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Impact strength and surface hardness properties: virgin PVC versus recycled PVC composites filled with two different natural fibers

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ABSTRACT

This study compares the impact strength and hardness properties between virgin polyvinyl chloride (vPVC) and recycled polyvinyl chloride (rPVC) composites filled with two different natural fibers (palm fibers and sawdust). Composites with fiber content varied from 2 to 8 wt% were prepared successfully using mini-extruder. The effects of the fiber type and fiber content were studied. As expected, the fiber type and fiber content played an important role in the investigated properties of PVC composites. The results revealed that the incorporation of palm fiber and sawdust into vPVC matrix showed to decrease the impact strength. Opposite effect was observed when palm fiber and sawdust were incorporated into rPVC matrix. The results of hardness pointed out that the average surface hardness values of rPVC and their composites were higher than that of vPVC and their composites. Sawdust-PVC composites (with either vPVC or rPVC) showed to have better impact strength and slightly higher surface hardness values than those of palm fibers-PVC composites.

Keywords. polyvinyl chloride, recycled polyvinyl chloride, palm fiber, sawdust, impact strength