

## APPLICATION OF TEXTILE WASTE FOR COMPOSITE MATERIALS PROCESSING TEKSTILATKRITUMU IZMANTOŠANAS IESPĒJAS KOMPOZĪTMATERIĀLU VEIDOŠANAI

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**Summary:** A series of composites were made with textile waste and low density polyethylene as matrix material. The mechanical, technological and water sorption properties were examined. The results suggest that presence of synthetic fibers waste increases mechanical properties and decreases melting index and water sorption of composites. Recyclability is the major attraction of composites with thermoplastic matrix and thermoplastic reinforcement therefore use of waste textile helps to solve the environmental and recycling problems.

The awareness of the relationship between the textile production and use and healthy and safe environment is growing. As a result, consumers purchase products they believe are environmentally friendly. During textile materials manufacturing processes a lot of waste forms. Much of the textile waste has been buried in landfills to biodegrade. Solid waste materials that require disposal are many and varied. Manufactured fibers are often cheaper than natural fibers, but synthetic materials are not as easily biodegraded. The investigation of recycling of textile waste is area of significant research and development. The experience of Polymer materials institute researchers shows that waste wood and linen fibers could be used for reinforcement of primary and secondary low-density polyethylene [1-3].

In this work natural (wool) and man-made (rayon, acrylic, polyamide 6, polyamide 6.6, polyester, polyurethane) fibers waste from Ogresjarns and Lauma Lingerie were used for reinforcement of virgin low density polyethylene grade 15813-020 (PE). Content of fibers 30 wt. - % and 50 wt. - %. Composites were compounded in rolling mills at 150 °C and compression moulded at 150 °C.

Tensile tests of composites specimens (length of basis 10 mm, width of basis 5 mm) were carried out on dynamometer UTS -100 (deformation rate 20 mm/min, estimating of tensile modulus at region of deformation 0,1-0,2 mm). Fixation of melting index at 190 °C, water sorption experiment according to ASTM - D - 3201 - 94.

The obtained results indicate the influence of kind and content of fibers waste on melting index, main mechanical properties and water sorption of composites.

### References

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