

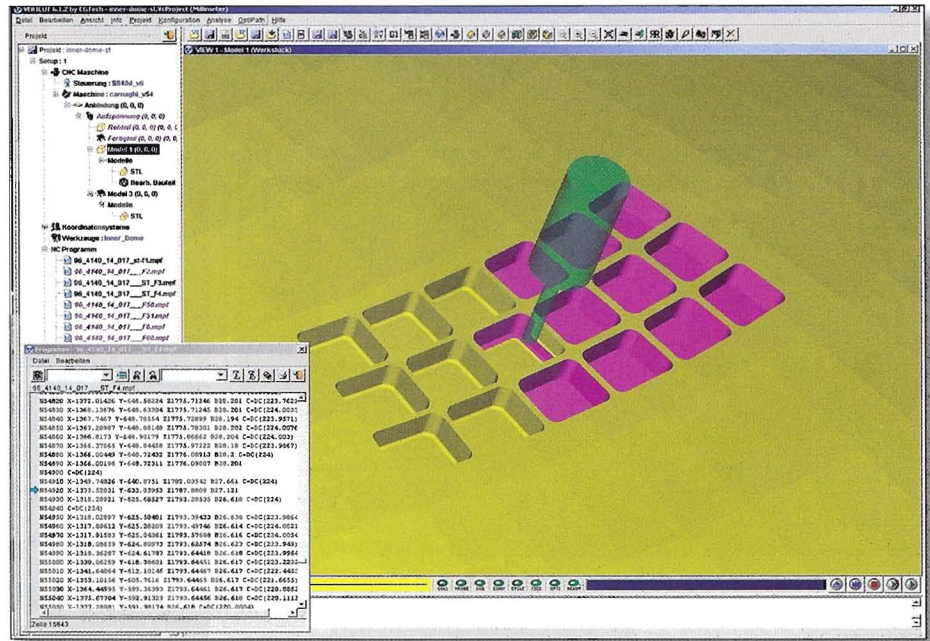
# Vericut NC simulation software takes off

The use of CGTech's Vericut NC simulation software can achieve considerable cost savings in production, as it helps to detect potential faults or problems prior to the actual production process. Components produced by MT Aerospace for the space industry show exactly how well the software works. Here, tanks for the Ariane rockets are manufactured with floors that have to be spherically milled to save weight.

MT Aerospace AG is based in Augsburg, Germany and provides around 10 per cent of the hardware on the Ariane 5, making it the largest supplier for this rocket programme outside of France. The company develops and produces key components and sub-systems for the Ariane, for example, large structures, booster housings and lightweight construction tanks. For its component manufacturing operations MT Aerospace puts its trust in Vericut's NC simulation software.

Predominantly the company develops and produces large, lightweight structures. Low density metals such as aluminium and titanium, as well as bonded materials are used here, and their production is characterised by special engineering processes. These include press cylinders, spin forming, complex welding methods and additive manufacturing processes for creating fibre composites.

Optimised, high precision production of these components is not just a must due to the high aerodynamic, thermal and mechanical loads placed on the components within the Ariane rocket.



"The actual materials and tools form a large part of the component costs, so zero-error quality is required before producing prototypes and test parts," explains Peter Zotz, head of NC Programming at MT Aerospace in Augsburg.

To achieve this goal the production department has been working with CGTech's Vericut simulation software for over a decade to ensure the quality of the NC program, especially for milled parts of the Ariane 5.

As the software simulates NC production (turning, drilling, milling, wire-cut EDM, radial milling) it detects errors in the NC code before the first actual machine run. This is done independently of machine, control system and CAM package. The software works both with G code and with CAM system outputs. Vericut's main functions are simulation of material removal with verification and analysis, and optimisation of milling feeds of the NC program.

Peter Zotz says: "Errors are detected with extreme precision. These 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. And, 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 exactly match each controller and can be simulated to adjust to the various

machines, programs, workpieces and functions. No special programming language is required.

What motivated MT Aerospace to introduce Vericut NC verification software was machine and component safety, which is understandable when you consider the extremely long run times and the very expensive raw materials. Peter Zotz says: "For example, the inner dome highlights the problems associated with a possible collision or a crash using a 'trial-and-error' production method. This hemispherical component is an integral part of the ESC LH2 tank structure developed by MT Aerospace. It has 4000 pockets which have to be milled and, due to the required surface quality of the components, the machining time for each part is around 600 hours."

Thanks to the use of Vericut NC simulation software, programs can be checked for collisions and errors before the machines are run. Manual testing is no longer required. And, the software allows milling feeds from the NC program to be optimised in such a way that production is not only more efficient but also more sympathetic to the machine tool.

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