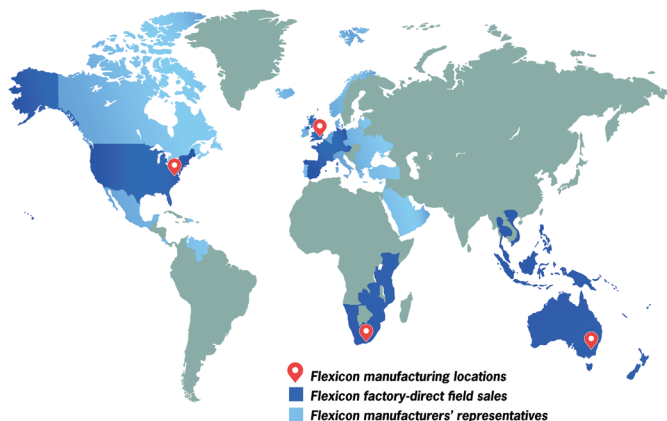




Powdered Antibiotics Conveyed in a Curve, Dust Free

T-0226



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Powdered Antibiotics Conveyed in a Curve, Dust Free

FORT COLLINS, CO—When Macleod Pharmaceuticals expanded to a new range of antibiotic products, it needed to fit a bulk solids mixer, conveyor and filling machine in a confined area, and reserve enough space for boxing, taping and labeling operations.

The company's antibiotics are typically comprised of seven or eight powdered ingredients that are manually dumped from fiber drums into a 25 cu-ft (0.71 cu-m) ribbon blender mounted on load cells. Weight gain information on a display enables operators to dump the required amount of each material.

After a mixing cycle, the powder is gravity discharged into the U-shaped charging adapter of a 3-in. (76 mm) diameter flexible screw conveyor manufactured by Flexicon Corporation, Bethlehem, PA.

The conveyor consists of a flexible steel screw enclosed in a tube that is driven by an electric motor. As the screw rotates, it propels material through the tube and self-centers, providing sufficient clearance between the screw and the tube wall to prevent product damage.

It transports the powder about 11.5 ft (3.5 m) at a 45-degree angle, into a surge hopper atop the filling machine that dispenses drugs into a variety of containers.

Products are made in campaigns, each of which typically lasts two weeks and involves the manufacture of several batches of a single product.

The screw is the only moving part contacting material, and can be removed rapidly between product changeovers for sanitizing of the screw and the tube's crevice-free interior.

Macleod selected a flexible screw conveyor to fit within the limited space and prevent contamination of the product and plant environment. "We ruled out other types of conveying systems that allowed the escape of dust, which must be avoided in the case of antibiotics," says Giovanni Parrinello, vice president of pharmaceutical operations, adding, "The Flexicon unit is dust tight, and allowed us to curve the conveyor tube to fit the restricted space between the blender and filler."

"To ensure the conveyor would transport our antibiotic powders efficiently," he continued, "Flexicon ran them in its test laboratory on a full size flexible screw conveyor configured to simulate our application."

He said Flexicon engineers also solved design problems specific to his application by orienting the charging adapter horizontally instead of at an angle, and fabricating a flange that attached tightly to the blender's valve to discharge powder directly into the charging adapter with no exposure to the atmosphere.

Due to a ceiling height restriction, the conveyor's discharge adapter also needed to be oriented as close to horizontal as the curvature of the



Due to space constraints, Macleod Pharmaceuticals selected a Flexicon flexible screw conveyor to transport powder between a ribbon blender to a filling machine.



Flexicon engineers maximized the curvature of the conveyor tube and calculated the corresponding angle of the discharge adapter to fit in a low headroom area.



Macleod Pharmaceuticals manufactures veterinary drugs in powdered form, including the antibiotic UNIPRIM, and INTRACELL, a biopolymer that forms a "natural bandage" to protect wounds.

conveyor tube would allow. "While we were suspending the discharge adapter, complete with its 192 lb (87 kg) motor, from the ceiling, we had one of the Flexicon engineers on the speakerphone. He entered the data into his AutoCAD and calculated the adapter angle that corresponded to the curvature of the conveyor," Parrinello says.

Because this is a new manufacturing site for products that will be packaged in a new container size, U.S. Food and Drug Administration (FDA) approval is required before commercial products can be produced, as is also the case with drugs for humans.

In anticipation, Macleod has been running pilot batches and practice runs to validate the system.



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