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Rotating drum/bulk bag filler plays role in quality of surfactant packaging at BASF

Chemicals producer BASF Corp recently upgraded the packaging of surfactants with two key additions to its manufacturing plant. Flexicon Corp played a key role in one of the upgrades.



Automated drum filler utilises an indexing diverter head to fill four 208 litre drums sequentially with surfactant powder feeding from rotary valve at top. System can also be configured for loading 907-kg bulk bags

BASF's first upgrade was a purpose-built room designed for greater cleanliness and control in loading surfactants in drums or bulk bags prior to shipping. The other upgrade was installation of a rotating drum and bulk bag filler from Flexicon Corp of the US. This automates the process and yields greater product output and quality control than the previous method of manual loading.

Surfactants are additives that reduce surface tension in liquids, making them easier to formulate and use in a range of consumer, industrial and healthcare products. BASF surfactants are formulated as liquids and then converted into powders. The materials are usually packaged in 208-litre fibre

drums and sometimes in 907-kg bulk bags for shipment to product manufacturers.

Since many surfactants produced by BASF are for the personal care market, such as toothpaste, mouthwash, soap, shampoo and laundry detergent, their manufacture must meet rigorous quality standards. The plant is certified as ISO 9001:2000, is FDA regulated and conforms to Good Manufacturing Practices. Processes comply with US Pharmacopeia (USP) and National Formulary (NF) guidelines. Hence, the need for a packaging operation that is accurate, efficient and capable of maintaining high levels of quality control, says Sherri Molomo, senior process engineer at BASF.

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The loading room was designed to meet these needs. Molomo says the room is part of BASF's commitment to continuous improvement in operations and product quality. Its efficiency will help BASF expand production of USP and NF surfactants and share of the market, she adds.

Automation of the loading process also has safety and regulatory benefits. Prior to construction of the room and installation of the bulk bag and drum filler, containers were manually loaded. This meant that an operative had to move a drum to a weigh-filling station, operate a slide gate to fill it, check the weight and, if it exceeded the limit, adjust as needed. After filling, a drum was physically moved onto a pallet for transport to the shipping area. The process required multiple steps, took time, and exposed workers to possible injury from handling the drums, says Molomo.

To automate the process, BASF engineers worked with Flexicon engineers and PME Equipment Co of Flanders, New Jersey, in America to specify a rear-post bulk bag filler that also has the capability to fill four fibre drums sequentially. An automated conveyor system now moves drums and bulk bags in and out of the filling station, and a rotary valve meters the required weight of material with a high degree of accuracy.

The bulk bag and drum filler installed in the loading room incorporates design features developed by both companies. BASF added a dust-collection system on the machine attached via flex-hose to contain particles that rise up during loading. The company also specified an Allen-Bradley PLC (programmable logic controller) to automate operations. The PLC communicates with a Mettler Toledo weigh-filler scale to regulate product flow and shut down the operation when a pre-set weight is reached.

An operative selects the appropriate product-loading program on the PLC and pushes a button to start the filling process. Surfactants are transported from the main plant to a vessel above the rotary valve, then gravity-fed into either a drum or a bulk bag.

When filling drums, the operative attaches the automatically rotating drum fill adapter to the Flexicon bulk filling station. Once the four drums have been positioned on the deck of the filling station, the operator presses a start-up button on the PLC and surfactant begins flowing. Each drum has a plastic lining into which the surfactant empties. When one drum fills, flow is interrupted while the diverter head indexes to fill the next drum in sequence. Once all drums are filled, the operative seals the liners, and puts lids on the drums. The drums are then transported via conveyor out of the purpose-built loading room into the shipping area.

When filling a bulk bag, an operative attaches the four bag straps to each corner of the loading frame, engages the bulk bag fill spout to the fill head utilising an inflatable collar to provide a dust tight connection and puts the bag in a rubber bladder, which seals the surfactant in the bag after product is



PLC communicates with weigh-filler scale to regulate product flow into each drum and shut down on reaching a pre-set weight. Four drums await filling as four are about to exit the room. System improves product output, worker safety, and quality control.



Pallet of four drums is conveyed into purpose-built loading room where they are filled by rotating drum/bulk bag filler.

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loaded, and acts as an extra layer of protection during transport. The frame raises to accommodate the height of the bag. The bag rests on a pallet atop the weigh-filler scale, which takes up about 2.3 square metres of floor space. The scale transmits weight data to the PLC, which automatically stops the flow of material when the correct weight of surfactant has been loaded. The bag is then closed and moved on the roller conveyor to the shipping area.

Molomo states that the automated loading process significantly enhances the surfactants packaging operation and increases operative productivity. Most importantly, though, is the improvement in operative ergonomics and safety, as well as elimination of manual involvement in the filling process. This has resulted in a more effective use of personnel. These benefits also mean less potential for contamination of surfactants during packaging.

In assessing the impact of the loading room and the Flexicon bulk bag and drum filler on operations, Molomo notes, "Our products have become better by using better tools."

Contact: sales@flexicon.com.au

BASF	→ Client
Flexicon/PME Equipment	→ Rear-post bulk bag filler
Allen-Bradley	→ PLC
Mettler Toledo	→ Weigh filler scale



Filled drums are conveyed from loading room to shipping area.

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