

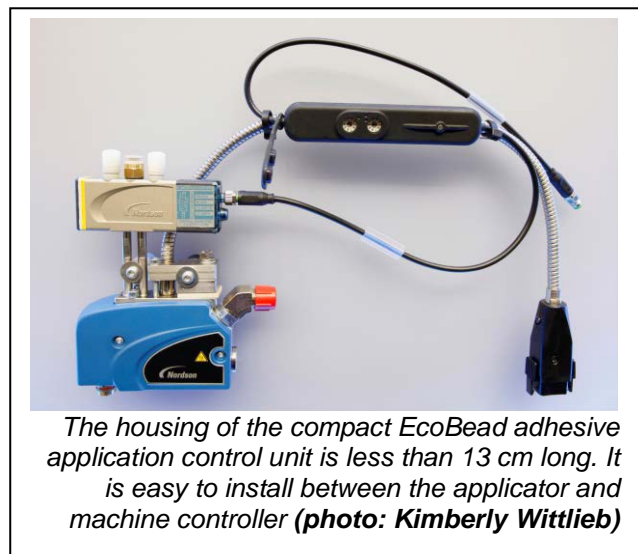
Application Report from Nordson Deutschland GmbH, Erkrath for Brandt Zwieback GmbH & Co. KG in Ohrdruf

Enormous savings in adhesive

Brandt optimizes the hot melt end-of-line gluing of the primary packaging for its brand name rusk bread with the innovative EcoBead™ application controller from Nordson®

With an annual production volume of about 14,000 tons or six to eight million slices a day, Brandt is by far the largest producer of rusk bread (Zwieback) in Germany. Just as impressive are the modern, fully-automated production facilities in Ohrdruf, a town near Gotha, Thuringia, which have been continually optimised since going into production in 2002, especially in terms of energy and material efficiency. For example, an EcoBead adhesive application control unit from Nordson was recently installed at the ends of the lines, significantly reducing consumption of hot melt for primary package sealing.

A total of six linear production facilities are operated in the production plant of Brandt Zwieback GmbH & Co KG, installed at ground level in a hall 360 meters long. Three of them are "major" lines. The other three smaller lines are for special products. They are operated in three shifts by 180 employees. A total of 24 steps are required to produce the twice-baked slices of bread. A slice of bread runs through the line in about 12 hours, including temporary storage. In addition to the classic product familiar for more than 100 years – the brand name rusk bread with the face of a laughing child on the package – numerous variants are produced, such as dipping and soup versions, whole-grain specialities, versions with chocolate or coconut flakes and various types of breakfast rusk bread. Many varieties including the brand name rusk bread are also available as "minis".



The housing of the compact EcoBead adhesive application control unit is less than 13 cm long. It is easy to install between the applicator and machine controller (photo: Kimberly Wittlieb)

While some of these products are available on store shelves in plastic pouch packs, the majority of sales of brand name rusk bread—sealed in transparent foil in folding boxes weighing 225, 338 or 450 grams—are to the retail market, as has long been the case. Upstream and downstream from the toploaders are erectors and closers from Mohrbach (located in Riesweiler-Mühlbach) and adhesive systems from the Nordson Corporation with German headquarters in Erkrath.

The American adhesive technology specialist has supplied the facility with adhesive since the beginning. Due to their close dialog with Nordson sales representatives, Brandt engineers were quick to notice an innovation that made its first appearance at FachPack 2012. This was the "intelligent" EcoBead adhesive application control unit, which delivers significant savings in adhesive. With this goal in mind, end-of-line gluing was modified as part of the company's internal system of suggestions, an idea used intensively in Ohrdruf.

The project was initiated by Hartmut Linde, an engineer shift manager responsible for smooth operation of the end-of-line systems. He has been with the company from the beginning and is familiar with all the practical details, and was therefore able to interest plant manager Marco Geimer and technical director Steffen Keichel in the idea quickly. The first module was installed on a closing machine in October 2013. After an extensive test, all three main lines were then converted in May of [2015].

