

# JOT

Journal für  
Oberflächentechnik

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## SPECIAL Galvanotechnik

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### Hartverchromung

Serienbeschichtung in  
Hochgeschwindigkeit

### REACH: Chromtrioxid

Aktueller Stand einer  
unendlichen Geschichte

### Messsystemanalyse

Messprozesse mithilfe  
Röntgenfluoreszenz optimieren



**HARTER**  
drying solutions

SPECIAL PRINT

Aviation – Drying a Safety Factor

# Aviation – Drying a Safety Factor

A supplier of civil and military aircraft structures invested in a new anodizing line including a flaw inspection facility to increase their capacity. Complex geometries and varying sizes of components required a special drying concept.

Reinhold Specht

Large and complex components made from aluminium, titanium and CFRP are designed and manufactured in factories of a global supplier of civil and military aircraft structures. To manage an increase in capacity it was initially considered to have all components subcontract anodized and dried. Yet, there were hardly any subcontractors globally to offer such services for components as wide as six metres. So, the aircraft equipment supplier invested in a new anodizing line including a flaw inspection facility. They also needed a suitable drying concept to go with their processing line.

Drying system manufacturer Harter has

developed and designed heat pump assisted condensation dryers for 30 years and installed much more than 1,000 systems in various branches of industry. Drying tests of original components in the Harter test station ultimately convinced the aircraft supplier's project manager of the Harter drying technology.

## Large Size Dryers

The new TSA anodizing line includes two rack dryers in tandem. The polypropylene dryers are very large to match the 6.30 m wide anodizing line. They are used to dry aluminium components at 50 °C in accordance with an aircraft component

processing specification. Three additional polypropylene dryers are associated with the flaw inspection facility where the highly sensitive aircraft components are exposed to ultraviolet light in a dark-room to reveal flaws, if any. This does not work, however, unless the components are completely dry. The three consecutive drying stations also operate at specified temperatures of 75 °C or 70 °C, respectively. Other than in conventional electrochemical deposition projects, the cycle times are defined by aircraft standards. Following drying, the components are cooled to about 20 °C in a stainless steel cooling station with an inbuilt cold water battery and then subjected to flaw inspection.

Related dryers are connected to one Airgenex dehumidification module each. A total of three such modules is installed – one for the TSA anodizing line and two for the flaw inspection facility. The dehumidification modules provide the required process air which must be extremely dry.

Most of the aircraft components to be dried have complex geometries highly liable to water entrapment. Plus, as the components have varying sizes, the number of the components to be dried at any time is also continuously varying. This is why the dryers are designed to cope with the components most difficult

















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An aircraft equipment supplier needed an efficient drying concept for their new anodizing line and flaw inspection facility



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Large size rack dryers can process aluminium components as wide as 6 m to become completely dry (photograph showing an example for drying 4.4 m max. widths)

		Number of fans	Connected load per fan	Connected load, total
<b>TSA Anodizing Line</b>				
	Rack dryer I and II	20 each  	0.5 kW each	20 kW
	Airgenex 30.000 dehumidification module			41,6 kW
Rated power of TSA anodizing facility dryers in production operation				
<b>Flaw Inspection Facility</b>				
	Rack dryer I and II at 75 °C	20 each  	0.7 kW each	28 kW
	Airgenex 30.000 dehumidification module			41,6 kW
Rated power of flaw inspection facility dryers I and II in production operation				
	Rack dryer III at 70 °C	20 	0.7 kW each	14 kW
	Airgenex 15.000 dehumidification module			15,9 kW
Rated power of flaw inspection facility dryer III in production operation				

Two rack dryers are installed in the TSA anodizing line and another three in the flaw inspection facility. Related dryers are connected to one Airgenex dehumidification module each.

to be dried. The drying parameters are determined on the basis of drying tests at the Harter premises. Such tests are indispensable for challenging projects.

### Energy and Carbon Saving

Upon completion of the project, the aircraft equipment supplier declared themselves highly satisfied. All standards were met and all engineering specifications fully complied with. The dryers do not

only provide quality drying results, they also contribute to saving energy. They feature an automatic lid system opening only as components are loaded or unloaded to retain the precious heat inside the system. The integrated heat pump and the closed air system (ref. info box below) are additional building blocks of low carbon drying. The inbuilt recirculation fans are particularly efficient special types purpose developed for Harter by a longstanding partner.

Owing to the high efficiency of the drying systems customers may apply with BAFA (Federal Office for Economic Affairs and Export Control) for a government subsidy 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.

### Closed Air Circuit

A Harter drying system basically consists of the dryer proper and an Airgenex dehumidification module which conditions the required process air - extremely dry and unsaturated air passed at customized high 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 and the moisture condenses to form water. The air is then reheated and recirculated to the dryer. The dryer proper always has an integrated air recirculation system providing specific air routing. The dry air must be routed exactly to flow over or through the items to be dried so that it may absorb any moisture present. The closed air system ensures that Harter dryers are exhaust-air-free.

### Author

**Reinhold Specht**  
 Managing Owner  
 Harter GmbH, Stiefenhofen, Germany  
 info@harter-gmbh.de  
 www.harter-gmbh.de