JUTE FIBRE REINFORCED LINEAR LOW DENSITY POLYETHYLENE (LLDPE) COMPOSITE PRODUCT

This development relates to a process for manufacturing Jute fibre reinforced Linear Low Density Polyethylene (LLDPE) composite product. The melt compounding process of plastic with bio-based material is cost intensive process due to involvement of costly machinery namely, Twin Screw Extruder. The current invention is the cost effective mixing process of Jute fibre (bio-based natural fibre) with polyolefin using a Kneader –extruder system in a batch process.

SALIENT FEATURES:

The Jute fibres used are either in the form of chopped fibre and the length of the same are kept ≈ 30mm, or loom waste material from jute industry where the fibre length usually kept within 10 – 50 mm. Pre-drying of the fibre to keep it relatively moisture free is optional. To increase more reaction sites for fibre-matrix adhesion, small percentage of compatibilizer (2-5% on the batch weight) has also been added. The granules / pellets, formed by the extrusion of the dough coming out of the Kneader are then used as the raw material to make natural fibre reinforced moulded products through suitable moulding processes namely, Roto-moulding. Jute fiber to the extent of 20 % by weight is incorporated in LLDPE by this process.

ADVANTAGES:

- Comparative characterization study of the virgin LLDPE based Roto-moulded water storage tank and jute fibre reinforced Roto-moulded water storage tank shows market improvement in impact strength.
- Noted 20% increase in Charpy impact strength.
- Functional property like exposure to UV Rays has improved

Scale of Development: Technology integration





