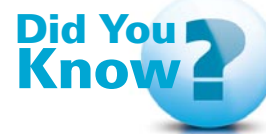


Improving the World One Teabag at a Time



10 years ago...on August 14th, 60 million Americans and Canadians lost electricity in a massive blackout.

Americans can trace their impact on the world of tea to a band of patriots who tossed a ship's cargo overboard into Boston Harbor to protest taxation without representation. Nearly two centuries later, an American merchant named John Sullivan made more tea history by inventing the teabag, although it wasn't exactly what he was aiming for. When he sent his customers samples of his teas in silken sachets he'd sewn by hand, his customers wrote back – asking if they could order the silken sachets!

Today a British ex-patriot living in America is elevating tea yet again by manufacturing teabags in the shape of a four-faced pyramid. "The market for tea in pyramid-shaped sachets has been projected to account for as much as half the tea bag market in just five years," says James Mackness, owner of Motovotano LLC in Seattle, Washington. "I personally think

that's a little high, but it's clearly a trend and it's going to be important."

Originally from London, England, Mackness has been in the Pacific Northwest since 1996. Before that he traveled extensively in India including Darjeeling which is renowned as a tea-growing region. "It's an incredibly scenic spot with rolling hills where they grow a lot of tea," he recalls. "I have a natural curiosity about tea and, being English, the pot was on every hour."

When Mackness came to Seattle, he found a local family-owned tea business and interviewed for a job as a tea production manager. "Somehow they gave me the job," he chuckles. "Perhaps being English was a contributing factor? Almost immediately I was sent to Italy to learn how to produce filled tea bags using a flow-through bagging machine. In the process I learned about different teas. It was just like heaven every day, going to work with the aromas from herbs and different kind of teas. There were also a lot of moving parts and cool technology. It was fun."

After spending many years working with tea and other food products, Mackness decided to take the next step and go into business for himself. "A good quality tea is an everyday affordable luxury," he explains. "In the tea business today, there is an undercurrent of people who are forming into cooperatives and working to create a value added, preferred format for tea. Before it was difficult for smaller companies to do this because they lack the equipment and expertise, but now they're sharing equipment, such as a cut and sift machine or a drying





Motovotano

What's in a name?

moto = motor

votano = Greek for Herb

Motovotano = The Herb Machine

machine. Producers that already have such equipment also tend to have their own brand, and they don't want to give competitors entry into the market by helping them out with packaging. That's where my company comes in. Motovotano LLC is a contract packager of custom tea blends in pyramidal tea bags. We are working with local producers who are carving their own niche in a new and expanding market."

Mackness says that more people want local products and he is working to help premium tea

blenders provide that through an innovative and accessible manufacturing model. "I think giving customers access to locally produced teabags from local growers is just fabulous," he says.

"We're providing quality tea in locally sourced, minimalist, biodegradable packaging without individual wrappers or tags. If you love great tea and are conscientious about reducing your carbon footprint and supporting local business, I can't think of a better way."

Motovotano occupies 3,000 square feet in a Seattle landmark, the century-old building that once housed the original Rainier Brewery. "At one time this building had the most bricks of

any building on the West coast," according to Mackness. "The current owners are restoring the property and it's attracting an interesting group of people, from farmers to hipsters to entrepreneurs. The whole neighborhood is quite historic and with eateries and pubs it's a fun place to be."

Through Motovotano, Mackness collaborates with local tea providers to package their high grade blends in pyramid-shaped teabags. "They're all organic or wild-crafted and



sourced in Washington and Oregon," he says. "The pyramid is the ideal geometric shape to allow the contents to unfurl and steep. One corner of the teabag presents itself in the cup so it's easy to remove without a

string and tag, and the bag material is biodegradable polylactic acid."

Motovotano commissioned a machine – the first of its kind in the world – that is configured to do on-the-fly blending of tea ingredients and packaging in pyramid bags. "It's a significant advancement," Mackness says. "Before, people would blend ingredients in a tumble style blender and hopefully end up with a homogenized blend, but higher grade teas with

whole leaves don't tumble blend very well. Our machine has multiple hoppers that feed a patented loading system. The product is precisely weighed using digital technology and loaded into the teabags. This makes a huge difference in consistency because each teabag has the same components in the same proportions as the master blended intended. Whenever the customer experiences any particular tea, every cup has that same flavor profile."

As the teabags are filled, they are cut and sealed ultrasonically. The seals on each end are perpendicular to each other, which creates the four-faced pyramid shape. "Pyramid bags have much more apparent space within than conventional or flow-through bags, even with the same amount of bag material," says Mackness. "With our special dosing mechanism, we can put much larger pieces of tea and herbs into the pyramid. Whole leaves like we use result in a smoother more rounded cup with more of the *terroirs* of where the leaf was grown."

Mackness stresses the importance of creating a manufacturing environment worthy of such high quality of ingredients. "We take great care with all aspects of our operation," he says. "For example, we set up a program to track what we throw away so we can measure our carbon footprint and work on making it continually smaller. There is no methyl ethyl ketone allowed in our factory. It's commonly used in ink printing for labels, but we use clean, crisp laser codification.

