Premiere for "Freedom"

The Krüger Group recently started using a tankless hotmelt application system developed by Nordson and Henkel under the shared brand "Freedom" at company headquarters in Bergisch Gladbach. They are among the first in the world to use this system, which was officially released in April of this year. The initial practical experience reveals astonishing results, and not just in terms of saving energy and material: They also show a significant increase in productivity due to the simplified process.

This optimisation is achieved especially through basic changes in the hardware configuration. As a leading manufacturer internationally of end-of-line packaging solutions with hotmelt, the US Nordson Corporation (Westlake/Ohio) together with its German headquarters in Erkrath has designed a new melter with a number of interesting technical features. The adhesive division of Henkel AG & Co. KGaA of Düsseldorf is providing special Freedom-certified Technomelt types suitable 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. This means significant optimisation, especially for packaging lines.

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 a precisely coordinated combination of innovative equipment and special adhesive formulations for bottom-tray gluing at the end of 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 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 in two-hour shift operation five days a week. These key figures alone reveal what large quantities of adhesive are processed and how stringent the requirements are that must be met by the filling system and dispensing guns.

Adhesive tank eliminated

The central component of the Freedom system is the melter, which has a reservoir that holds only the amount of adhesive that is actually needed at a temperature between 40 and maximum 204° C. It processes up to 12 kg of hotmelt 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 per cent.
Another noteworthy advantage of the melter is its highly compact dimensions of 838 x 533 x 279 mm (W x H x D), with a weight of about 45 kg. 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 metres up in the case packer. That means the connection hoses between the melter and the two applicators are just 1.2 m long.

The granulate is automatically supplied from an externally installed 60-kg storage container with the aid of a powerful pump. Because of this, the difference in height from that point to the melter does not represent a problem. The new RediFlex hoses are used in Bergisch Gladbach as the connecting lines from the melter to the dispensing guns. Because of their significantly reduced diameter they are considerably more pliant. They also feature a patented chlorine-free insulation. Special movable brackets have been developed for assembly to suit specific requirements.

Efficient control

In addition to the mechanical melt section including the 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 just the required amount of melt with fully adequate applicators and consistent gluing quality it achieves adhesive savings that may be in the range between 30 and 60%, according to reports from the company.

For simple operation and process monitoring, the melter is equipped with a 7" Optix Touch Screen Panel, which makes the colour display even more clear and concise. It not only provides detailed diagnostics of the processing sequence, including error messages, it also features component detection that includes part numbers to use when purchasing spare parts.
The dispensing guns also have a proven track record in the OptiBond configuration, where they have made a name for themselves as the "endurance sprinters" or pneumatic applicators of the MiniBlue II series. They have been equipped with modified connections for the Freedom system. The modules are now available with either ball or needle seat. They are fully insulated, work with a minimal switching time of 2 ms and, depending on the hotmelt that is used, achieve a service life of more than 100 million switching cycles.

**Savings potential confirmed**

Krüger engineers will no doubt 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 hotmelt application 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 melt, 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 carbonisation, which means the nozzles are not clogged.

The case packer's design provided ideal conditions for the elevated positioning of the Freedom System 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."