

### Software on the track of carbon fibers

Fiber composite materials (CFRP, GRP) are on the advance in the passenger aircraft industry. Design and production of CFRP structures require very sophisticated techniques: The orientation of the fibers, for example, is a decisive factor for the properties of the end product. This is why the examination of fiber orientation is becoming a more and more important task in quality testing. What is true for all plastics is true for these materials, too: They are ideally suited for analysis by computed tomography because they are easily penetrated by x-rays.

"The trend towards fiber composite materials is noticeable to us as a provider of CT analysis software, too", explains Christof Reinhart, CEO of Volume Graphics in Heidelberg. "We have been receiving requests for tools to determine fiber orientation for some time, with some of the most important impulses coming from the aerospace industry. We were aware that we would have to react to this demand in the coming Version 2.2. of our VGStudio MAX software to provide the required functionality."

A new tool in Version 2.2 of the CT analysis software VGStudio MAX provides statistical analyses of the predominant orientation of fibers. To achieve this, the software looks deeply into the object. Even in datasets containing fibers which can no longer be resolved, due to factors such as the size of the part and the fiber thickness, the main orientation can still be detected. VGStudio MAX is able to differentiate the low contrasts within the grey value profile and use these to determine fiber orientations.

VGStudio MAX 2.2 will also be bringing actual and nominal data even closer together: The new version of the analysis software for industrial computer tomography will support the direct importation of CAD



Picture: Volume Graphics

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models in STEP and IGES format. This will not only increase the accuracy of actual/nominal comparisons since the calculation is no longer based on STL but on original CAD data, but it will also simplify the analysis of complex parts consisting of several components. Possible applications are injection-molded parts with inserts made of different types of plastic, rubber or metals, or assembled equipment or instruments. Whenever CT data sets of such objects are to be analyzed metrologically, the various components have to be separated. In the past, this required a lot of manual work, depending on the complexity of the assembly. Now the imported CAD data tells VGStudio MAX in advance where the material borders or object edges are. The software uses this data to find the borders and edges within the voxel data set. The analysis of CT models is, of course, always done on the basis of the actual scan data.

The benefit to the user are enormous time savings. Now he will have access to options for fully or semi-automatic separation of the object components. As Christof Reinhart says: 'CAD importing of STEP and IGES files will be included in the basic Version 2.2. license of VGStudio MAX, with no further costs to the user for this functionality.' [www.volumegraphics.com](http://www.volumegraphics.com)