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PLIABLE PACKAGING LINES

ON DEMAND PACKAGE DESIGN FORCES FLEXIBLE LINES
PAGE 36

SHOCKING!
PRIMER ON POWER SUPPLIES
PAGE 8

CAN WE TALK?
STANDARDIZING CONTROLS LANGUAGE
PAGE 50

Flexible Footprint

HOW TO EXPAND INTO ADDITIONAL PHARMACEUTICAL PRODUCTS WITHIN AN EXISTING BUT RESTRICTIVE FOOTPRINT.

BY SEAN RILEY

Ever wish you could get another opinion when it comes to solving a packaging problem? Here one packaging expert shares a solution to a difficult scenario.

Challenge: ***We're interested in enhancing our line of pharmaceuticals but are limited to our present plant size. How can we expand our product and packaging base within an already established area?***

Solutions: Flexible screw conveyors to maximize space.

"Our company ran into a situation similar to this, when we decided to expand into a new range of veterinary antibiotics. While we wanted to add new products, we needed to fit a bulk solids mixer, conveyor and filling machine into a confined area. There also needed to be enough space left over for boxing, taping and labeling operations.

"Making matters even more difficult was the fact that we were dealing with height restrictions. Building vertically to compensate for our lack of floor space was not necessarily a viable answer.

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

"Comprised of seven or eight powdered ingredients, the antibiotics 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.

Flexible screw conveyors, like this Flexicon model, can use less space by conveying vertically in a tight footprint.

"At this point we were still within our allowable space, but needed a conveying solution that didn't increase our footprint. Many conveyors (such as rigid screw conveyors, bucket elevators, drag chain conveyors and aero mechanical conveyors) have limited angles of incline and/or straight-only conveying paths.

"Since dust must be avoided in the case of antibiotics, we immediately ruled out most types of conveying systems that allowed the escape of dust.

"After settling on a flexible screw conveyor to fit within the limited space and prevent contamination of the product and plant environment, we selected a 3 in. (76 mm) diameter flexible screw conveyor manufactured by Flexicon Corporation, Bethlehem, Pa. After the mixing cycle the powder is gravity discharged into the charging adapter of the screw conveyor.

"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 grinding, crushing, and other product damage.

"In addition, the gentle rolling action created by the screw prevents the separation of blends throughout the entire length of the conveyor.

"The conveyor 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.

"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.

"The Flexicon unit is dust tight, and allowed us to curve the conveyor tube to fit the restricted space between the blender and filler. Flexicon flexible screw conveyors can move material vertically, horizontally, or at any angle—over, under, or around obstructions, through small holes in walls or ceilings.

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

"Flexicon engineers also solved design problems specific to our 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 our ceiling height restriction, the conveyor's discharge adapter also needed to be oriented as close to horizontal as the curvature of the conveyor tube would allow.

"While we were suspending the discharge adapter, complete with its 192 lb (87 kg) motor, from the ceiling, we were fortunate to have one of the Flexicon engineers available on speakerphone. He entered the data into his AutoCAD and calculated the adapter angle that corresponded to the curvature of the conveyor, ensuring compliance.

"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 of this approval however we have been successfully running pilot batches and practice runs to validate the system."

Giovanni Parrinello
Vice President of Pharmaceutical Operations
Macleod Pharmaceuticals

Interview by **Sean Riley**, Editor of PMT

Share your packaging challenges and solutions with PMT readers by sending an e-mail to PMT@PMTdirect.com