

When it comes to high-quality confectionery, many suppliers rely on innovative production plants from Winkler und Dünnebier



Perfectly Molded

Turck's BL ident RFID system used in Winkler und Dünnebier confectionery machines ensures transparency in mold logistics

Santa Clauses made of chocolate, Easter rabbits filled with nougat or the finest chocolate candy – many of the production systems turning out such sweet delicacies come from Rengsdorf in Germany's Rhineland-Palatinate. It is in this

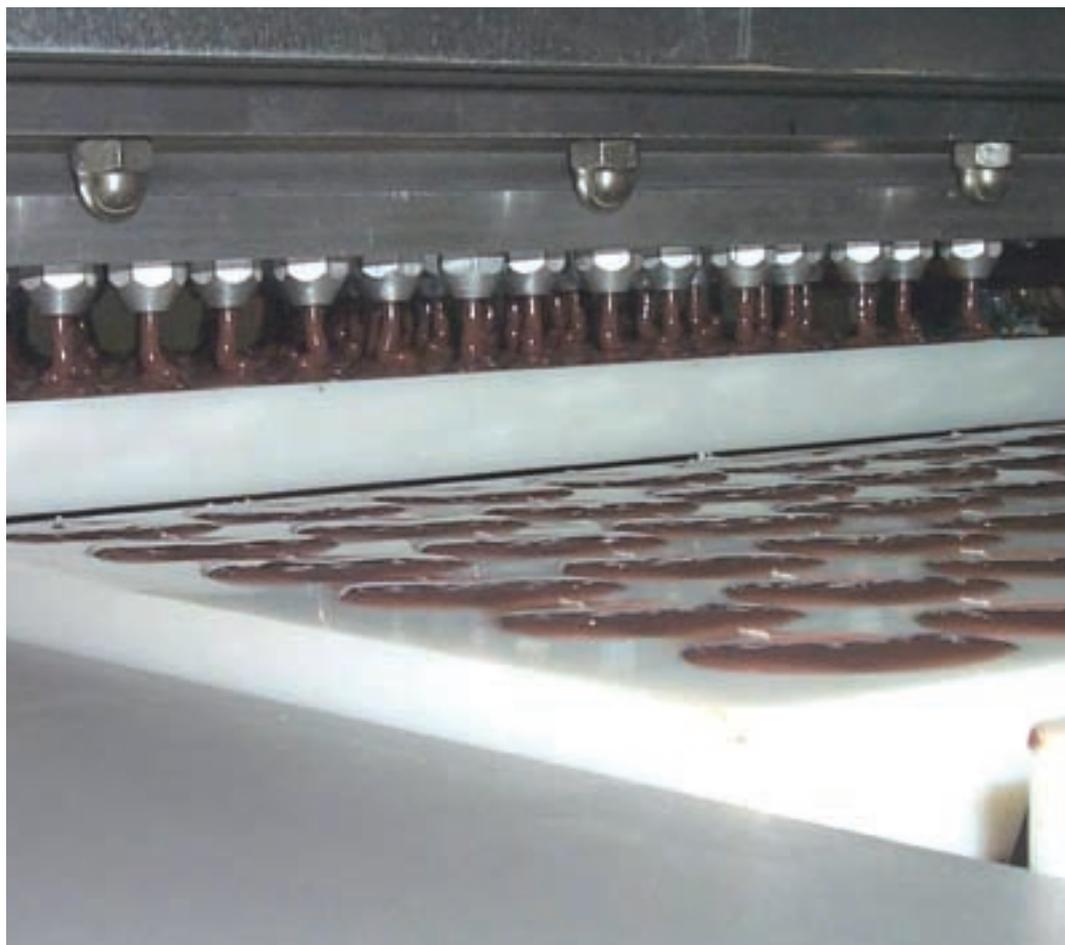
town near Neuwied, that Winkler und Dünnebier Süßwarenmaschinen GmbH (WDS) manufacture machinery for the confectionery industry. At this site the company also works on developing new molding/depositing processes and optimizing existing techniques.

Growing international demand for confectionery has ensured the worldwide popularity of WDS machines for years. An extremely wide range of products is available: molding lines for hard candies and toffee products, shelling molding systems for filled and solid chocolate products, mogul plants for all starch-molded products, machines for flat chocolate products and universal piston extruders for plastically formable masses. In addition, Rengsdorf also supplies laboratory depositors for product development catering for a wide range of applications.

▶ Quick read

With its high-quality production plants for the confectionery industry, Winkler und Dünnebier (WDS) has become one of the world's most sought-after mechanical engineering companies in this sector. Besides tradition and quality, it owes its success to constant innovation. Today the company can offer its customers maximum plant efficiency, safety and control, thanks to optimum mold logistics. Here data defining the latest status of every mold is supplied by Turck's RFID BL ident system.

