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Use of ZeMac as a compatibilizer for engineering plastics alloys

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The unique chemistry of ZeMac® alternating copolymer of ethylene and maleic anhydride, used as an additive, provides several advantages for compounders of engineering plastics. The paper will cover some recent exciting developments for using this compatibilizer to improve interfacial adhesion between two dissimilar engineering plastics such as nylon and PET to improve mechanical properties compared to incompatible blends of the engineering plastics at the same ratios. This allows compounders to reduce raw material costs, get additional benefits and allows OEMs to improve sustainability of engineering plastics. Such compatibilized polymer alloys are very useful for automotive, appliance, high end furniture, other high performance applications and other polyamides.

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Textural evolution of commercially pure aluminum in Al/Ni laminated composite produced by severe plastic deformation

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In this study, the 4-layer accumulative roll bonding (ARB) process in three consecutive steps was carried out at room temperature to fabricate a bimetallic Al-Ni composites. The ARB process is a severe plastic deformation methods proper to produce layered composites. Al-Ni laminated composites are promising materials for applications such as structural materials in automotive, aerospace and electronics industries addressing market demands of lightweight, corrosion resistance, suitable strength and ductility.

The microstructure and texture evolutions of the aluminium matrix were characterized using field emission gun scanning electron microscopy (FEG-SEM) equipped with an electron backscatter diffraction (EBSD) device. The microstructures revealed that applied strain on the composite was partitioned between Al and Ni layers. The partitioning followed isostrain conditions of deformation at cold roll bonding (CRB) step and then became progressively deviated toward isostress condition with increasing the ARB cycles.

Texture results indicate that the Al texture was produced by a combination of shear and plane strain compression modes. The mixed texture intensified up to a maximum level and then weakened in third cycle. There was no sign of α (<110>//ND) and τ fibers (<110>//TD)) while β-rolling fiber became stronger with increasing the process cycles except the third one.

The factors leading to texture weakening in the third cycle, were comprehensively evaluated including grain fragmentation, continuous dynamic recrystallization and the presence of nickel fragments. It was realized that nickel fragments substantially influenced on the plastic flow of Al, which induces specific texture evolutions

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