

User report

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Flexible technology for safe take-off

A modern aircraft is a highly complex machine. The safety of passengers as well as the reliability and cost-effectiveness of an airline's flying operations depends on error-free functioning of the parts and perfect interactions. This is based on state-of-the-art technology on board - and behind the scenes. It must also enable maximum possible flexibility in the "manufacturing" unit of "VIP and Governance". The spectrum of parts is considerable, customer wishes are extremely individual and maintenance and repair work can be unpredictable.

Expandable systems and maximum data transparency are essential requirements - Lufthansa Technik has the right partners with CAMTECH, master reseller for Edgecam in Germany, and ZOLLER.

State-of-the-art technology on board - and behind the scenes

Next to safety, exceptionally high quality demands are the focus for mechanical manufacturing in the business unit "VIP, business and government aircraft". Individual requirements include the production of high quality components with new geometries every day. A tool pool of approximately 2000 different, complete tools is available for this purpose. Since 2000, the elaborate NC programs for these complex geometries have been programmed using the Edgecam CAM system, and since 2009 also with 5-axis simultaneous operation. Both prismatic parts and free-formed surfaces are milled here.

More and more tool data

Over the years, new requirements were added and necessitated a greater variety of tool data. The distribution over several data bases (i.e. Edgecam, machine control and ZOLLER) resulted in redundant data management. This led to increased inefficiencies and contained potential sources of error due to repeated manual entering of data.



Lufthansa Technik comprises six business areas— one is the area of VIP Services, where production sets highest demands on flexibility.



Lufthansa hangar in Hamburg with approximately 8000 employees



Frank Pieterwas and Jan Horn of Lufthansa Technik with Julian Lüdecke from Zoller and Ulrich Rienks from Camtech/Edgecam (from left to right)

Safety, quality and flexibility

Following the purchase of a state-of-the-art machine pool, investments were also made into high-tech peripherals. The objective was not only to increase process safety, but in particular to ensure maximum flexibility to respond to market changes. Until this time, only a single manual tool presetting machine was in use, labels were printed and the data was entered manually into the machine.

Expandable solutions

The CNC-guided »venturion 450« tool presetting and measuring machine has been in use since 2007. "We decided in favor of ZOLLER, following a cost benefit analysis", explains planning engineer Frank Pieterwas. "Decisive for us was the expandability and linking to the machines." In addition to the potential of introducing a system-superimposed tool data base, there were also a number of application details in favor of ZOLLER. "The graphic user interface for the otherwise laborious presetting of fine drilling tools, for example, or the fact that I can clearly view the cutting edge with the magnifying glass", states Mr Jan Horn, CAM specialist at Lufthansa.

A leading tool data base

The basic machine had been successively extended over the years and Tool Management Solutions had been added. "We wanted the ZOLLER data base, because it is the leading system", says Jan Horn. "If a new tool is set up, it should be entered into the ZOLLER Tool Management data base, so that the name is correct, as well as the description and the T-number. Thus, once entered it can be used by all employees in a standardized manner throughout the entire process and can be found consistently".

The interface from Edgcam to the ZOLLER Tool Management Solutions had already been developed in 2011. In 2013, the Edgcam-CAM system, the tool memory of the CNC machines along with the ZOLLER tool presetting and measuring machine, were linked via the ZOLLER data base.

Data consistency ensures operator independence

This ensured data consistency from the CAM system through to the machine. All data is saved in TMS Tool Management Solutions and accessed by the CAM system. The measuring regulations are saved in the database directly next to the tool



Data consistency from the CAM system through to the machine



Large component spectrum for individual customer requirements



CNC-driven ZOLLER tool presetting and measuring machine »venturion 450«



Creating perspectives for the future - fast response to market changes is possible

and are available on the measuring machine. Professional measurements are made at the push of a button and the tool data is transferred to the machine. This ensures consistency and eliminates all sources of error due to manual entry. Multiple storing of data was thus abolished.

Programming with real data

The tool data is now saved in the leading ZOLLER TMS data base according to DIN4000 and is available in the Edgecam CAM system as a precise, 3D model. The system programs using real data and outputs the data of those tools with which simulation was performed. These can then be assembled on the machine in the same way as they were simulated. Particularly in the case of complex processing methods, it is important to have the true tool data available for programming in order to avoid crashes. And it saves enormously on time.

Error rate has dropped significantly

After the first six months of operation, the error rate had already dropped significantly and employees were given optimal support when looking for possible tools to satisfy individual customer requirements. Of course, the savings can not be quantified as in a series production. However, being able to efficiently search for tools is a factor, confirms Jan Horn and adds "the flexibility for the employees is, of course, a big advantage due to continuous changes on the NC machines. Everyone simply downloads their NC program onto the machine, the tools are included and have standardized descriptions. Everyone can orient themselves everywhere, and all that is occasionally needed is to retrofit a tool: "I use a single set of tool data and it applies to all machines. Once I have written a program in Edgecam, then it also applies to all machines. All I need to do is change the post-processor, send the NC program, and the process is completed. A big advantage with Edgecam is the simple, subsequent change of already programmed parts to other machines".

High process safety with maximum flexibility

Lufthansa-Technik often has to respond to market changes extremely fast. Repairs and some customers unique requirements are often unpredictable. High flexibility is necessary, especially to realize the external manufacturing ratio of up to 70%.

"We have created a perspective for the future with the introduction of these systems" is how Mr Pieterwas summarizes the benefits of the investment. "This also allows us to actively approach the external market. We are independent of our own assembly components. Operating systems such as Edgecam and from ZOLLER, allow us to respond in a flexible manner" – and customers can continue to take off safely in the future.

Lufthansa Technik AG

Everyone knows Lufthansa. Only few people are aware that the Lufthansa hangar in Hamburg employs some 8000 staff for the maintenance, repairs and interior fitting of aircraft. Over 1000 employees take care of the VIP, business and government aircraft.

The "Manufacturing Department" at Lufthansa Technik

This has over 50 years of tradition at Lufthansa Technik. The business field "VIP & Executive Jet Solutions" covers the areas maintenance, design and production. As a full-service provider of technical inspection, retrofitting, maintenance, overhaul and painting, it is possible to offer VIP customers with unique solutions for their aircraft.

E. ZOLLER GmbH & Co. KG

With enthusiasm for testing technology and metrology, E. ZOLLER GmbH & Co. KG., based in Pleidelsheim near Stuttgart, have been developing innovative solutions for greater cost-efficiency in manufacturing process for nearly 70 years. More than 30,000 presetting and measuring machines with worldwide unrivalled software solutions have been installed to date across the globe. ZOLLER is developing more and more from a manufacturer of presetting and measuring machines to a globally operating provider of technology and system solutions. An international network of subsidiaries and agents ensures the highest level of service quality with personal customer care.

CAMTECH GmbH & Co. KG

CAMTECH GmbH & Co. KG is the master reseller of Edgecam in Germany, Austria and Switzerland. The CAMTECH team offers complete solutions, from design to manufacturing. Edgecam is a market leading computer aided manufacturing (CAM) system for NC part programming with unparalleled ease of use and sophisticated toolpath generation.

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