

## THE PROPERTIES OF COMPOSITES FROM MODIFIED WOOD FIBERS AND RECYCLED POLYETHYLENE

### MODIFICĒTAS KOKA ŠĶIEDRAS UN OTRREIZĒJĀ POLIETILĒNA KOMPOZĪTU ĪPAŠĪBAS

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**Summary:** Utilization of wood fibers as reinforcement of thermoplastic polymers are enjoying a rapid growth in many applications today. One of the disadvantages of natural vegetable fibers containing composites is their low water resistance. Use of modifiers allows halting the negative action of water and maintaining the composites properties. In this paper we report about the mechanical properties of wood fiber containing recycled polyethylene composites with and without modifiers and influence of sorpted water on them.

Hardwood fibre (length < 0,25 mm) was used for recycled polyethylene reinforcement. Content of wood fibers 30 wt.-%. As the melamine resins have the high affinity to wood (1) formaldehyde melamine crosslinking derivative Tubifix MF 100 was selected as modifier. The other modifiers were fluorocontaining water repellent Oleophobol (2) and diphenylmethane diisocyanate (DIC) – effective modifier for similar systems (3). Content of modifiers 6 wt.-% from wood fiber. Wood fibers were dried at 100 °C 24 hours. 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-570.

The obtained results indicate that the influence of investigated modifiers on mechanical properties and melting index of composites is not significant. The 35 % decrease of composite water sorption is reached with modifier DIC. The physicomechanical properties are affected by sorpted water amount – the slight decrease of tensile strength is observed. Experimental results about composites elongation at break confirms the plasticizing effect of water. The water influence after one cycle water sorption – desorption is reversible.

#### References

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