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**Adhesion of Polymer Composite Melt to PTFE at Elevated Temperature** DAVID PAN, THOMAS DEBIES, DAN MCVEIGH, Xerox Corp. — A novel technique for measuring the adhesive force between a thin molten polyester composite film and a PTFE surface is presented in the paper. The molten film was prepared by first depositing powdery composite particles on a substrate and then heating the powdery film on the substrate to the test temperature through a heated pressure nip between two conformable rollers comprising a PTFE overcoat at a speed up to 400 mm/s. The adhesive force is measured by wedging a bendable metal knife into the interface between the molten film and PTFE near the exit of the heating nip. Strain gauges were mounted on both sides of the metal knife. The differential strain gauge reading resulting from the degree of the knife bending is calibrated against standard weights. The technique was used to investigate the effects of the substrate, substrate roughness, molten film thickness, temperature and type of wax additive on the adhesion of the molten composite film to PTFE. On the effects of temperature and type of wax, we found that the adhesive force remains relatively constant at low temperature, and then drops significantly, in some instances to zero, as the temperature further increases. A phenomenological model is proposed to explain the effects of main temperature and the wax additive. The model is evidenced by the surface segregation of wax from the polyester composite film as determined by XPS.

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