Our vacuum cleaners have hepa filters so we don't circulate dust back into the air. At every point of our process we try to make sure we aren't solving one problem but creating another. Oil-free compressed air is part of our system because it is a foundation of clean manufacturing. For me, having educated myself, oil-free air is a no brainer. I think oil-free air will be very much on the radar of the FDA and third party inspectors at some point soon, and I prefer to make such decisions myself."

On Motovotano's machine, actuators for the ultrasonic oscillators are pneumatically controlled. Horns which convey the ultrasonic frequency for sealing get hot, and they are cooled with compressed air. "I've been in so many factories where processes are controlled and product is conveyed using oil-injected compressed air. I just can't see doing that in an operation that's making food."

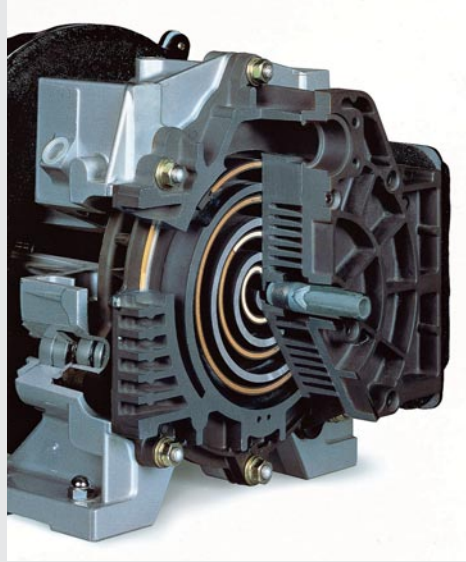
For Motovotano, Mackness specified an Atlas Copco SF4 Full Feature oil-free scroll compressor and an air distribution system built with AIRnet modular piping. "I had specified Atlas Copco scrolls and AIRnet



How the Scroll Compressor Works

Atlas Copco scroll compressors use two spiral elements or “scrolls.” One element is fixed and a second one orbits about the first. Air is drawn in from an exterior port, continually compressed into a smaller and smaller pocket, and released as a smooth, non-pulsing stream of compressed air through a port in the center.

The scroll element is belt-driven and because there is no metal-to-metal contact there is no need for oil lubrication in the compression chamber. As a result, air quality is exceptional and 100% oil-free, making it ideal for sensitive applications such as food processing, pharmaceuticals and laboratories. Scroll compressors are also very quiet and compact, making them ideal for applications where the compressor is located in work-space or where space is at a premium.



in a manufacturing operation I designed in a previous position, and I knew I wanted to use that same technology in my own company.”

Atlas Copco offers oil-free scroll compressors in the two-to-twenty horsepower range. “For food applications without the need for a large oil-free compressor, scrolls are a great solution,” according to John Kuipers, Service Sales Manager for Atlas Copco Compressors LLC in the northwestern Washington. “Compared to conventional compressors, scrolls are more energy efficient and compact. There are just a few moving parts, so scroll compressors offer high-reliability operation with minimal service interventions. They are much quieter than piston compressors, too. Scrolls are so quiet that customers install them at the point of use rather than in a remotely located compressor room.”

Based on previous experience, Mackness chose AIRnet modular piping again. “We started with 1” diameter tubing so we can add to it easily,” he explains. “We carefully located shut off valves so we can add drops or enlarge our network even while it’s in operation. The

installation is clean, easy and fast, and it looks clean and modern. I get the air exactly where I need it and I don’t have to be a certified pipe sweater to install it. Because it’s aluminum pipe, it’s probably been recycled already and someday it will be recycled again.”

Mackness has embarked on a new business venture that integrates an Englishman’s love of tea with a Northwesterner’s attitude about quality. “When the Americans get ahold of something, they really go,” he observes.



AIRnet

AIRnet is Atlas Copco’s modular air piping system. AIRnet is made from robust, lightweight, powder-coated aluminum tube and designed for easy, low-cost installation with a large selection of engineered polymer fittings. No special tools are required.

The smooth, low friction inner surface of the aluminum pipe maintains a minimum pressure drop throughout the air distribution system. This allows compressors to work at lower operating pressures, reducing power consumption and operating costs.

The non-corrosive properties of AIRnet maintain a constant air quality from compressor to site of use. System cleanliness protects downstream equipment from contamination for improved reliability and lower operating costs.

Pipe is available to cover ½ inch to 4½ inch nominal pipe sizes. The system is suitable for compressed air and inert gases such as nitrogen. The working temperature range is -4°F to +158°F and the working pressure extends up to 188 psi. AIRnet can be used for complete installation solutions or to extend existing piping systems.

“That’s been the case with coffee and wine and beer and distilled spirits, especially here in the Northwest. Now there’s a renaissance with tea. There are fascinating new types of tea, especially what’s grown here in the U.S. My ambition is to create American teas, not necessarily under my own brand, but with local sources and local packaging that minimizes the carbon footprint.”

Through Motovotano, Mackness is giving quality tea blenders access to a format. Tea is becoming more popular and the market is big enough to support growers and help merchants and tea houses succeed. “My ambition is to use my skills and knowledge and make a living

while leaving the planet in a better state than how I found it,” he says. “Enough people have that same mindset, but I don’t know that they have enough opportunity to buy products produced in a conscientious manner. Motovotano is working to fix that, one teabag at a time.”



To learn more:

motovotano.com