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30-year-old batch makers going strong at feed plant

A trio of rotary batch machines – which run 20 hours a day, every day – are still putting out consistent mixes, thirty years since they were installed.

Archer Daniels Midland subsidiary, Alliance Nutrition is a manufacturer and distributor of vitamin and trace mineral pre-mixes, ingredients and food additives used in manufacturing pet food products.

In addition, about 10% of the company's output is mixes for bovine and swine feed.

"We run about 1100 pre-mixes from 400 different powdered ingredients, largely for pet food producers," says Alliance Nutrition's location manager, Kyle Taylor. "The mixers we use to produce our blends are critical to the success of our business."

The ingredient list is vast, including zinc sulphate, zinc oxide, manganese, L-phenonine, riboflavin, lysine, assorted vitamins and minerals, and a host of other nutritional compounds.

Putting those ingredients together at Alliance Nutrition's plant in Quincy, Illinois, are the company's three rotary batch mixers, which are over thirty years old. The Munson machines were installed in the 1980s, and run twenty hours a day, seven days a week.

"The rotary batch mixers have lasted a long time, process high volumes, and are very reliable," Taylor says. "Their motors are a lot smaller than the ones in our paddle mixers, so they are very energy-efficient."

"They also clean up quicker because they discharge completely with little or no product heel. This is important because of the many fast changeovers for different customers we need to make each day."

Once a unit discharges, workers stop the machine, lock the drum and physically get inside to sweep out residues.

"It's pretty much a dry process. Sometimes we use limestone, but no cleansers."

Taylor prepares each batch to keep the particle size and bulk density of his raw materials as uniform as possible, in an effort to get the best mix for each product run, but says sometimes this is not possible.

But Munson assures that its rotary batch mixers can produce uniform



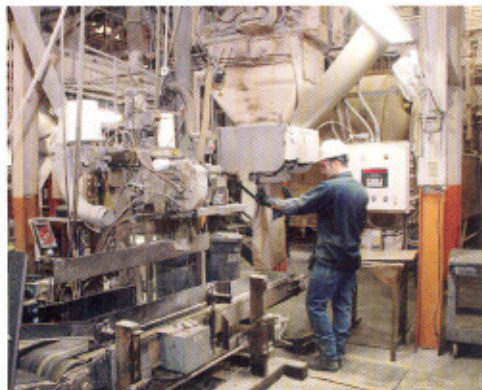
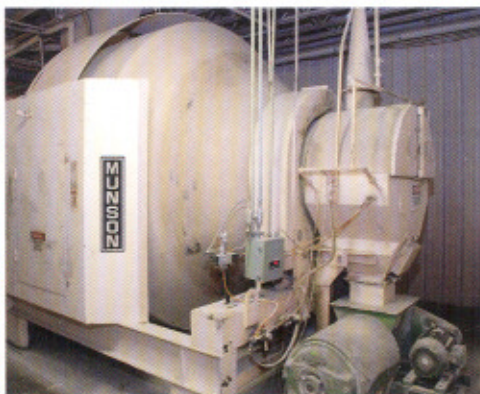
Munson Rotary Batch mixers at ADM Alliance Nutrition have been processing high volumes 20/7 for more than 30 years.



Operator dumps "hand-adds" into mixer from floor above.



The rotary batch mixers discharge with little or no product residual, simplifying changeovers.



Blends are bagged below the mixers.



Sample packs indicate the many blends produced at ADM Alliance Nutrition.

blends, even if particle sizes are significantly different and densities are as disparate as 320kg/m³ to 1350kg/m³.

"The units are versatile," Taylor says. "In the past we used them to do batches of peas and carrots with virtually no separation, and when we switched them over to pet food powders we got the same even results without having to make any engineering changes."

The smallest of the three mixers, the 700 THS-110 model, has a capacity of

3.1m³. The other two – one a 700 TS-180, the other a 700 THC-180 – are rated at 5.1m³. The 700 THS-110 and 700 TS-180 machines can mix 2727kg per batch, while the 700 THC-180 can mix 5454kg, thanks to its more powerful motor and gearbox.

Considering their longevity, Taylor says, maintenance has been light.

"We've replaced the main sprockets, chains, rollers and drive motors twice in the last 25 years," he says, "and we

replace the seals about once a year on average."

One key benefit of rotary batch mixers to the animal vitamin industry, as opposed to agitated mixers, which Alliance Nutrition also utilizes, is that rotary batch mixers don't heat material up to a significant extent during mixing.

This prevents delicate and expensive additives, such as vitamins with time-release coatings, from breaking down.

Individual product runs on the rotary batch mixers average between 900kg and 2700kg, but can go as high as 27,000kg for bulk loads, which are packed into pneumatic trucks, or hopper bottoms as they're also called, that customers provide.

Smaller batches are packed either in bulk bags or standard bags in the 9-27 kg range.

Alliance Nutrition has three bagging lines and four bulk bag lines. At an average six minutes per batch, it completes about 60 batches per day for an average weekly output of 843 tonnes.

The rotary batch machines at Alliance Nutrition have been mixing heavy volumes for decades, and will likely continue for decades to come. But Taylor understands that everything has an expiration date in industry.

"Sooner or later, like everything else, they will be up for replacement," he admits. "But considering how robust and well designed they are, an overhaul if and when needed could make them last another 20 years." ■

Contact: info@munsonmachinery.com

Alliance Nutrition's process

Powder flow at the facility is largely gravity fed over four floors, and assisted by 'drags' – paddles hooked to U-shaped conveyor chains.

At the top level, workers feed the special ingredient hand-adds into the mixers. One floor below are the mixers, along with 17 bulk bins for 12 different bulk ingredients that automatically batch into the three units.

Surge bins, which are rectangular steel holding tanks sized to accommodate one entire load from the mixers, are located on the second floor. These in turn feed the bulk loaders, bulk bags, and bag lines on the ground floor.

Metal detectors, which use either ceramic or rare earth magnets, are in place at strategic locations throughout the plant.

"If material coming in has gone through a grinding process – for instance calcium carbonate which starts as large rocks – we want to be sure we can catch a loose bolt, broken blade, or other item from equipment failure, which is rare, but nothing we want to take chances with," explains Taylor.

Testing for consistency

As part of its quality assurance policy, ADM says it carries out mixer studies on a regular basis.

Small samples of the batch are taken from various areas of the mixer (around 15 typically), and the number of particles of each ingredient are counted. The number of counted particles in each sample is then compared to the average in the batch recipe.

"Assays are an important part of the quality control program we've developed together with our customers over the years," explains Taylor.

While the plant is considered 'feed-grade,' Taylor says high-tech quality and other controls are moving it toward food-grade.

"Companies involved in companion animal feed are going toward that way of doing things," he says. ■

Contact: info@munsonmachinery.com