

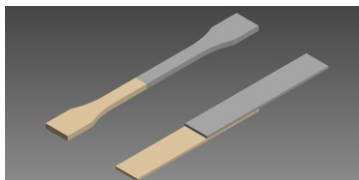
Injection Molding and Composites



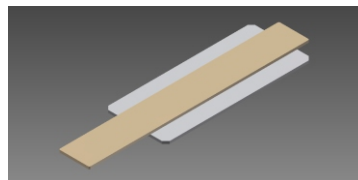
A comprehensive examination of the failure behavior of multi-material composites requires consideration of material properties, process control, specimen geometry and test methodology. For the selection of suitable material combinations for plastic-plastic or metal-plastic composites, their compatibility with each other can be analyzed using an adhesion test.

At the Leibniz-Institut für Polymerforschung Dresden e.V., simulation software is used for the thermal design of injection molds for process optimization and for determining mold filling and distortion properties. Furthermore, a strain field analysis can be used to draw conclusions about the deformation behavior of different multi-material composites. Interfacial and surface activation can also be used for an optimal composite formation.

Specimen and Assembly Injection Molding



Tensile and shear test specimens



Peel and compression shear test specimen

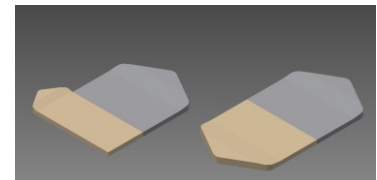
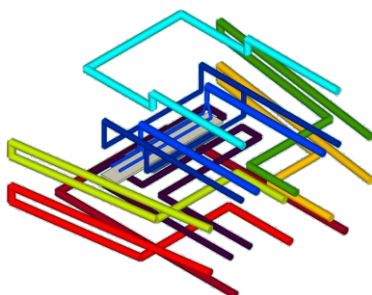
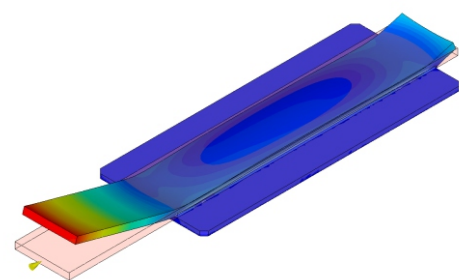


Plate specimens (variation)

Simulation (Process and Part)

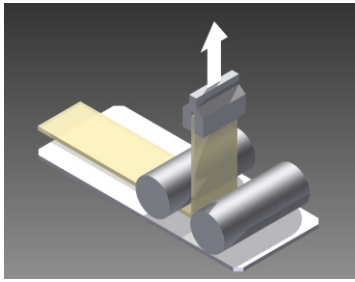


Thermal mold design

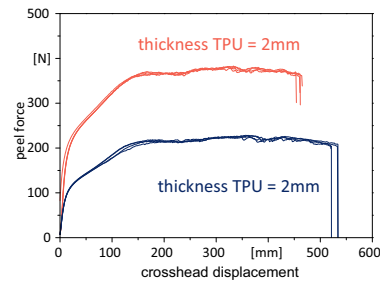


Filling and warpage analysis

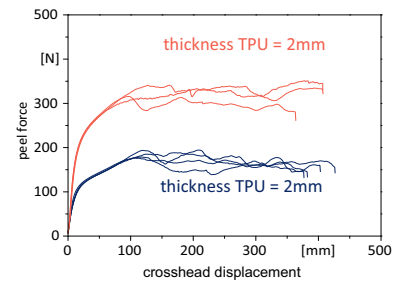
Testing of Soft-Rigid-Hybrids (Peel Test)



Peel test (Scheme)

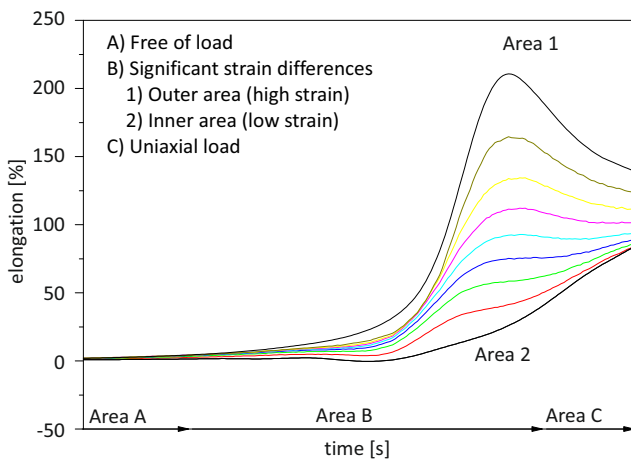


Peel force (polymer-polymer)

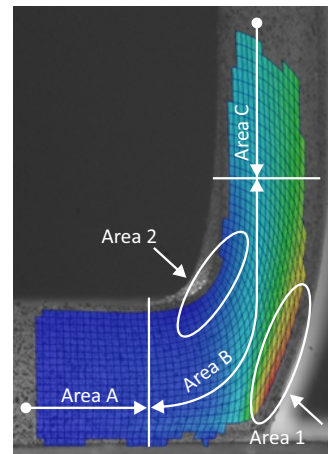


Peel force (polymer-metal hybrid)

Digital Image Correlation (DIC) and Deformation Analysis at the Peel Zone

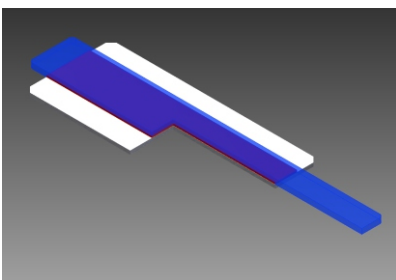


Strain curve in the peeling area

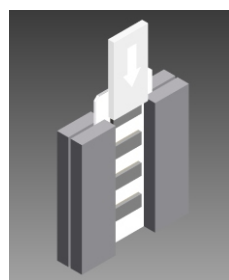


Area classification in the deformation zone

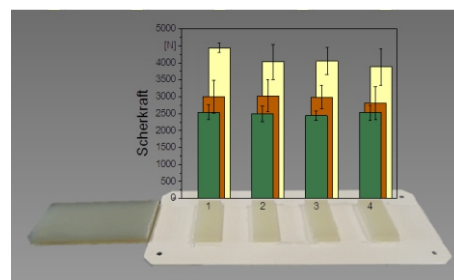
Testing of Rigid-Rigid Composites (Compression Shear Test)



4-Layer composite (cross-sectional view)



Compression shear test (Scheme)



Compression shear specimen with flow length dependent shear forces (insert temperature variation)

Contact

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Literature

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