

FreiLacke



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On course for efficiency via control

How a paint manufacturer optimized its compressed air supply

Connecting two spatially separated compressed air stations, each with three uncontrolled compressors, via a cable and installing a higher-level control system for both - this is the formula for success for more compressed air efficiency with high savings at the same time. You can read more about the remarkable project below.

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System paints are the domain of the family business Emil Frei GmbH & Co. KG. Based in Döggingen in the Black Forest, the company develops and produces industrial, powder and electrophoretic coatings as well as Durelastic surface solutions for composites. Customers are supplied from a wide range of areas such as wheel manufacturing, vehicle construction, mechanical and apparatus engineering, contract coating, furniture manufacturing, storage technology, construction and sanitation.

Responsible behavior towards people and the environment is not only a tradition at FreiLacke, but is also firmly anchored in the future-oriented company orientation. As a member of the Association of the Chemical Industry (VCI) and the Association of the German Coatings and Printing Inks Industry (VdL), the company actively promotes the concept of "Responsible

Care". "The definition of our own environmental policy and our commitment within the framework of the European community system for certified environmental management (EMAS II certification) since 1996 is a milestone in the company's history and one of the most important investments in the future," emphasizes Dipl.-Ing. Hans-Peter Frei, managing director and technical manager of the company. In concrete terms, this means: Critical substances that are hazardous to the environment and health are substituted as quickly as possible at FreiLacke. The maxim is to develop environmentally friendly products, reduce emissions, packaging material and waste and use resources carefully.

"For example, we received a prize in the 2016 VCI Responsible Care competition for our project 'Clean more with less solvents'," reports

01 FreiLacke acts responsibly towards people and the environment firmly anchored in the future-oriented company orientation



02 Paul Wenzinger, Norman Kloss and Alois

Kuster (from left to right) agree: The installation of the Airleader control was the key to success at FreiLacke

Hans Peter Frei. "And this year we're taking part again. This time we're presenting our optimized compressed air technology as an example of intelligent and sustainable use of resources."

Consumption measurements as a basis

It's worth taking a closer look here. Already in 2009, managing director Hans-Peter Frei and Alois Kuster started

A total of six compressors without speed control from two different manufacturers with a combined output of 300 kW - three in the liquid coating plant and three in the powder coating plant - were in use, some of them for over 20 years, redundancy was no longer guaranteed, high idling rates and leaks were an issue.

"First, we carried out consumption measurements for electricity and air in order to determine reliable key figures.

We wanted a basis to know where we come from, where we want to go and where the measures were worth it in the end," says Alois Kuster, describing the first step. Hans Peter Frei goes into detail: "In total, we had a compressed air consumption of 5 million m³ per year. The delivery quantities in the existing systems could not be regulated. Then we had idle costs of over 30%. This was certainly due to the old devices, but also to the inadequate controls. The specific output, i.e. the energy required to produce 1 m³ of compressed air, was 0.16 kWh/m³.

Network was 8.5 bar and the leakage rate was 15%." It was agreed that something had to be done here.

Ambitious goals

"Next we set goals: 100% security of supply, a tiered delivery quantity, idle costs below 5%, a specific output of 0.12 kWh/m³, a reduction in the pressure in the compressed air network to 6.5 bar and a reduction in leaks to less than 8%," explains Hans-Peter Frei. "The idea was also to connect the two spatially separated compressed air stations with a compressed air line."

No sooner said than done: the installation of the connecting line was made easier by the construction of a new shipping/high-bay extension. As part of the shell construction work, the connecting compressed air line was pulled in. From there the line was pushed under the street and connected to the network of the second plant.



Dipl.-Ing. Hans-Peter Frei, Managing Director FreiLacke, Döggingen

Operating technology, and his employee Paul Wenzinger began initial activities to make the existing compressed air technology more effective. The initial situation at that time was that there were two completely separate compressed air stations in the parts of the factory for powder paint and liquid paint production that were separated from each other by a road. The

Comprehensive control brings the breakthrough

The next step was to plan the installation of a comprehensive control system. The idea of relying on a control system that is superior for both stations



03 The efficiency project was completed this year with the investment in new compressors completed

net, Alois Kuster and Paul Wenzinger came through a meeting of the Schwarzwald-Baar energy efficiency network. Here one of the participating companies reported on its successes with the Airleader control. Contact was quickly made with Dipl.-Ing. Norman Kloss from WF Steuerungstechnik, the provider of the

said control, recorded. His assessment after assessing the circumstances: With Airleader, a lot can be achieved in the compressed air supply with the existing unregulated units at FreiLacke. His forecast: idle share below 5% and energy savings worth around €30,000 each

year if both stations are controlled together.

Impressive achievements

The Airleader was finally installed in 2011. The actual figures for 2016, reliable figures from building management technology, impressively demonstrate the successes since then. Hans-Peter Frei summarizes: "We have actually created 100% security of supply. We can now provide the delivery quantity in stages. The idle costs are less than 3%, the specific power is 0.113 kWh/m³, the target was 0.12. We have reduced the pressure to 6.5 bar and the leakage rate is 7% instead of 15%." And what does that mean in monetary terms: "If you look at the period from 2010 to 2016 compared to 2005 to 2010, we get savings of 170,000 euros, which is 28,400 euros per year. Laying the compressed air line cost around 30,000 euros. It's fair to say that without the new building it would have been significantly more expensive. The installations within the buildings cost 12,000 euros, the Airleader control 23,000 euros. A total investment of 65,000 euros. That gives an ROI of 2.3 years. Remarkable for such technology," was Hans-Peter Frei's positive conclusion.

Alois Kuster adds: "And we made these savings without investing in new compressors. We initially only invested in technology in the control system! And with great success. This year we have gone one better by purchasing new compressors - again without speed control. And lo and behold, we are achieving further improvements in interaction with the Airleader control." Paul Wenzinger goes into detail: "With compressed air consumption having now increased to 7 million m³, we now only have idle costs of 0.6%, and the specific output is 0.101 kWh/m³."

And the control system was also involved in the decision as to which compressors fit best into the existing ensemble: "We were able to carry out a simulation based on the Airleader data. Thanks to Airleader, you have a high level of transparency, so you know exactly how you can plan further in the future," says control expert Norman Kloss in conclusion.

Photos 1-3 and statement: Martina Laun; boxed material: WF Steuerungstechnik

www.airleader.de



Airleader in detail

■ The control can be used across manufacturers.

■ Integrated energy data collection on every compressor provides real data. Irregularities such as deterioration in efficiency are immediately detected via online monitoring (ISO 50 001).

■ Integrated oil temperature monitoring on each compressor for early detection of thermal problems.

■ Monitoring of compressed air auxiliary units such as dryers and condensate drains as well as permanent recording and monitoring of the pressure dew point and the compressor room temperature. This means that production errors due to poor compressed air quality can be ruled out.

■ Visualization also for non-compressed air professionals. You can see the status of the compressed air system at a glance.

■ Good planning tool for future compressor designs. Avoids bad investments due to incorrect dimensions.

■ Long-term data storage on the company's own server.

■ Over 10,000 references in Germany.

■ This year, Airleader Master II, a new control generation with a simpler operating concept via touchscreen, was brought onto the market (picture).

