

Sustainable food production with oil-free turbocompressors

For more than a century, a leading European food company has been manufacturing and selling various types of high-quality pork, beef, poultry and lamb products. To satisfy the ever more demanding consumers, the products must not only taste good, but they must also be made in a sustainable way and with the lowest carbon footprint. A few years back, the production processes of the client were improved by the installation of a high-speed turbocompressor in one of the meat factories. It delivers 100% oil-free compressed air for the distribution network.



“A piece of meat with peace of mind. With its absolutely oil-free design, the HSR high-speed turbocompressor eliminates all risks of compressed air contamination.”

Edward Paro, Global Product Manager at Sulzer

The challenge

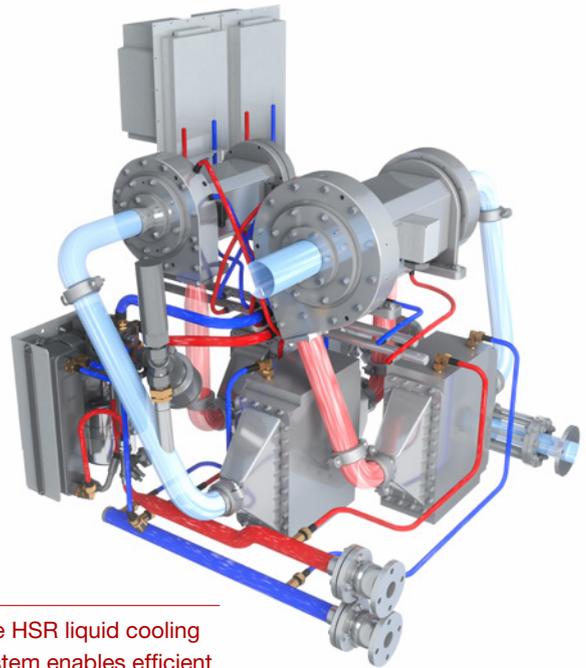
In the meat factory, 8 bar compressed air is widely used for pneumatic tools, control of instruments, activation of pneumatic components and valves, etc. Some compressed air also comes directly in contact with the food. Therefore, it must be clean, oil-free, dry and odorless. This quality could not be 100% guaranteed with the oil-lubricated screw compressors initially installed on site, even with appropriate air-oil separators and oil filters. In addition, the screw compressors proved to be maintenance-costly as they required regular replacement of numerous wearing parts and frequent change of expensive food-grade oil. Considering these major drawbacks, the client decided to recently replace one screw compressor by a high-speed turbocompressor.

The solution

During the first discussions, the client became highly interested in the high-speed turbocompressors, but wanted some testing in real conditions to validate all promised advantages. Therefore, a turbocompressor installed in a container was brought to the site and started to run in replacement of an installed screw compressor. These tests were the perfect foundation for a fruitful partnership. After having run for one year without any maintenance, the turbocompressor proved to deliver 100% oil-free air with remarkable efficiency even at partial loads. Moreover, the ease of use of the machine and its low noise level convinced the client that the turbocompressor fitted his needs exactly. The high-speed turbocompressor was finally placed permanently in the main compressor room.

Customer benefit

The high-speed turbocompressor has digitally controlled magnetic bearings which work without physical contact between rotating and stationary elements. There is no mechanical friction whatsoever. This gives the client three major advantages:



The HSR liquid cooling system enables efficient heat recovery

1. No need for lubrication. No single drop of oil in the machine ultimately means no threat to food product safety.
2. No parts to wear. No gears, bearings, seals, etc. to replace regularly. Except for changing the air filters when clogged, the machine is maintenance free.
3. No risk of failure. Parts that don't wear don't fail. The machine is extremely reliable, and unplanned stops which could affect the whole production process do not occur.

The turbocompressor is equipped with an integrated variable speed drive which controls the motor speed – based on actual air demand – and maintains a constant air pressure. The unit is highly flexible and perfectly adapts to ever-changing conditions at the client's site.

The turbocompressor has high-speed motors and directly-driven titanium impellers rotating at up to 35'000 rpm. This ensures an optimal wire-to-air efficiency. 90% of the heat produced during successive compression stages is recovered with an advanced liquid cooling system, and can be re-used by the client for various heating processes in the plant.

The high-speed turbocompressor has now run in the meat factory for more than 3 years with no maintenance. It has proven to be highly efficient and reliable with lower total cost of ownership compared to the initially installed screw compressors. The client is extremely satisfied with the equipment and collaboration and will soon order a second high-speed turbocompressor.



Turbocompressor HSR 185-201.020.1013

Volume flow	28 m ³ /mn
Pressure	8 bar g
Input power	200 kW
Input voltage	400 V ± 10%
Input frequency	50 Hz
Number of compression stages	3
Max. noise level	79 dB
Dimensions	1820 x 1980 x 2056 mm
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The HSR 185 is compact and easy to install

The Sulzer difference

- In the high-speed turbocompressor market, Sulzer has a solid reputation for quality and reliability. The technology has been tried and tested over two decades of operation.
- The HSR high-speed turbocompressors have a low total cost of ownership, combining high efficiency and reliability with virtually no maintenance.
- The HSRs are 100% real oil-free compressors. All risks of oil contamination are eliminated.
- The HSR high-speed turbocompressors are compact and easy to install, which make them ideal for the upgrading of existing compressor stations.

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