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Rotary mixer cuts tea blend time and degradation

Choice Organic Teas, of the USA, recently moved into a new certified organic facility, meaning that all product handling and packaging is done in accordance with, or exceeding, the U.S. Dept. of Agriculture's National Organics Program regulations.

All of the company's teas are packaged using recycled and unbleached materials, and blending and packaging are performed using energy efficient equipment. It's a process the company has fine-tuned over its history.

In 1990, Choice Organic Teas was using a 0.28m≥ capacity modified food-grade cement mixer to blend up to 13.6kg of tea per batch. During the mixing process, however, the mixer had to be stopped and opened several times, both to add flavouring and to address unblended areas, which significantly slowed the blending process.

Quality assurance manager at Choice Organic Teas, Rod Hanson, said long mixing cycles degraded the delicate tea leaves, while frequent stoppages and low capacity meant that an entire workday was lost blending enough batches to yield 109kg of blended organic tea.

"The modified cement mixer lacked a baffle system like that in the mixer we use today. Because of this, there was a dead zone in the middle of the mixer where the tea would not properly blend, and this area had to be manually scooped and stirred, after which the machine could be restarted."

As the company grew, it added increasingly sophisticated bagging equipment, the most recent of which produces stapleless tea bags by automatically tying the tag onto the bag. It eventually replaced its blender with a 0.42m≥ capacity MX15-SS mini rotary batch mixer manufactured from Munson Machinery.

Blender eliminates waste, blends uniformly

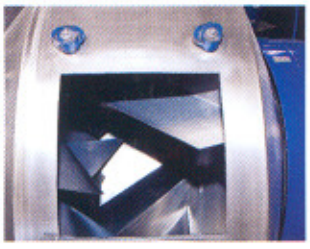
The stainless steel Munson blender uses a gravity-driven mixing process, which employs internal mixing flights that produce a tumble-turn-cut-fold mixing action said to yield 100% batch uniformity in less than three minutes using minimal energy. However, the company runs the mixer continuously for 15 to 20 minutes per batch to prevent stratification of ingredients throughout loading and final discharge with no residual.

An employee loads ingredients into the mixer. Tea blends contain up to 12 ingredients.

Choice Organic Tea's purchasing manager Eric Ring said "the Munson mixer revolutionized our blending operation. It allowed us to do large amounts of blending with no ribbons of non-blended ingredients, yet gently enough that it didn't damage the tea."

Average weights for each batch of tea range from 68kg to 136kg, depending on the type of tea. "Teabag cuts, which are finer than leaf tea, can be mixed at higher weights – up to 145kg because they're stronger and heavier. Leaf teas are mixed in smaller batches to protect the leaf," Ring said.

Mixing flights produce a tumble-turn-cut-fold mixing action that yields 100% batch uniformity in less than three minutes.



Ingredients are weighed out for each blend; each batch has a precise blending time.

A variety of natural flavours can be added to the tea via an internal spray system. Choice Organic also uses the spray system to neutralise the flavours between batches.

The mixer is self-emptying, resulting in total discharge and no waste.

A point-of-source vacuum reduces dust associated with discharge.

Dry leaf tea.
Photo: Matthew G. Monroe.

Some blends have only two to three ingredients, while others require 10 to 12. Hanson said "we choose hundreds of different organic certified ingredients from select tea gardens and vendors worldwide.

"We have specific recipes for our blends that are formulated pre-production for our many bagged tea and whole leaf offerings. Our master blender adheres to these blend sheets when weighing out specific ingredients for each blend and knows through experience, the blend time necessary for each batch."

Internal spray lines built into the mixer allow for a wide, even spray of natural flavours. For instance, oil of bergamot is added to the company's Earl Grey tea. The internal spray system is also used for cleaning the blender between batches.

Ring said "we choose from a variety of nozzles based on the viscosity of the flavour. Using the internal spray system and a specific nozzle, we are able to pressurise the flavour and apply it widely and uniformly as the tea tumbles, resulting in uniform distribution with no saturated areas.

"We have a nozzle that allows a strong flow of our own special formula for flavour neutralization and cleaning between batches."

The mixer is self-emptying and free of any dead areas or shaft seals that can trap materials, resulting in total discharge without waste. Hanson explained that "once the tea is blended, internal baffles elevate the batch and direct it through a stationary discharge chute. The tea passes through strong magnets that remove the possibility of any foreign metal material, while a vacuum reduces dust associated with discharge." Blended tea is then transferred to a packing station.

Choice Organic Teas are packaged in 100% biodegradable kraft paper bags lined with glassine. Whole leaf varieties are packaged in biodegradable mesh pyramid tea bags while certain blends are packaged in unbleached filter paper envelopes and 100% paperboard boxes. ■

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