

Success for New Integrated Hot Melt Packaging Solution

The Krüger Group recently started using the Nordson Freedom tankless hot melt system and Henkel Freedom-certified adhesive jointly developed at company headquarters in Bergisch Gladbach. They are among the first in the world to use this system, which was officially released in April 2013. Krüger's experience reveals astonishing results in terms of energy and material savings as well as a significant increase in productivity due to the simplified process.

Hot melt system optimization is achieved through basic changes in the hardware configuration. As a leading international manufacturer of end-of-line hot melt packaging solutions, Nordson Corporation (Westlake, Ohio USA) together with its German headquarters in Erkrath has designed a new melter with a number of interesting technical features. Henkel AG & Co. KGaA of Düsseldorf is providing special Freedom-certified Technomelt adhesives for the system.

The two partners have left nothing to chance in their alliance. The development project is based on numerous customer surveys and thorough practical tests, resulting in a consistently user-oriented implementation.

Krüger GmbH & Co. KG produces many products including instant beverages, and has achieved much success in this segment throughout Europe. Following an extensive trial phase, in December 2012 they began using the combination of Nordson Freedom equipment and Henkel adhesive formulations for bottom-tray gluing for a line on which 100g and 200g glasses with instant coffee are grouped to form packs of six and eight. A Meypack case packer type VP 501/SW 60-30 with

a downstream foil wrapping machine is used to shrink wrap the outer packaging.

Two adhesive dispensing guns are used to set four glue points for each tray. The system currently achieves an output of 200 glasses per minute or, an average of 60,000 to 70,000 containers in an eight-hour shift. Normally, the line runs two shifts, five days a week. These figures reveal that the system must process and dispense large quantities of adhesive with little room for error, maintenance or downtime from the adhesive melter, automatic adhesive fill system or dispensing guns.

Adhesive tank eliminated

The central component of the Freedom system is the melter, which has a small reservoir, instead of a conventional tank of molten adhesive. The reservoir holds less than a few hundred milliliters – the amount of adhesive that is actually needed at a temperature between 40 and maximum 204° C (104 to 400° F). It processes up to 12 kg (26 lbs) of hot melt an hour and requires only a short warm-up period of about 15 minutes. Using only the amount of adhesive actually needed significantly reduces energy consumption. Krüger achieved savings in the range of about 30-percent.

Another noteworthy advantage of the melter is its highly compact dimensions of 838 x 533 x 279 mm (W x H x D), (33 X 21 X 11 inches) with a weight of about 45 kg (99 lbs). This means it can be flexibly installed, specifically in a location close to the dispensing guns using the fastening adapter included with delivery. Krüger installed the unit at a height of about two meters (6 ft) up in the case packer. That means the connection hoses between the melter and the two applicators are just 1.2 m (4 ft) long.

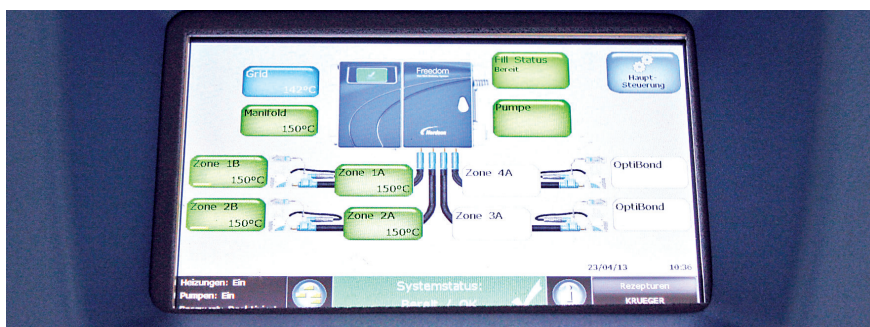
The pelletized Henkel adhesive is automatically supplied from an externally installed 60-kg (132 lb) storage container with the aid of a powerful venturi pump. Because of this, the difference in height from that point to the melter does not represent a problem. The new Nordson RediFlex™ hot melt hoses are used in Bergisch Gladbach as the connecting lines from the melter to the dispensing guns. The hoses feature a significantly reduced diameter for reduced energy use and they are considerably more flexible. They also feature a patented chlorine-free insulation. Special movable, integrated mounting brackets on the hoses allow for easy routing, hanging and attachment to parent machinery.



