

DMA of Composites: Selection of the Optimal Measurement Mode

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ABSTRACT

Dynamic mechanical analysis, DMA, is used to determine the glass transition temperature and the mechanical quantities of filled or fiber reinforced polymers, for example. These results are used to characterize the quality and stability of the composites, including bonds and lacquers. The characteristic glass transition temperature, T_g , is assigned by various standard methods, for example using an onset on the storage modulus or the maximum temperature of $\tan \delta$.

Using reactive processes like curing, it will be shown how DMA can deliver accurate information about the stability of materials, if an appropriate measurement mode is applied. Even sandwich systems (polymers with metals or fabrics), adhesives in bonded structures, lacquers and coatings can be optimally analyzed by DMA.

Results from various samples will be presented. The influences of the different deformation modes, bending and shear, will be discussed on the basis of physical principles.