

Enhanced Thermal Properties of Rigid PVC Foams Using Fly Ash

Authors : Nidal H. Abu-Zahra, Parisa Khoshnoud, Murtatha Jamel, Subhashini Gunashekar

Abstract : PVC foam-fly ash composites (PVC-FA) are characterized for their structural, morphological, mechanical and thermal properties. The tensile strength of the composites increased modestly with higher fly ash loading, while there was a significant increase in the elastic modulus for the same composites. On the other hand, a decrease in elongation at UTS was observed upon increasing fly ash content due to increased rigidity of the composites. Similarly, the flexural modulus increased as the fly ash loading increased, where the composites containing 25 phr fly ash showed the highest flexural strength. Thermal properties of PVC-fly ash composites were determined by Thermo Gravimetric Analysis (TGA). The micro structural properties were studied by Scanning Electron Microscopy (SEM). SEM results confirm that fly ash particles were mechanically interlocked in PVC matrix with good inter facial interaction with the matrix. Particle agglomeration and debonding was observed in samples containing higher amounts of fly ash.

Keywords : PVC foam, polyvinyl chloride, rigid PVC, fly ash composites, polymer composites

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