

The non-contact adhesive dot application is achieved by three applicators.

Photos: Kimberly Wittlieb

# Significant Savings Through Non-Contact Adhesive Application

**As the first site in the Coca-Cola Hellenic group, the factory in Schimatari recently converted the glue wheels of two roll-fed labeling stations to the Nordson Deutschland GmbH non-contact e.dot+ labeling system.**

by BERND NEUMANN, journalist (translated from German into English by Alexander Wilhelm, Nordson Germany)

As the largest European bottler and distributor of non-alcoholic beverages, Coca-Cola Hellenic Bottling Company S.A., headquartered in the north of Athens in Maroussi, serves a market of around 560 million consumers in 28 countries spanning between Ireland, eastern Russia and Nigeria. 77 production sites are maintained in total. To optimize the technical performance of the roll-fed labeling stations at the Greek Schimatari plant, two non-contact e.dot+ adhesive application systems have been in use since March 2010 and late February of this year.

The Schimatari plant, located approximately 60 km north-west of the Greek capital, is the first facility world-wide in the beverage group to use the innovative



Partners in adhesive technology: Dimitris Dressios (right), PET line Production Supervisor in Coca-Cola Hellenic Bottling Company's Schimatari plant, and Dennis Kouliantonis, managing owner of Nordson's distributor in Greece, Meltko SA.

non-contact hot-melt application system from the adhesive technology specialist, whose head office is located in the US state of Ohio. Schimatari is not only the largest of the seven domestic plants, with 200 employees and a production volume of around 120 million PET bottles per year, but also the most significant PET user. The plant exclusively bottles Coca-Cola products, whereas the group also produces its own brands and bottles under license.

The PET bottles come out of a Sidel SBO before they run through two KHS lines, where the bottles are labeled before filling. This is done by an Innoket RF 33 and a RF 25, which are usually run at Schimatari with 24,000 and 20,000 bottles per hour respectively. These ma-



The labeling stations typically run in production with a speed of 24,000 and 20,000 bottles per hour respectively.

chines have been retrofitted by the e.dot+ system, which completely replaces the normal glue wheel.

**Low wear increases productivity**

The decisive advantage of the non-contact hot-melt application is that the rubber pads are no longer damaged or worn-down by contact with the glue wheel. These pads act as spacers on the vacuum drum, which holds the labels by suction as they pass the glue wheel. Significant cost savings are thus realized by eliminating the regular replacement of the pads and avoiding productivity-killing machine stops.

The vacuum drum itself was not modified. Depending on the bottle volume, different drums are used to fit the required label lengths and heights. The RF 33 has eight, the RF 25 six drums.

The project was initiated by the Nordson representative in Greece, Meltko SA, Haidari/Athen - more specifically, the project was started by Dennis Kouliantonis, managing owner of the company he founded in 1995, who has maintained a close relationship with Coca-Cola Hellenic for many years. The retrofit of the labeler was executed by Nordson Deutschland GmbH, to which

Meltko is organizationally assigned within Nordson.

**Electric Applicators**

The two e.dot+ systems installed are nearly identical and consist primarily of four connected components. The e.dot+ electric applicators form the heart of the configuration. These are notable not only for their speed, but also for their remarkably long life, made possible by the absence of any hydraulic seals in the path of the valve's needle.

The opening time of the valves lies between 0.4 and 0.5 ms. During the application of two or more dots in sequence, cycle times of 1.8 ms can be achieved. The life time of the units is approx. 500 million cycles, whereby (untested) values garnered from experience lie even higher.

**Dots instead of full-surface pattern**

Three e.dot+ applicators are arranged one after the other and produce adhesive dots of about 3 mm diameter from a 0.25 mm nozzle opening. The radius can be changed by varying the application time and pressure. The diameter should however not be reduced past 2 mm in order to ensure sufficient adhesion.

