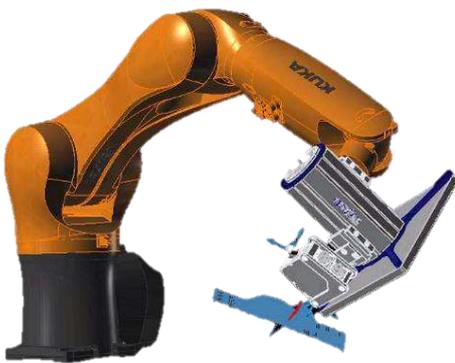


MEASURING FIBER ORIENTATION FOR COMPOSITE PARTS

The new innovative AVS 3D vision system is able to measure both part geometry and fiber orientation.

MAIN CHALLENGE

In today's fiber composite production there are still many manual steps with no quality traceability. The main requirements that are actually needed are part's three-dimensional geometry and the local fiber orientation.



OUR SOLUTION

Apodius brings a third dimension to the standard Apodius Vision System AVS, which is already industries first choice when dry fiber preform structures for resin transfer moulding are involved. The model-based measuring approach by Apodius brings a never seen robustness to optical measurements with every system that is developed and delivered for use in factories.



APODIUS VISION SYSTEM AVS 3D IN OPERATION

The AVS 3D uses a special diffuse illumination well known from the AVS standard system to operate with complex fiber structures. Choosing the right combination of texture and geometric measurements is crucial. A new sensor data fusion model for both texture and geometry made Apodius to integrate a light-section sensor module into the existing AVS product range.

SIGNIFICANT ACHIEVEMENTS

Our key customers already automatically scan their parts and feed the results back into simulation and lightweight design of their products. They benefit directly and

- save carbon fiber material wherever possible,
- immediately improve production efficiency,
- add further value to high-value parts,
- reduce cycle times,
- guarantee reproducible component quality,
- reach stable processes,
- minimize scrap and rework rates,
- and reduce previously required over-dimensioning of components.



3D FIBER ORIENTATION

- AVS 3D works fine without loss of generality for different materials in various applications.
- The measurement accuracy of the in-plane results could be approved to $\pm 0.1^\circ$ and the geometry measurements showed variations of less than ± 0.1 mm.
- First studies have approved that the accuracy for 3D fiber orientation measurements is less than $\pm 0.3^\circ$ for different complex carbon fiber structures and performs.



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