How Drying Can Produce Multiple Gains

The co-operation between GALVANO WULLIMANN and HARTER is characterised by a longstanding and reliable partnership with an ambition for highest quality. The German drying system manufacturer was entrusted with several drying projects for the Swiss electroplating subcontractor. These projects shortened drying periods, expanded capacity, ensured quality, reduced energy cost, and saved space. The icing on the cake of WULLIMANN's gains were the government subsidies granted for the projects.

Comment le séchage permet de réaliser des bénéfices

Un partenariat fiable de longue date, avec l'exigence d'une qualité maximale, voilà ce qui caractérise la collaboration entre les entreprises Galvano Wullimann et Harter. Le fabricant de systèmes de séchage du sud de l'Allemagne a pu réaliser plusieurs projets de séchage pour la grande entreprise suisse de galvanisation a façon. Ces projets ont permis de réduire les temps de séchage, d'augmenter les capacités, de garantir la qualité, de reduire les coûts énergétiques et de gagner de la place. Le fait que Wullimann ait en outre obtenu des subventions de l'État a permis d'accroître ses gains.

Galvano Wullimann of Selzach is one of the biggest electroplating subcontractors in Switzerland. They focus on high quality platings of diverse metal parts for use in automotive, civil engineering, fixtures, furniture, and mechanical engineering applications. Fastener components, stampings and machine elements are surface finished in ten large facilities. They process 10 to 30 tons of functional and decorative surfaces daily. Years ago, WULLIMANN learned through the Swiss-galvanic trade association of German drying system manufacturer HARTER whose customer base includes many renowned Swiss companies. HARTER developed their heat pump based condensation drying more than 30 years back. HARTER has resolved many drying problems and optimised many processes with more than 2,000 drying systems installed primarily in Germany, Austria, and Switzerland to date. Back then, the South German company was much ahead of the time with their heat pump technology. Today, their extremely energy efficient systems go with the flow, more than ever. As a matter of fact, energy saving has become a crucial incentive for investment, besides quality improvement. Moreover, buyers of HARTER dryers obtain government subsidy in Switzerland, Austria, and Germany.

Testing as a Bedrock

HARTER's in-house Test Center is a powerhouse of ideas. It is the place where components of prospective customers are tested to determine their drying properties and the parameters for successful drying. In the case of surface finishing subcontractors, who do not really know which parts they will electroplate in the future, HARTER tests their geometrically most complex items.

Reinhold Specht, Managing Owner of HARTER, explains: "A certain time allowance is always factored in the subsequent system layout and design because reliability has topmost priority." The customers are thus best placed for the future.

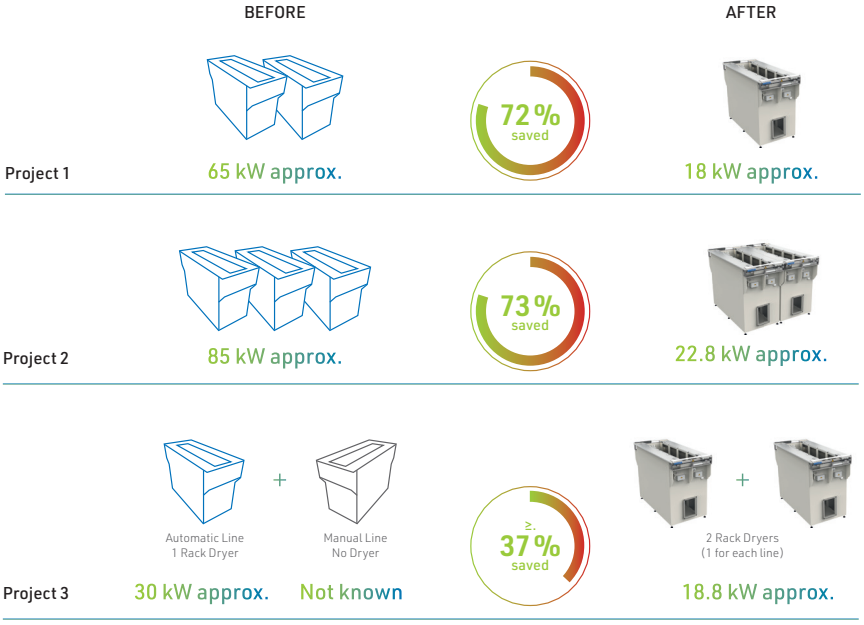
"For us, the drying tests were an ideal opportunity to see, with our own eyes, if and how well HARTER's technology works," reports Tobias Moser, CEO of WULLIMANN, about the tests for the first project. The metal parts of complex geometry were dry after four minutes at 70 °C, other parts comparatively faster. As the two existing dryers had a total dwell time of 18 minutes, it became quickly clear that a second dryer would not be required for the future. "This gave us an abundance of improvements and opportunities." Moser adds. WULLIMANN used the same approach for the second project. Testing was dropped for the third project because the key parameters were known and confidence in the technology had been established by then.

