

SILICA FOR SUSTAINABLE FOOD PRODUCTION

AEROSIL® 

SIPERNAT® 

ZEOFREE® 



Silica from Evonik saves resources and reduces waste in food processing

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Caking is one of the major causes of food loss

Caking is a major cause of food loss when processing and storing powdered foods such as milk powders, non-dairy creamers, spices and seasoning blends. When spray-drying dairy products, for example, about 10 to 25% of the raw material can be lost. Caking, clumping and stickiness also affect the quality of ingredients and impede their processing. Moreover, wall deposit in a spray dryer may cause a safety issue as it could oxidize or even combust.

Silica for sustainable food production

AEROSIL® fumed silica, SIPERNAT® and ZEOFREE® specialty silica from Evonik contribute to the efficient processing of food powders because they reduce caking in spray dryers and prevent clogging of pipes. The main benefit is that less of the valuable raw material is lost as production waste. Furthermore, food manufacturers benefit from shorter cleaning downtime, in turn saving water, energy and labor costs.

Improving the efficiency and output of food processing benefits the whole value chain: Less food loss means that less animal feed, fertilizer, water and effort – and on the whole less CO₂ – are wasted per food unit produced. Consistent product quality keeps consumers from dumping food powders just because of clumping. AEROSIL®, SIPERNAT® and ZEOFREE® thus enhance the sustainability of the entire value chain.

Evonik can provide life cycle analysis (LCA) data for silica products and help customers calculate their LCA values.

Benefits of silica for food processing

- Increased efficiency of spray drying
- Less downtime for cleaning
- Reduced energy and water consumption
- Sustainable food production
- Less food waste and higher total yield

The Silica specialists at Evonik – Inside, to get it right.

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Customer case study: milk powder

During the production process of milk powder, about 25% of the product is lost due to caking at the walls of the spray dryer's cyclone. If a dairy company produces approximately 70 metric tons* of milk powder every day, this results in 17.5 metric tons of waste every day, totaling 6,387.5 metric tons per year. As well as impacting output, the waste product accumulates and requires the production lines to be shut down and cleaned every three days, further reducing their total capacity (see graphic below).

The solution:

- 1) Adding a loading level of 0.2% silica from Evonik as a processing aid prevents caking and reduces the loss of raw material by approximately 50%. Cleaning downtime can be limited to once a week.
- 2) Silica likewise improves the quality of the dairy product itself: Anti-caking and free-flow properties are also important for processing powdered food ingredients – for example baking mixes or non-dairy creamer in vending machines. Caking within these systems leads to hygiene issues and machine failure, in turn causing high maintenance costs.

Milk powder processing**: 0.2% silica cuts resource waste by 50%

Using a loading level of 0.2% silica in milk powder production has a tremendous impact on sustainability.



*Estimates based on customer interviews; **Assuming daily production of 70 metric tons per day

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