

Optimum End-of-Line Gluing

When three companies – each a market leader in its own area of operations – cooperate to comprehensively modernize end-of-line packaging gluing, it is virtually a certainty they will achieve an absolute state-of-the-art project. That is just what happened in the Oschersleben plant of potato processor Agrarfrost, where all the box erectors and lidding machines were recently retrofitted with Freedom systems developed by Nordson. A Freedom-certified hotmelt system adapted to the innovative adhesive melters by Henkel was used in the project.

by Bernd Neumann

With headquarters in Wildeshausen-Aldrup, Lower Saxony, Agrarfrost GmbH & Co. KG processes more than 500,000 tonnes of potatoes a year into more than 250,000 tonnes of finished products, in over 60 different varieties. The plant situated near Magdeburg specializes in producing quick-frozen French fries and is also the Group's only commercial unit to produce potato chips.

Various box erectors and lidding machines from Bedo Verpackungstechnik GmbH (Lübeck, Germany) and Norwegian company Nor-Reg Systems A/S (Honefoss) are used for secondary packaging of goods ready for sale.

Hotmelt gluing is used for bottom tray blanks, by applying two beads at each corner, and also for the "shoe covers" placed on top. These are formed on each tab using two short two-centimeter strips.

Until last year, production of transport boxes was accomplished by a mix of tank devices from different manufacturers and using different types of glue. To reduce this complexity, technical managers of



Photos: Kimberly Wittlieb

Playing key roles in implementing the new end-of-line gluing systems were (left to right) Rene Bartsch, Aftermarket Sales Manager at Nordson, Ingo Barthel, Technical Director of the Agrarfrost plant in Oschersleben, and Jörg Hurdelbrink, Technical Service and Sales department of the Henkel Adhesive Technologies business division

the plant decided to standardize the end-of-line gluing systems and use of materials.

They opted to use the innovative, tankless Freedom systems which were introduced to the market as a complete solution with great success in April 2013 by the American adhesive specialist

Nordson Corporation (Westlake/Ohio) with German headquarters in Erkrath and the Adhesive Technologies division of Henkel AG & Co. KGaA (Düsseldorf). The innovative design of the adhesive melter and the Freedom-certified adhesive types precisely matched to it make users considerably more independent, not only in terms



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Bottom trays are produced and distributed to the production lines with five box erectors simultaneously in potato chip production

of procurement of raw and substitute materials, but also regarding installation options.

18 tankless systems

A total of 18 Freedom systems are now in use at Agrarfrost in Oschersleben, all of them installed within the last half year. The major project was completed last November.

A maintenance-free Venturi pump supplies adhesive to the melter, the central component of the Freedom system, which works like an instantaneous water heater. Unlike a conventional tank melt device, the melting unit has a reservoir which keeps only the amount of adhesive actually needed at processing temperature. The device has a throughput of up to twelve kilogrammes of hotmelt per hour and requires only a short warm-up time of only about 15 minutes. That makes it possible to significantly reduce energy



consumption, as only the required amount of hotmelt is heated.

The Freedom melter is very compact, with dimensions of 838 x 533 x 279 mm (W x H x D). It weighs about 45 kg and comes with a special attachment adapter, which also allows for customer-specific "overhead" installation if desired. Four box erectors arranged in series in a hall at the Oschersleben plant were in need of modernization. These box erectors process a large number of bottom trays and send them centrally to the respective production lines. The result was four adhesive melters lined up one after the other "like tin soldiers" on the end-of-line packaging machines.

They are automatically fed through four supply line hoses from just one 240-liter storage drum – another special feature of the configuration. The multiple supply is controlled by an integrated sequencer, which receives signals indicating a low level of adhesive and determines the order for pumping adhesive.

Efficient control

In addition to the mechanical melting section, the melter also consists of an Optix electronic control unit which also includes the "intelligent" EcoBead application control system. It is used to optimize a wide range of patterns, changing the sequences and replacing



The 240-liter storage tank is equipped with a multiple-feed system for supplying granulate to as many as four adhesive melters

long beads with shorter ones in such a manner that gluing quality is not adversely affected. A considerable amount of adhesive was saved by heating only what is actually required with a high-performance hotmelt unit and using the MiniBlue II Slim Line applicators, thus boosting efficiency.

