

Silesia Flavors

SAFE INDULGENCE





Ever since its inception in 1910, flavor manufacturer Silesia has been family owned. Today, some 700 employees worldwide develop and produce flavors for the food and beverage industry. Silesia relies on explosion suppression solutions from IEP Technologies in the expansion of its manufacturing plant in Kalkar, Germany.

Text: **Catrin Jansen-Steffe** Photography: **Marcel Billaudet, Silesia**

Similarly to a perfumer who creates complex scents from a whole host of base materials, flavorists at Silesia compose flavors from thousands of substances and semi-finished goods. In terms of the substances that are used, a distinction can be made between individual substances (flavoring agents), complex mixtures such as flavor extracts, smoke flavorings, and culinary products. Flavoring agents are considered natural if they satisfy defined requirements. The raw materials for aroma extracts, which are typically obtained from fruits, herbs, spices, and vegetables by way of distillation, extraction, and other separating processes, are regarded

as natural components per se. Natural flavors are composed solely of substances from these two raw material categories. If further substances from other categories are used in a composition, the term “natural” must be eliminated in the declaration of the flavor. “Only a fraction of the world’s demand for industrially produced foods that have an appealing taste can be covered by directly adding or processing fresh fruit, herbs, and spices,” says Silesia’s Managing Director Michael Mausbach. The use of flavors makes multifaceted taste experiences and enjoyment possible, and ultimately also affordable, for the global population at large.

At the Kalkar location, Silesia focuses on the production of flavor powders for the food industry. Mausbach on the investment in an additional manufacturing facility: “Our construction of an additional plant in Kalkar was in response to the rising demand for flavor powders. Our capacity for producing these powders at our parent location in Neuss had reached its limits.”

The relocation not only resulted in more space for an expansion of the manufacturing operation and for modern control equipment, but also necessitated innovative explosion protection solutions, since a wide variety of technologies, such as spray drying, granulation, and extrusion, are used to produce flavors. These technologies allow liquid substances to be converted into powders, for example. Spray drying is a process where a liquid flavor is processed into an emulsion with water and various carriers. The emulsion is injected via nozzles into the spray tower, where it is converted into dry powder.

Technical Plant Manager Michael Tacke explains: “Potentially explosive dust/air mixtures in the atomizer dryer cannot be entirely precluded in the thermal drying process we use. While the average dust concentration is generally below the temperature-based explosion limit, the majority of atomizer dryers are tapered in the discharge area, meaning that an explosive dust concentration cannot be completely eliminated.”

In addition, the product can undergo an exothermic decomposition reaction. Caking or films can develop on the dryer walls.



Silesia plant in Kalkar: the focus is on the production of flavor powders for the food industry.



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1 In the event of an incipient explosion, IEP Technologies' explosion suppression system provides a safe environment.

2 Flavorists at Silesia compose flavors from thousands of substances and semi-finished goods.

3 Silesia Managing Director Michael Mausbach: "As a result of the increased demand for flavor powders, our owner Clemens Hanke is investing in an additional production facility in Kalkar."

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The new plant in Kalkar necessitated innovative explosion protection solutions, since a wide variety of technologies, such as spray drying, granulation, and extrusion, are used to produce flavors and potentially explosive dust/air mixtures cannot be entirely avoided.



“IN OUR COMPANY, THE NEED FOR AND SIGNIFICANCE OF ADVANCED EXPLOSION PROTECTION HAS INCREASED DRAMATICALLY AS A RESULT OF CONTINUING TECHNOLOGICAL PROGRESS, AS WELL AS THE TREND TOWARD EVER-LARGER PRODUCTION UNITS WITH HIGHER MANUFACTURING VOLUMES.”

Michael Mausbach, Silesia Managing Director

In the worst-case scenario, these heat to a smoldering temperature, and as a result of the high air intake temperature in the atomizer dryer, form pockets of embers. These ember pockets can trigger a fire or a dust explosion, depending on the ignition properties.

BEST-POSSIBLE SAFETY

Comprehensive explosion protection solutions from IEP Technologies, a member of the HOERBIGER Group, were implemented in the planning of Silesia's systems. These solutions offer efficient and sustainable protection to both the employees and the production equipment. “Our top priority is, of course, to protect lives and prevent disruptions in production,” says Managing Director Michael Mausbach. “In our company, the need for and significance of advanced explosion protection has increased dramatically as a result of continuing technological progress, as well as the trend toward ever-larger production units with higher manufacturing volumes.”

In the event of an incipient explosion, IEP Technologies' explosion suppression system ensures a safe environment. Within milliseconds, dynamic pressure sensors detect the increased explosion pressure, and the explosion flames are quenched by extinguishant powder. This reduces the maximum explosion overpressure that is to be expected to below the system's pressure resistance limit. The explosion suppression system at flavor expert Silesia includes the detector system, the control unit, and the high-rate discharge (HRD) dry chemical extinguishers. The extinguishers are loaded with sodium bicarbonate-based powder suppressant and pressurized to 60 bar with nitrogen. Special-purpose valves make the entire cross-section available for the powder in a matter of milliseconds. A special nozzle system was installed to achieve optimal and uniform distribution of the extinguishant in the dryer to be protected.



Michael Tacke, Technical Plant Manager
Silesia: “This safety solution not only protects our colleagues at the workplace, but also helps us achieve an efficient flow of production.”

In addition to implementing the explosion suppression solutions, IEP Technologies is also in charge of conducting regular service. The system was optimally tailored to the equipment being operated and provides Silesia with a state-of-the-art, cost-effective explosion mitigation measure against a potential dust explosion. Tacke sums it up: “This safety solution not only protects our colleagues at the workplace, but also helps us achieve an efficient flow of production.”