EVERDRY® the concept

By precooling the compressed air, an EVERDRY adsorption dryer of the 3400 FRA type can even reliably master an overload of up to 5,000 m³/h.
Picture: BEKO

considered during the implementation of the project. Therefore, the regeneration-air blowers generating a high level of noise were installed in the basement to meet the requirements of the noise prevention regulations. Rising mains are used for the connections with the adsorption dryers. BEKO SYSTEMS was also responsible for the rough planning regarding the integration of the pipework.

Residual oil vapour monitoring with METPOINT OCV

Although the compressed air at Nestlé is generated by oil-free compressors, this is, as a result of the air intake from the environment, no guarantee for a compressed-air quality meeting the requirements of the residual oil classification in accordance with ISO 8573-1 class 1. The induced air normally contains small amounts of oil vapour which, subsequent to the compression process, exists in a concentrated form in the compressed air. Absolutely oil-free air is guaranteed only downstream of the activated-carbon adsorber. A METPOINT OCV made by BEKO TECHNOLOGIES is installed for the continuous monitoring of the compressed-air quality. The innovative measuring device for the monitoring of the residual oil vapour content in compressed air continuously

More than 16 million packs of so-called hypoallergenic food (H.A. food) are supplied around the globe per annum by the Nestlé factory in Biessenhofen.
Picture: Nestlé Deutschland AG

measures and documents the vaporous residual oil content of the compressed air down to the range of a thousandth mg/m³.

Multiple safety features during operation

All data is recorded by a master control which is also connected with the controls of both adsorption dryers, and which monitors the function of these controls. If one adsorption dryer fails, the control will deactivate it or switch over to the independent operation of the remaining adsorption dryer. At the same time, the master control is connected with the control system via Ethernet. Besides the operating and process data of the two EVERDRY adsorption dryers, transmission of the residual oil content from the METPOINT OCV, of the pressure dew point and of the normal grid operation pressure also takes place. Furthermore, the master control is equipped with a modem, so that perfect functioning of the plant is additionally monitored via remote transmission by specialists of the manufacturing company. By means of continuous analysis of the recorded temperature history, possible future malfunctions can be identified at a very early stage. This allows early intervention before damage to the plant or – even worse – damage to the production occurs.

With this project, Nestlé and BEKO SYSTEMS have implemented a processing solution corresponding to all specifications and meeting all boundary conditions, a solution which exceeds the requirements by far. A residual oil content of 0.0001 mg/m³ and pressure dew point of down to -100 °C are not only snapshots. Good to know that the compressed air used for the food of our smallest ones exceeds the quality requirements and regulations by far. Because Nestlé and BEKO SYSTEMS rely successfully on the extra slice of quality.

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FOOD INDUSTRY

EVERDRY® AND METPOINT OCV

The finest for the youngest

EVERDRY® FRA-V 3400

The finest for the youngest

As is well known, the food industry makes high demands on the quality of compressed-air. When it comes to hypoallergenic baby food, Nestlé, together with BEKO SYSTEMS, raises the bar even further.

Mineral water, coffee, confectionery, soups – hardly a day goes by without us consuming food produced by Nestlé. Every German household buys 100 different Nestlé products per annum on average. The worldwide leading food company provides people all around the globe with food. Not just adults but also the very youngest, as the range of products includes a wide variety of baby food. For Germany, these are the well known brands Nestlé Beba and Nestlé Alete, which are produced in the Biessenhofen factory, the competence centre for the fabrication of hypoallergenic baby food. Nestlé products stand for highest quality throughout the world. In the factory-owned laboratory, the raw materials and intermediate and final products are continuously monitored and analysed. Baby food is therefore checked for up to 800 substances and needs to pass through up to 80 individual analyses. So it is no surprise that greatest demands are made on the compressed air at Nestlé Biessenhofen. Besides pneumatic processes, the compressed-air is mainly used here for the pressure balance of the sterile tanks subsequent to steam sterilisation and for the pneumatic transport of the baby food.

The production capacities for the fabrication of H.A. food in Biessenhofen were doubled between spring 2009 and the end of 2010 in the course of a massive factory expansion. This is why there was an immediate need for action for the expansion or renewal of the compressed-air station. The requirements regarding the purity of the compressed air were precisely defined from the outset. For the particle concentration and in particular for the residual oil content, class 1 compressed air in accordance with ISO 8573-1 (class 1 = 0.01 mg/m³) was required. Although class 3 would suffice for the residual moisture content (pressure dew point -20 °C), the company wanted to have the possibility to change to up to class 1 (pressure dew point -70 °C). For this, adsorption drying was indispensable.

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Together they developed the optimum solution for compressed air purification in the Nestlé factory at Bissenhofen: Katharina Boehler of the energy and environmental management department, Tobias Stadler of the central workshop / energy department at Nestlé and Klaus Osterlehner of BEKO.

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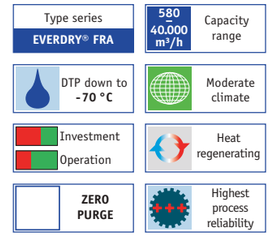
The compressed-air processing system with both EVERDRY adsorption dryers is installed in a room which previously accommodated a steam turbine.



Precooling for the adsorption drying

Nestlé realised early that cooling-down the compressed air prior to the adsorption process renders compressed-air processing particularly efficient and safe. Ice water from the production which could be used for these cooling purposes was abundant. However, at first, a suitable partner for the implementation of the project was missing. This was when the BEKO SYSTEMS specialists came into play. The experts for user- and customer-oriented system solutions in compressed-air processing analysed the specifications and demands most accurately and, together with Nestlé, developed a processing solution which was superior to the competition.

For compressed-air drying, two EVERDRY adsorption dryers of the FRA-V 3400 type with the proven pressure-vacuum regeneration are now installed. The adsorption dryers made by BEKO SYSTEMS with a nominal capacity of 3,400 m³/h are designed in such a manner that, in the event of failure or maintenance of one of the dryers, the remaining dryer will be able to reliably master even an overload of up to 5,000 m³/h with simultaneous precooling of the compressed air.

Energy-optimised compressed-air drying

For energy optimisation purposes, a precooling unit, consisting of an air/air and a cold water/air heat exchanger, has been installed. Similar systems are already known as a combination of a refrigeration dryer with an adsorption dryer. Here, loading periods of far more than 24 hours per adsorption tower or column can be realised even at full load. For this, the adsorption dryer is not installed downstream of the air/air heat exchanger but integrated between the cold water/air and the air/air heat exchanger, meaning that the compressed air first flows into the air/air heat exchanger, then into the cold water/air heat exchanger, and finally into the adsorption dryer, before re-entering the air/air heat exchanger to precool the incoming compressed-air.

This placement also protects the activated-carbon adsorber connected downstream against unacceptably high inlet temperatures in the event of false triggering or insufficient cooling of one of the adsorption dryers. The switch-over of the adsorption dryers depends on the dew point, so that the maximum possible cycle time is always reached. The placement of all components was chosen in such a way that, with the lowest possible employment of components, processing in accordance with the purity requirements is also possible at any time during maintenance measures (for example during the replacement of filter elements).

As there is also a temporary workplace for the operating personnel in the room where the EVERDRY adsorption dryers are installed, additional safety and workplace directives had to be