The fully insulated pneumatic dispensing guns are equipped with a ball-and-seat module and operate with a minimum switching time of 2 ms. Depending on which hotmelt is used, they can reach a service life of more than 100 million switching cycles. The flexibility of the adhesive melter in terms of where it is located means it can be installed in the immediate vicinity of the applicators if necessary. The new RediFlex connecting hoses with movable holders are used for this purpose. With a considerably smaller diameter, they bend much more easily and are also fitted with patented chlorine-free insulation.

To ensure simple operation and process monitoring, the Optix is equipped with a clearly arranged 7" color touchscreen panel for visualization. It not only provides detailed diagnostics of the entire processing sequence, including error messages, but also features component detection which includes the corresponding part numbers for use when purchasing spare parts.

Exemplary collaboration

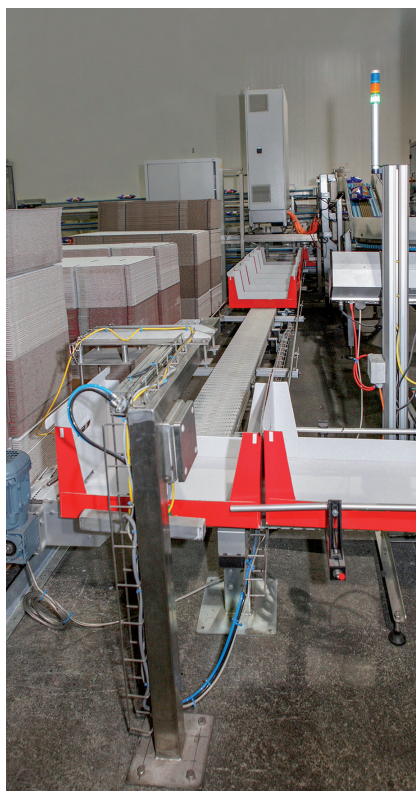
Ingo Barthel, Technical Director of the Agrarfrost plant in Oschersleben, is very pleased with the optimization of end-of-line packaging. Although parts of the systems had only been in operation for a few weeks when we visited the company at the end of November 2014, so that no concrete figures were available yet regarding reduced energy consumption and savings in adhesive, he can already list a whole series of positive experiences. He highlighted especially the exemplary three-way collaboration, emphasizing the competent advice provided by his direct contact partners Rene Bartsch, Aftermarket Sales Manager at Nordson, and Jörg Hurdelbrink from the Technical Service and Sales department of the Henkel Adhesive Technologies business division.

He noted that cleaning expenses had clearly been minimized and that malfunctions and downtimes were both down considerably. There were also no problems as employees learned how to use the new system. There were no difficulties of any kind handling the new systems. He added that it is practically impossible to tamper with the new process, as the device controllers are protected against unauthorized operation by passwords.

Now just one type of hotmelt

For Ingo Barthel, another significant aspect is concentrating on just one type of hotmelt. The type used is Technomelt 6003 Freedom Certified, a combination of three formulations specially designed for the system. Hotmelt is especially recommended for low application temperatures and is ideally suited as a "cool" solution for Agrarfrost, since immaculate gluing quality must be ensured for deep freeze products as well as outer packaging for snacks.

It exhibits exceptional adhesive force even on difficult surfaces and with high filling weights. The hotmelt is delivered in granulate form in 25-kg sacks. It has a viscosity of from 1100 to 1500 mPas (Brookfield at 130 °C). The low viscosity guarantees optimum flow behavior even at low temperatures between 130 and 150 °C.



Bottom trays at the discharge of a box erector

Clean processing of the high-quality hotmelt is guaranteed by the enclosed nature of all components in the system. Because the hotmelt is not exposed to any environmental influences at all – in contrast to conventional hotmelt devices, where such exposure is unavoidable – contamination and carbonization are practically eliminated.

The granulate size is optimized to prevent problems while filling the melter. This also reduces the risk of clogging. Multi-filtering also prevents clogged nozzles and the resulting machine downtimes. And last but not least, the automatic supply of hotmelt minimizes the danger of injury through burns which could affect operating personnel during manual refilling.

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