

Development of Composite Material Based on Waste Paper and Waste LDPE for Ceiling Sheets.

T.G. Pathirage, D.K.R. Munasinghe, and S.V. Udayakumara

In Sri Lanka used papers are re-utilized only for paper and board industry. However, collecting used papers and recycling them are still highly inhomogeneous. Therefore major part of used papers become garbage.

Used plastics are another agent that produce many environmental issues. Major part of waste plastics consist low density polyethylene (LDPE) which is mostly used for packaging items. This study was aimed to develop light weight composite material based on waste paper and waste LDPE specially for ceiling sheets. Use of waste as a starting materials for composite will contributes to savings of natural materials, reduction of energy and chemicals consumption, reduction of the impact on fresh water and improvement of waste management strategies. The composites with various compositions were prepared by hot compression moulding by varying weight percentage of paper and LDPE. . Tensile strength, modulus of rupture, hardness, thickness swelling, linear swelling, water absorption and thermal conductivity were determined for all compositions according to the ASTM standards.

According to the test results water absorption and swelling gradually increased. However all the composite samples showed less thermal conductivity, less density and better mechanical properties than asbestos which is the mostly used material for ceiling sheets. Therefore in future paper based composites will become a cheaper replacement for ceiling materials.