

Adhesion to TPC or TSC

The so-called hybrid structure, in which a thermoplastic is overmolded onto a thermoset or thermoplastic composite laminate (whether 2D or already thermoformed), combines the high strength and stiffness of composite laminates with the flexibility and ease of processing offered by thermoplastics. This process is typically employed to enhance structural integrity, improve impact resistance, and enable the integration of complex geometries or additional features. Hybrid overmolding is particularly advantageous in industries such as automotive and aerospace, where the demand for lightweight yet durable components is critical.

A potential weakness of such structures lies in the poor adhesion between the composite laminates and the thermoplastic, making it crucial to accurately quantify the adhesion strength for a given system.

In 2023-2024, a study was performed in Alpharetta with that specific objective. The procedure is briefly described [here](#) and the results (confidential) are available in this report for [TPC](#) and in this one for [TSC](#).

In 2024, another study, focused on the warpage of small hybrid structures has been performed in NoH (Brussels). While the primary objective was not to quantify adhesion, we were able to confirm some of the data generated by MSAC through analysis of the force-displacement curve and the coupling with finite element analysis (FEA) calculations - see [document](#).