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Natural Fibre / PA6 Composites with Flame Retardance Properties: Extrusion and characterisation

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Abstract

Replacing glass fibre by natural one in reinforcing engineering plastics for electronic industries has two pre-requirements. Firstly, the processing window should be defined for the engineering plastics of high melting temperature and the natural fibres of limited thermal stability. These processing parameters should be ensured in a stable extrusion procedure. Secondly, a flame retardant (FR) to meet the requirements of electronic industries. FR should be however minimised as much as possible to keep good mechanical properties.

An optimisation is carried out for extruding thermoplastics like Polyamide 6 (PA6) with natural fibre like flax or kenaf and FR. Extruder configuration is adjusted to obtain a stable process up to 22.5 wt.-% fibre. Mechanical testing shows just a decrease of 10% in strength and 15-25% in impact strength after the addition of 20% FR.V-0 rating is obtained by 20% FR according to UL94 test. The cone calorimetry shows a reduction in heat release rate