

FATIGUE BEHAVIOUR OF SHORT-FIBRE REINFORCED POLYPROPYLENE DESCRIBED BY EXPERIMENT AND SIMULATION

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ABSTRACT

In the presented project the fatigue behaviour of short-fibre reinforced thermoplastics will be described by experimental investigations and simulation.

A test plate was developed which gives the possibility to produce regions of different oriented fibres, also weld line and sharp edges. At first the real morphology of the composite plates developed during injection moulding was characterized by microscopy and X-ray computed tomography (XCT). Several methods of specific automatic data evaluation concepts were applied which lead to a high perfectness of determination of the composite morphology (fibre distribution, orientation tensor, fibre length distribution). The comparison of the experimental results and the injection moulding process simulation gives good correlation.

The next step included fatigue testing and the characterization of the damage evolution by optical strain measurement, thermography and acoustic emission (AE). AE and XCT can be used to get more insight into the damage process during the fatigue loading.

First approaches of fatigue simulation will be shown.

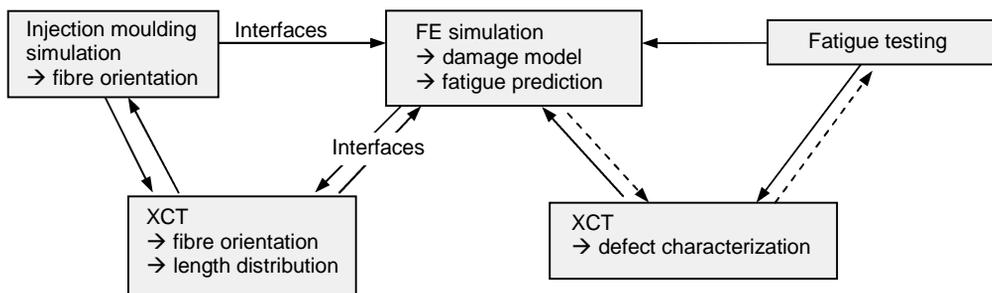


Fig. 1: Scheme of the approach

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