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Investigation of thermophysical properties of Turkey oak particleboard for sustainable building envelopes

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Abstract: The article investigates the thermophysical parameters of Turkey oak particleboard with different densities and their response to varying heat pulse power to cover possible thermally dependent disturbance effects during the measurement. Samples were measured by the Pulse Transient Method using a Cuboid Model to estimate all basic thermophysical parameters. The aim was to assess the properties of the two different particleboard of high and medium density and compare them with published data. We also calculated uncertainties based on sensitivity coefficients analysis for the cuboid model. This methodology helps to assess how the input error propagates into the resulting parameter estimate and helps to optimize the experiment. The quality of oak particleboard holds significant importance in building construction. Additionally, the analysis results assess the suitability of different materials for improving energy efficiency in building construction. Interestingly even slight density differences and thickness can significantly impact the effectiveness of building insulation properties of materials.

• **R. Tiwari**, V. Boháč, R. Réh, V. Lo Giudice, L. Todaro, V. Vretenár, V. Štofanik, L. Kristak. Developments in the Built Environment, 16 (2023) 100228. DOI: 10.1016/j.dibe.2023.100228