Experimental investigation on the anisotropic damage behavior of rubber-toughened polymers

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Abstract

Rubber-toughened polymers such as ABS are composed of a thermoplastic matrix and small rubber particles e.g. [1]. Macroscopic effects of the rubber particles are a reduced overall stiffness and yield strength and an enhanced ductility and fracture toughness [2,3]. These macroscopic effects are caused by mechanisms on the micro scale such as shear yielding, void growth and crazing [4].
In the present work experimental investigations on an ABS-material are used to characterize the deformation behavior. The damage and fracture behavior is characterized by cyclic tests. An increasing volume strain indicates the crazing mechanism, which goes along with an anisotropic yielding behavior. Tensile tests with an inelastic pre-deformed ABS-material show the evaluation of the anisotropic yielding behavior.

1 Literature

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