2017 project: Two replaced by one
So, the two obsolete dryers were decommissioned and one new rack dryer made from polypropylene installed. As space was restricted, the associated heat pump module was placed in the basement. The module conditions the required process air and is also responsible for the condensation process. It is connected to the dryer through insulated air ducting. Today, components are processed at 70 °C for four minutes max. to become completely dry and stain-free. For components reluctant to be dried, HARTER integrated additional air knives at the last rinse. These use non-compressed air and remove an initial large part of the water entrapped. A frequency transformer controls the airflow rate and air speed as required for the specific items to be dried. The space saved by the new dryer is used for a nickel tank in the plating line, today. This added to WULLIMANN's increased productivity. The heat pump module was designed to allow for connecting a second dryer if required for more capacity. So, WULLIMANN is best prepared for all contingencies.

2020 Project: Three replaced by two
Beim zweiten Projekt von Wullimann ging WULLIMANN's second project was, again, about an existing line and process optimisation. The three original rack dryers had done their duty and were replaced by two rack dryers that were up-to-date technically speaking and in terms of energy. The two new dryers, as any HARTER dryer, feature an air recirculation system which ensures uniform air distribution inside the dryer. The airflow is always produced by special fans developed by HARTER in co-operation with a long-term supplier. Eight fans are installed in each dryer. The cutting-edge EC fans have a connected load of only 0.5 kW, and their speed is infinitely variable as required for the specific items to be dried. The geometry of the items processed in this line did not require an air blow-off provision. The two dryers have their process air supplied by a single heat pump module. The cycle time in this line is four minutes. The items are processed at 60 °C for a period not exceeding seven minutes to become completely dry and stain-free. The former process had required 12 minutes to produce lesser quality results.
"In the time between the two WULLIMANN projects, our heat pump dryers were classified as future fit technology throughout the region comprising Germany, Austria, and Switzerland." reports Specht in retrospect. Miroslav Martic, CTO of WULLIMANN, gladly adds: "On top of all the improvements achieved we enjoyed government subsidy." The Swiss plating specialist will also receive government subsidy for another project which is being realised.

2023 Project: A new variation
The third project which the two owner-managed companies are getting off the ground in a joint effort is somewhat different. It is about two dryers. One is part of a manual line, the other is to be integrated in an automatic line. Such split configuration is also possible. In the manual line - where no dryer has been installed so far – parts are electropolished. The automatic line – where aluminium parts are anodised - has an existing drying station. Dryers for the two processes are now being installed. Again, the two dryers have the required process air supplied by a single heat pump module. While the manual line dryer needs only two fans, the automatic line dryer features six fans. The fans used are, again, cutting-edge EC types. The heat pump modules in all WULLIMANN projects feature electric booster heaters. These are only used when the process starts. The purpose of the heaters is to produce the required temperature as quickly as possible. They are shut down when this temperature is reached. All dryers also feature automatic lid systems to retain the precious heat inside the system. This is also the reason why air ducts are insulated. "So, we have designed our drying systems to be maximally efficient in every aspect," explains Specht.

Dry and to the point
Grundlage für eine erfolgreiche TrockThe success of HARTER's system is based on two components. First, efficient air dehumidification, and second, appropriate air routeing. HARTER uses an alternative physical approach for the process. Extremely dry and thus unsaturated air is passed over or through the items to be dried. In this process, it absorbs any humidity present. The air is subsequently stripped, in two stages, of the humidity is carries using the Airgenex® dehumidification technology. The humidity condenses, and the condensate is drained off the system. Then, the cooled air is reheated, again in two stages, using the energy recuperated, and passed on. The air circuit is closed. Drying is always performed at temperatures between 40 °C and 75 °C which may be varied for the specific application. Specht explains: "It is now important to combine air dehumidification with targeted air routeing. Because the driest air is of no avail unless directed to the place where it is supposed to absorb humidity." Appropriate air routeing design is part of the wealth of experience held by the drying system manufacturer, who is strongly rooted in their home region. This is particularly true for bulk material applications which may be in-container dried using the HARTER technology. Martic summarizes in conclusion: "The change to heat pump dryers is a big gain for us in many respects. We also feel very comfortable with HARTER's personal and professional dealings."



About Harter GmbH

HARTER DRYING SOLUTIONS is a drying system manufacturer of Stiefenhofen, South Germany. The company manufactures and sells heat pump based condensation drying systems. HARTER developed this technology in 1991. It is used for drying off adherent water from cleaning or paint coating, and for drying industrial sludge. HARTER dryers are meanwhile used for pharmaceutical, medical devices, food and pet food applications, too. The energy-saving technology has been eligible for government assistance in Germany, Austria, and Switzerland since 2017. HARTER has a workforce of 100 and manufactures everything at their Stiefenhofen site.

About Galvano Wullimann GmbH

GALVANO WULLIMANN is an electroplating subcontractor for functional and decorative surfaces. They focus on surface finishing metallic small, bulk, and racked parts - particularly fastener components, stampings, and machine elements. Based on more than 70 years of company tradition and experience WULLIMANN offers services to renowned customers of the automotive, civil engineering, fixtures, furniture, metal and mechanical engineering industry. WULLIMANN has ten large plating facilities for processing a daily 10 to 30 tons.

Contact

■ Harter GmbH

Reinhold Specht

D-88167 Stiefenhofen
Tel. +49 8383 / 9223-15

www.harter-gmbh.de

■ Galvano Wullimann AG

Miroslav Martic

CH-2524 Selzach
Tel. +41 32 641 60 60

www.galvano-wullimann.ch

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