RESEARCH ON THE PROPERTIES OF LIGHT BOARDS FROM LIGNO-CELLULOSE MATERIALS AND CEMENT

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ABSTRACT

The aim of this research is production in laboratory conditions of light weight boards from different types of ligno-cellulosic materials and Portland cement as inorganic binder. Wood particles from recycled coniferous wood (white pine) and recycled deciduous wood species are used as ligno-cellulosic materials, as well as particles from grape vine rods, flax and hemp. Gel made from aluminum sulphate and sodium silicate solution (water glass) is used for mineralization of the particles.

Boards with thickness of 50 mm and dimensions of 400×400 mm are made in laboratory conditions. Test specimens for determination of the most important physical and mechanical properties re made from the boards. Some test specimens are used for determination of the coefficients of sound absorption and thermal conductivity.

The results from the research show that light-weight boards from ligno-cellulosic materials and cement with density bellow 0,630 g/cm^3 can be classified as structural-insulation materials. Insulation properties and strength properties of investigated boards indicate that the latter meet the requirements for application in construction as a material for components of wall panels, permanent formwork, roof panels, partition walls etc.

The obtained light-weight boards made of ligno-cellulosic materials and cement are a good option for sustainable material management, with a view to protecting, preserving and improving the quality of the environment, protecting human health, ensuring prudent, efficient and rational utilization of natural resources.

REFERENCES

Kostov, G., Mihailova, J. (2008): Forest Industry Demand and Forest Resources Suplly – Challenges and Outlooks in Bulgaria. Proceedings of Conference „A European Wood Processing Strategy: Future Resources Matching Products and Innovations", ISBN 9789080656550, pg. 57-64, Milan.

Mihailova, J. (2008): Properties of Light–Weight Cement Boards Made of Ligno- cellulosic Residues and Mineral Binding Agents. Proceedings of the COST E49 International Workshop „Lightweight composites"– production, properties and usage, ISBN 978-961-6144-21-6, pg. 96-107, Bled.

Savov, V. (2007): Wooden Raw-Material Base Source for Fiberboard Manufacturing in Bulgaria. Proceedings of Conference „Management and Sustainable Development", ISSN 1311-4506, pg. 373-384, Jundola.

Yossifov, N., Dimeski, J., Mihailova, J., Iliev, B. (2001): Grapevine Rods – Potential Substitute for Wood Raw Material in Production of Boards. Proceedings of Third Balkan Ssientific Conference „Study, Conservation and Utilization of Forest Resources", Volume IV, ISBN 954-90896-5-7, pg 139-147, Sofia.

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