Rigid insulation panel from hemp

Eco-materials for low-carbon construction

Innovation showcase

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CAVAC Biomatériaux (France) :
A complete hemp chain “from field to site”, unique in Europe!
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- Hemp and flax cultivator
- Transformer: Production of hemp and flax fibers (and shiv)
- Producer of bio-based insulation panels
- Member of the ISOBIO Project
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Cavac objectives in ISOBIO projet:

- **Context of development**

  - Straw
  - Hemp fibre 20-25%wt
  - Hemp Shiv 55-60%wt
  - Hemp fines 15-20%wt
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  **Building applications**

  - Equalization screed

  Zero waste policy!
Cavac objectives in ISOBIO projet:

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  - **Straw**

**Building applications**

- New application: Rigid insulating panel from hemp shiv?

**Zero waste policy!**
Development with ISOBIO

• **One year ago**

Research on **biobased binder formulation** to bind the hemp shiv.

Research on the **manufacturing tools and production process**.
Development with ISOBIO

• **Production trials on industrial tools**

Industrial testing on a continuous thermopressing line
One month ago

Still working on the industrialisation of the material and automotization
Hemp shiv rigid insulation panel: Performances
Panel performances

- **New valorisation of an industrial byproduct**
- Low density ~ 200 kg/m³
- Good thermal insulation
- Good/excellent moisture buffering value: Improve indoor air quality
- Vapor permeable
- Water proof
- Good mechanical properties
- Bio based content > 95 %wt
- Groove and Tongue profil
- Still working on fire performances
Panel performances

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$\lambda = 0.055 \text{ W/m.K (hot plate method)}$

Complementary insulation
50 mm thickness, $R = 0.9 \text{ m}^2\text{K/W}$
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Nordest project MBV classification

Hemp shiv insulation panel: Good or excellent hygric regulator
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Moisture vapor can pass through the panel:
- Reduced condensation risk
- Avoid water vapor blocking in the wall
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Compressive strength can reach 1 MPa
(5 times higher than similar wood based product)

Flexural strength can reach 2 MPa
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No added formaldehyde
No reactive PMDI
Reduced VOC content
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Ease of implementation
Reduce thermal bridges

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N°636835.
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Expected uses

• Expected uses:
  • Wood frame building
  • Internal insulation (new building and retrofitting)
  • External insulation (new building and retrofitting)
  • Plaster/render substrate
  • Sarking insulation
Wood frame building: lime render finish
Wood frame building: siding
External insulation (retrofit or new building)

Internal insulation (retrofit or new building)
Sarking insulation
Thank you