Thus, the system does without a full-surface adhesive pattern, saving material in the process. The adhesive dots are applied from a distance of 0.7 mm from

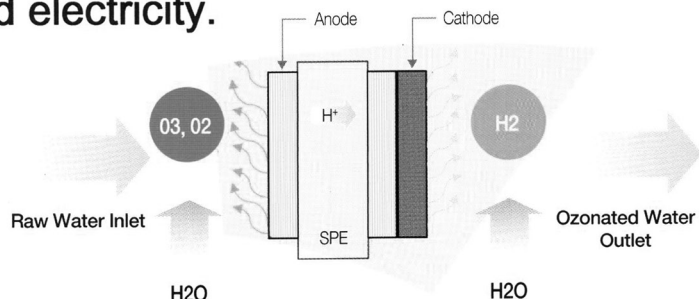
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RtoR, Inc :#7, Seongdong tax-tower, 294 Gwangnaru-ro, Seongdong-gu, Seoul Korea  
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The adhesive dots become visible when viewed up close.

the label surface and are spaced 8.5 mm apart in a vertical row at the edge of the label. Each dot requires 0.6 mg of adhesive.

The number of valves on the applicator varies depending on label size. In the first labeler there are five, in the second four modules per applicator. These can handle label heights from 50-90 mm without any problems. The theoretical maximum is eight modules, which allows adhesive application on labels up to 200 mm high.

The applicators are mounted in bracket especially developed by Nordson that allows for precise positioning and height adjustment. A special feature of the bracket design is that the applicators can be pulled back into a service position.

### Intelligent pattern control

The third component of the labeling system is the LogiComm pattern control and verification system, which works more precisely than a machine PLC to control the adhesive pattern and volume as required. It not only ensures simple programming of the application pattern, but also allows a fast format change.

Of particular note is the sensor-based automatic label detection. Only when the presence of a label is detected on the vacuum drum does the LogiComm allow adhesive to be applied.



A ProBlue 4 melter unit is used to heat the hot-melt.

### Maintaining high hot-melt quality

The adhesive is supplied through a ProBlue 4 melter, from the ProBlue product series that includes several units of varying capacity and has proven itself over the course of many years. The model 4, as per its designation, has tank volume of four liters and can provide a maximum instantaneous delivery rate of 32.7 kg/hr. The non-circulating unit equipped with a piston pump achieves a melt rate of 4.3 kg/hr and allows up to four hose connections.

Of particular note for real-world use is the fact that the adhesive never circulates at any point in the process - only the required amount of fresh adhesive is delivered to the nozzles. As opposed to wheel-pot systems, there is no possibility of adhesive contamination through moisture, dust, label snippets or even entire labels, and the adhesive is not worn down by constant circulation. In addition, the adhesive temperature is precisely controlled by the ProBlue. The adhesive is only brought to its full application temperature on its way through the hose and the applicator, reducing heat degradation and avoiding undesired changes in the adhesive's properties. This ensures a reliable, high quality application.

Two special adhesive types are validated for the Nordson system: Euromelt 150 from Henkel and Clarity 4167 from H.B.

Fuller. Only the former is used in the Schimatari plant.

### Fast Payback

After one year of experience and after more than 100 million cycles with the first installed e.dot+ system, Dimitris Dressios, production supervisor on the PET lines, speaks highly about the non-contact adhesive application system. In particular, he praises how little maintenance is required. Service is restricted to cleaning only.

Considering the eight vacuum drums in use on the RF33 and the elimination of wear part costs - particularly the rubber pads - he calculates savings of about 4000-6000 Euro/drum or a yearly cost reduction of around 48,000 Euro. Added to this is a substantial reduction in downtime which leads to a corresponding increase in line productivity. A further benefit is the reduced hot-melt usage due to the switch from full-surface to dot pattern.

The clear conclusion is that the investment in modifying a labeler amortizes itself in short order. Since being introduced to the market in 2008, the Nordson e.dot+ system has been installed around a dozen times - irrespective of OEM - in production lines of different well-known producers. Coca-Hellenic is already planning the acquisition of another system for their Saloniki plant for the near future.

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