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Tag in the box: Rugged data carriers attached to the trolleys may stay with the object during the autoclave process

RFID Under Pressure

RFID systems featuring rugged data carriers (tags) enable users in the food and animal feed industry to make challenging processes more efficient

High ambient temperatures of up 140 °C, humidity and ambient pressures are not exactly favorable environmental conditions for electronic components. In fact, autoclaves are one of the most challenging applications in the food and animal feed industry for a good reason: autoclaves cook food or feed very efficiently and preserve the packed consumables at the same time. Only a consistent track-and-trace system that provides information about each and every processing step enables users to fully integrate this challenging application into their production chain. And only a rugged and versatile identification solution allows such a consistent track-and-trace system.

In order to know exactly where each and every intermediate or final product is at any time – enabling the user to implement the corresponding processing

steps – users oftentimes rely on conventional optical identification methods, such as barcodes or data matrix codes. Both systems enable users to identify batches between the different processing steps and handle them accordingly. Both identification methods have disadvantages, though. First, printed labels attached externally may become unusable when they are exposed to high temperatures, moisture or dirt. Secondly, neither bar codes nor data matrix codes can efficiently provide more than batch information. In this way, automated identification and production control remain not fully integrated.

Advantage: RFID

This is where a radio-based identification system, RFID, offers additional benefits. Unlike conventional



identification systems, data carrier based identification provides much more information about the processed products. EEPROM- or FRAM-based data carriers (tags) with memory sizes of up to several kBytes can provide unique IDs for single objects, information about the most recent processing steps or control data, for example. This data may be read automatically, without time lag and – depending on the type of memory used – up to ten billion times.

Another advantage of radio frequency identification: The transmission of information via electromagnetic radio waves is generally less susceptible to environmental influences. While printed labels may be affected by the harsh conditions in autoclaves,

special RFID tags and rugged, mobile reading devices enable radio-based identification to be used even under these tough conditions.

Track-and-Trace

Specially suited to the EU regulation 178/2002 – specifying that “the traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution [and] that business operators are required to apply appropriate systems and procedures” – Turck is offering corresponding components for its RFID system, BL ident.

Besides glass-coated data carriers (TW-R4-22-B128) for ambient temperatures of up to 140 °C, BL ident is comprised of rugged write-read heads (even for use in washdown areas), food-safe connectivity products and corresponding fieldbus and interface solutions for use in control cabinets (BL20) or directly in the field (BL67). In this way, the comprehensive identification system enables users in the food and feed industry to identify their intermediates and end products at any time – without regard to the environmental conditions.

Complete package

BL ident does not only help users make individual processing steps more efficient, it also facilitates consistent track-and-trace concepts – reducing downtime and total costs. Attached to containers or trolleys, the IP68-rated data carriers may remain with the objects during the entire production process; relevant data may be retained and retrieved automatically before each processing step, after each step or at the end of the production chain, so that the user can access a comprehensive processing protocol that verifies the complete production process. In this way, the fully automated information transmission between tags, read/write heads and the higher level control system helps make the entire production chain safe and reliable.

Ultimately, even upgrades to the instrumentation or the control system can easily be performed with BL ident, since the modular fieldbus system supports various fieldbus protocols – ranging from Profibus, to DeviceNet, to Ethernet/IP – and different signal types, such as digital I/O, RS232/422/485, or high-speed counters. ■



The glass-coated data carrier, TW-R4-22-B128, withstands high temperatures, humidity and pressure in autoclaves

▶ Quick read

With its RFID system, BL ident, Turck offers a versatile identification solution for use even in tough applications, such as autoclaves. Rugged, re-writable data carriers facilitate more efficient processing steps and consistent tracking systems – significantly increasing machine uptimes and thus opening up new streamlining potentials.