

Abstract Submitted
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Effects of Molecular Architecture on Shear Band Formation and Mode II Fracture of Polymeric Glasses JARED ARCHER, ALAN LESSER, University of Massachusetts - Amherst — Mode II fracture studies were performed at various rates on a series of acrylic polymers and on polycarbonate (PC). The shear banding response of polymethyl methacrylate (PMMA) is shown to be highly sensitive to rate. As the rate increases, shear deformation becomes more localized to the point where Mode II fracture occurs. PC is much less rate dependent with lesser amounts of localization. A new theory is formulated relating orientation in a shear band to intrinsic material properties obtained from true-stress true-strain tests. A kinematic limit for orientation within a shear band is also derived based on entanglement network parameters.

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