

## **Effect of elastomer type on the crystallinity and physical properties of PHB or PHB-co-HV / elastomer blends**

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Poly(3-hydroxybutyrate) (PHB) and its copolymer with hydroxyvalerate (HV) (PHcoBV) are bacterial polyesters presenting the advantages of biodegradability and biocompatibility with a large potential application. The properties of PHB are often compared to those of polypropylene[1]; however, PHB is both stiffer and more brittle and shows a rapid thermal degradation and a rather narrow window of processability. PHcoBV presents better properties when compared to PHB, including among others reduced brittleness. In this work, the effect of addition of a rubbery phase, (i) ethylene-propylene-diene terpolymer (EPDM) or (ii) alternatively poly(vinyl butyral) (PVB), on the PHB and PHBcoHV properties was studied. The effect of rubber type and the change of PHB or PHBcoHV / rubber blends processing way on the crystallinity, the crystalline structure and physical properties of the composites were investigated. In both PHB and PHBcoHV blends, the main role of EPDM is its nucleating effect evidenced by a decrease of the crystallization temperature and an increase of the crystallinity with the higher EPDM ratio regardless of the processing route. While EPDM has a weak effect on the PHB (or PHBcoHV) glass transition temperature, PVB induces an outstanding decrease of this temperature due to its plasticizer component that swells the PHB amorphous phase. This plasticizer appears very efficient to lower PHB glass transition temperature but is a more environmentally friendly plasticizer.