

COMPARATIVE CHARACTERISTICS OF EXPLOITATION PROPERTIES OF MDF MANUFACTURED WITH PARTICIPATION OF NON-WOOD LIGNOCELLULOSIC RAW MATERIALS

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ABSTRACT

Shortage of wood raw material and the considerable amounts of agricultural waste and residues are one of the main environmental challenges today, which justify the relevance of studying the possibilities of utilization of non-wood lignocellulosic raw materials in production of wood-based composites.

This article presents the study on the impact of including different non-wood lignocellulosic raw materials in the composition of MDF on their exploitation properties. Three types of non-wood lignocellulosic raw materials – maize stalks, industrial hemp stalks and thin bamboo stalks - were used for the purpose of the study. The materials were refined in laboratory conditions using defibrator disc mill. The panels were manufactured by using industrial wood-fibre mass and variation of non-wood raw materials from 10 to 40%. The main exploitation properties of MDF were determined and analysis on the possibilities of including the studied lignocellulosic raw materials in the composition of the panels was made.

REFERENCES

- Ero lu H and stek A (2000) Medium density fiberboard (MDF) manufacturing from wheat straw (*Triticum aestivum* L.). *Inpaper International* 4, pp. 11-14.
- Gencer A, Ero lu H, Ozen R (2001) Medium density fiberboard manufacturing from cotton stalks (*Gossypium hirsutum* L.). *Inpaper International* 5, pp. 26-28.
- Mihailova J., T. Todorov, R. Grigorov. (2006). "Utilization of cotton stems as raw material for intermediate layer of particleboards". Conference Proceedings "Wood Resources and Panel Properties", Conference Co-organized by Cost Action E44 - E49, ISBN 84-95077-24-8, Valencia, Spain, 37-44.
- Akgul, M., Guler, C., Copur, Y. (2010). Certain physical and mechanical properties of medium density fiberboards manufactured from blends of corn (*Zea mays indurata* Sturt.) stalks and pine (*Pinus nigra*) wood. *Turk J Agric For* 34 (2010) 197-206
c TUB TAK doi:10.3906/tar-0902-26.
- Mihailova J., B. Iliev, M. Pesevski, T. Todorov, R. Grogorov. (2007). "Quality Estimation of Particleboards for Non-construction Use with Different Swingling-Tow Participation in Middle Layer". Proceedings of International Symposium "Sustainable Forestry – Problems and Challenges", ISSN 9989-132-10-0, Skopje, R of Macedonia, 442 – 448;
- Todorov T., J. Mihailova, R. Grigorov. (2007). "Utilisation of Raspberry Stalks as a Raw Material for Three-Layered Particleboards". Proceedings of International Symposium "Sustainable Forestry – Problems and Challenges", ISSN 9989-132-10-0, Skopje, R of Macedonia, 518 – 521;
- Mihailova, J. (2008). Properties of Light–Weight Cement Boards Made of Lignocellulosic Residues and Mineral Binding Agents. Proceedings of the COST E49 International Workshop "Lightweight composites" – production, properties and usage, Bled – Slovenia, ISBN 978-961-6144-21-6, 96-107.

Mihajlova, J., Iliev, B., Todorov, T., Grigorov, R. (2008). Mechanical Properties of Three-Layered Boards with Different Kind of Lignocellulosic Agricultural Residues in Intermediate Layer. Proceedings of Scientific Conference “Innovations in the Wood Industry and Engineering Design”, Undola – Bulgaria; ISBN 978-954-323-538-4, 93 – 98;

Mihajlova, J., Savov, V., Grigorov, R. (2018a) Effect of Participation of Mass of Maize Stalks on Some Physicomechanical Indicators of Medium-density Fibreboards (MDF). Proceedings of the International Forest Products Congress, Trabzon, Turkey, 26-29 September 2018.

Mihajlova, J. Savov, V., Grigorov, R. (2018b) Utilization of Mass of Industrial Hemp in the Production of Medium-density Fibreboards (MDF). Proceedings of the International Forest Products Congress Trabzon, Turkey, ORENKO 2018 Paper ID. 85. pp. 434-440.

Wang, D. and Sun, X.S. (2002). Low density particleboard from wheat straw and corn pith. *Industrial Crops and Products* 15(1), pp. 43-50.

EN 310:1999 Wood-based panels - Determination of modulus of elasticity in bending and of bending strength

EN 317:1998 Particleboards and fibreboards - Determination of swelling in thickness after immersion in water

EN 323:2001 Wood-based panels - Determination of density

EN 622-5:2010 Fibreboards - Specifications - Part 5: Requirements for dry process boards
<http://www.fao.org/forestry/statistics/> (last accessed 04.2019)