The tankless Freedom hot melt application system is used on a tray packer at the Nordgetreide plant in Falkenhagen

Saving energy with comfort

As a leading German producer of cereals and milled products, the Nordgetreide Group with headquarters in Lübeck and three operating production sites is constantly engaged in optimising its technical production processes. And so it happened recently at the Falkenhagen location in Brandenburg, as part of ISO 50001 energy management certification, that an innovative Freedom hot melt application system from Nordson was installed in one of the packaging lines. This not only reduces energy costs, but also points out some interesting innovations compared to end-of-line gluing.

Located just a few kilometres north of Pritzwalk, the Nordgetreide GmbH & Co. KG plant was founded in 1994 and expanded in 2001 and again in 2008. Breakfast cereals for the food retail market are produced here. Along with classic corn flakes, there are also numerous other specialities. Usually two bags containing 600 to 850 grams are placed in the outer packaging from above, typically consisting of eight to twelve units each and designed as shelf-ready trays, meaning that they are largely open in the front for removing the products. The boxes are then wrapped with foil for transport and shipping.

One of the packaging lines was refitted in mid-February of this year with the Freedom hot melt application system from Nordson. The system then successfully passed an eight-week trial run period and has been in continuous operation since April. According to plant director Aziz Bregieth, decisive factors for the investment included not only the requirements of DIN EN ISO 50001 for reducing energy consumption, but also the company’s general premise of always using the latest technology to guarantee the best possible process reliability. In this special case, increasing work safety also played an important role.

The Nordson components are used on a tray packer. After the flat blanks are aligned and before the outer packages are filled, adhesive is applied to the two side tabs, which are each about seven centimetres high and just under 40 cm wide. This is done by means of horizontal application of three beads at the end of each tab, each about 30 to 35 mm long. Two MiniBlue II applicators arranged opposite each other are used to apply the strips, with a total of 12 for each box.

Tankless hot melt preparation

One of the special features of the enclosed Freedom system is the innovative process for
preparing adhesive. The central unit consists of the mechanical melter including pump and electronic control unit, which requires no conventional tank and only keeps the hot melt quantity actually required at the processing temperature. It works in a similar manner to instantaneous water heaters, with a melting capacity of up to 12 kg per hour, and only requires a short warm-up time of around 15 minutes. The reservoir with reduced volume is automatically supplied by a maintenance-free Venturi pump from a 60 kg storage container. It is located on the back of the tray packer in Falkenhagen, connected with the melter by a conveying hose nine meters long. The hot melt is provided in granulate form.

Melting only what is actually required makes it possible to significantly reduce energy consumption. Initial calculations made by Stefan Oppitz, engineer and project manager at Nordgetreide, document savings of about 25%. It would even be possible to improve on this result if the production process were interrupted more frequently. Because the system runs in continuous three-shift operation, however, no energy-intensive heating up phase is needed.

Considerable savings in adhesive consumption can also be achieved, especially by means of the integrated EcoBead application control system. The system’s flexibility in terms of optimized generating of a wide range of point and strip patterns is currently not being fully utilized due to the standardized bead application process in Falkenhagen. That flexibility could become more important in the near future, however, as there are currently plans for upgrading additional packaging lines in the plant and the systems would then possibly be used to glue folding boxes.

Flexible installation

Another advantage of the melter—which fully deserves the name ‘compact,’ weighing only about 45 kg with dimensions of 838 x 533 x 279 mm (W x H x D)—is that unlike conventional tank devices, which are installed on the floor, it can be adapted individually to specific operating and machine conditions. This is made possible by a special fastening adapter that can be used to mount the melter higher to save space, for example, or even "overhead" in the system – or in the immediate vicinity of the dispensing guns.

Floor installation was chosen initially at Nordgetreide, but there are plans to fasten the melter higher up inside the machine housing in the near future. Regardless of the installation location, the Freedom system offers improved work safety, as manual refilling of the hot tank is eliminated and with it the risk of burn injuries. The enclosed nature of the system also ensures consistently high adhesive quality because the hot melt is not exposed to any environmental influences, while contamination and charring are practically eliminated.

Reliable dispensing guns

Two Nordson MiniBlue II pneumatic applicators (slim line version) are used to apply adhesive beads. The energy-saving heads – which have won the German Packaging Prize in the category of machine technology and are often referred to as "non-stop-sprinters" – are protected against accidental contact. They feature full plastic insulation and are also equipped with a rapidly opening and closing ball-and-seat module that guarantees precise adhesive separation and neat application patterns. The assemblies work with a minimum switching time of 2 ms. Depending on which hot melt is used, a service life of more than 100 million switching cycles can be achieved.

Recently developed Blue Series hoses are used to connect the dispensing guns with the melting section. Because of their significantly reduced diameter, they are considerably more pliant. They also feature a patented chlorine-free insulation. Special movable brackets are available for flexible assembly.

The Optix electronic control unit is also especially worth mentioning. It has been fitted with a clearly laid-out 7" color touch screen display for simple operation and continuous process monitoring. The display not only provides detailed diagnostics of the entire processing sequence, including error messages, it also features component detection.
which includes the corresponding part numbers for use when purchasing spare parts. It is also possible to assign passwords to prevent unauthorized entry of data.

**Initial positive experiences**

This convenient operation using a touch screen is not the only feature praised by Stefan Oppitz, but it is the main one. "We are very impressed with the problem-free handling of the application system. The configuration adapts optimally to rapid production changes, for example due to many smaller batch sizes.

"In addition to the remarkable energy savings, the high level of process reliability is already apparent after just a few weeks. The system works extremely reliably and there is no more cracking caused by burnt plastic. Other difficulties that occurred earlier during manual refilling have also been relegated to the past. The possibility of overfilling is excluded and operating personnel benefit from considerably improved work safety."

Bernd Neumann

(All photos: Kimberly Wittlieb)

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