

## CASE STUDY

### FOOD & BEVERAGE



# Only the best is good enough for Hochwald dairy

At Hochwald Nahrungsmittelwerke's (Hochwald) Erfstadt dairy, one of the cooperative's fastest growing sites, there is continuous investment in production to keep pace with growing consumer demand for a wider range of products, including fresh and long-life milk, cheese and yoghurt

As a result, the company has expanded its compressed air system by installing CompAir's new Quantima compressor and is one of the first factories in Europe to benefit from the machine's innovative design features. These include high energy efficiency and guaranteed oil-free air quality, with very low cost of ownership for a compressor in its class.

## Overview

- ▶ **Client**  
Hochwald Nahrungsmittelwerke GmbH Dairy Cooperative
- ▶ **Location**  
Erfstadt Dairy, Germany
- ▶ **Application**  
Dairy Processing
- ▶ **Products**  
Quantima compressor and Q-Life predictive maintenance package
- ▶ **Customer Benefit**  
Oil-free air guaranteed/high energy efficiency for fast payback

## High quality and safety standards

The compressed air is used at many points in the production process, such as when emptying tanks and during sterile filling, placing stringent requirements on its quality. Plant manager Ralf Fuchs explains: "We manufacture high-quality products and, because the air comes into direct contact with these products, we demand the highest levels of purity and safety. As well as achieving Level 4 International Food

Standard (IFS) certification for our production process, we also now satisfy the requirements for IFS level 5 as we are continually developing our quality standards."

In order to achieve these standards, the Erfstadt factory operates two compressed air networks; one produces oil-free air for the central processing stages and a second, smaller network uses oil-lubricated compressors to supply the packaging machines, where the air does not come into direct contact with the product.

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## Producing oil-free compressed air

Hochwald has been using CompAir compressors for a number of years to provide the oil-free air that its processes require. Prior to the installation of Quantima, the compressor station housed four CompAir piston compressors, which supplied around 68 m<sup>3</sup>/min of compressed air to the oil-free, 8 bar network.

Achim Derr, head of technology explains, "We require 100% oil-free compressed air production because this is the only way we can be sure that there is no contamination and the CompAir piston compressors are able to give us this assurance of air quality." To optimise energy usage, Hochwald technicians developed a practical, demand-based control system for the four compressors. Achim Derr explains, "The machines are regulated at half load and controlled centrally. This produces eight power levels which fit the demand profiles perfectly."

## Choosing Quantima

When Hochwald started considering how to expand the compressed air station, it seemed obvious to install two further piston compressors in the space available. However, CompAir proposed a system comprising one new Quantima unit and, following detailed analyses by the plant engineering team including research in to the unit's energy performance and operating costs, its air quality and its physical size, the benefits were compelling. Compared to a conventional compressor of the same performance class, a Quantima compressor has less than half the footprint – further evidence that highly innovative developments can lead to simple functionality. Derr adds, "The compact installation space was another feature which convinced us to purchase Quantima as otherwise, we would not have been able to fit any other equipment in the compressor room."

He concludes, "We calculated the payback based on data provided by CompAir and the findings were impressive. As a result, CompAir was tasked with supplying and installing one of Europe's first Quantima Q-43s; with a 250 kW drive and maximum volumetric flow of 43 m<sup>3</sup>/min."

## Benefits at a glance

- ▶ **Guaranteed oil-free air - ensuring stringent international food quality standards are maintained to avoid production network**
- ▶ **Half the footprint of conventional compressors - for easier installation into the existing compressor station**
- ▶ **High energy efficiency - with the potential to cut energy consumption by up to 25%**
- ▶ **Low cost of ownership - reducing equipment payback time**
- ▶ **Q-Life predictive maintenance - remote monitoring package identifies potential faults before they cause compressor breakdown**

## Using Quantima

As the largest machine in the station, the Quantima speed-regulated compressor handles the base load and therefore, usually runs at full load. The piston machines are then activated in a cascade when the requirement exceeds 43 m<sup>3</sup>/min. A huge, 30 m<sup>3</sup> storage tank ensures that peaks in load are buffered. Ralf Fuchs adds, "This allows us to make best possible use of the energy-saving potential of the new compressor technology." Shortly after Quantima was installed, a volumetric flow-recording unit was fitted for all lines and departments. As the compressed air-related power requirement is known, this is enabling Hochwald to calculate the compressed air costs with great accuracy.

Ralf Fuchs adds, "We always monitor the return on investment for any new equipment we purchase and features such as reduced energy demands of course impact on payback. Factors like energy saving and the compact design tipped the scales when it came to making this investment, as did the partnership we have nurtured over the years with CompAir. Staff at Hochwald are already completely satisfied with Quantima."



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## About Quantima

Quantima uses the unique Q-drive compression assembly. A high-speed electric motor drives a rotor shaft that is linked to an impeller at each end.

This directly-driven rotor shaft is levitated by active electromagnetic bearings – without any gears, rolling contact bearings, friction, oil lubrication or wear, to achieve variable speeds of up to 60 000 rpm.

The air flows firstly through a highly effective filter. It is then compressed in the first impeller and forwarded to the second impeller via an intermediate cooler that produces the operating pressure. The compressed air passes through another cooler before being dried and filtered and reaching the next stage of post treatment and then finally the network. The simple gear-free design ensures an extremely high level of efficiency.

## Very low energy consumption in off-load running

Overall a company using Quantima in place of a standard compressor can cut energy use by up to 25%. The variable-speed drive matches air output automatically to plant demand to provide the precise volume of compressed air needed, helping to minimise off-load running. Furthermore, when idling at 2.5%, a Quantima compressor requires just a fraction of the energy needed by a screw or standard turbo compressor.

## Reliability and efficiency assured

Compressor operations are monitored by the intelligent Q-Master control system (Picture 3), which continually records and checks all system parameters. The system also allows for remote analysis and diagnostics of compressor performance via the Q-Life predictive maintenance package. When necessary, CompAir engineers can moderate the machine's performance remotely to prevent a fault occurring or send a local engineer to site to carry out remedial repairs.

Combining Q-Master with Q-Life and scheduled maintenance means that every Quantima compressor comes with a ten-year warranty as standard and will deliver the reliability and uptime essential for Hochwald's continuous production processes.



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**Achim Derr**  
Head of Technology