# Significantly improved endurance

## Inductive sensors withstand extremely low continuous temperatures

Inductive sensors have a wide range of "sensing qualities" and are therefore particularly suitable for use in harsh industrial environments. However, permanently low temperatures can cause extreme damage to standard sensors over time, which increases the failure rates and quickly separates the wheat from the chaff among the possible alternatives.

On a production area of around 5,000 square meters, a company specializing in frozen baked goods primarily produces pretzels and various types of bread rolls. The dough is produced on site and the baked goods are either ready-baked, pre-baked or deep-frozen as dough pieces and then stored for dispatch.

Inductive sensors from IPF prove their special qualities time and time again, especially under harsh operating conditions such as at very high or low temperatures, as shown here in a blast freezer for baked goods.

(all images: ipf electronic gmbh)

### Preservation of around 15,000 baked goods per hour

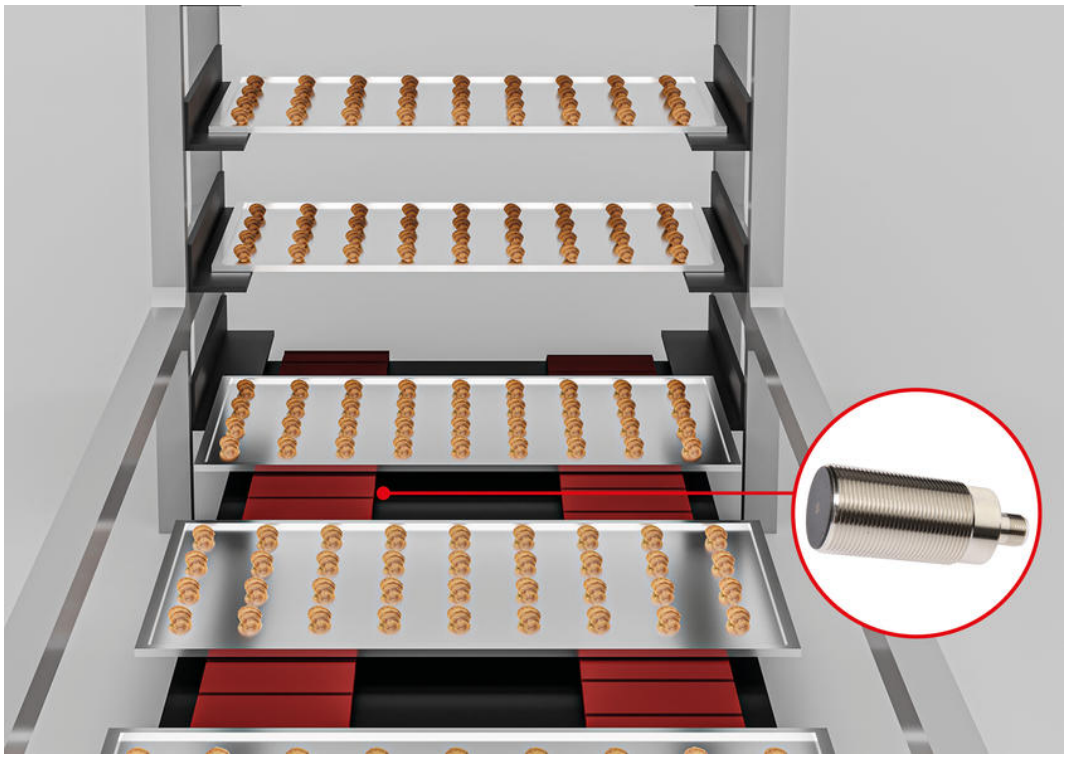
The baked goods are preserved in a system with two blast freezers. Each blast freezer consists of five cooling towers, each with a paternoster system. Through this cooling section, which has a constant temperature of
temperature of -24° C, the trays with the baked goods are transported.
"The individual towers with the paternosters are used to achieve the required time for deep-freezing, with each tray requiring around 40 minutes for a complete system cycle. Each blast freezer has space for around 140 trays for deep-freezing in a continuous process. This means, for example, that up to 7,500 pasta products can be preserved per hour with just one cooling section," explains the company's technical manager.

**Position sensing ensures smooth sheet transfer**

A plate chain system is located around the system, on which the trays with the baked goods are placed in order to automatically load the blast freezers. Once a tray has passed through a cooling tower via the paternoster, it is transferred to the next tower via a chain conveyor. For this purpose, one chain of the conveyor has a carrier that positions the tray accordingly. The carrier position is monitored by an inductive sensor. "If we didn't monitor the position, the carrier could jam the sheet metal and block its onward transportation to the next tower," says the technical manager.
For this reason, a sensor is installed at each transfer station to the individual towers and at the inlet of the first tower and the outlet of the last tower, so that a total of six sensors are in operation. If a sensor detects a carrier, the drive of the carrier chain is de-energized and the motor brake is activated so that the chain is at the desired end position for transferring the sheet to the next tower.

**System downtimes due to frequent sensor failures**

The inductive sensors previously used in the blast freezers were part of the original standard system equipment and consisted of commercially available devices with an operating temperature range of -25° C to +70° C. However, these sensors could not withstand constant low temperatures along the cooling section over the long term. However, these sensors could not withstand the constantly low temperatures along the cooling section in the long term and therefore failed almost regularly. In this case, the PLC (programmable logic controller) stopped the chain conveyor and the entire system came to a standstill until the defective sensor was replaced. According to the technical manager, this ended up happening every three weeks on average, which meant that the system was down regularly. As sensor solutions from IPF were already being used elsewhere in the plant, the technical manager asked the sensor specialist for an alternative to the susceptible devices."



The inductive sensors from IPF monitor the position of metal sheets in the chain conveyor area of the system.

### Solution specialist for extended ambient temperatures

The inquiry ultimately proved to be the right decision, as IPF is one of the leading suppliers in the field of inductive sensor technology with a comprehensive portfolio of more than 750 devices in various designs and sizes as well as standard and extended switching distances. In addition, IPF specializes in solutions that must be designed for extended ambient temperatures. These include the **IA30012W** with M12 connector in a robust metal housing (protection class IP67) with integrated amplifier, which ultimately proved to be the ideal solution for the application at the frozen baked goods manufacturer with an operating temperature range of -40° C to +100° C and a range of up to 10 mm.

The inductive sensor **IA30012W** in robust metal housing with integrated amplifier is designed for a temperature range of -40° C to +100° C.

### Sustainably increased availability of blast freezers

The technical manager recalls the first experiences: "In 2017, we initially installed two new sensors in a cooling section in order to test the devices extensively. As these sensors no longer failed, we retrofitted the entire system with both cooling sections with IPF solutions a year later."
According to the technical manager, endurance has improved significantly since then. "Whereas previously we were confronted with the need to replace defective sensors within just a few weeks, we are now talking about years. Of course, sensors still de-energize from time to time. But not due to the low temperatures, but due to unintentional mechanical damage, and therefore no longer with the frequency that was the case with the old devices. With the inductive sensors from IPF, we have been able to significantly reduce system failures and sustainably increase the availability of the blast chillers."