With Government Support to the Latest Drying Technology

Investment in energy-saving heat pump technology fixes staining and quality problems and is subsidized at that.

Rudi Göbel GmbH & Co. KG produces plastic, metal and silicone injection moulded, blanked and hybrid components. These parts are formed, joined and surface finished. The company based at Helmbrechts, Upper Franconia, Germany, was founded in 1957 and has since become a specialist supplier offering a widely varied product portfolio to customers all over the world.

Examples of metal parts manufactured by Rudi Göbel GmbH & Co. KG (Photograph courtesy of Rudi Göbel GmbH & Co. KG)

Components having undergone some plating or coating process obviously must be dried subsequently. Much as many other manufacturers, Göbel had long used a simple hot air blower to do the job. Water present on the surfaces of the metal parts evaporated at 85 °C. This resulted in strong heating and staining of the parts as well as failure to fully dry the parts within the seven-minute cycle time. The subsequent soldering process, which requires absolute freedom from staining, was sometimes impaired if impossible. Also, given that the parts were very hot workers had to handle them with great care. And the dated hot air blower, of course, consumed loads of energy. Senior director Franz Pichler has always acted on the maxim to keep abreast with the state of the art, and this is exactly what also his son, director Frank Pichler, has done to date in all factories of the Rudi Göbel Group. It was about time to bring in a new, efficient, and ecologically reasonable technology for drying, too says factory manager Reinhard Schneider. A construction company gave the materials specialist a recommendation.

Tests and Cycle Times

Drying system manufacturer Harter of Stiefenhofen, Germany, followed their standard operating procedure for this project. They tested original Göbel parts in their in-house test station for response to various drying parameters. The tests witnessed by Göbel's project managers showed that the customer specified criteria could easily be met. Owing to its alternative physical approach Harter's condensation drying technology may operate at low temperatures variable between 40 °C and 75 °C. The heat pump integrated in every system makes it extremely efficient. This is why the drying times required are very often much shorter than the specified cycle times. Also, energy consumption is considerably lower compared with conventional dryers. 60 °C, four minutes drying time, zero staining – the results were impressive.

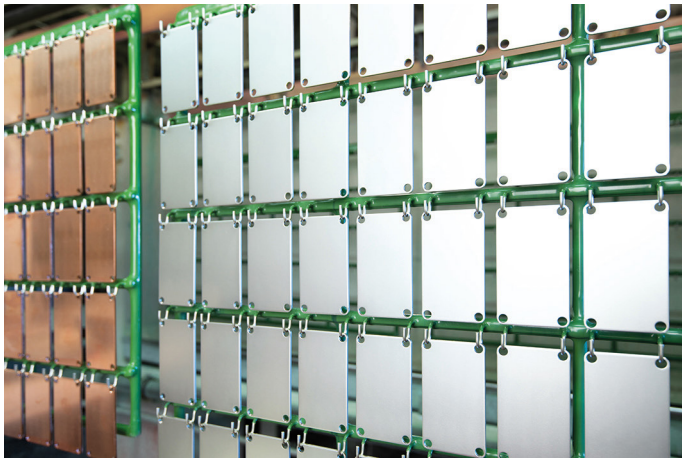
No Heat Stroke

Today, Göbel have two Harter rack dryers in use. Their internal dimensions in direction of rack travel are 350 mm long, 1,400 mm wide and 1,600 mm high or 350 mm long, 2,250 mm wide and 1,600 mm high, respectively. The two dryers are made from polypropylene and feature an automatic lid system opening only upon loading or unloading the product carriers. This way, the precious heat is contained inside the system during the drying process. There is no exhaust air and, thus, no moisture load on the workers in the production area. Drying takes place at 60 °C as determined by the preliminary tests. After the extremely short drying time of four minutes the items are completely dry and do not show any stains. Also, items do not become warmer than 45 °C within this short processing time, which makes immediate subsequent processing possible.

Closed Air Circuit

All Harter dryers have an in-built air recirculation system featuring customized

Rack upon entering the dryer subsidized in account of its energy efficiency (Photograph courtesy of Rudi Göbel GmbH & Co. KG)



After four minutes at 60 °C items are completely dry and free from stains (Photograph courtesy of Rudi Göbel GmbH & Co. KG)

air routeing. The Göbel dryers have four or six air recirculation fans, respectively, to produce the required air flowrate. Also, the dryers include special air nozzles to blow off a large amount of water from the items as the product carrier enters the system. The nozzles are non-compressive air types and, thus, energy-saving. Harter frequently uses this option where highly complex component geometries or extremely short drying times are involved.

A drying system basically consists of the dryer proper and an Airgenex® dehumidification module which conditions the required process air - extremely dry air passed at customized speed over the surfaces of the items to be dried. By its very nature, the dry air quickly absorbs any moisture present. Once returned to the dehumidification module this air is cooled, the moisture condenses to form water. The air is then reheated and recirculated to the dryer. It is an established fact that Harter dryers are the only systems on the market with a closed air circuit and no exhaust air.

Much Money for Little Energy

Heat pump assisted condensation drying is also very attractive under energy aspects. The Airgenex® dehumidification modules have a power rating of 4 kW each. The air recirculation fans, specially built for Harter and optimized again and again over the years, have a rating of only 0.7 kW. The total rated power in production operation of the systems installed with Göbel is 6.8 kW or 8.2 kW, respectively. An enormously low rate in Schneider's opinion.

Owing to this high efficiency customers may apply with BAFA (Federal Office for Economic Affairs and Export Control) for a government grant amounting to 40 percent of the investment volume. For customers to overcome bureaucratic barriers Harter has partnered with an energy consulting firm to see about the application, if desired, which they have so far done one hundred percent successfully. Schneider contentedly comes to the following conclusion: *The subsidy for this innovative technology is an asset that has added to the substantial quality improvement achieved.*

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