

Characterisation of Composite Materials with Full-Field Optical Measurement Equipment

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Abstract

Modern HiTec products today are in many instances made from composite materials, which have been developed specifically for this purpose. Detailed knowledge of these frequently anisotropic materials is of the essence and highly specialized measurement equipment is required. Optical measurement methods can help to obtain such knowledge. It is requested to reduce “time to market” even and specifically with HiTec products, thus R&D Departments are obliged to use methods which can be compared with FEM quickly and efficiently and even validate results obtained with FE analysis. Material characteristics and component design can be determined or validated with optical measurement methods, non-contact, full-field and 3D. The advantage is that comprehensive information can be obtained in a very short time. Optical measurement equipment is also used for quality inspection of safety relevant parts, particularly in composites. In air and space industry as well as in boat industry optical methods in general, and Shearography in particular are recognized as fast and reliable techniques. After being tested in R&D this method are now used in quality control and maintenance.

This presentation will give an overview about newest generation of Speckle interferometry (ESPI), Digital Image Correlation (DIC) and Shearography, together with a comparison to classical techniques.