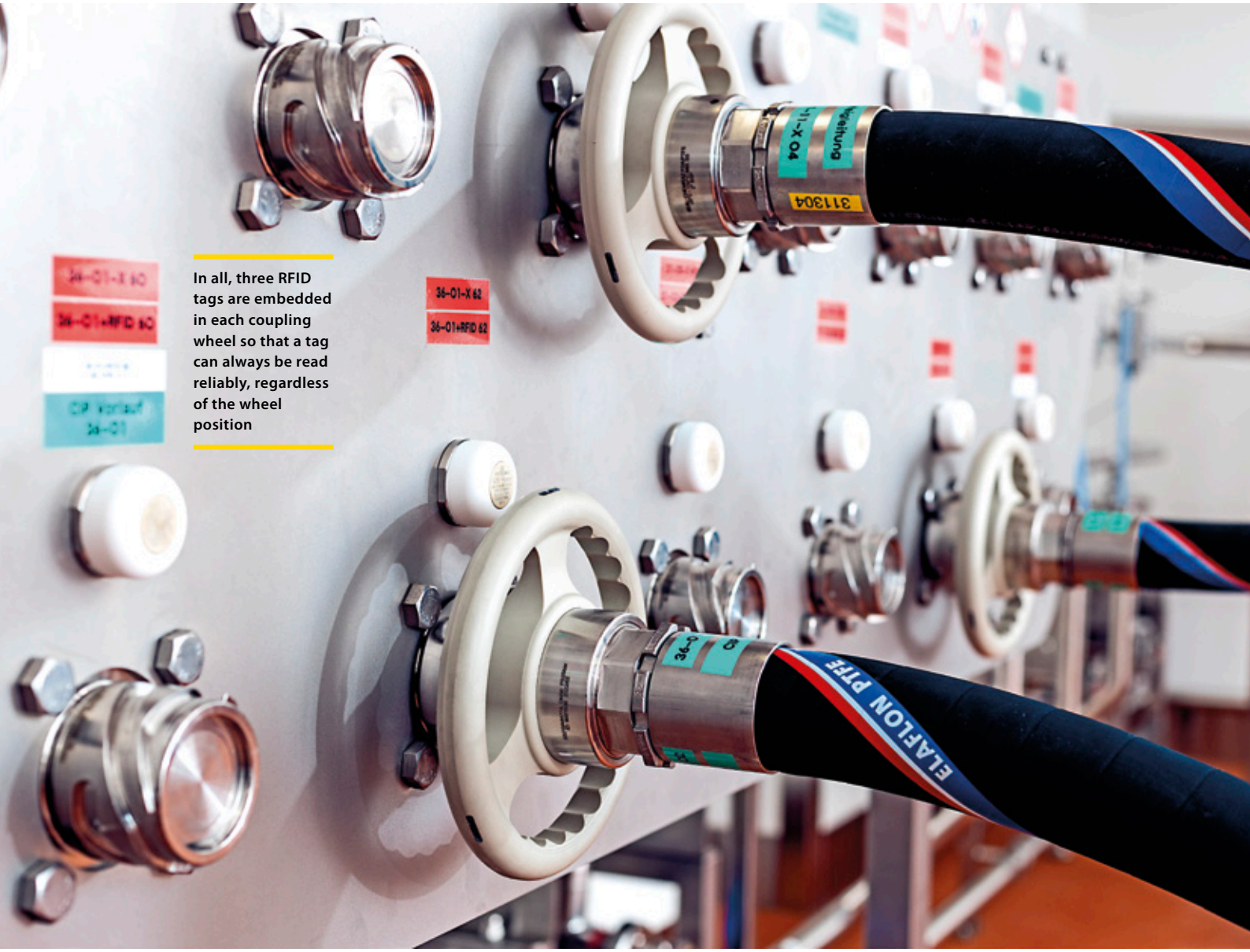

In all, three RFID tags are embedded in each coupling wheel so that a tag can always be read reliably, regardless of the wheel position

Correct Coupling

B. Braun Medical AG guarantees reliable mixing and filling processes through fail-safe verification of hose connections in ATEX zone 2 – with an RFID solution from Turck

B. Braun Medical AG is a subsidiary of the German B. Braun Group, one of the world's leading manufacturers and suppliers of medical technology products. The B. Braun Group employs around 65,000 people in 64 countries, including over 1000 in Switzerland. In development, production and sales, they ensure the supply of high-quality products to the healthcare market.

The production facility of B. Braun Medical AG in Sempach in the Swiss canton of Lucerne specializes in the manufacture of medical disinfectants, hygiene products and medicines for the treatment of chronic wounds. Complex mixing and filling processes are carried out here, in which various chemical raw materials are mixed in tanks and then filled. The company is in the process of doubling its production capacity due to a sharp increase in demand.

