

Lean Manufacturing

Process Knowledge Makes Machining More Efficient

Brought To You by Walter Tools, USA | Nov 30, 2017

Although the topic is not new, it appears as a new item on the agenda on a daily basis: The demands made on manufacturers in the aviation and aerospace industry are becoming increasingly more demanding and complex. And what applies to production businesses, also applies to the machining industry that provides them with the tools they require.

In order to be more cost-efficient, manufacturers need to not only use tools with perfect performance and a long tool life, but also continuously optimize their machining solutions and processes. In this area in particular, Walter – the Tübingen-based machining specialist – has taken on the task of supporting its aerospace customers.

The goal is to create complete solutions that address the complexity of the task and help to increase productivity and cost-efficiency. Thomas Schaarschmidt, Director Business & Application Development at Walter, explains: "Today customers expect their tool supplier to have a high level of expertise in all key operations that are carried out using its tools. This reduces the increasing cost pressure and compensates for the loss of expertise which arises as a result of outsourcing a large number of tasks."

More specifically this means that, in addition to the tools required for the relevant machining solutions and the associated comprehensive service, suppliers must have an impressive recycling and reconditioning program. They must provide extensive technical support and offer simple order processing which is integrated as seamlessly as possible into the customer's workflows. The supplier programs the machining systems (or helps the user's staff to do so) and trains the customer's employees – to name a few of the most important basic requirements.

Crucial Beneficial Effect

The crucial beneficial effect that Walter has been offering its customers for some time now, goes well beyond this: The tool specialist develops complete machining concepts, including all process steps which arise during the production of a component. These concepts are individually tailored to the customer's needs and contain detailed recommendations regarding which tools are used in which step.

Thomas Schaarschmidt says: "We have taken our customers' list of requirements and developed it further. In other words, we have been systematically building on the comprehensive expertise that our customers need to take on the problems and challenges associated with the production of their components. We make this expertise and the discoveries which result for the production process available to our customers. We are thereby actively helping them to use our tools as efficiently, and as cost-effectively, as possible."

First, Schaarschmidt's team defined specific components that are frequently used in the aerospace industry: Structural parts made from titanium aluminum alloys, for example, or engine and landing gear components. The Tübingen-based experts developed complete machining solutions for these components in close collaboration with technology partners from the sector: Key customers, machinery and software manufacturers, suppliers, universities and research institutes.

Did You Know?

Wing ribs are structural components inside the wing. Together with the longerons, they form the frame for the wing skin. Wing ribs are predominantly manufactured from aluminium wrought alloys. These are light, have a high load-bearing capacity and are extremely robust.

Practical Development

"For every component for which we develop a machining solution together with the customer, we analyze the features and look at which and how many variations exist for each component. Then we map the entire process chain as it is implemented at the customer, at Walter in-house or at technology partners. This means that we know every detail that is relevant for machining the customer component."

In the next step, a roadmap is created that defines which steps are to be taken to the finished solution. The specialists identify what they can do where, which processes they have already mastered, where there is need for development and how this should be covered most effectively and in the quickest way possible.

The creation of machining concepts involves tool specialists who bring their expertise in machining turning, drilling, threading or milling using a wide range of different materials. The process also involves component experts who know exactly which challenges associated with the manufacture of specific components need to be overcome.

To enable them to tailor their solutions as closely as possible to the specific requirements of the user, Walter's component managers visit their customers on a regular basis. "Our component managers are deeply involved in the topic, they speak the language of our customers and know exactly where the problem areas lie," explains Thomas Schaarschmidt. Their task is to keep up to date with what the users of Walter tools are currently doing and what optimization measures or open topics they are looking at. Of course, they also gather feedback on the machining solutions recommended by Walter. "Generally speaking, there are one or two large manufacturers for every component – the market leaders, if you will. We use our component approach to work very closely with these companies – with great success."

Solutions With a Competitive Advantage

The solutions that Schaarschmidt's team develops with customers are extremely detailed, with the purpose of creating competitive advantages for customers. It is therefore not uncommon for one machining concept to include hundreds of pieces of detailed information or machining steps or more. This includes numerous variant-specific machining solutions for every component. "Our goal is to offer a complete solution for 80% of the different variants of a component – all documented down to the finest detail, partly standardized and accessible to our specialists at all times."

The result is recommendations that present exactly which tools, machining parameters and processes can be used to produce a certain component at what cost. The experts at Walter pass this detailed information on to their customers via technology days together with technology partners, via roadshows, using training videos or animations on YouTube and, in the future – to deal with the trend in digitalization – via our homepage and augmented reality. "We make absolutely sure that the skills that we have built up for our customers and are continuously adding to are also available to them globally."

It goes without saying that extensive knowledge about future products and requirements also flows into the development processes. Thomas Schaarschmidt clearly explains that this is another definite advantage for Walter's customers: "Forward-looking planning and development enables us to offer our customers a completely new type of machining solution, often right at the start of production of a new product, which is precisely tailored to them. The best example is our new generation of cutting tool material, Tiger-Tec Gold®. Selected customers from the aviation industry have already tested and verified the new coating platform in conjunction with material-specific substrates, e.g. for titanium machining. After the official introduction at the AMB, we are able to support our customers with new component-specific cutting material solutions with immediate effect." It goes without saying that the start-up costs are reduced, the time between development and series production (time-to-market) is considerably accelerated and that this has a positive impact on cost-effectiveness.

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