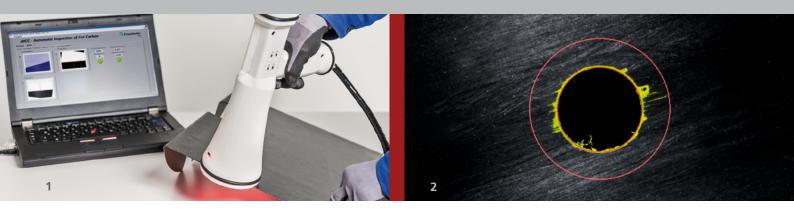# Fraunhofer

IPA

FRAUNHOFER INSTITUTE FOR MANUFACTURING ENGINEERING AND AUTOMATION IPA

1 *Optical measurement of a machined edge with AICC.*

2 *Defect detection on a drill hole.*

AICC – AUTOMATED QUALITY CONTROL FOR DRILL HOLES AND MACHINED EDGES OF CFRP

Facts

In the machining of fiber-reinforced components, typical defects such as delamination, fraying, spalling and feathering take place. The evaluation of the machining quality of machined edges and drill holes is currently conducted by machine operators, using defined catalogues of boundary samples. This evaluation is subjective, error-prone and time-consuming.

Approach

In order to ensure a quick and objective evaluation of the machining quality, the department "Lightweight Construction Technologies" at Fraunhofer IPA developed the handheld unit AICC. This device optically examines machined components and evaluates the process quality. Using illumination and image technology, different machining defects, such as feathering or delamination, can be detected. Special algorithms, which can be freely adjusted according to the respective quality criteria, are applied in this evaluation.

Fields of application

Easy handling and part-independent default detection allow a vast variety of application areas – from prototyping to series production:
- Inspection of incoming goods or documentation directly at the supplier
- Flexible monitoring of the machining process:
  - Use of a handheld unit directly after processing
  - Machine-tool integrated solution for measurements during or right after the machining process
- Adjustment for random sampling or 100-percent-examination

Advantages

- Fast and objective determination of the machining quality
- Simple determination of "good part" or "bad part" or alternatively high-precision quantitative analysis using key quality indicators
- Automatic documentation of measured values within a database

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