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market outlook 2010

Special FEATURE

Market leaders in the various businesses within the food industry share their thoughts for the new year

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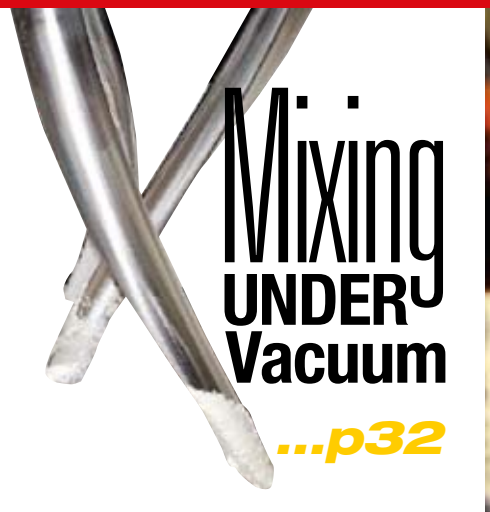

Mixing UNDER Vacuum

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Alcoholic Beverages

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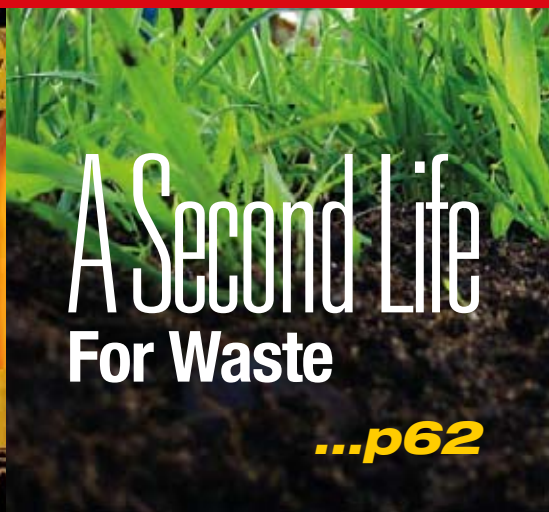

A Second Life For Waste

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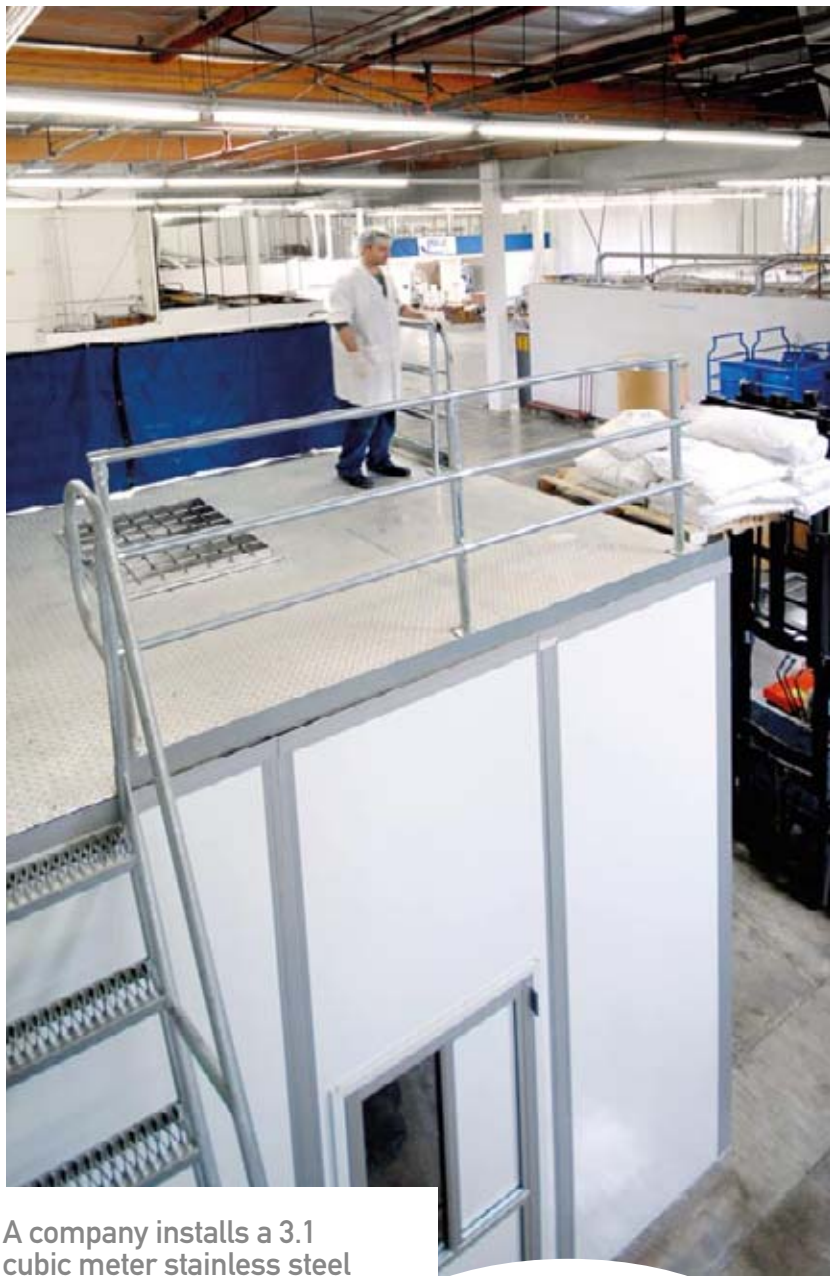


