MIXERS

Lindor is main supplement at vitamin plant

Aventis Rhone-Poulenc Biochemie has selected a Lindor mixer for its new vitamin B-12 feed formulation plant at the Saint Aubin les Elbeuf factory near Rouen, France.

The process consists of accurate blending of precisely measured components according to different recipes of vitamin B-12 – in the form of a silica-based concentrate – and calcium carbonate or lactose. Each of these powders has different specific characteristics (grain size, bulk density, flow properties). The key requirements for the project are: good homogeneity of the mix with different formulations; mixing times of a few minutes; practically zero de-mixing during the mixer discharge; the quality of mix to be independent of the load; mix/de-mix cycle controlled by adjustment of the rotation speed during emptying; and mix quality should be practically constant throughout emptying.

After tests with various mixers, Aventis specified a Lindor 8300 mixer because this was the only machine that met all the criteria.

Reader Response SH 526

MINERALS

Fairport flushes out its quarry!

The giant Swinden Quarry in North Yorkshire is about to "vanish" in a £15 million "new look" thanks to Tarmac plant engineered by Fairport Engineering.

The investment in the two million tonnes a year operation means the ageing fixed plant and buildings will disappear from view, replaced with state-of-the-art equipment and relocated deep in the quarry bowl. The new plant will be commissioned in October, followed by the demolition of the old equipment, the building of a new quarry entrance and landscaping.

Reader Response SH 527

SYSTEMS

Flexicon teams up with Drywite in search of the perfect chip

Established 1933, Drywite makes a product with a secretly formulated "additive" for treating cut potatoes in order to achieve the perfect chip.

However, its success prompted a serious review of production. Greater throughput with economy had become another vital ingredient to the mix to meet fast-growing, worldwide demand.

Previously, 25 kg bags of bulk material were emptied into a floor mounted hopper with the additive where it was mixed and conveyed via an old rope disc conveyor to a 1,000 kg capacity silo. From here the mix was gravity fed to the auger filler packaging line. The result was a modest daily production of two to three tonnes with three operatives tied to the system all day. Changing from one formulation to another presented still greater difficulties because the bulk source would need to be used before changeover.

The need of an improved system of bulk materials handling with sophisticated automation, which would have eliminated the manual procedure and presented greater economies of scale, was tempered by the severely restricted ceiling clearance in the factory. For this reason Drywite approached Flexicon (Europe).

Throughout the actual project development, Drywite engineers worked closely with Flexicon. This enabled the design of a conveyor system which would overcome the ceiling height restriction, simplify the dosing procedure and the give greater versatility to the conveying of bulk product to and from the silos which were to feed the auger filler packaging machines.

The final result was a system consisting of a three-part bulk bag frame comprising cruciform, intermediate frame and base frame, a receiving hopper, inclined conveyor, horizontal conveyor, two silos and a sack tip hopper with a volumetric feeder for dosing the additive. The total system was automated by two control panels, back-to-back. One located in the process line, the other in the packaging line to allow operation from both parts of the factory. In addition, Flexicon designed-in and installed a third party dust extraction unit.

The complete system with the operator programming the required process parameters

To overcome the restriction in ceiling height caused by cross members supporting a pitched roof, the cruciform is first separated from the bulk bag frame using a fork-lift truck and located onto the FIBC at floor level. The intermediate frame is then lifted clear of the base frame and placed remotely from the system on the factory floor. The FIBC is then relocated onto the intermediate frame. With the FIBC now in place, both bag and intermediate frame are lifted and negotiated between two ceiling cross members and re-located onto the base frame. The clearance is very fine and was only overcome by careful engineering of the system.

With the bulk bag in position, the FIBC spout is lowered through an iris valve, and into the bag bag interface box with snap action door which is then closed, enabling the bag tie to be released without spillage. The notched lever of the valve gives instant control over the rate at which the bulk material is allowed to discharge into the hopper, minimising dust emissions.

At the point of discharge from bulk bag to hopper, strategically mounted Flow Flexer Plates massage the lower side walls of the bulk bag at pre-set, timed intervals. This motion frees products, which are prone to compact while in transport or storage, directing the flow to the central flow column. As discharge continues and the bag slowly empties, the massaging strokes increase, raising the side walls of the bag creating a V-shape, eliminating dead spots and maximising the amount of product discharged. Also situated within the hopper is a side wall mounted FlexiFinger vibrator to ensure uninterrupted flow into the inlet of the flexible screw conveyor. When product within the hopper falls below a pre-determined level it exposes a level sensor which stops the process, making the operator aware of the status. Adjacent to the receiving hopper is the sack tip hopper with a volumetric feeder which feeds the additive to the throat of the silo feed conveyor. The final compound is mixed as it is transferred through the 4.4 metre long conveyor at 45° to either of the two silos that feed the auger machines in the packaging lines. Low level sensors in the base of the volumetric feeder hopper also alert the operator of the status. To ensure the precise dosage is maintained, in the event of either hopper responding to the low-level sensors, the control system will cease the operation.

The product capacity of each of the two silos is two tons or 2000 kg, holding between them either four tons of one specific formulation or two tons of alternative formulations with a further 1,000 kg (one ton) on line. When any particular additive is fully discharged the operative may choose to change formulation.

After opening a valve and reversing the conveyor screw to enable cleaning-in-place, an alternative additive can be loaded into the volumetric feeder and the process re-started. From the control panel the operative is able to switch from the first silo to the second silo by automatically activating a slide valve and diverting product flow to a horizontal conveyor which carries product to the second silo. This presents greater flexibility in choice of formulation to be sent to the packaging line. Each of the silos is fitted with a high and low-level sensors informing the operator of the status of the product level in the silos.

The final result has been a trebling of production by a third of the manpower with considerably reduced downtime and the flexibility to expand production without further investment.

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