

SOFTWARE READY FOR LIFT-OFF!

The use of the latest NC simulation software can achieve considerable cost savings in production by detecting potential problems prior to the production process.

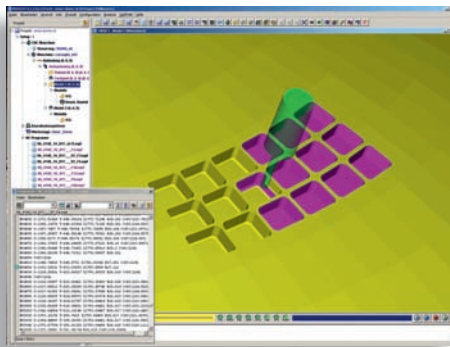
Components produced for the space industry by MT Aerospace show exactly how well CGTech's Vericut NC simulation software works. Here, tanks for Ariane rockets are manufactured with floors that have to be spherically milled to save weight.

Based in Augsburg Germany, MT Aerospace produces key components and subsystems for Ariane such as large structures, booster housings and lightweight construction tanks from lightweight structures in low density metals such as aluminium and titanium as well as bonded materials.

Production is characterised by special engineering processes, including press cylinders, spin forming, complex welding methods and additive manufacturing processes for creating fibre composites. Precision component production is vital due to the high aerodynamic, thermal and mechanical loads placed on the parts. For manufacturing operations, the company puts its faith in CGTech's Vericut NC simulation software.

"The materials and tools form a large part of the component costs, so zero error quality is required before producing prototypes and test parts," states MT Aerospace's head of NC programming, Peter Zotz. The production department has been working with the Vericut simulation software for over a decade to ensure quality of the NC program – especially for milled parts.

As the software simulates NC production, it detects errors in the NC code before the first machine run



Ensuring the quality of NC programs: CGTech's Vericut simulation of the machining process

and independently of machine, control system and CAM package. The software works with both G code and with CAM system outputs. Vericut's main functions are simulation of material removal with verification, analysis, and optimisation of NC program milling feeds.

"Errors are detected with extreme precision," continues Zotz. "Errors can be displayed in a selected colour; clicking on the error highlights the appropriate NC record. All errors are stored in a log file. The program can also be run in batch mode and can be set to take graphical snapshots of all errors."

The system uses the appropriate CNC control logic to match each controller and can be simulated to adjust to various machines, programs, workpieces and functions. No special programming language is required.

MT Aerospace introduced Vericut NC to improve machine and component safety; understandable given the long runtimes and expensive raw materials.

"For example, the inner dome highlights problems with a possible collision using a 'trial and error' production method," states Zotz. "This part is an integral part of the ESC LH2 tank structure developed by MT Aerospace. It has 4,000 pockets requiring milling and, due to the required surface quality of the components, machining time for each part is around 600 hours."

Unverified working methods – where the programmer checks through an extensive NC code list before the machining process begins – are unacceptable. Using this method, the consequences of a crashed machine tool 'worse case' scenario would include the costs of repair, replacement of raw material and machine downtime, a high scrap yield and failed delivery times or penalties for non-performance. There hasn't been a single collision at MT Aerospace since introducing Vericut NC. Running-in phases of the program have also been reduced. The software also helps to optimise cycle times and production planning as well as determining overall scheduling times.

With Vericut NC, programs can be checked for collisions and errors before the machines are run. The software also allows milling feeds from the NC program to be optimised so that production is more efficient. For MT Aerospace this software has proven its value during prismatic machining, and its use for turned parts is being planned. | www.cgtech.co.uk

