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New Project: SurfSim

Surface Quality Prediction of SMC

The prediction of surface defects in SMC parts, like pores and waviness, is the goal of a new research project, carried out by BMW GROUP, Peguform GmbH, Menzolit Compounds International GmbH, Institut für Kunststoffverarbeitung (IKV) and M-Base Engineering + Software GmbH.

The project works with the hybrid material Sheet Molding Compound (SMC), a long-glass fiber reinforced compression molding Thermoset, which offers many advantages like high design freedom, low cost molds and electro-magnetic permeability.

In automotive applications SMC is in direct competition to steel and aluminum sheets, which results in very high expectations concerning the surface quality. The continuous use and especially new applications depend considerably on the compliance with these requirements.

For the new project existing simulation software will be extended, in order to calculate the development of surface effects during processing. New methods will be developed to define and determine the necessary material properties, which exemplarily will be measured and documented.

The computational prediction of the surface quality will allow to define processing windows much more precise than today and to evaluate the relevance of all influencing parameters systematically, resulting in a much better quality and process stability.

The project is funded by the Federal Ministry of Education and Research via Project Management Jülich.

EXPRESS

M-Base will contribute the compression molding software

EXPRESS to this project, which will be extended by new modules and functionality accordingly.

EXPRESS allows to simulate the compression molding process. It can handle all kinds of compression molding materials, Thermosets (i.e. SMC, BMC) and Thermoplastics (i.e. GMT, LFT, LFT-D). It delivers a multitude of results for the determination of flow, fiber orientation and warpage. These are needed to detect and control problems in quality, dimensional accuracy and mechanical behavior.

The warpage and the calculated anisotropic material characteristics can also be exported to other FE-packages to improve the results of all kinds of follow up analysis.

Parallel to the new research project we will extend our calculation/consulting offers for the compression molding industry.

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