A small device with a big impact

Measuring only 12.7 cm in length, the EcoBead is a very compact device that is easy to miss in the overall

configuration of the adhesive section. It is located between the machine control unit and the hot melt dispensing gun, without its own supply of power. Assembly is easy and takes only a few minutes. The unit was installed in the immediate vicinity of the corresponding applicator at Brandt. Pneumatic heads of the MiniBlue II series are used as applicator modules. With a service life of more than 100 million switching cycles and a minimum application time of 2 ms, they are often referred to as "non-stop sprinters".

The EcoBead controller provides an economical and uncomplicated option for applying several short beads instead of long continuous ones. There is no need to reprogram the PLC and a conventional dispensing pattern control is not needed. The "self-learning" function of the device is critically important. The PLC output signal of the packaging machine is intercepted and subdivided into four sequences: initial, intermediate and final application as well as the desired saving.

All values can be defined as percentages of the original application. This ensures that the final bead is always located at the end of the original length and the pattern always ends with an application of adhesive. Changes in speed and signal length are detected and interpreted automatically.

Consumption reduced by up to 50%

Optimization of hot melt consumption for Brandt rusk bread production is achieved with closing of the front and two side flaps of the folding boxes for the brand name product. Three MiniBlue II applicators and a total of nine EcoBead controllers are used in each of the three major lines for this purpose. They break down the beads which were previously continuous into four parts: two somewhat longer ones on the outside and two shorter ones in the middle.

The change in the pattern can be illustrated using the 450-g package as an example. A 19-cm bead was originally applied to glue the front flap. It is now broken down into one sequence of about 2.5 cm and two strips about 1.7 cm long. The two side flap beads, originally measuring 11 cm, are now represented by two strips about 1.5 and 1.1 cm long.



Using the EcoBead application controller, the previously continuous hot melt beads for front and side flap gluing were divided into four sequences each, saving considerable material. The transparent strips of hot melt are shown blue in the picture for better visualization (photo: Kimberly Wittlieb)

As part of the extensive practical tests on the first closer to be converted, Brandt engineers determined highly accurate figures for reduced consumption, which range from 30% to 50%. The basis for comparison was a nominal speed of 136 cycles per minute for the horizontal tube bag welding machines.

Around 48,960 folding boxes weighing 450 grams each are produced daily at this output level. The EcoBead reduces adhesive usage from 0.70 g to 0.38 g for the front tab and from 0.15 g to 0.10 g for each side flap, which comes to a savings of more than 20 kg of glue per day in just one system. Similarly remarkable results were obtained for the 225-gram and 338-gram packages.

A cautious approach

Of course, the highest priority in the practical tests was to ensure proper gluing. Because of this, all due caution was exercised in changing the application pattern. Marco Geimer, Steffen Keichel and Hartmut Linde are all the more pleased with the results, for which they also credit the competent consulting provided by Rene Bartsch, responsible aftermarket sales manager for Nordson. They point out that there were never any complaints from the customer side and no problems came up, even in logistics handling.

Based on the initial experience, the company's business and technical managers estimate that reductions in costs achieved by minimizing adhesive consumption will exceed 30,000 euros a year. They believe an even larger total is possible. They noted however that the success of tests depends on meticulous settings of many different parameters. Choosing optimum glue and carton quality is also a critical factor.

The extraordinarily good partnership between Brandt Zwieback and Nordson is due in part to the fact that in 12 years of collaboration in Ohrdruf, there has not been a single standstill in production caused by the adhesive system. So it is no surprise that this virtual immunity to failure for all components from the tank devices to the hose supply lines, dispensing guns and nozzles, led Brandt Zwieback in 2006 to become one of Nordson's first flatrate customers for replacement part deliveries in Germany. This not only makes calculations more reliable, but also guarantees the hot melt systems are in the best possible condition at all times.

Bernd Neumann



Participating extensively in optimizing end-of-line adhesive technology were Steffen Keichel (left), technical director of the Brandt Zwieback plant in Ohrdruf; Rene Bartsch (middle), aftermarket sales manager at Nordson; and Hartmut Linde, shift manager, who initiated the conversion through the company's internal suggestion system (photo: Kimberly Wittlieb)



Detail view of front flap gluing (photo: Kimberly Wittlieb)

Specimen copies may be requested from:

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Between six and eight million slices of rusk bread are produced each day (plant photo: Brandt)