

Static Drying of Bulk Material

Drying bulk material used to place many an operator in a dilemma. Spinning in a centrifuge tended to leave surfaces scratched. Omitting spinning left bulk material wet. So, what to do? Actually, there is an alternative on the market that is capable of perfectly drying bulk material in static mode.

More than 20 years ago, drying system manufacturer Harter's extensive development effort was rewarded by finding a special solution for drying bulk material in fully static or minimal intermittent movement mode. Hundreds of bulk material dryers have since been designed and built. Still, widespread belief persistently holds that this is impossible. Harter's heat pump based condensation dryers can prove otherwise, again and again. Prospective customers may visit reference clients or have drying tests run in Harter's pilot plant station. "Prospects may convince themselves of how powerful our technology can be for their special portfolio" says managing owner

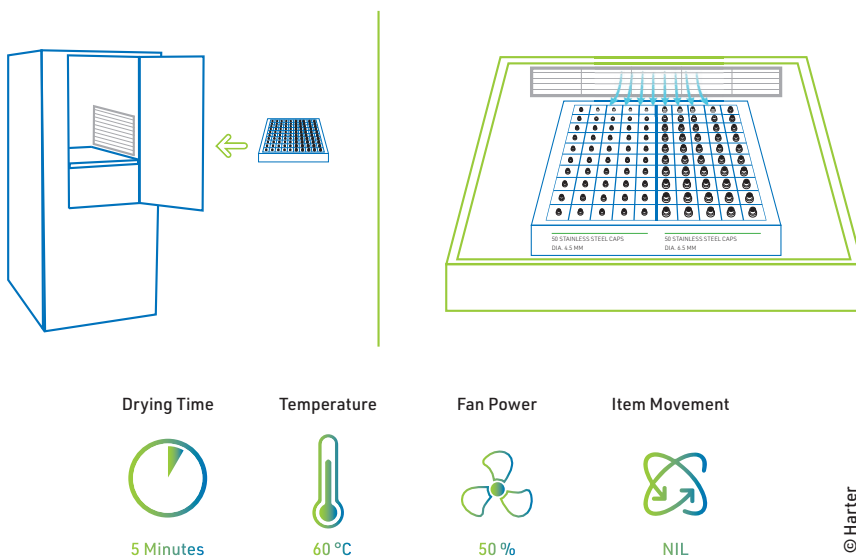
Reinhold Specht. Series of tests are conducted to determine the parameters controlling successful drying, namely time, temperature, humidity, airflow rate and speed, and air routing. Specht continues: "Drying tests form the basis for dryer design. This procedure has proved itself excellently over the decades."

Tests to Ensure Success

This is exactly what was done for the Pforzheim jewellery manufacturer Schofer Germany. The family business with long-standing tradition is specialized in manufacturing jewellery chains. 95 percent of their products are sold to custo-

mers around the globe. Obviously, quality has top priority in this line of trade. Schofer used a classic centrifugal dryer with its generally known drawbacks. This dryer featured drying times of 30 to 60 minutes and temperatures between 50 °C and 80 °C, as required for the specific items to be dried. Executive Assistant Max Zorn badly wanted a change to this situation and looked for a potential alternative. On recommendation by another company, he learned about drying system manufacturer Harter and contacted them. For Schofer, the issue at hand was the drying of small stainless steel caps of various sizes that required absolute freedom from staining. These caps are first cleaned and need to be dried thereafter. For subsequent plating, the caps must be absolutely free from staining, otherwise the plate would be compromised. Schofer's primary requirement was a fully clean and dry surface.

For the purpose of the tests, the caps were placed in plastic caskets. The responsible engineer varied the drying parameters to find the best result. Airflow rate and speed required special attendance. As the caps are very lightweight, the challenge was to control the airflow rate such that the caps remained in place while an adequate amount of drying air was supplied for the process. Finally, the engineer combined the parameters to form a reasonable result. "We were very impressed to see that this drying technology produced such a good result within this short period of time", Zorn reports.



Stainless steel caps of various sizes placed in Baskets were subjected to intense drying tests

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The compact dryer was purpose developed for small quantities of high quality products – dried in baskets, on racks or individually

Variable Small Dryer

Harter developed a compact chamber dryer for drying smallest items. It may be employed in conjunction with racks, baskets, or individual items. Schofer uses a manual process, processes comparatively small quantities of jewellery items and has a portfolio including a large variety of items. So, the compact dryer was the best answer to their special requirements.

The compact dryer features a special shelf to accommodate caskets or baskets alternatively. It also includes a rotating motor so that items suspended on rotating racks may be dried. All jewellery items are perfectly dried within five minutes at temperatures ranging from 45 °C to 60 °C, as required for the geometry of each individual item. There is no centrifugal movement. Drying is accomplished in fully static mode. So, there is no danger of the delicate appearance of the items deteriorating. By standard, this dryer includes a special fan to recirculate the process air. 50 percent fan power is sufficient to produce the drying result needed by Schofer. This further enhances the inherently high energy efficiency of

this dryer and provides opportunity for processing larger quantities or other products.

Dry Air for Dehumidification

Harter drying systems operate at low temperature levels. This applies to racked items, bulk material as well as continuous processes. Items are dried at defined temperatures between 40 °C and 75 °C. Harter's heat pump based condensation dryers use a physically alternative approach which, according to Harter, stands out from all conventional processes. This drying method is based on highly efficient air dehumidification combined with precise air routing. Extremely dry and thus unsaturated air is passed over or through the items to be dried. By its very nature, the dry air quickly absorbs any moisture present. The moisture laden air has its humidity extracted in the so-called Airgenex dehumidification module. The air is cooled and the moisture condenses to form water. The air is then reheated and recirculated to the dryer. The air circuit, and thus the energy circuit, is closed. This renders the drying cycle almost emission-free.

Process Reliability and Government Subsidy

“Even the driest air is of no avail unless directed to the place where it is supposed to absorb humidity” explains Specht. Air always follows the path of least resistance. For drying to be successful, it is essential to adequately control the air route. Harter has gathered experience in and collected know-how of air routing for more than three decades.

Those who wish to change their process should also have a close look at their cleaning process. If the water used for cleaning is contaminated particles will be left on the surfaces of components. Drying cannot be perfect unless items are properly cleaned beforehand. For jewellery manufacturer Schofer, established in 1904, investment in the compact dryer resulted in an enormous quality improvement.

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There is still another bonus – Those who invest in Harter technology may expect to receive government support. Harter dryers are efficient and carbon saving enough to be eligible for grants. Not only German but also Austrian and Swiss customers may obtain subsidies amounting to 40 percent maximum of the total cost incurred. “For us, the drying project was first class at every level” says Zorn in summary.//

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