

Conveying Air for Foodstuff

Bulk materials are often transported by means of air. The suitability of a substance for transport by air depends primarily on its deposition velocity. That is why the particle size and the density of the material to be conveyed play a major role. To transport foodstuffs such as flour, powdered milk, sugar or cocoa, around 300 m³ of compressed air are used per ton of goods.

Oil can cause serious food contamination

In most systems, the compressed air volume flow is produced by a compressor operated with oil injection.

Foodstuffs in powder form have a particularly large surface exposed to the compressed air. Any oil contained in the compressed air therefore quickly contaminates the food. This does not only affect its taste, but also significantly shortens its shelf life. In addition, the intake air of compressed air systems always contains germs and moisture. Where the air is also contaminated with oil, micro-organisms thrive, as they can feed on the hydrocarbons. This has obviously a deteriorating effect on the quality of the foodstuff and further reduces its shelf life.

The oil concentration in the compressed air at the compressor outlet might be as high as 180 mg/m³ (see VDMA publication 15390-1, compiled in cooperation with renowned compressor manufacturers).

This means that every ton of foodstuff conveyed with compressed air could be potentially contaminated with 54 grams of oil.

Calculation

$300 \text{ m}^3 \text{ compressed air} / \text{ton bulk material} * 180 \text{ mg oil} / \text{m}^3 \text{ compressed air} = 54 \text{ mg oil} / \text{kg bulk material}$

Each time the bulk material is transferred, contamination increases accordingly (e.g. filling and emptying of silo = contamination x 2).

On-board compressors pose additional risks

The compressed air used in tanker vehicles is normally generated by on-board compressors driven by the internal combustion engine of the vehicle. If exhaust fumes from the engine are released near the intake point of the compressor, they can seriously contaminate the compressed air, as compression increases the concentration of the contaminants.

HACCP recommendation

Most foodstuff producers use high-grade compressed air for the processing of ingredients. For seamless quality management along the entire processing chain, we strongly recommend using a stationary compressed air system with suitable compressed air treatment equipment in combination with continuous quality monitoring and measuring.

