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Characterization of Newly Developed Conductive Composites

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Abstract: Conductive composites consisting of various thermoplastics filled with conductive chopped fibers have been studied. The thermoplastics chosen were polyphenylene sulfide (PPS), polyetherimide (PEI), polyphenylene oxide (PPO), polyamide (Nylon), polycarbonate (PC), and liquid crystalline polyester (LCP). The chopped fibers included graphite (Gr), stainless steel (SS), aluminum flake (Al Fl), and nickel coated graphite (NiGr). Drop weight impact and tensile properties were determined. The effect of fiber loading and type on specific mechanical properties was determined. Photomicroscopy and scanning electron microscopy were performed on several composites noting fiber distribution, orientation and fracture morphology. A laser diffraction technique was used to determine the degree of orientation. Electrical conductivities (DC Resistance Method) were obtained for various samples. Physical properties such as water absorption, water vapor transmission, and chemical resistance have also been determined.

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