



Hygrothermal Analysis of Timber-Based External Walls Across Different Australian Climate Zones

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Author: Gasparri, Eugenia
Brambilla, Arianna
Aitchison, Mathew

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Material: CLT (Cross-Laminated Timber)
Light Frame (Lumber+Panels)

Application: Walls

Topic: Moisture

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Summary:

The aim of this work is to examine the hygrothermal performance of timber-based envelopes across Australia. The heat and moisture (HAM) analyses are performed with consideration of various climatic conditions for all major Australian cities including: Darwin (zone 1); Brisbane (zone 2); Sydney (zone 5); Melbourne (zone 6); and Canberra (zone 7). Two main typical wall sections are selected for investigation, a massive CLT wall type with an external insulation layer and a cavity-insulated timber frame wall. The transient hygrothermal behaviour and mould growth risk assessments are simulated with WUFI software. The study shows how emerging construction practices perform poorly with respect to HAM transfer, particularly in hot and humid climatic contexts during the cooling season. Critical configurations are identified and design alternatives suggested so to prevent material damage, guarantee durable wood structures and maintain indoor environment healthiness.

Online Access: Free

Resource Link

https://www.researchgate.net/publication/327155544_HYGROTHERMAL_ANALYSIS_OF_TIMBER-BASED_EXTERNAL_WALLS_ACROSS_DIFFERENT_AUSTRALIAN_CLIMATE_ZONES ↗