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# A Constitutive Law for Glassy Polymers and Blends

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In this study, a modelization of the viscoplastic behaviour of glassy polymers is proposed, from an approach originally developed for metallic alloys at high temperature and in which state variable constitutive equations have been modified. A procedure for parameters determination is developed. Experimental tests in tension on an RT-PMMA material have been achieved under constant true strain rate. Video measurements allows evaluation of the volume variation in real time during the deformation. The viscoplastic constitutive equation describing the mechanical behaviour of the matrix is combined with a micromecanical model to account for both the influence of damage mechanisms in the RT-PMMA and subsequent yielding of the matrix around the particles. The model includes the effect of strain rate sensitivity, strain softening, strain hardening and the void volume fraction evolution. A quite nice agreement is observed between experimental results and the predicted behaviour given by our model.

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