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Processing

SOLUTIONS FOR THE PROCESS INDUSTRIES®

COVER SERIES P12

PHARMACEUTICAL PROCESSING

Pharmaceutical freeze-drying is a tried and tested procedure, but new challenges lie in minimizing energy use and the handling of new types of biotechnological drugs.

FEATURED PRODUCTS

BEARING ISOLATOR

Ideal for lubricant reliability, the hybrid design of the EXP Bearing Isolator merges labyrinth technology with a new expeller technology that allows end users to achieve high sealing performance levels. The device maximizes bearing and lubricant life by expelling contaminants, eliminating lubrication leakage and protecting against water contamination. It also mitigates worn shafts and sleeves.

Sealing Equipment Co. Inc. (SEPCO)
www.sepco.com

PUMP CONDITION MONITORING DEVICE

The IN-1000 condition monitoring device from Allweiler, a CIRCOR International brand, is designed for pumps in operationally critical and environmentally sensitive chemical engineering applications. With one master and up to 10 satellite modules per network, the device lets operators monitor as many as 11 pumps at once. Built-in features include a two-level warning and alarm system, logging of sensor data and remote monitoring with a smartphone app. The device is available with ATEX certification for use in EX zones.

CIRCOR International Inc.
www.circorpt.com

FLEXIBLE SCREW CONVEYOR

The Twin BEV-CON Flexible Screw Conveyor from Flexicon has a common hopper and mobile base constructed and finished to meet sanitary standards. Ready to plug in and run, the self-contained system can fill two vessels with the same material simultaneously. Mounted on a frame with locking casters for in-plant mobility, it can be used in multiple locations and rolled to a washdown booth. The hopper is equipped with dual discharge adapters, each of which charges a BEV-CON flexible screw engineered to move free- and non-free-flowing bulk materials that pack, cake, smear, fluidize, compress or are otherwise problematic to convey.

Flexicon
www.flexicon.com

HIGH HORSEPOWER CONTROL PANEL FOR HAZARDOUS LOCATIONS

ROSS Systems and Controls (SysCon) offers new specialized control panels for use with high horsepower equipment in hazardous locations. A NEMA 12 main power panel, housing high-voltage variable frequency drives (VFDs) and motor protection fusing, is installed in a non-classified area and wired to a NEMA 7/9 operator station. In the pictured system built for a 500-gallon multishaft mixer, the explosion-proof panel is designed for Class 1, Division 1 and Groups C & D and features a user-friendly color display.

ROSS Systems and Controls
www.rosssyscon.com

TRADE SHOWS & EVENTS

Courtesy of Interphex

2019 INTERNATIONAL PHARMACEUTICAL EXPO

The 40th annual INTERPHEX brings together pharmaceutical, biotechnology and manufacturing professionals to "experience science through commercialization."

www.bit.ly/2WdFChl

FLUIDIZED BED MIXING

An animal feed producer ups uniformity, cuts cycle times by replacing auger mixer with fluidized bed mixer

By Steve Knauth, Munson Machinery

Country Junction Feeds has produced animal feed products in Alberta, Canada for more than 100 years. Today, it offers a full line of organic wet and dry feeds for cattle, hogs, poultry, horses, bison, elk, goats and sheep. To improve batch consistency and prevent damage when adding liquids to fragile ingredients, the company installed a fluidized bed type mixer on its wet feed production line.

Dry feed in raw or pelletized form is typically preblended in a 4,400 pound (lb.) (2,000 kilogram [kg.]) capacity mixer. The wet blending process adds oils and/or molasses to rolled oats, barley, pellets and "bull ration" calf feed for nutrition and palatability as well as dust control.

To blend dry ingredients with liquid additions in batches up to 660 lbs. (300 kg.), the company installed a Munson model MF-18-SS fluidized bed mixer.

"Fluidized bed mixing brought more batch-to-batch consistency than the previous auger mixer," said Mark Shantz, Country Junction's maintenance manager, adding that it imparts less shear than the auger mixer, reducing product degradation, particularly with fragile materials.

How liquid additions are mixed with dry blends

To initiate a mixing cycle, an operator enters a preprogrammed recipe at a plant workstation. Individual ingredients, stored in outdoor granaries, are transported by chain drag conveyors to the aforementioned dry mixer for preblending.

Blended batches discharged into bins are then conveyed by either of two drag chain conveyors to the fluidized bed mixer. Load cells supporting the mixer transmit weight gain information to a programmable logic controller (PLC), which stops the conveyor once the preset batch weight has been gained, with +/- 2.2 lb. (+/- 1 kg.) accuracy.

Once mixing begins, a fluid volume of oil or molasses equivalent to 3 to 10 percent of the dry premix weight is automatically metered from a 44 lb. (20 kg.) capacity vessel and gravity discharged into the top center intake of the fluidized bed mixer.

In batches up to 660 lbs. (300 kg.), the fluidized bed mixer improves batch uniformity and reduces degradation when blending liquids with fragile dry ingredients.

All images courtesy of Munson Machinery

(Top-left) Twin paddle agitators counter-rotating within two U-shaped troughs create a fluidizing zone in which airborne materials intersperse rapidly with minimal degradation.

(Above) An operator fills 44 lb. (20 kg) plastic fiber sacks at the bagging machine below the mixer and hopper.

(Left) A drag chain conveyor (foreground) moves batches of dry feed to the fluid bed mixer (on platform). Below the mixer, a hopper receives the blended batches and releases them to a bagging machine filling 44 lb. (20 kg) plastic fiber bags.

Fluidized mixing zone improves dispersion

The machine's fluidizing effect is achieved by twin paddle agitators rotating at 36 rpm within twin U-shaped troughs at the bottom of the mixing vessel. The counter-rotating agitators cause material from the troughs to become airborne along the centerline of the vessel where it intersperses rapidly with liquids sprayed into the "fluidized zone."

Mixing cycle times range from 10 seconds to 2 minutes depending on recipe.

Full-length, drop-bottom gates open to discharge blended batches into a hopper, which feeds a filling line for 44 lb. (20 kg) plastic fiber bags. Immediately after the bottom gates close, dry premix is loaded into the mixer, a pump refills the overhead liquid hopper and a new cycle begins.

Shantz said, "We lift the lid and wash out the inside with water. The interior is smooth and free of obstructions that trap material, which eliminates the need to manually scrape away residue. It's easier to clean than the auger, and not as time-consuming."

Country Junction Feeds is a division of Wetaskiwin Co-op, a cooperative whose local operations in the area include a home center, agro center, food store, bulk fuel and equipment sales and related services. Country Junction's feed is sold in Canada, but Shantz said the company is looking at international sales. PR

Steve Knauth is marketing manager at Munson Machinery. Established in 1823, Munson Machinery is a world leader in mixers, blenders and size reduction equipment for bulk solids materials. Munson offers 17 high-performance equipment lines, each with numerous models to meet specialized requirements in the chemical, pharmaceutical, nutritional and food/dairy industries.

Munson Machinery Company
www.munsonmachinery.com

Country Junction Feeds
www.countryjunctionfeeds.com

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