

Case history | Gently blending for increased detergent quality

A contract packaging company installs a fluidizing blender to mix a new product.

APCO Packaging, a contract manufacturer in Bridgeview, IL, offers contract packaging services for makers of household, industrial, and personal care brands. The company manufactures and packages products such as soaps, detergents, powder and liquid pod formulations, and sodium percarbonate blends, among many others.

A few years ago, APCO was contracted to blend a new laundry detergent for one of its largest customers. The detergent consisted of several ingredients, including liquid surfactant, dye, and fragrance. However, the company didn't have enough capacity for the additional volume the new laundry detergent blending contract would require.

Increasing capacity and maintaining product quality

To add capacity to match the new demand, APCO contacted Eirich Machines, a manufacturer and supplier of mixers and blenders with its US operations based in Gurnee, IL. APCO had worked with the supplier, specifically its

American Process System's sanitary product line, for more than 15 years and as a result of this long relationship had installed multiple double-ribbon and paddle-ribbon blenders on other contract manufacturing production lines.

Traditional double-ribbon blenders have a U-shaped tank with a horizontal agitator featuring helical blades (also called *ribbons*) to blend the ingredients. The outer ribbons move the material toward the center discharge and the inner ribbons move the material toward the outside of the blender, causing the material to move back and forth during blending. However, when APCO tested the double-ribbon blender for its new application, the blending time required to thoroughly blend the ingredients resulted in frequent material degradation of the larger, more fragile ingredients.

APCO had also previously purchased a paddle-ribbon blender, which is similar in shape and construction to a double-ribbon blender. In the paddle-ribbon blender, the outer ribbon is replaced with paddles, which reduces the shearing



APCO installed an OptimaBlend blender to provide an efficient, high-quality mixture for a new product line.

effect on fragile ingredients. The outer paddles and inner ribbons are mounted onto support posts and provide a counter-directional material flow with the outer paddles moving the material toward the center discharge, whereas the inner ribbons move material toward the blender ends.

"We were just looking to increase capacity," says Clarence Totleben, R&D/manufacturing support engineer for APCO. "Before we talked to our supplier, we weren't aware that dramatic increases in speed and quality would be possible. We were quite content with purchasing two additional paddle-ribbon blenders, since they're gentler and don't shear the powders like double-ribbon blenders."

In order to get a quality blend for the new product line, the supplier suggested using a fluidizing blender, a newer technology that would better fit the company's application. APCO purchased two model FPB-050 OptimaBlend fluidizing blenders in all stainless-steel, each with a 50-cubic-foot working capacity.

Each blender is accessed via a mezzanine, where it is manually charged and the cover is closed before being turned on using a soft start to reduce the torque and energy to start the agitator. Paddles attached to the solid center shaft blend the product throughout the tank.

The blender's motor turns the shaft at a high tip speed that's about 80 percent faster than a double-ribbon or paddle-ribbon blender. The higher tip speed provides a high level of fluidization and more efficient blending. The finished product is then discharged into a hopper and transported to a filling station. After completing the first initial batches with the new fluidizing blenders, Totleben calls the results "remarkable."

"The first thing we noticed was the reduction in blending time,

which went down from 10 minutes to 1 minute with the new blender," he says. "Rather than the dye being dispersed slowly side-to-side like in a double-ribbon or paddle-ribbon blender, the fluidizing blender threw the ingredients into the air in a cross-hatch pattern, blending faster and with better dispersion than our other blenders."

In addition to producing a faster, more homogeneous mix, APCO found the fluidizing blender to be more flexible. "We mixed batches at 20, 50, and 75 percent of blender capacity, and all three batches produced the same quality mix," Totleben says. "It gave us the flexibility to run both short and long production runs."

The final benefit that APCO found after adding the new blenders is that when a lot of cleanout is required between batches, the new blender was easy to clean, which helps operators ensure the blender is cleaned effectively and eliminates contamination issues. Totleben says. "We work with many different fragrances and if residue is left from the previous recipe, it can contaminate the new recipe," he says. **PBE**

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