A company installs a 3.1 cubic meter stainless steel rotary batch mixer, which allows the company to triple its mixing capacity. By **Steve Knauth**, general sales manager, Munson Machinery

Case Study: 3 Times THE Charm

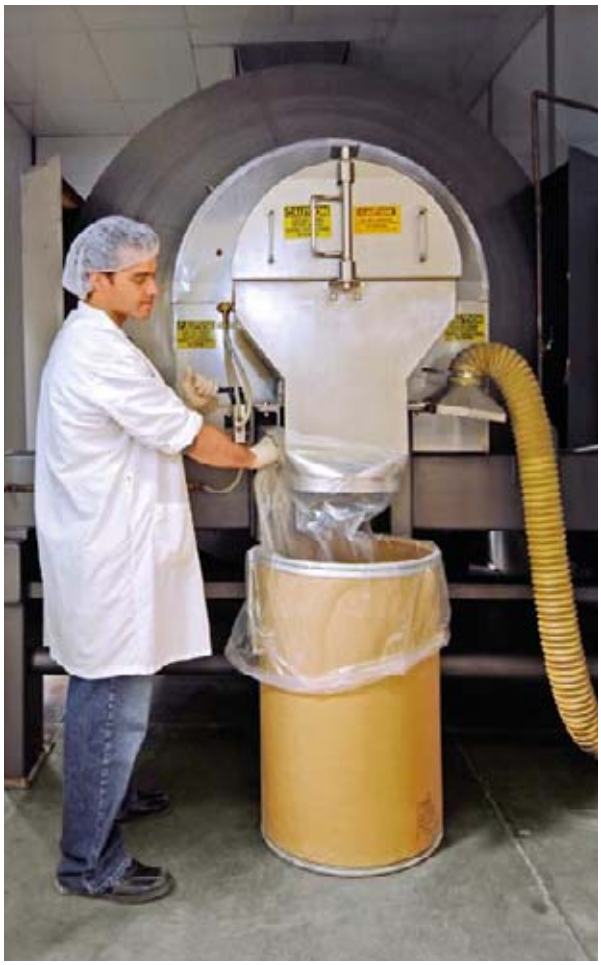
Benjamin Earwicker, Boise, US

ROEX'S division, Pro-X Nutraceuticals was growing rapidly and production manager Kory Seitz, realised that demand would soon exceed the capacity of the company's only mixer, a 0.85 cubic meter ribbon blender.

The mixer was a bottleneck to the operation due to its small size, requiring that each batch be split up, and needed extra labour for feeding, weighing, discharging and cleaning. "We were constantly splitting up batches, sometimes doing several batches to fill an order for a single product. We had to find a larger blender to keep pace with our process of making tablets, capsules and blends from dry powders," says Mr Seitz.

In addition to increasing capacity, the company wanted to comply with the US Food & Drug Administration's Good Manufacturing Practices (GMP) by installing a standalone blender in a separate room. This blender would include a load-bearing structure onto which bins of material would be fork lifted, and emptied into a hopper over the blender intake.

After considering V-blenders and rotary batch mixers, the company installed a 3.1 cubic meter stainless steel rotary batch mixer. Whereas the original ribbon blender has a capacity of 650 kg, the rotary



Internal mixing flights elevate the material which is discharged through a plug gate valve into plastic-lined drums.

batch mixer handles up to 2,000 kg, allowing the company to triple its mixing capacity.

They also realised benefits in the form of reduced labour, shorter blending cycles, ease of cleaning and minimised waste.

