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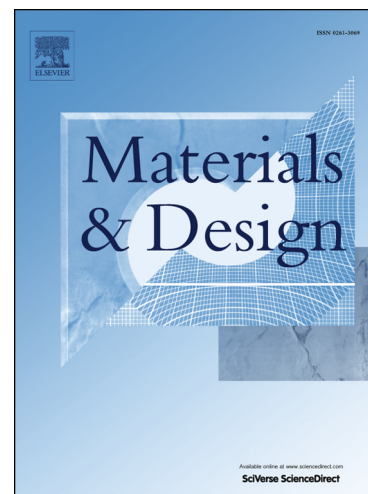
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Improved mechanical properties of recycled linear low-density polyethylene composites filled with date palm wood powder

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Abstract

Recycled linear low-density polyethylene (RLLDPE) was blended with date palm wood powder to prepare composites in which the concentration of the filler ranged from 10 to 70 wt.%. The cross-linking of composites was performed in some selected cases. The Young's modulus of the composites significantly increased as the filler content increased over the entire concentration range. A maximum value of 1989 MPa was observed for the composite filled with 70 wt.% filler, which was approximately 6.5 times higher than that observed for neat RLLDPE. The presence of filler increased the flexural strength from 11.4 MPa for unmodified RLLDPE to 17 MPa for the composite containing 70 wt.% filler. The Young's modulus and stress at break measured at 50 °C decreased significantly compared with those values measured at 25 °C. The ratio between the stress at break at 25 °C versus 50 °C (σ_{25}/σ_{50}) was between 2.7 and 3.8, whereas the ratio of the Young's modulus of E_{25}/E_{50} was between 1.6 and 2.6.

Key words: recycled linear low density polyethylene; date palm wood; composites; mechanical properties; cross-linking; water uptake

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