The pelletized adhesive is automatically supplied from an external 60 kg container



The central component of the Freedom system is the melter. Photos: Kimberly Wittlieb



The Freedom system features simple operation using a 7 inch color touch-screen control

Efficient control

In addition to the mechanical melt section including a piston pump, the Freedom Melter consists of an electronic control unit incorporating the EcoBead™ application control system, which was presented for the first time in August 2012. It is the latest component of Nordson's OptiBond™ concept. By coordinating the precise amount of adhesive required for bonding/sealing, shorter intermittent adhesive beads are applied in place of traditional longer beads for adhesive savings and optimized bond strength. Adhesive savings of 30- to -60-percent are achievable in most applications, according to reports from the company.

The MiniBlue® II adhesive dispensing guns also have a proven track record as the longest-life pneumatic applicators available in the packaging industry, and for delivering extremely fast cycle times. They have been equipped with component identification connections for the Freedom system. The modules are now available in a choice of standard MiniBlue II ball-and-seat or new, self-cleaning MiniBlue II SureBead® needle-and-seat configurations.

Single-module applicators feature durable, solid plastic insulating covers that reduce energy use up to 38-percent while minimizing operator exposure to hot surfaces. Fast cycle rates with minimum bead deposition time of 2 ms (dependent on the hot melt that is used) and a service life of more than 100 million switching cycles, makes them industry leaders for virtually all packaging applications.

The Freedom system features simple operation and process monitoring, using a 7-inch (177 mm) Optix™ color, touch-screen control. Detailed diagnostics of the processing sequence, including error messages are displayed in plain text. Component detection and recognition, including part numbers, simplifies maintenance and spare parts purchasing.

Savings potential confirmed

Krüger engineers will soon be able to confirm this long service life. The first concrete assessments can now be made regarding energy and adhesive savings. The Technical Director and other employees in the company responsible

for working with the system are extremely impressed with the new Freedom system.

"I can fully confirm the predicted reduction in energy requirement in the range of 30%. Adhesive savings are also certainly not negligible, amounting to something like 15%. The 'intelligence' of the system is a contributing factor in both these effects. In addition to using just the right amount of adhesive, with the temperature automatically lowered at times when the machine is stopped, converting to the MiniBlue II application technology is certainly an effective improvement. And there is practically no more encrustation or carbonization (adhesive char), which means the nozzles are not clogged.

"The case packer's design provided ideal conditions for the elevated positioning of the Freedom melter in the system. This resulted in much shorter hoses to the dispensing guns, which is naturally a great advantage. The user-friendly design of the melter was an especially pleasant detail. The display is very easy to read and handling is simple. All in all we are very satisfied and we can certainly imagine converting some of the 80 Nordson application systems we have already installed to this system in the near future."

Key No. 81873

Bernd Neumann



Nordson's Area Manager, Martina Hammer, was largely responsible for this project, together with Krüger's Technical Director and Senior Technical Manager

It is no exaggeration at all to call certain aspects of the Freedom System revolutionary. Eliminating molten tanks of adhesive and replacing it with a tankless, on-demand melter, which can be positioned close to the dispensing guns, is surely a trend-setting feature which facilitates the short distance from the melt to the dispensing guns. Installation flexibility is an example of the "freedom" expressed by the brand name. Users will also discover new "freedoms" in minimized downtime, prevention the use of excessive amounts use of adhesive, the availability of adhesives specially designed for the filling system and a design that avoids operating errors whenever possible.