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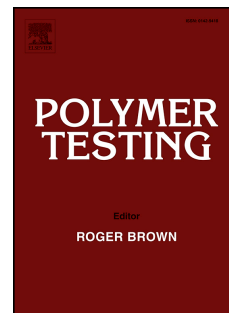
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Test Method

Measuring the direct piezoelectric charge coefficient for polymer matrix composites

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Abstract

To realize proper measurements of the piezoelectric charge constant d_{33} of materials a certain mechanical load is required. Usually, this implies using a dynamic load (to evaluate the material's response) superimposed on a static preload (to achieve good mechanical contact). As the value of d_{33} depends on the applied stress, this preload can lead to load dependence of the experimentally determined value of d_{33} . For stiff materials, the effect should be negligible but for compliant materials, such as composites using a low modulus matrix, a considerable contribution can arise, and thus the experimental data should be corrected accordingly. In order to characterise d_{33} accurately, the load dependence of d_{33} for several compliant polymer matrix composites was determined. The results show that for these composites correction to zero load is a prerequisite for accurate d_{33} evaluation.

Keywords

Piezoelectric properties, Piezoelectric composites, Smart materials, PZT, 0-3 connectivity

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