

# New Packaging Line Boosts Throughput, Streamlines Efficiency for Powdered Cleanser Manufacturer

First introduced in 1882, Bar Keepers Friend (BKF) brand powdered cleanser has grown to become a widespread seller found in big box stores and supermarkets throughout the U.S. and internationally. The same non-bleach formula that put a shine on brass rails of taverns more than 100 years ago is used today on stainless steel, porcelain, ceramic, and many other surfaces. Over the years sales have grown, peaking at more than 10 million units annually. This growth prompted SerVaas Laboratories Inc. (SerVaas), manufacturers of BKF, to expand its production capacity and improve its packaging cost efficiency.



SerVaas Laboratories streamlined its packaging line for canister handling.

## Inadequate Packaging Line

SerVaas' main business is formulating BKF cleanser, mixing and filling it into containers that are available in 12- and 21-oz paper-composite cans. In its prior 30,000-sq-ft plant, SerVaas outsourced the manufacture of its containers, trucking them into its facility, and warehousing the empty cans until needed for production. The canisters were then manually un-

loaded from pallets, put onto conveyors open end up, filled, sealed, labeled, cased, and palletized. Lift trucks then transported the pallets to shipping or storage.

The facility had the capacity to fill and package 90 canisters per minute, and that ceiling had become seriously challenged from increasing production demands.

*“We had been experiencing significant process delays because of the high levels of manual participation on our line,” said Ryan Miller, vice president of engineering for SerVaas.*

The decision was made in 2010 to not only make severe modifications to the packaging line, but to relocate the plant to a new 66,000-sq-ft facility eight miles away.

“We had been experiencing significant process delays because of the high levels of manual participation on our line,” said Ryan Miller, vice president of engineering for SerVaas. “We wanted to automate to improve throughput and minimize these system delays, particularly at filling.”

SerVaas also opted to stop outsourcing its canister manufacturing and bring it in-house. “Our throughput volumes increased to a level where it made sense to look at manufacturing our own composite cans,” said Miller, “We were shipping hundreds of truckloads of empty cans each year into our plant, then using up our warehouse space to store them.”

## New Packaging Line Streamlines Canister Handling

After commencing production in its new facility in February 2011, SerVaas automated its mixing, filling, and packaging line for powdered BKF. The company also built out additional lines for the manufacturing



and packaging of its liquid BKF product.

Included in this upgrade was the capability to manufacture its own canisters for the company's powdered product. Set up as an in-line process, it starts out with rolls of Kraft paper and ends up with finished goods in palletized cases. Formed canisters are fed directly to filling, lidding, and downstream shrink bundling into 8- or 12-piece can padpacks, and then palletizing, in one continuous line.

One of the main issues was how to convey the empty cans, which are fairly small in diameter, tall, and light-weight, through the process. A unique system of low back pressure conveyors and accumulation conveyors were implemented to move the canisters rapidly, but smoothly, throughout the line, which can achieve throughput of 140 cans per minute, almost 60 percent faster than the company's prior line.

"With the accumulation conveyors we are trying to maintain uptime as much as possible," said Miller. "They give us more time to clear a jam or to refill film in the shrink wrapper or labels in the labeling machine, while not having to stop the line.

"We have accumulation conveyors before the seaming of the bottom cap on the can, as well as before the canisters go into the rotary filler where we would typically have jam ups on our prior line," Miller continued.

Engineered by Shuttleworth Inc., a division of Pro Mach, the specialized accumulation conveyors utilize a technology called Slip-Torque which eliminates product jam-ups and damage to the containers.

Slip-Torque technology provides low line pressure throughout the continuous-motion accumulation conveyors. This allows for precise product placement and virtually eliminates product damage. Should the line need to slow or stop, the conveyor can continue to take canisters from the upstream line for a specified period of time instead of stopping the line. A low-pressure accumulation buffer absorbs irregularities in the production flow, and provides a smooth, even flow on the line.

Slip-Torque utilizes individually-powered rotating roller shafts and loose-fit rollers, which become the conveyor surface, powered by a continuous chain. The size

and weight of the canisters determines the driving force. When the product stops on the surface of the conveyor, the segmented rollers beneath the product also stop.

Conveyors with Slip-Torque have the ability to modulate the speed of different sections of the conveyor via a central control PLC and HMI. As the canisters are moving down the line, the

rollers at the back end of the conveyor can be moving faster than the ones at the front end of the conveyor. The canisters can be moving at variable speeds on different sections of the conveyors as dictated by throughput requirements.

More than 60 linear feet of specialized conveyor and accumulation systems were installed into the line.

### Engineered for Harsh Operating Conditions

Handling the highly abrasive powdered product, which uses oxalic

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acid as its active ingredient, posed a serious challenge for engineering the packaging line.

"The abrasive we use in Bar Keepers Friend is different than any other powdered cleanser," said Miller. "It is a very hard, extremely fine material. The problem was how to contain such a small dust particle that has very abrasive characteristics wherever it lands."

This became critical with moving parts, such as gears and motors, where the oxalic acid laden dust can become embedded into the metal and plastic components,

creating accelerated abrasion and wear.

To minimize the effect of the dust, the conveyors were de-

signed with enclosed motors to limit dust intrusion, and equipped with specialized pharmaceutical-grade vacuum cleaners were installed along the line to remove ambient fine powder. The accumulating

and equipped with a blower to maintain positive air pressure and minimize dust intrusion.

The mixing area was also enclosed and kept under negative pressure, the ambient dust being pulled into a filtrated collection system, so that the through-the-wall openings for the conveyors would not release dust into the packaging line.

*For SerVaas, the new facility and packaging line has provided significant improvements in operation and cost efficiency.*

signed with enclosed motors to limit dust intrusion, and equipped with robust cooling systems.

conveyor that feeds the critical filling area where dust is most extreme was enclosed in Plexiglas

### Benefits

For SerVaas, the new facility and packaging line has provided significant improvements in operation and cost efficiency. Such as, its labor rate per-case is lower because manual handling of the product is greatly reduced.

"Downtime on the line, because of product bottlenecks and changeovers, was virtually eliminated," said Miller. "The accumulating conveyors make it possible to keep the line moving. Flexibility is increased."

With its new packaging line now better able to handle its throughput of 10 million cans of powdered cleanser annually, BKF is positioned for continual growth.

*A leading designer and manufacturer of material handling solutions, Shuttleworth (Huntington, IN) has been a member of the Packaging Machinery Manufacturers Institute (PMMI) since 1967. The company is certified ISO 9001 since 2008. For more information, visit [www.shuttleworth.com](http://www.shuttleworth.com).*

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