

Saving Energy and Cycle Time with Novel Drying

Many a hot air or fan type system has failed when it came to properly drying bulk material. It requires a trick and a half to dry smallest parts in the barrel. With a suitable drying system, plating processor ODU has reduced the cycle time by 75 percent.

The drastically enhanced efficiency was obtained by Otto Dunkel GmbH & Co. KG, or ODU for short, of Muehldorf, Germany. What required 20 minutes before was now completed with less than five minutes – with excellent quality results, at that. This special project was realized by the international leader for electrical connecting systems in co-operation with drying system manufacturer Harter of Stiefenhofen, Germany.

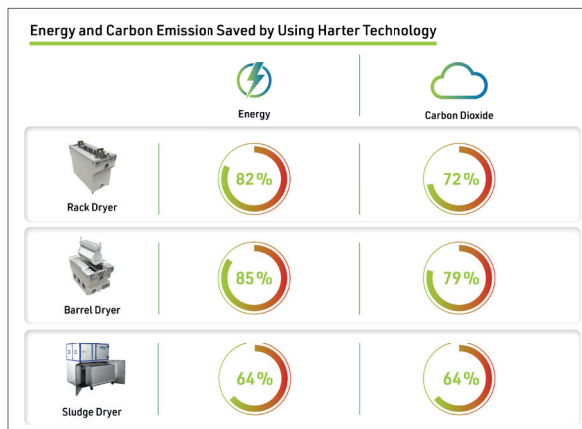
The two companies have known each other for quite some time. ODU has had a Harter sludge dryer in operation for some years. ODU use a chamber filter press to dewater their plating waste sludge and then use the dryer to dehumidify the sludge to a uniform dry matter content of 85 percent. Drying reduces the weight and volume of the sludge by as much as 60 percent. Transport and deposition cost are reduced by the same percentage. When the drying system for pins and connectors in the plating line was working to capacity, ODU decided to change to Harter technology in their production, too. Preliminary tests were run to demonstrate whether the heat pump based condensation drying system was also capable of producing the desired results in this area. “We were very surprised to see that our sensitive pins were completely dry within shortest time”, reports Michael Antholzner who is responsible for ODU’s plating production. Harter tested various existing baskets with vibration unit. These baskets have different diameters and can hold different quantities of bulk material, accordingly. ODU produce a total of some 100 million pins and connectors a year. The test results for all baskets were the same and they were all very good. So, the decision came easy for ODU to invest in this alternative drying technology, which is both efficient and energy-saving.



Since 2017, customers may apply for government subsidy for using Harter technology which has demonstrated to save energy and carbon emission by up to 85 percent or 79 percent, as applicable.

Quick and Flexible

Harter’s drying system built for ODU includes several components. One is the Airgenex 9500 dehumidification module that conditions the required process air. Then, there are two dryers connected to the dehumidification module through insulated ducting. One dryer accommo-



Pins and connectors in baskets with vibration units are processed at 50 °C to become perfectly and uniformly dry within five minutes. The cycle time was reduced by 75 percent as a result of the efficient heat pump technology employed.

dates the carrier for a single basket, the other dryer the carriers for two baskets. The single-basket dryer includes round vibration units with diameters ranging from 180 to 300 millimetres. The double-basket dryer houses identical baskets 120 millimetre in diameter. The applicable carrier is inserted in the dryer, the lid system closes automatically, and the drying cycle starts. The bulk material is perfectly and uniformly dry after only a few minutes. Conformance with this requirement is continuously verified by strict quality control. The drying temperature is about 50 °C. This low temperature goes easy on both workers and materials (baskets and items to be dried). The dehumidification module was placed next to ODU’s production line. The module may also be installed on other floors or on a platform in applications where space is restricted. For the purpose of this project, the dehumidification module was dimensioned such that additional drying chambers may be integrated at a later stage. UDO plans to instal another two barrel dryers. But how may perfect drying of bulk material be achieved anyway? And with various basket sizes at that?

Air Dehumidification and Routeing

Harter systems operate with extremely dry process air. When very dry, air is unsaturated and may absorb any moisture present very quickly. Harter has made use of this

effect for more than 30 years. “We pass dry air over or through the items to be dried, and may thus dehumidify the latter extremely quickly”, explains Reinhold Specht, managing owner of Harter. “But” he adds “the air must be routed precisely, otherwise it would take the path of least resistance. Success is only obtained if these two necessities are combined.” This implies that each drying chamber has a special sealing system integrated in order to ensure that the process air strictly follows the defined path. “There is much experience and know-how involved in adequate air routeing” expands Specht. With an engineering trick, Harter succeeded in designing the sealing system of the single-basket dryer such that bulk material in baskets of any diameter may in fact become completely dry. ODU may easily modify the double-basket dryer for use with a single basket. This provides maximum flexibility of use for the connector specialist.

There are systems operating in a similar way, yet exhausting the process air into the ambience. Harter’s systems are closed air-wise. This does not only save a lot of energy but also relieves the impact on the ambient production area, the workers and, of course, the environment.

Balance and Vision

The new system also outpoints the obsolete hot air system in terms of energy. The two drying chambers include two fans each with a connected load of only 1.6 kW. The total system has a rated current of 8.9 kW in production operation. This record is attributable to the energy-efficient heat pump system – the core of the dehumidification module and, thus, each drying system. Customers may sometimes save up to 85 percent of their energy cost by acquiring a new system. ODU saves some 65 percent of the energy cost incurred before their investment. These are the figures determined for an application for government subsidy which ODU submitted with the help of a specialized energy consultant. In 2017, Harter’s drying technology was classified as future technology eligible for government subsidy. Having obtained 75 percent cycle time reduction ODU is now free to increase their output and advance their business. “This is an additional major benefit for us” says Antholzner in summary.

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