Marchetti, Kurt:

Untersuchungen zum Ermüdungsverhalten
stranggepresster kurzfaserverstärkter Glasverbundkörper
mit Hilfe von Spannung-Dehnung-Hysterismessungen

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Abstract

Through the insertion of fibres with high strength and high modulus, the mechanical properties of inorganic glasses can be considerably improved in comparison with non-reinforced glasses. Former studies were mainly concentrated an the determination of quasi-static and fracture mechanical properties of these glasses whereas their fatigue behaviour has barely been studied. In the present work pure glass specimens and SiC-short-fibre reinforced glass specimens were produced by extrusion and investigated in stress and strain controlled 3-point-bending tests in the threshold und alternating range at ambient and elevated temperatures. The cyclic deformation behaviour was characterized and the failure mechanisms were evaluated by hysteresis measurements as functions of loading amplitudes, number of cycles and fibre volume fraction. Light and scanning electron microscopic investigations of the specimen surfaces and the fracture surfaces were performed in order to determine the onset of damage and to evaluate the damage progress an the specimen surfaces. Crack formation and growth processes were correlated with the hysteresis values, the mean edge stress, the mean edge strain and the development of the damping values.

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Lehrstuhl für Werkstoffkunde
Technische Universität Kaiserslautern
Gottlieb-Daimler-Straße
67663 Kaiserslautern
Tel.: +49 631/205-2413
Fax: +49 631/205-2137