

Watches Dried in Continuous Operation

Dry premium wrist watches at low temperatures in a fast, gentle, and stain-free way. This customer requirement is met by a sophisticated belt dryer in only five minutes.

A famous Swiss luxury watchmaker required a system for post-cleaning drying to be integrated in a new production line. They wanted the solution to be a continuous type. The critical requirement to be met was the specified 10 minute cycle time for wet watches to become perfectly dry. Also, 50 °C drying temperature should not be exceeded. Another must was absolute freedom from staining.

Positive Experience Tipped the Balance

The manufacturer of luxury watches already had several drying systems operating on the heat pump based condensation principle. These systems have been in use for various process operations at various production sites. They include various rack dryers for case components or larger gears, or basket dryers for minute bulk items. Having made positive experiences with all these systems the customer had ample reason to turn to the same development and technology partner, namely drying system manufacturer Harter.

As much as 85 Percent Energy Saved

With their purpose-developed heat pump based condensation, Harter has successfully positioned themselves on diverse markets including the automotive, electronics, and optical industry, watches and jewellery, pharmaceuticals, and medical devices. Energy or carbon savings obtained by the energetically closed heat pump based system amount to as much as 85 percent or 79 percent, respectively.

“These are reliable figures taken from government subsidy approvals granted to our customers” explains Regina Mader,

Director of Harter. Harter’s heat pump based dryers were recognised as future technology in Germany, Austria, and Switzerland in 2017. Customers may obtain government subsidy ever since. “Once a nice-to-have energy-saving has become a criterion for investment today, besides better product quality” Mader expands on this issue.

Tests on the drying system manufacturer’s in-house pilot plant station demonstrated

that the watchmaker’s high requirements were met in this project, too. The results of these tests were a solid and reasonable basis for system layout and design. In these tests, finished watches were dried to define the processing parameters for successful drying. Ten watches, each, placed in a tray were cleaned and then dried under various conditions. It turned out that the overall geometry of tray and watches was very complex. There was



The trays with the premium watches are perfectly dry and stain-free after five minutes maximum.



The belt dryer features an air blow-off provision and a special air recirculation system.

also much water entrapped and difficult to remove. The solution ultimately designed and built was a belt dryer with a special air blow-off provision.

Belt Dryer with Non-compressed Air Blow-off

The premium watches are processed at 45 °C for 5 minutes maximum to become perfectly dry and stain-free. Drying is accomplished within the specified low temperature limits. The drying time was reduced to half the specified maximum, and staining was eliminated. Trays holding 10 watches each enter the dryer. An integrated water blow-off provision ensures that the large quantity of water entrapped may be removed. The provision consists of two nozzles running parallel to the belt. They have the same length as the belt and are attached above and below the belt, respectively. While the trays advance with the belt, the two nozzles remove the better part of the water entrapped. Drying proper takes place at the same time with the highly saturated air stripped off its humidity in the drying system. This way, the watches in their trays are dried within a few minutes.

The belt dryer built is 1,500 long, 1,200 wide and 1,800 mm high. It has three different fans installed. One fan is used to recirculate the air in the system, the other two fans provide for non-com-

pressed air blow-off. An observation window enables the customer to watch the process at any time, in addition to the feedback provided by the controller. The dehumidification module is placed next to the dryer and connected to it by insulated ducting. The module conditions the required process air. This is extremely dry and, thus, unsaturated air which is passed over the items to be dried. By its very nature, the air absorbs humidity very quickly. The now saturated air is then cooled in the dehumidification module. The humidity condenses to form water which leaves the system. The air is reheated in two stages and returned to the dryer. The whole system is closed in terms of air and energy. The condensation drying process is therefore independent of environmental conditions and the seasons. It is reliable and reproducible.

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