
Press release

An important step towards the industrialisation of additive manufacturing

toolcraft sets a milestone with its partner BCT GmbH from Dortmund.

Georgensgmünd (D), 07/12/2021: toolcraft's strategy focuses on breaking new ground and simplifying processes. Innovative software and automation are important building blocks for progressing towards this goal. With this in mind, the medium-sized company uses the product OpenARMS from BCT Steuerungs- und DV-Systeme GmbH to precisely adapt tool paths for the further machining of additively manufactured components. toolcraft can carry out automatic adaptive post-processing by using OpenARMS as a near-machine solution.

Precise alignment of the additively manufactured component during further processing

During additive manufacturing, the use of a laser to apply material can cause thermal stresses which lead to distortion. Despite process simulation, this can result in extremely slight deviations between the CAD model (target state) and the actual AM component (actual state). Ideally, these must be compensated for on each individual component before the subsequent machining process. Using machine-integrated measurement technology and advanced algorithms, the OpenARMS software from BCT GmbH automatically combines the coordinate systems of the actual component, the target NC paths and the milling machine. First of all, the tool path is automatically aligned to the position and orientation of the individual component by means of a rigid body transformation. In this way, distortions and deviations can be ideally compensated for during clamping. This means that the machining process is precisely adapted to the real conditions and there is no need to manually align the component on the milling machine. Functions such as the definition of mutual dependencies among several functional surfaces ensure compliance with tolerances while also reducing waste.

Transition-free geometries between subtractive and additive manufacturing

In the area of high-precision manufacturing, an absolutely transition-free machining surface must be provided for the additively manufactured geometry. In addition, auxiliary elements are printed, for example, on the component's free-form surfaces for clamping in the milling machine. "Geometric adaptation" functions are also available in the OpenARMS software. These not only allow the position and orientation of the machining programme and the component to be coordinated, but also enable the course of the milling path to be adapted to the component. As a result, additively manufactured components are further machined to a higher quality and there is no need for further finishing steps. This means that the manual finishing of residues on free-form surfaces is no longer necessary. "With all this, toolcraft is meeting numerous customer requirements and taking another important step towards the industrialisation of additive manufacturing," says Christoph Hauck, Chief Technology and Sales Officer at toolcraft.

Future prospects with "OpenARMS"

Rigid body transformation and geometric adaptation are already in use in high-precision manufacturing at toolcraft. The company will step up its partnership with BCT in order to jointly

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develop additional function modules for the automated further processing of additively manufactured components. The aim is to ensure a continuous process chain and to reduce or, at best, completely avoid manual intervention. As part of the IDEA development project (Industrialisation of Digital Engineering and Additive Manufacturing), BCT and toolcraft AG are continuously working on advancing the industrialisation of additive manufacturing.

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About toolcraft

The medium-sized family-owned company, located in Georgensgmünd and Spalt, was founded by Bernd Krebs in 1989. toolcraft is a pioneer of forward-looking technologies, such as additive manufacturing and the construction of customised turn-key robotic solutions. As a provider of comprehensive solutions, toolcraft covers the entire process chain, from the initial idea to manufacturing, quality assurance and testing in the areas of CNC machining, additive manufacturing, injection moulding and mould making. Its clients include market leaders in the semiconductors, aerospace, medical technology, optical, special machinery manufacturing, motor sports and automotive industries. Building close working relationships with collaborative partners as well as universities, other institutions of higher education and research centres is an important part of its corporate philosophy.