WDS is now equipping all plastic molds with RFID data carriers – sometimes totaling several thousand depending on the plant



Production process for chocolate

Producing a filled chocolate article such as chocolate candy, involves many different processes. The first of these is the so-called mold insert station. It is here that the molds, loosely lying on feed chains, set off on their journey round the production plant. The molds are moved either inter-

mittently or continuously by means of aligner chains depending on the application and output. The molds are then, shaken to distribute the sweet filling evenly and to remove any air bubbles. Then they are turned upside down and spun carefully while being cooled at the same time. The so-called chocolate shells are left in the cooling cabinet to harden.

The second molding line supplies typical fillings such as nougat or fondant (a crystalline sugar mass).



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Once the molds have been heated sufficiently with hot air or an infrared radiator, the first molding machine deposits a carefully metered amount of chocolate mass into the mold to produce the shell

The principle is the same: Heating before filling, cooling down afterwards. The smooth underside of the chocolate candy – the lid so to speak – is then produced by melting a second application of chocolate, removal of the superfluous mass and final cooling. At the end of the line, the product is dislodged from its

At the changing station the machine operator can introduce molds for a new batch and eject the old ones. Every movement is directly recorded in the central database



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**Bernd Plies,
Winkler und
Dünnebier**

envelope by light blows to the back of the mold with pneumatic hammers. While a conveyor belt takes the finished item to the packaging line, the molds initially remain in the production cycle. They are transported to a changing station, where they are checked for product residues and replaced by new empty molds if required. The entire installation is managed by a PLC, as well as motion controllers for the servo section. Operator PCs or CE Clients, which are linked to a central server, can be found at every molding machine.

All molds at a glance

In view of the numerous industrial production processes and sequences that are already optimized and managed by non-contact RFID transponders (tags), Winkler und Dünnebier Süßwarenmaschinen GmbH decided to also introduce this innovative NFC technology to its confectionery production.

All plastic molds – and that may be several thousand depending on the plant – are equipped with RFID data carriers for this purpose. Permanently installed read/write heads in the production lines and mobile acquisition systems at warehouses and production areas allow the progress of each mold to be traced from a central station. Within the production lines, the database-oriented RFID system helps to ensure optimum mold and product tracking, as well as process optimization and improvement of production statistics.

The readers used by Turck, the RFID specialist from Mülheim, Germany, are integrated in the fieldbus system via BL ident I/O modules so that the latest data is available for control of the WDS installation at all times. The read/write heads are typically installed

at the mold changing stations, the molding/depositing machines and optionally at weighing or other control units.

All information acquired by the control system is transmitted to a local database on the plant's operator server, which stores the data for all molds currently in the production cycle of the line. The information produced is synchronized with a server for comprehensive mold management and tracking. A complete RFID system not only includes the reading points on production machinery, but also read heads on mold washing stations and storage systems. If wished by the customer, WDS will even retrofit third-party installations with RFID readers from Turck.

Data with added value

Today Turck's RFID systems ensure that the central server database of every WDS machine contains valuable information that can be used to optimize both plant productivity and production quality. There is a wide range of possible applications for the data pool, including optimizing logistics. With a click of the mouse, the system will show the location of every single mold or trace the route it has taken within the production plant. This allows potential error sources to be easily located.

Production-specific data can also be determined: For example, it is possible to easily identify molds or even complete mold sets that produce above-average levels of scrap, and sort them out automatically. Another application could be comparing mold sets and production characteristics of a specific batch.

The data pool provides a wide range of applications for in-plant monitoring of quality or hygiene





The RFID monitoring system instantly emits an alarm if inserted molds are not suitable for the production process underway

guidelines, not least in terms of quality management. The system can easily identify whether a cleaning cycle has been correctly followed. Today it is possible to closely track production sequences, such as pushing together molds in the cooling cabinet or exchanging them for special test samples during operation, thanks to RFID. This technology also instantly emits an alarm if inserted molds are not suitable for the production process currently underway. Even a "flying" product change is possible.

Here, new molds are introduced to the system while old ones are ejected. Even production scenarios with mold sets mixed at random are possible to increase flexibility.

Successful together

Following initial attempts involving a competitive product, we subsequently opted for Turck: "The BL ident system offers hardware with standardized interfaces that are suitable for industrial applications," explained Bernd Plies, head of Electrical Engineering and Automation Technology at WDS. "We were won over by the option of combining Turck's RFID system with the bus systems, such as Profibus, DeviceNet and Modbus IP, in use at our plant, as well as the scope offered for future bus systems." Another important factor was the wide range of read heads suitable for industrial applications.

As expected, integration of the system in plants ready to go on line did not present any problems. "Implementation went really smoothly," recalls Plies. "All components supplied were swiftly incorporated in the first WDS application, which was realized with Step7. And when one or two queries did crop up, they were quickly sorted out on the telephone."

According to Plies, another advantage was the close cooperation between the two companies: "Cooperation with Turck has been constructive at all times." Turck staff are always open to new ideas and try to put customer wishes directly into practice or develop alternatives. "The close contact with Turck's developers was of great benefit to us", adds Plies.



Thanks to RFID support the user always keeps an overview of the wide range of different molds that have to be used, stored and managed for the various products

Author



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