



→ **Airspray International**, based in Alkmaar, The Netherlands, produces more than 170 million foam pump dispensers for body care products such as soap, shampoo and cosmetics every year. Airspray not only develops the pumps in-house, but also deals with construction and engineering of new assembly machines. Since 1996, Airspray has been using Beckhoff technology for control systems.

## Airspray: Innovation in product development and mechanical engineering



Airspray has been producing dispensers for personal care products since 1989. Environmental-friendliness of the products has always been an important aspect of the corporate philosophy. One example is the avoidance of propellants. An important step in this direction was taken in 1996, when Airspray developed a new foam pump dispenser for series production. In parallel with the product development, Airspray started designing the required assembly machines.

“Increased availability of standard systems has simplified in-house development and construction of custom-built machines”, said Rein de Jong, Operations Manager at Airspray. “Instead of outsourcing engineering and construction to a machine manufacturer, we developed the machine ourselves. One of our arguments was that this approach enables us make more expedient choices regarding machine components. Component lifetime and long-term availability are important

aspects for us. Machine manufacturers often tend to install cheaper parts so that they can make more attractive offers to their customers. We work differently. Our production runs semi-continuously, and we deal with very large quantities. This illustrated by the fact that our dispenser production involves processing of more than 2 billion plastic components per year. Our production speed is tremendous. We therefore demand absolute certainty regarding the technical availability of our machines.”

The pumps are assembled using machines referred to as rotating indexers, which are comparable to a merry-go-round. Step by step, the plastic components are fed from drums and magazines. Naturally, the presence of each part is monitored via sensors. The parts are picked up by pneumatic grippers and pressed onto their counterparts. Depending on the product, the total cycle time is 0.75 to 1 second.



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The Airspray machine has three servo axes equipped with AX2003 Servo Drives. The Company not only develops the pumps in-house, but also deals with construction and engineering of new assembly machines.



Once the product has passed through all stations, it is removed and placed in cartons in regular rows by a robot.

### Interaction of product and machine development

Airspray already has already built 25 assembly machines. "For us, the development of a new pump is directly coupled to finding the technical solution for mass-producing the product", said Rein de Jong. "Our decision to use standardized, commercially available components offers a high degree of freedom and flexibility." When it comes to control technology, Airspray has been using Beckhoff technology for a long time. "When the Bus Terminal system from Beckhoff was introduced in 1996, we were one of the first users", said the operations manager. "For control purposes, we used the S2000 software, the DOS-based predecessor of TwinCAT, which was later followed by TwinCAT for Windows operating systems. Since then, control components from Beckhoff have become the standard for Airspray. Our new machines are equipped with EtherCAT, which enables us to reduce the cycle time from 2 ms to 0.01 ms."

→ Airspray NV [www.airspray.nl](http://www.airspray.nl)

→ Industrial Automation Link BV [www.ial.nl](http://www.ial.nl)



### Foam pump dispenser without propellants

The foam pump dispenser, an in-house development by Airspray, is a good example of the company's innovation. Airspray is the only company worldwide producing this pump in large quantities. Well-known soap and cosmetics manufacturers such as Procter & Gamble, Unilever and Johnson use these pumps on an enormous scale. The pump delivers liquid soap without propellants and dispenses it as airy foam. To this end, the soap is mixed with air in the pump, resulting in a perfect foam mass.



### Assembly machine control

The centerpiece of the control system is a C5102 Industrial PC from Beckhoff with Lightbus and CANopen interface cards and Windows XP operating system. The machine has three servo axes with AX2003 Servo Drives. TwinCAT NC PTP is used as software for the Servo Drives. The openness of the system enables an interface with SQL database to be realized in order to improve the efficiency of the machine. The database can be accessed via a .NET application in the corporate network. Faults, frequencies etc. are shown in a well-organized manner. The data originate from sensors installed at the machine for detecting wear, for example. The Lightbus system transfers the data to the TwinCAT controller within 1 millisecond, where they are assigned a time stamp.