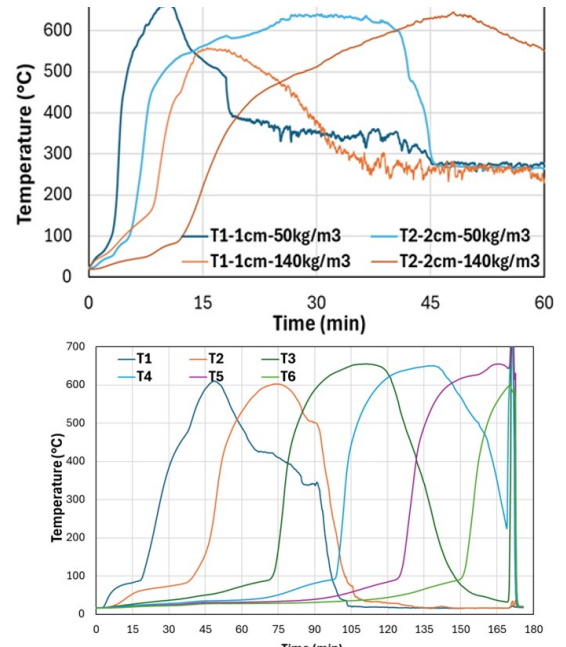


FRIC Paper
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Smoldering in bio-based insulation

Experimental study of gas emissions & the role of density

Bio-based insulation is eco-friendly but can be prone to smoldering fires - slow, flameless, and hard to detect. This study examines how wood fiber board density affects smoldering behavior and gas emissions.

Experimental Setup and Materials

Low (50 kg/m³) and high (140 kg/m³) density wood fiber boards were studied using two fire testing methods simulating different fire exposures - the cone calorimeter (ISO 5660-1) and a bench-scale apparatus (EN 16733).

Key Findings

Low-density boards ignited faster and emitted more CO. High-density boards burned slower due to higher thermal inertia.

Implications for fire safety in buildings

Understanding how smoldering behaves in bio-based insulation helps build essential fire safety knowledge. The findings may support better detection, smarter material choices, and updated safety guidelines, especially in low-ventilation spaces where smoldering is a hidden hazard.

More info

The paper «*Gas emissions during smoldering in bio-based insulation: experimental study of the role of wood fiber board density*» is published in the conference proceedings of Interflam 2025. The study is a collaboration between FRIC and partners in France, as part of the PhD work of Lydia Hammad at CSTB (lydia.hammad@cstb.fr).



Fire Research & Innovation Centre

Postal Address
PO box 4767 Torgarden
7465 Trondheim
Norway

Visiting Address
Tillerbruvegen 202
7092 Tiller
Norway

Telephone
+47 464 18 000

E-mail/ web
post@fric.no
www.fric.no