

Abstract Submitted
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Effects of Composition and Crystallinity on the Mechanical Properties of Reactive Ternary Blends XIGUO ZENG, JAYARAMAN KRISHNAMOORTHY, SHAW L. HSU, Polymer Science and Engineering, University of Massachusetts, Amherst, CHARLES W. PAUL, BRIGITTE WANG, NATIONAL STARCH AND CHEMICALS COLLABORATION — Studies were conducted to elucidate the effects of composition, morphology and crystallinity on the mechanical properties of reactive ternary blends. The blends, used as the model system of high performance hot-melt adhesives, contain functionalized crystallizable polyester, functionalized noncrystallizable polyether and an acrylic random copolymer. When mixed, the prepolymers offer a wide range of physical properties. Results indicate the mechanical properties, discussed in terms of tensile strength and modulus, are strongly dependent on morphological features such as degree of crystallinity, crystal size and blend composition. Apart from the bulk mechanical properties, adhesive strength of the blends were also studied on different substrates having different surface energies. From the failure mechanisms and surface analyses of the newly-created surfaces, a correlation was drawn between migration of polymers, surface energy of the substrate and deformation mechanism of the polymer components.

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