

Modeling of composite materials

Product development partner

Code Product Solutions is an international, independent provider of engineering and consulting services. We provide solutions for products made of plastics, composite materials and metals. We rely on accurate computational simulations for mastering challenges long before the first prototypes become available. Reliable material measurements are essential for our approach.

Composite materials

Thermoplastic composite laminates based on endless fibers have a very high mechanical performance at a low weight compared to conventional materials, such as metals or plastics. The mechanical behavior of these TP composite laminates is also much more complex than conventional materials. The stiffness is anisotropic and can even be non-linear for transverse or shear loading.

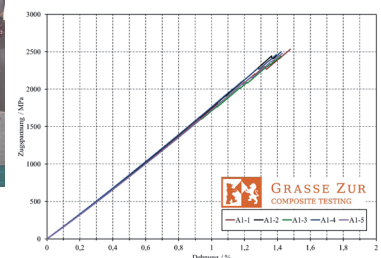
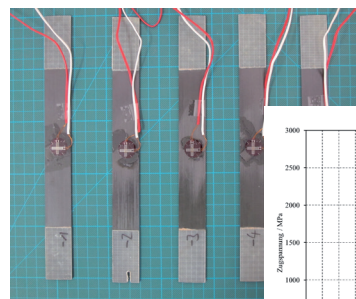
Failure of composite laminates is depending on factors such as the direction of loading, the loading rate and whether it is loaded uniaxially or biaxially.



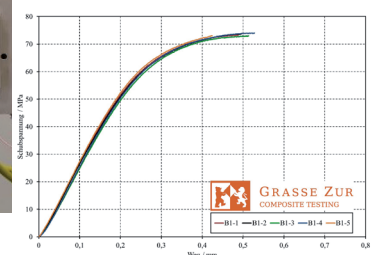
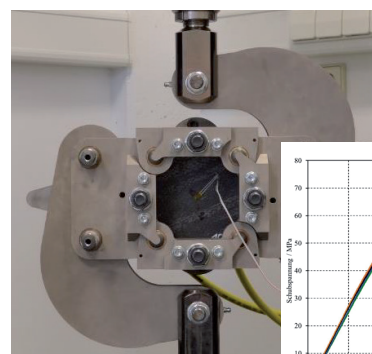
Composite material testing

The complexity of the mechanical behavior of composite laminates also means that characterization is difficult. Therefore, Code Product Solutions works closely together with **Grasse Zur Composite Testing** to obtain accurate measurement data for non-linear anisotropic material models with failure behavior.

The care that is taken for the **preparation** of the testing specimens as well as for the measurements themselves results in very **repeatable and reliable test results**.



In addition to all the important testing equipment for tensile and compressive mechanical characterization, *Grasse Zur* has developed a **Picture Frame Test System** (ISO 20337) to measure accurate shear behavior beyond strain levels capable by other testing standards.



Predictive engineering

The reliability of the measurements is very important to calibrate accurate material models. Therefore, the high level of measurement quality provided by *Grasse Zur* perfectly matches the modeling quality for predictive engineering at Code Product Solutions.