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How long is the fibre?

Testing method for the determination of the fibre length in long fibre reinforced plastic parts

Fiber reinforced plastics are successfully used in numerous industrial segments (e.g. automotive, aircraft construction) in an increasing manner.

The goal of fortifying a polymer with fibrous fillers is to utilize the durability and stiffness of the fiber to improve the quality of the composite material. Adding mineral or natural fibers to a polymer results in a significant increase of the mechanical parameters (tensile strength, stiffness etc.). The matrix (polymer) is designated to surround the chopped strands in a force-fitting manner.

In order to utilize the high durability of a fiber, its length in the molded part must exceed the so called critical fiber length. Because the fiber is excessively and repeatedly stressed during the process of part production, which results in fiber breakage, the length of the fiber and the fiber length distribution in the part must be monitored. To achieve this, the fibers must be extracted from the molded part and their length must be assessed. The current technical standard for fiber length analysis increasingly utilizes image-analytical procedures in addition to the manual enumeration method.

This presentation describes the development and application of an established procedure to assess the fiber length as well as the normative background.

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