

Chocolate products

Wergona manufactures numerous chocolate products, including the brands Friedel and Gubor. The plant also produces products for high-profile retail chains.

Oil-free piston compressors at Wergona: an energy-saving and reliable solution

Clean compressed air – an essential feature of chocolate production

Chocolate is a very sensitive foodstuff. Every effort must be made at the production and packaging stages to prevent contamination with even the faintest traces of mineral oils. Wergona Schokoladen GmbH, based in Wernigerode, has completely replaced its compressed air station – partly to ensure reliability in this area. The system now combines great energy efficiency with excellent production reliability thanks to four oil-free, water-cooled piston compressors from the Champion range by CompAir, which generate the compressed air required. The company's management has calculated that it will make annual energy savings of € 48,000.

Customer

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A fast-growing „chocolate hub“

„Our production area covers some 24,000 m² – plus 36,000 m² of temperature-controlled storage space – and produces, with the help of 250 permanent employees, around 15,000 tonnes of chocolate products.“

Wanted: energy-efficient oil-free compressors

Having studied various options in some depth, Wergona decided on a concept which involved installing four oil-free piston compressors from the Champion range by CompAir.

Railway enthusiasts tend to think of Wernigerode as the starting point of the famous narrow-gauge railway through the Harz mountains, while those with an interest in folklore associate it with the witchcraft trials held in the Middle Ages

at the foot of the legendary peak known as the Brocken. Not to mention chocolate lovers – surely the largest group – who are familiar with the town at the foot of the Harz mountains as a location of rich tradition, a place where several



Four identical piston compressors generate compressed air for Wergona – efficiently, oil-free and across eight volumetric flow ranges.

manufacturers and some 3000 workers were making chocolate as long ago as 1900. A well-known product of the former East Germany was the “Brockensplitter” chocolate drop made by Argenta.

A fast-growing “chocolate hub”

Today, Wergona Schokoladen GmbH is continuing this tradition, although owners Monika, Claus and Oliver Cersovsky are interested in more than historical continuity. They are continually investing to develop the production facility, which was completely rebuilt during 2002/03 on what truly is a greenfield site.

Andreas Harth, Head of Technology at Wergona, has the facts and figures: “When the new production building opened in 2003, we had 56 employees and were manufacturing some 2000 tonnes of chocolate. Since then the plant has been expanded several times. Our production area covers some 24,000 m² – plus 36,000 m² of temperature-controlled storage space – and produces, with the help of 250 permanent employees, around 15,000 tonnes of chocolate products. For a few years now we have also been manufacturing sugar-coated chocolates and have increased production volumes in this new area of the business from 4,500 to 8,000 tonnes during this period.” These figures are particularly impressive given that some of the individual units, such as pralines, hollow varieties, bars and sugar-coated types, only weigh a few grams.

Among other things, Wergona manufactures the range for the famous



Andreas Harth, Head of Technology at Wergona (left) with Marco Krengel, Managing Director of Druckluft Krengel (centre) and Werner Struck, Regional Sales Manager at CompAir (right).

Friedel and Gubor brands, as well as chocolate products for leading retail chains. In addition to increases in capacity, the range of available products is also expanded on a regular basis. The proprietary chocolate masses, for which there are 57 basic recipes, are processed at a wide variety of casting plants. As Andreas Harth explains: “We take care of almost all the production technology.” By way of example, up to 1.6 million individual products are manufactured and packed every day (!) at one of the state-of-the-art rotary plants – and there are even two of these! And when holiday periods are looming, daily production levels for chocolate Easter bunnies and Father Christmases can hit seven figures.

“Compressed air is absolutely essential”

For Andreas Harth, the role played by compressed air in chocolate production is all too obvious: “Compressed air is absolutely essential.” Even the system of tubes, developed in house, for conveying the chocolate masses to the casting units is controlled by pneumatically activated valves.

The plants themselves also feature numerous pneumatic drive elements. Compressed air is also used as a process medium, such as when removing the powder from jelly products produced by mogul plants, and for cleaning the plants.

When the compressed air station, installed in 2003 and enlarged several times thereafter, was no longer really suitable for further expansion, Wergona had to think about investing in a completely new station. It was clear from the outset that oil-free compressors should be used. Andreas Harth again: “It might not be a requirement yet, but it makes perfect sense for us – particularly in light of the very tough hygiene standards which apply across the business.” Those responsible also set the bar very high in terms of reliability of supply and energy efficiency.

Wanted: energy-efficient oil-free compressors

Having studied various options in some depth, Wergona decided on a concept devised by Druckluft Krengel, a specialist provider based in Osterwieck. As Managing Director Marco Krengel recalls:

“We first established what was needed and then, on the basis of this, recommended installing four oil-free piston compressors from the Champion range by CompAir.”

The systems are now operational and performing their task reliably. Each compressor delivers a maximum 9.1 m³/min of compressed air to the 8-bar network. This adds up to a maximum volume of 36.4 m³/min, of which Wergona is currently using around two thirds. So there is plenty of air for additional use. Not forgetting that the station can also be expanded.

As Marco Krengel explains: “We have configured the station in a way that makes it really easy to integrate additional compressors into the network.”

Four systems – eight power levels – low consumption when idle

The four systems providing the compressed air combine eight power levels, since piston compressors can be operated at two power levels. In the case of half load the pistons only compress upwards; at full load they compress both upwards and downwards. The system is characterised by a high level of efficiency, even at half load: in comparison to full load, the energy consumption in this operating mode is 53%.

A narrow pressure band can be achieved with this mode of operation. This oil-free compressor is also associated with very low consumption when idle. Marco Krengel again: “Piston compressors are a must for users who want to generate oil-free compressed air in the 8-bar range and for whom energy efficiency is also important.” This can be explained by the operating principle for piston machines, which



Refrigerant dryers and filters support centralised preparation of oil-free compressed air.

remains compelling, although hardly a secret anymore. Essentially, the piston rings ensure a 100% seal for the compression area, which makes these machines extremely efficient. And low energy consumption is not the only benefit of these machines in terms of life cycle costs, with the low investment costs involved also giving them an edge over other compressor designs from the very outset.

Integrated heat recovery

The Champion machines at Wergona are of the water-cooled variety. This is because the compressor station is located in a central position where, given the immediate



Even the components involved in water cooling were selected with maximum energy efficiency in mind.

proximity of cool chocolate production, the discharge of warm air is unwelcome. The higher compression temperature associated with piston compressors, as compared with screw compressors, is actually advantageous from a processing perspective in this case (and many others too), with the heat being recovered and used within the network: chocolate production is ultimately a temperature-controlled process and a heat source is required to heat the chocolate masses.

In terms of control, the four compressor are connected together whereby one is the master system and the other three are „slaves“. This has the benefit of keeping

the control technology comparatively simple. It is also relatively easy to measure efficiency at the station, with both power consumption and the volume flow generated being recorded. As such, it is simple enough to calculate the factor known as ‘cost per cubic metre of compressed air’. And the results have been positive, even if the equipment is still too new for any definitive conclusions to be drawn regarding compressed air costs.

Andreas Harth sums things up as follows: „The compressors are working very efficiently and delivering a high specific output. We are expecting to make an annual saving on energy costs of € 48,000.“



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