

Selective Stain-free Drying

Drying only a defined portion of a small, lightweight component in a specific quantity, time, and quality is a challenge. It took experience and innovative spirit to master this application.

A renowned supplier needed a special drying solution for a new component series. The components in question are small caps of highly complex geometry for use in the automotive industry. The requirement for drying is restricted to the bottom of these caps where three small pins are attached. Three dozens of these items, which may not be depicted for secrecy, are placed in one plastic cartridge each. They are processed as follows. To obtain lasting, perfect quality the pins are insulated, gold plated for optimum electric conductivity, and

rinsed. Then, they need to be dried. The enterprise has used Harter rack and barrel driers in factories the world over for more than 25 years. So, obviously, they contacted their established technology partner for energy-saving heat pump based condensation drying. This application requires a continuous drying solution.

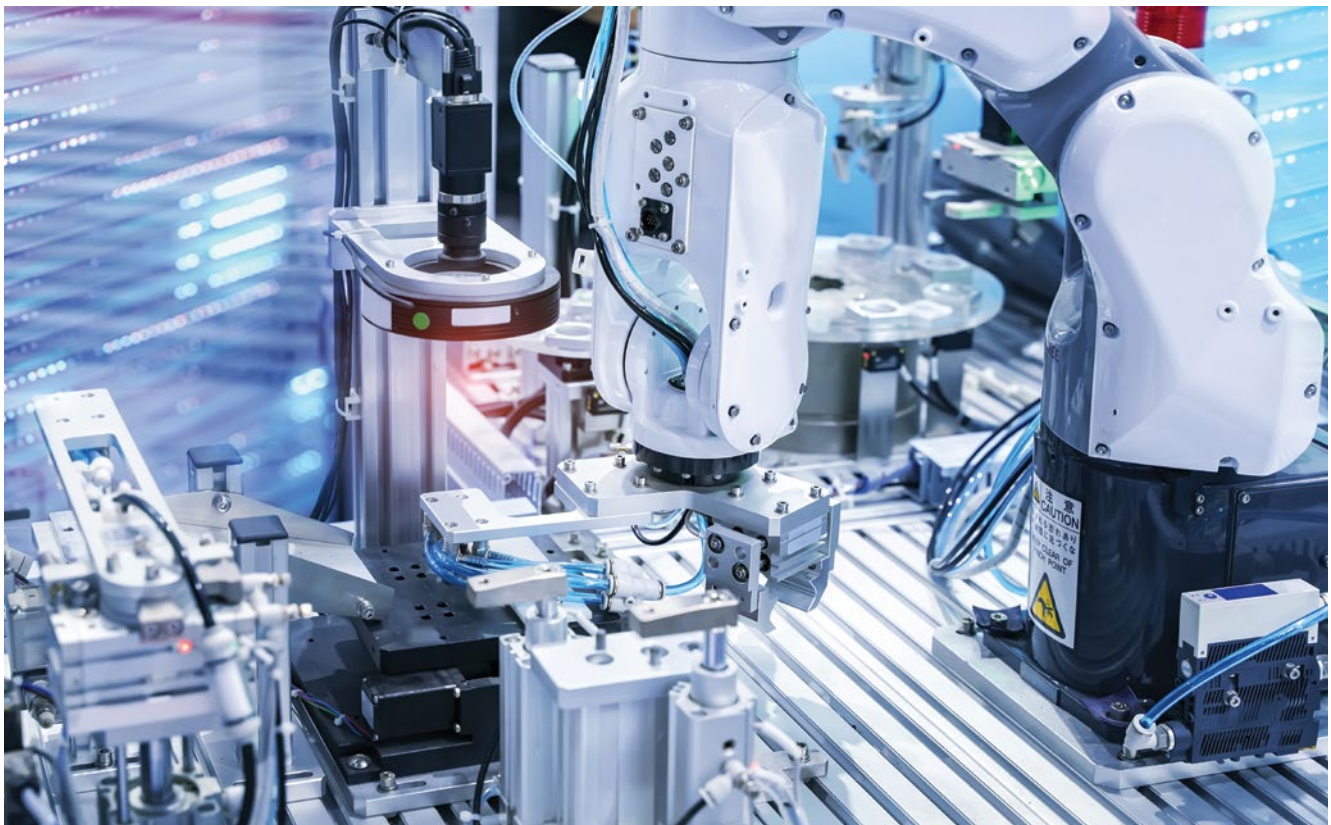
Tests Form the Basis

For such challenging tasks, it is indispensable to determine the drying parameters up front. This was done at the drying spe-

cialist's premises who had built a special drier to run the tests for this project. In co-operation with the customer, a continuous solution was developed for the specific purpose in a step by step approach.

Optimum Solution for the Application

The system built is made from polypropylene. External dimensions are 2,000 mm long, 1,000 mm wide, and 2,000 mm high. The system features a timing belt conveyor which picks the cartridges automatically



To meet the stringent requirements of the automotive industry, suppliers must also provide highly efficient and individual drying solutions. five minutes maximum.



This energy-saving continuous dryer including an air blow-off zone and a drying zone was developed for a new component series. Insulated and gold plated pins are processed at 70 °C for three minutes to become perfectly dry and stain-free.

while lateral guideways hold them in place. The pins to be dried are located at the bottom of the caps. “We always use extremely dry and thus unsaturated air for drying” says Reinhold Specht, managing owner of Harter. “This (air) is passed, in a steady stream, upwards over the pins using a sophisticated air routing system. The difficulty in this project was that an accurately defined airflow rate is required to slightly lift the caps in the cartridges so that the air may reach the tips of the pins and the pins will be dry and stain-free all over as a result. Yet, the items must not fly about the drier, of course.”

As in other difficult drying applications, a preliminary air blow-off station was integrated in the drier to largely reduce the water entrapped. The station uses

non-compressed air and is installed in the entry zone of the tunnel. Downstream this station, the drying process proper begins. After a pass-through time of three minutes the pins are completely dry and stain-free. The drying temperature is about 70 °C. The power rating of the system in production operation is 9.3 kW. The drying system is a part of the fully automated overall process.

Process Reliability and Government Subsidy

Each drying system has a dehumidification module attached to condition the required process air. Drying is accomplished at a defined temperature range

of 40 °C to 75 °C, as required for the specific product or process. Harter uses a physically alternative approach for their heat pump based condensation drying process. This drying technique is based on a combination of highly efficient air dehumidification and targeted air routing. Extremely dry and thus unsaturated air is passed over or through the items to be dried. By its very nature, this air very quickly absorbs any humidity present. The humidity laden air is stripped of its moisture in the so-called Airgenex dehumidification module. The humidity condenses to form water, and the condensate is drained off the system. Subsequently, the cooled air is reheated and passed on. The air circuit is closed. The drying cycle is thus almost emission-free, and the process is reproducible. Owing to their efficient and carbon-saving operation, these driers are eligible for government subsidy in Germany, Austria, and Switzerland. According to the vendor, customers may obtain subsidy amounting to as much as 40 percent of the total cost incurred.

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