AUSTRALIAN
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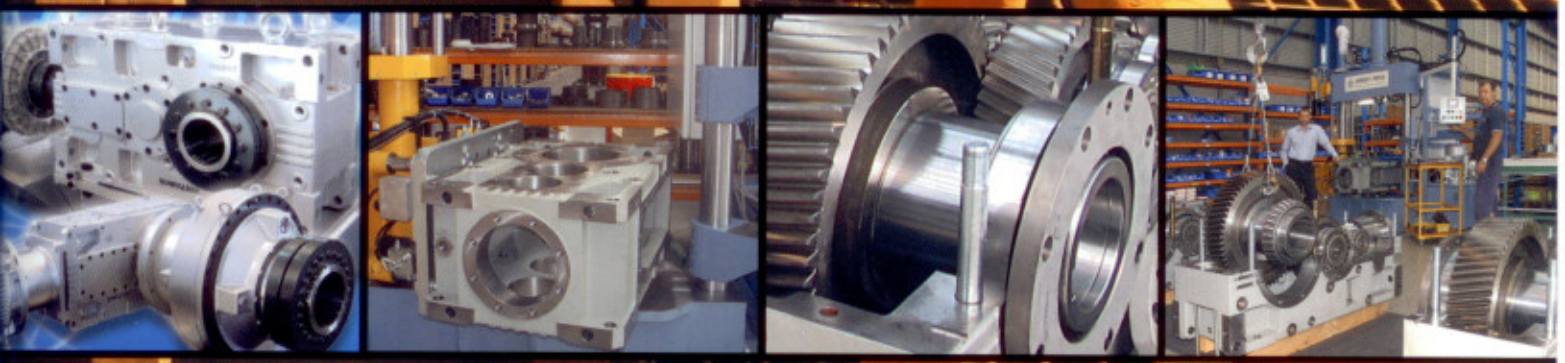

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SUPPLIER OF THE YEAR BULK HANDLING AWARDS

BONFIGLIOLI TRANSMISSION AUSTRALIA

MORE TORQUE MORE ACTION

From its headquarters and roasting plant, the Papanicholas Coffee Company supplies gourmet whole bean and ground coffees in the Midwest US and beyond.

Batch blending consistency grows gourmet coffee bean business

Two Munson rotary batch mixers have improved blending at a US coffee bean processor.

The Papanicholas Coffee Company, a top Midwestern US processor of gourmet coffee beans, is a family owned and run business that prides itself on fine quality gourmet coffees. Business is growing, particularly in the area of flavoured coffees, and the company offers more than 50 varieties of whole-bean and ground coffees.

To expand from the Midwest into select markets in the Northwest and Mid-Atlantic regions, the company moved into new facilities housing both corporate headquarters and a roasting plant with a capacity of more than 454,000kg a year (Figures 1 and 4). At the heart of the plant are a new 905kg/h capacity Lilla roaster and two new Munson rotary batch mixers.

Roasting creates the flavor

The region and weather in which a coffee is grown determine its distinct flavour. Roasting the green beans brings out that flavour and develops the characteristic coffee aroma. The longer the roast, the darker the beans and the stronger the flavour until you reach the almost-burnt taste of a very strong roast.

"There are many intricacies in the art of roasting coffee beans," says Vaughn Papanicholas, vice-president, "and it takes tremendous experience to maintain consistency."

The Brazilian Lilla roaster is designed to roast evenly and provide immediate cooling once the desired colour and aroma are attained. With partial cooling in the drum itself and a cooling

Figure 1: Heart of the Papanicholas plant is a 0.7 cubic metre Munson stainless-steel enclosed rotary batch mixer (left), a 1.4 cubic metre Munson rotary batch mixer (right), and a 905kg/h capacity Lilla roaster (not shown).

Figure 2: This 1.4 cubic metre rotary batch mixer blends a variety of roasted beans to produce distinct coffee flavours.

Figure 3: This 0.7 cubic metre enclosed rotary batch mixer sprays roasted coffee beans with liquid flavourings.

Figure 4: Seen from discharge end, 0.7 cubic metre rotary batch mixer sprays liquid flavours while mixing roasted beans. The mixer is equipped with a clean-in-place system.

hopper to quickly drop the temperature of the roasted beans, the roaster protects the coffee's aromatic oils for better flavour and appearance.

Most coffee sold consists of a blend of several different types of beans to create a balanced coffee with the desired taste qualities. According to Papanicholas, different types of beans from different sources are best roasted separately and then blended to deliver the optimal taste. "Although it's easier process-wise to blend before roasting, some of the beans will be under- or over-roasted. Blending after roasting gives much more uniform and consistent results."

Blending after roasting achieves uniformity

In the old plant, mixing of the various types of beans occurred within the roaster, as vanes integral to the rotating vessel lifted and tumbled the beans. But variations in the density and moisture content of different types of beans produced corresponding variations in the degree to which each type was roasted.

Papanicholas overcame this limitation by roasting each type of bean separately, then blending roasted beans using a 1.4 cubic metre stainless steel Munson rotary batch mixer (Figure 2). "The rotary mixer has a gentle tumbling action that does not break the beans or cause damage," he says. The gentle blending is a result of low-rpm rotation of the mixing vessel, unlike stationary horizontal mixing vessels with rotating ribbon blades, plows or paddles that push through the material, increasing friction, degradation and heat build-up.

Internal mixing flights of the rotary mixer alternate in direction for gravity-driven cascading of the material back and forth, producing a 100 percent uniform blend in three minutes or less. The flights also serve to direct the beans toward the discharge port, evacuating the vessel in three to four minutes with no residual in the machine.

The mixer has a stationary intake chute fed by a mechanical conveyor, and is fully enclosed, containing dust and preventing contamination of the product.

Figure 5: Papanicholas offers more than 50 varieties of whole-bean and ground coffees.

Second mixer conserves flavouring

Papanicholas also purchased a 0.7 cubic metre Munson stainless-steel rotary batch mixer (Figure 3) for flavour spraycoating downstream, replacing a continuous process coater of a different manufacturer. The rotary batch mixer is fully enclosed, a significant improvement according to Papanicholas. The old machine was open on both ends, allowing the flavoring to mist out, so there was a substantial amount of waste. Profitability benefits from saving this expensive component. The enclosed design also prevents flavourings from wafting inside the building, invading the non-flavoured area.

Previously, it was impossible to accurately measure the amount of liquid applied to the beans due to the lost liquid. With the new mixer, the operator weighs the coffee beans and flavouring for an exact blend. "Every batch is exactly the same with the rotary mixer," says Papanicholas. A typical batch of 200kg requires about 6kg, or 3 per cent, of liquid flavouring. Spray heads inside the mixer atomise the flavoring, and the gentle yet efficient tumbling effect ensures complete distribution without overspray or waste.

With a footprint of six square meatres the rotary batch mixer fits in the same space as the continuous mixer, while tripling its output because of the short mixing time. The mixer can coat up to six batches per hour of a flavour, producing 1180kg/h versus 400kg/h in the old machine. A clean-in-place (CIP) system eliminates hand washing, shortening downtime between flavours and further boosting production.

Batch size may be varied with demand to as little as 10 per cent of rated capacity with no variation in mixing time or uniformity. "We can run full batches of French vanilla all day long, but only need half-batches of toasted cinnamon pecan, a lower volume product," says Papanicholas, adding, "The machine is also quiet, further improving working conditions." ■

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