

Modelling tensile force oscillation during the tensile test of PET specimens

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Abstract. Force oscillation occurring during the tensile testing of poly(ethylene terephthalate) (PET), resulting in periodical cavitation of the test specimens, has been studied. A mathematical model has been developed to describe the phenomenon, wherein special fibre bundles are assigned to the amorphous molecular chains. In order to model the local periodical transformations and the rate dependent viscoelastic behaviour the coupled fibre bundle cells were supplemented with a two-element Maxwell model. Using the parameters determined from the measurements the model was compared to the measured force-elongation diagrams and it has been concluded that the simple model can be well used to describe the phenomenon.

Keywords: *modelling and simulation, stress oscillation, viscoelastic properties*

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