

Nailing an automation upgrade

Unscrambling and feeding of spiral-wound canisters got a big boost at this Liquid Nails packaging line thanks to some clever customizing by the machine builder.

Pat Reynolds, Editor

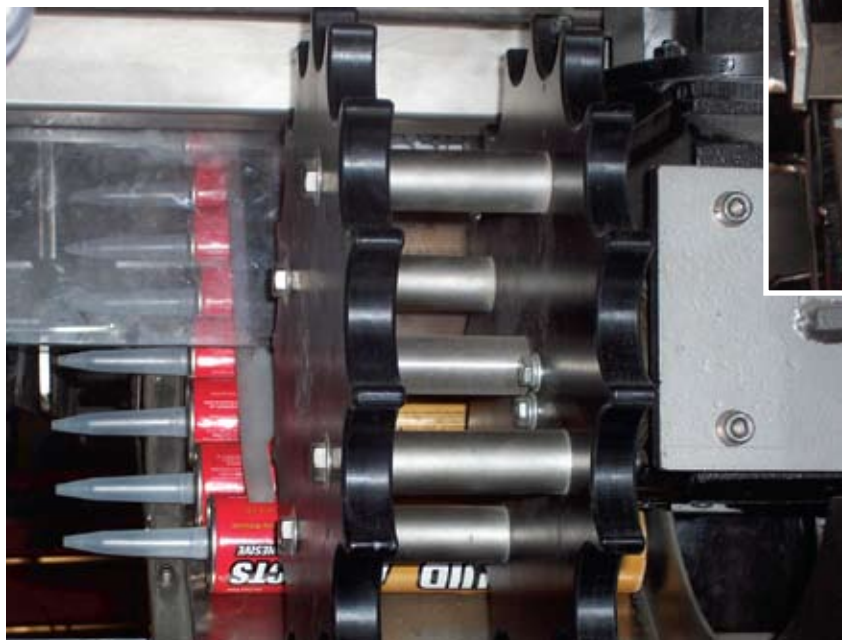
Manual loading of spiral-wound cartridges into a four-lane volumetric filler was too slow and carried the risk of repetitive-motion injuries. So the Liquid Nails Div. of Akzo Nobel LLC looked for an automated cartridge unscrambling and infeed system for its Liquid Nails line in Temple, TX. Their search led to a custom-built system called the Necosort-85-TS from **Nalbach** (www.nalbach.com) that was installed in November of 2007.

“The sorting bowl is fundamentally the same as many of the systems that Nalbach makes,” says Todd Baker, project and reliability engineer at the Temple facility. “But the star wheel infeed portion of the system is pretty special in terms of meeting our specific needs.”

The cartridges, which hold 10 oz of the very viscous Liquid Nails construction adhesive, begin the filling process when they’re dumped by hand from a large corrugated shipper into a floor-level hopper. A flighted incline conveyor carries the cartridges to an overhead sorting bowl that sits at a 30-degree angle. Cartridges fall to the bottom, or 6 o’clock, position of the large bowl and settle into one of the many



STAR WHEEL. A flighted takeaway conveyor (above) carries individual cartridges from the overhead orienting bowl down to a chute that feeds cartridges into a servo-driven star wheel (left).



pockets that move continuously around the circumference of the bowl in a clockwise direction. At this point, cartridge dispensing nozzles are randomly oriented.

When cartridges in their pockets reach the 12 o’clock position of the bowl, the design of the tooling causes them to be suspended by their nozzles with the body

hanging directly below. The cartridges then drop down a chute, nozzle trailing, and make their way to a flighted takeaway conveyor and then to a chute that feeds them into a starwheel feeding system. Cartridges are advanced by the starwheel into a position from which they can be pushed at a right angle, four across, into the pockets that carry them through the volumetric filler. It's this section, from the takeaway conveyor to the cartridge pusher, that Nalbach custom-designed for Akso Nobel Paints.

"It seemed the most reliable way of keeping cartridges from getting jammed," says Nalbach's Ed Atwell. "Compared to an infeed approach that relies more or less on gravity, the use of the star wheel



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keeps the cartridge in firm and positive control. It's a servo-driven solution driven by a PLC. The PLC receives inputs from sensors at the unscrambler bowl, the flighted takeaway conveyor, the cartridge chute, and the cartridge pusher so that everything is synchronized."

Controls components deployed by Nalbach include a Direct Logic 06 PLC from Automation Direct (www.automationdirect.com), a graphic touchscreen Human Machine Interface from Maple Systems (www.maplesystems.com), and from Lenze-AC Tech (www.actech.com) a Model 940 servo motor for the cartridge-feed starwheel.

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FILLER INFEEED. The new infeed system places empty cartridges in these pockets on the four-lane volumetric filler.

The elimination of repetitive motion was among the key drivers behind the installation. Mission accomplished, says Baker. A pleasant surprise, he adds, is higher throughput. "Twice we've broken production records since the Nalbach system went in."

One additional benefit gained, says Baker, is that the filler operator can now spend time addressing other needs since he isn't occupied loading cartridges by hand. 🌐