Identification ensures safety

The core process of the new systems essentially involves feeding the various chemical raw materials from the weighing containers into the mixing tanks

»It´s not easy to find products with Zone 1 and 2 explosion protection that are also suitable for clean rooms, and vice versa.«

Thomas Mühlebach | B. Braun

and transferring the finished products to the filling line. The nodes in the system are two coupling stations, one of which is located at the feeding station and the other at the interface to the filling line.

During the process, the hoses have to be moved three to four times per batch. To prevent mix-ups with disastrous consequences, the hose stations are integrated into the RFID system, which monitors the entire system. For each connection, one RFID tag on the hose side must interact with a corresponding RFID read/write head. The outlet only opens when the system has identified the correct medium.

The communication-capable coupling wheel

There are a large number of hose couplings with integrated RFID tags on the market. However, a standard solution was not an option in this case due to the limited space available and the weight of the hoses – a major challenge for the inventors among the RFID specialists at Bachofen AG, Turck's national sales partner in Switzerland. Their vision: a hose coupling with a coupling wheel into which the RFID tags are cast.

Together with the specialists for coupling technology and hose systems, MannTek and Schudel AG, Bachofen implemented the unconventional idea and developed a prototype that completely impressed B. Braun Medical. "The specialists at Bachofen really got to grips with the task and didn't give up until we had a solution that we could unreservedly say 'yes' to," explains Thomas Mühlebach, head of maintenance and technology at the Sempach site.

The final rotary wheel version contains three RFID tags embedded 120° apart. Their signals identify the connection instantly when rotated and release the flow if the result is positive. Bachofen used Turck's BL ident RFID system with TBEN I/O block modules with IP67/IP69K protection to integrate and control the coupling solution. With special protective housing, these are also approved for use in ATEX zone 2, which is rarely the case with Ethernet I/O modules. The read/write heads used can also be used in zone 2, the TN-R42TC-EX even in zone 1. Thanks to the multiprotocol capability of Turck's TBEN modules, they can be used in any industrial Ethernet network with Profinet, Ethernet/IP or Modbus TCP networks. B. Braun Medical uses OPC UA to communicate with the higher-level production system.

Precision with easy handling

The system works with the utmost precision: The three RFID tags in each coupling wheel ensure that they are read quickly and reliably. The IN TAG 200 tags used are specially designed for use in potentially explosive atmospheres. The TN-EM30WD-H1147-EX read/write head used is also approved for potentially explosive atmospheres up to ATEX zone 2. Its stainless steel and liquid crystal polymer housing meets protection class IP69K and withstands even the harshest cleaning processes.

Hose couplings and RFID verification

As soon as the hose is connected, the read/write head reads the information from the RFID tags in the coupling wheel. The recorded data is immediately compared with the tank information. This ensures that only the correctly identified components are

QUICK READ

The medical technology company B. Braun Medical AG manufactures medical disinfection and hygiene products as well as medicines for the treatment of chronic wounds at its Sempach site in Switzerland. This requires the use of highly precise and reliable mixing and filling processes. To meet the strict safety and quality requirements involved, an RFID system using Turck TBEN I/O modules verifies the correct connection of the hoses in ATEX zone 2. Three RFID tags are located in the coupling wheels of the hose connections for this purpose. The Turck solution impressed with its ATEX approvals, high degrees of protection and Ethernet multiprotocol.

As soon as the hose is connected, the RFID system verifies the connection

The Turck BL ident system reliably prevents incorrect coupling and thus ensures consistent product quality

The TBEN I/O block modules are installed under the cable trays in ATEX protective housings to save space

combined. If a faulty coupling is detected, the system blocks the flow. This automated verification process has several benefits: It firstly increases safety, and also improves efficiency, since the verification process is fast and reliable without the need for manual checks.

Optimized production reliability and reproducible quality

The module also enables the RFID tags to be written with specific data about the completed processes and the materials used. This data logging not only supports traceability in quality control, but also optimizes the documentation and compliance of production processes. For example, the last time a hose was cleaned can be stored on the RFID tag. If this period is exceeded, the system automatically stops the material flow to ensure the sterility and quality of the production process. This ensures that both production reliability and consistent product quality are guaranteed.

Conclusion

The development of the special solution was a highlight in the collaboration between B. Braun Medical and Turck's swiss sales partner, Bachofen. They were also able to fully meet the product requirements of the plant operator with the automation components from Turck and Banner Engineering. Besides the RFID components, Turck supplied numerous TBEN-L5-8IOL I/O block modules which connect the valves, among other things, as well as all Ethernet, power and many sensor-actuator cables.

"It's not easy to find products with zone 1 and 2 explosion protection that are also suitable for clean rooms," summarizes Thomas Mühlebach. "Bachofen understood what we needed and provided us during the evaluation with expert advice and the right products."

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