

## **Improving compatibility of Recycled Nitrile Rubber (rNBR) and Ethylene Vinyl Acetate (EVA) blends by electron beam irradiation**

### **ABSTRACT**

Blends of ethylene vinyl acetate (EVA) copolymer and recycled nitrile rubber (rNBR) were prepared using an internal mixer. N,N'-m-phenylenedimaleimide (HVA-2) was added into the blend composed of 70 wt % of EVA and 30 wt % of rNBR, and served as a crosslinking agent. The HVA-2 concentration was varied from 0 to 5 phr. The changes in the compatibility of the blends were investigated before and after electron beam irradiation by means of physical and morphological tests. The results obtained from these tests were then analysed, namely tensile strength (TS), modulus 100 (M100), elongation at break, gel content and scanning electron microscopy (SEM). The results showed that the TS and elongation at break had decreased with increasing in HVA-2 concentration and electron beam irradiation dose, while the M100 had increased. It is believed that the blends had undergone early crosslinking reaction during mixing. Hence, the brittleness of the materials had increased upon exposure to electron beam irradiation due to the excessive crosslinking bonds. This observation was supported by the gel content and SEM micrographs.

**Keyword:** Recycled rubber; Electron beam irradiation; Polymer blends; Rubber recycling; Synthetic rubber