

Patented self-cleaning Mini Blue II SureBead dispensing guns with small nozzles are used for gluing boxes



Photos: Kimberly Wittlieb

Unilever has invested in modern end-of-line gluing technology

A complete conversion of note

Sustainability and work safety play an important role at all locations of the British-Dutch Unilever Group, and the plant in Heilbronn is no exception. One of the most recent steps for optimizing processes in this regard is the extensive modernization of end-of-line gluing in one of the two production areas. Numerous Freedom and ProBlue Liberty tankless hotmelt application systems from Nordson are now in use. These systems are efficient in terms of energy and material and are also user-friendly.

The production site in Heilbronn is not only the largest of its kind that Unilever has in Europe, it is also inseparably connected with “Knorr”, the name of the corporate group’s best selling brand. Knorr is sold in more than 100 countries, and given that Unilever claims that over 80 % of all Germans buy at least one of the over one billion packages sold domestically every year, there is no need here for a detailed description of the exceptionally diversified assortment of the brand.

Production can be broken down essentially into two main areas. Dehydrated products for mixing with water to make soups, sauces and dressings are produced in the first area, “Produktion Eins”. The second area, referred to as “Produktion Zwei”, concentrates mainly on paste-like foods and dry premixes. The company numbers about 800 employees including management. The amount of product delivered annually comes to about 90,000 tonnes.

17 processing lines run in Produktion Eins alone. Starting in the middle of last year,

they were successively fitted with new hotmelt adhesive application devices. As part of this major project, a total of 20 Nordson systems have now been installed: six Freedom and 14 ProBlue Liberty melters. They are used mainly as case packers for forming slip-lid cartons, but they also perform other tasks as well, for example to glue folding boxes.

Tankless demand-driven melting

The two hotmelt application systems have some significant technical features in common, for example the absence of a conventional tank. The central unit consists of the melt section, which functions essentially like an instantaneous water heater, keeping only the amount of adhesive actually required at the processing temperature in a reservoir with reduced volume. Preparing only what is needed cuts heating up and flow-through times by as much as two thirds, to 15-30 minutes. This significantly reduces energy consumption for the melters.

The enclosed nature of the system brings many other advantages. Gluing quality is improved because the hotmelt is not exposed to any environmental effects, such as dust, dirt and other accumulations. In addition, a lower temperature load for the adhesive prevents cracking, so that clogging in the filters, hoses and dispensing gun nozzles is largely

eliminated, which in turn lowers maintenance and repair costs. The lower heat requirement also makes it possible to use specially optimized types of hotmelt, which results in minimized consumption. Essentially all standard commercial hotmelt adhesives can be used.

Another important benefit is increased work safety. Because the granulate is now supplied automatically from a storage tank equipped with a pump that works based on the Venturi principle instead of manually, the risk of burn injuries – unavoidable with conventional tank devices – is completely eliminated.

Numerous optimizations

Further advantages are clear from this specific case. At a plant tour in March of this year, Thomas Bittner, the responsible WCM (World Class Standard in Manufacturing) project manager of the Unilever plant in Heilbronn, Thomas Fritsch, department manager of Produktion Eins and Martin Schweiger from the repairs department explained some technical details involved in the practical implementation of this major project. The question concerning the criteria for choosing the one system or the other was also answered. They agreed that the melters are also similar in terms of their per-



Nordson:
Hall 14, booth D15

Two ProBlue Liberty 14 systems are installed on a case packer designed for two lanes. A third device on an additional packaging machine can be seen in the background



Pleased with the successful modernization of the end-of-line gluing technology they have achieved together: Guillaume Cuney, Manager of Produktion Eins in the Heilbronn plant of Unilever Deutschland Produktions GmbH & Co. KG, the responsible Nordson Service Engineer Ulrich Mauch, Thomas Fritsch, Department Manager of Produktion Eins, Thomas Bittner, WCM Project Manager in the Unilever plant in Heilbronn, Martina Hammer, Key Account Manager Packaging for Germany, Austria and Switzerland at Nordson Deutschland GmbH, and Martin Schweiger from the maintenance department (left to right)

formance capability and their greatly reduced dimensions, which allows for flexible installation.

The numerous improvements brought by modernization are evident everywhere. This has to do in part with technical aspects of the installation. For example, by arranging the Freedom systems in the area of the Hesser machines, the number of gluing devices required was deftly reduced from eight to four. Due to the compactness and relatively low unladen weight of the melters, it was possible to install them at head height. This not only saves space, but also makes the solution user-friendlier.

Dispensing guns

The connections between the melters and the dispensing guns were also optimized. The Freedom melter can be used to supply up to four applicators with hotmelt simultaneously, while the ProBlue Liberty 14, the version used most commonly, can supply as many as six applicators. This option, which allows for more sophisticated gluing configurations, is the main reason why the Liberty variant was chosen over the Freedom system for some case packers in the conversion.

The Freedom model also features the impressive integrated EcoBead function. This is an application control system that saves material by replacing long continuous beads of adhesive with multiple short ones. It is also available as an accessory for the ProBlue Liberty series. The highly compact unit offers plug-and-play functionality, and can easily be inserted between machine control and the dispensing gun. An EcoBead is currently being tested in Heilbronn with positive results. Two models from the MiniBlue II series

that work with a minimum switching time of 2 ms and achieve a service life of more than 100 million cycles were selected as applicators. The patented SureBead type is used for glue folding boxes. Since small nozzles are used for this application, it is a great advantage that the pneumatic dispensing gun is equipped with a self-cleaning needle and seat module so that nozzle clogging can be optimally prevented. Fully insulated MiniBlue II standard heads, pneumatically opening and closing with a ball-and-seat module, are also used.

Savings: Energy and material

Another important factor contributing to the improved overall configuration is the 240-litre adhesive storage container, which offers the option of connecting as many as four filling hoses. That means that only seven of the large-volume reservoirs are now needed for all 20 melters. The Multi-Feed function is controlled by a sequencer, which determines the order required for pumping hotmelt adhesive based on melter level signals.

The savings in electrical power and glue consumption achieved so far are especially worth noting. After more than six months of experience with the new application systems, Thomas Bittner can now give some specific figures: "Because of the way the systems work, the selective use of the right modules and nozzles for our specific requirements, and by changing to an optimized type of adhesive, we have achieved savings on adhesive in the range of about 20 to as much as 35 percent, depending on the system. The energy requirement has also fallen

significantly. This is partly because the total number of devices has been reduced, but especially due to the general efficiency of the modern melters with their reduced heat-up times."

He emphasizes that all important aspects were implemented very satisfactorily in this major project. "The competent support by Nordson and the problem-free way in which the conversion proceeded will form the basis for the upcoming modernization of 'Produktion Zwei', which will be similar in scope. According to plans, this will take place before the end of the year." The Adhesive Tracking System (ATS), which is new to the market, will also be tested at that time.

Bernd Neumann

INFORMATION

Precise adhesive tracking

ATS, which will also be available as an upgrade kit since spring 2017, is integrated into the ProBlue and ProBlue Liberty systems. To boost process reliability, it directly and precisely measures the add-on weight per product. Tolerance limits can be defined so that a warning signal is triggered if the quantity is too low or too high, and the line can be stopped if necessary. In this manner the tracking system optimizes consumption of adhesive and reduces product waste. It also makes it possible to detect batch and age-related changes to the adhesive viscosity, and faults in individual application units.