ELIMINATE THE EXTRAS

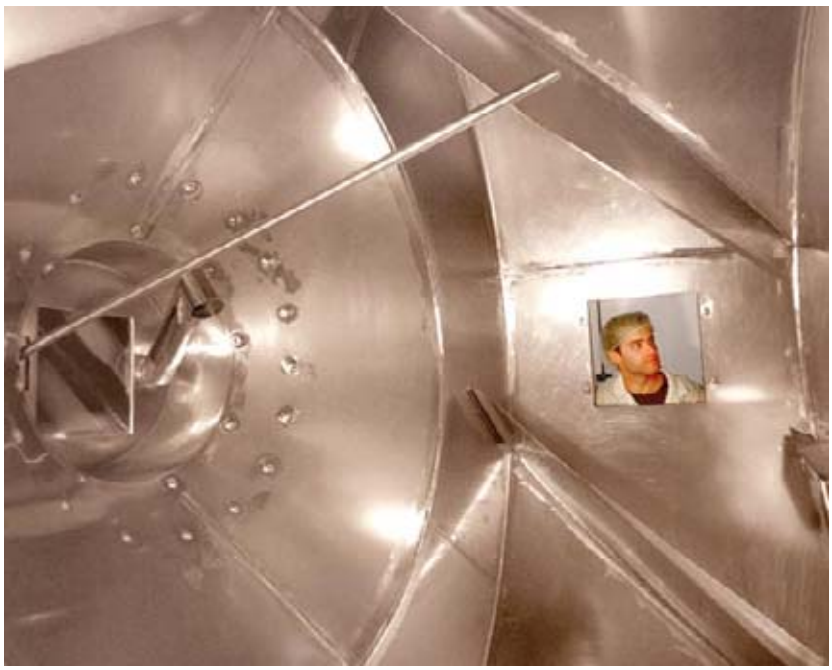
"Think of the productivity gains in being able to mix once versus three times," added Mr Seitz. "Not only are we mixing fewer times, but labour for weighing, screening and staging prior to mixing has also been reduced."

When an order comes into the facility, the appropriate raw material powders are selected and inspected for quality, screened, weighed and sent to an area where they are staged for blending. Certain items need special treatment. For example, some herbal mixtures are too big and need to be grounded, while other materials need to be oscillated to reduce clumps.

The preparation stage ensures that materials become free-flowing and ready to enter the blending and grinding area. Since each raw material – anywhere from two to 50 powders per blend – has a different bulk density and its own 'specific quirks', operators adjust for the differences by feeding the materials at different times.

"For instance, we add the excipients, materials, such as magnesium stearate, last to ensure that they are blended throughout the entire batch without affecting their function. If you overblend excipients, they will not produce the desired effect of a good flow of material, solid compression or anti-sticking, which they are intended to accomplish," says Mr Seitz. "For every product there is a specific order to add materials to the blend to assist in creating a problem free batch."

Once the formulators determine the sequence in which materials should be fed,



Rotating drum with proprietary mixing flights achieves total batch uniformity in less than three minutes.

each bin of material is fork lifted to the top of the structure surrounding the blender, where material is gravity discharged in the hopper and, in turn, into the blender which turns approximately two RPM during feeding. The hopper allows raw material to be poured into the blender at a rate of 50 kg per minute.

The ability to discharge material directly into the mixer via the hopper cuts labour by 75 percent. With the old blender, it took four to five hours to feed the powder by hand or by using an auger conveyor.

FULL UNIFORMITY

The mixer is capable of achieving 100 percent uniformity in less than three minutes, but the company runs longer cycles for absolute insurance of uniform blends. There are no moving parts inside the mixer, but the mixing flights attached to the interior of the rotating drum picks up the powder and moves it to the front of the blender and then back over itself. Continuous rotation assures all materials remain in motion, preventing segregation of materials of varying bulk densities.

When mixing is complete, the blend is discharged from a chute into plastic-lined drums, each of which carries between 90 kg and 120 kg of powder, which the blender discharges in less than 20 seconds.

Filled barrels move down the line, where the product is again inspected, weighed and sent to the appropriate manufacturing areas for production of tablets, capsules or powders, which are then packed and shipped.

REDUCTION IN RESIDUAL WASTE

After discharging the mixer, usually less than 500 grm of residue remain inside, according to Mr Seitz. "Getting nearly 100 percent out of our blend increases revenue because we're dealing with expensive materials. With less waste remaining in the blender, we increase the yield of tablets, capsules and powders in the end."

Negligible amounts of material remaining inside the blender also simplify cleaning. "With the ribbon blender we had to open it, sweep the residual heel of material from the trough and remove and clean the seals and other moving parts. Since the rotary mixer has no internal moving parts, operators simply attach a hose inside, which sprays water while the mixer is running, removing any remaining powder. Next, operators spray a cleaning solution inside the blender, run it and wipe it down." APFI

> "Getting nearly 100 percent out of our blend increases revenue because we're dealing with expensive materials. With less waste remaining in the blender, we increase the yield of tablets, capsules and powders in the end."
>
> Kory Seitz, production manager
> Pro-X Nutraceuticals, Roex's division

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