

≡ No More Drying Induced Staining

Fast and stain-free drying of products with complex geometries and decorative surfaces ranges among the more challenging drying jobs. A manufacturer looked for a drying method to improve their process quality and came upon heat pump based condensation drying.

World-renowned fitting manufacturer Hansa of Stuttgart, Germany, now a company of the Finnish Oras Group, wanted to optimize their production process in terms of drying at their Burglengenfeld site. The operation of their existing three steam heat exchanger type drying stations was not considered satisfactory any longer. The manufacturer of high end kitchen and bathroom fittings wanted to eliminate several problems. First, the racked fittings were incompletely dry at the end of the cycle time. Second, the drying temperature was high enough to leave or even burn-in stains on the classy surfaces so that the hot fittings had to be reworked manually after drying. Plus, the high power consumption did not comply with Hansa's philosophy as Matthias Reiser, Supervisor Chromeplating, put it - *Our products are destined for the sustainable use of water. We want a sustainable use of natural resources for our production processes.* Hansa found drying system manufacturer Harter of Stiefenhofen, Germany, as a business partner who was able to meet their quality requirements in terms of drying results and consumption of energy.

Tests as a Foundation for Successful Drying

Reinhold Specht, managing owner of Harter, visited the Hansa site and suggested to conduct drying tests in Harter's in-house pilot plant station. Such testing has demonstrated to be a reasonable approach in hundredth of projects in that it provides the necessary information on which further design may be based. The tests are made to determine the parameters required for successful drying, namely time, temperature, humidity, airflow rate, air speed and air routing. Hansa provided some of their cast brass fittings for test purposes and witnessed the tests at the Harter premises.

Highly complex products such as fittings with their bores, holes and recesses are basically very difficult to be dried. Many factors, including the racking method, need to be considered to obtain satisfactory results. The series of tests were run at temperatures between 50 °C and 75 °C and with the fittings racked in dif-

ferent ways. The tests showed that all types of fittings could be dried completely within the specified cycle time if specific parameters were used. So, there were no more obstacles to continued planning and investment.

Reasonable Use of Energy

The three obsolete drying stations were replaced by three new Harter dryers. These are made from rugged polypropylene and have an automatic lid system. The lids open and close automatically before and after drying. They are a major contributor to the efficiency and sparse consumption of energy. Each dryer includes ten special fans ensuring optimum and efficient internal air recirculation. They have a rated power of 0.7 kW each. Each dryer also includes a heater battery with hot water supplied through long-distance heating.

Our ambition was to use the hot water produced in our combined heat and power unit for the dryers as possible, explains Stefan Mändl, Maintenance Team Manager. The heater bat-



Fittings with complex geometries entering one of the three dryers



The Airgenex dehumidification module provides the required process air

SURFACES

terry mentioned is used only when the dryer is started so that the operating temperature is obtained faster. The use of low cost energy is, of course, ideal. The three dryers are connected to a so-called Airgenex® dehumidification module which conditions the process air required for drying. The heat pump used in this process makes the module highly energy-efficient. The Airgenex® module may be placed next to the dryer or as far as on another floor if required for space restrictions. Module and dryer are always connected by insulated tubing to retain the precious heat inside the system. In Hansa's application the Airgenex® dehumidification module is placed in the immediate vicinity of the dryer. The rated power of the overall system in production operation is about 29 kW.

Faster and Better

After leaving the hot rinse the fittings suspended on the racks are moved in one of the three dryers. Today, the fittings are dehumidified in

the closed system at a gentle temperature of 70 °C. After the specified cycle time, all fittings are completely dry and stain-free. Manual rework is no longer required. As Reinhold Specht puts it - *Heat pump based condensation drying is successful through the combination of efficient air dehumidification and appropriate air routing.*

The dehumidification module produces extremely dry and thus unsaturated air. This air is passed over or through the items to be dried inside the dryer absorbing moisture in the process. Back in the dehumidification module, the air is stripped of the moisture it carries. The moisture condenses and the condensate is drained off the system. Then, the cooled air is reheated using the energy recuperated and passed on to the dryer. This circuit is closed.

Drying may basically be effected at temperatures between 40 °C and 90 °C as required for the specific application. We pass the dry air exactly to the place where it is intended to ab-

sorb moisture. Appropriate air routing is key to success. And we have meanwhile gathered a lot of experience in air routing, says Specht.

Contact

Harter GmbH, Reinhold Specht
reinhold.specht@harter-gmbh.de
www.harter-gmbh.de
➔ www.harter-gmbh.de

Hansa Armaturen GmbH, Stefan Mändl
E-Mail: stefan.maendl@orasgroup.com
➔ www.hansa.com

HARTER
drying solutions



NO MORE WET PARTS.

Do not compromise on DRYING if you want the best and most reliable results.

Harter dryers are government sponsored.

Your DIRECT partner: **HARTER GmbH** | ☎ (+49) 08383-9223-0 | info@harter-gmbh.de | www.harter-gmbh.de