



Fire Detection for Food Production Under Extreme Conditions

Germany

Project Overview

Food production facilities present demanding conditions for fire detection systems. Temperature variations, enclosed machinery, cooling and heating equipment, moisture and regular cleaning processes can all affect the performance of fire detection technologies.

At a major German bakery manufacturer with a long history and an extensive international presence, reliable fire protection is essential to maintaining safe and continuous production. The company produces baked goods on a large scale for a broad network of retail and food service locations across multiple markets, making uninterrupted production and dependable safety systems particularly important to its day-to-day operations.

Following requirements from its corporate insurer, the company sought to enhance fire detection throughout one of its production facilities in Germany. The objective was to achieve comprehensive coverage across the production environment, including areas with challenging operating conditions, without interfering with normal production.



Background

- Large food production facility required reliable fire detection across production
- Detection system needed to operate reliably during normal production, in deep-freeze areas and during cleaning processes
- The end customer's insurer required a solution designed in accordance with strict fire protection requirements, including DIN VDE 0833-2



Solution & Benefits

- AP Sensing's N45 Linear Heat Detection (LHD) system with metal-free S2000A sensor cable
- Opportunity to extend the installation at a later stage to integrate further parts of the production or the photovoltaic (PV) installation
- Sensor cable was installed across production areas and integrated into enclosed production machinery as well as large cooling and heating equipment
- Dedicated system test validated operation under actual process conditions



Figure 1: Production areas, machinery and equipment create a complex environment. Reliable fire detection must provide comprehensive coverage.

The Challenge

Temperatures within the production areas to be monitored range from -30°C to $+30^{\circ}\text{C}$. In addition, regular cleaning processes introduce moisture and temporary temperature increases caused by warm water. The fire detection system therefore needed to distinguish normal process-related temperature changes from conditions requiring a fire alarm.

Another challenge was achieving comprehensive coverage throughout the facility. The detection system needed to monitor general production areas as well as enclosed production machinery and large cooling and heating equipment. The system had to be designed in accordance with the German design standard DIN VDE 0833-2.

AP Sensing's Solution

A fiber optic Linear Heat Detection (LHD) system with a 2 km measurement range and four sensor channels, together with 1,200 m of metal-free S2000A sensor cable, provides early fire detection throughout the production facility, with the option to extend the installation in the future. The installation team routed the sensor cable across production areas and into enclosed machinery, enabling continuous monitoring along the cable route. The system mainly uses alarm parameters configured according to EN 54-22, class A1N.

Validation Under Real Conditions

Following installation, the project team tested the system under actual operating conditions, focusing particularly on potential process-related nuisance alarms.

The test confirmed that the system met the expected performance requirements. Testing the alarm configuration during normal production and cleaning processes demonstrated reliable fire detection and was officially approved.

Conclusion

AP Sensing's fiber optic LHD solution provides continuous monitoring of critical production areas and equipment without compromising day-to-day operations. The successful validation gives the end customer confidence in enhanced fire protection while minimizing the risk of process-related nuisance alarms. Beyond fulfilling the insurer's requirements, the solution contributes to protecting people, production assets, and business continuity.

By detecting critical temperature increases at an early stage, AP Sensing's fiber optic Linear Heat Detection system can provide an early warning before a fire develops, enabling timely action to help prevent escalation.