanine.



After processing, another set of flexible screw conveyors, ranging from 4 to 8 metres (13 to 26 ft), transfers the materials to the bins above the bulk bag filling stations.

Since the first bulk bag fillers and dischargers arrived, Stassen has added only Flexicon systems. "We didn't look at other equipment. We have good service...they are quickly here to support us, we are good partners at this moment and they understand our needs and issues best."

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From the silo above, milled graphite continuously fills into a pair of bulk bag fillers.



Raw graphite material is sourced from around the world.



Asbury Graphite & Carbon's final product,

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A rotary valve beneath each hopper feeds graphite to a tubular cable conveyor, which gently moves it dust-free to a jet mill for fine grinding.



A SPOUT-LOCK® clamp ring positioned atop a TELE-TUBE® telescoping tube applies constant downward tension as the bag empties and elongates for full and dust-free evacuation.



At the Twin-Centrepost bulk bag filler, the operator secures the bag spout to the fill head with inflatable collar to assure dust-free filling. The height-adjustable fill head accommodates various bulk bag sizes.