This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N°636835.
• LHOIST
• BUILDING MARKET
• BCB INTO EUROPEAN INNOVATION
• LIME AS PART OF AN ETICS SYSTEM
• IMPLEMENTATION
• TECHNICAL CHARACTERISTICS
LHOIST

28/11/2017
BUILDING MARKET

- Mortar render and plaster
- Aggregates and limestone filler
- Silico-calcareous bricks
- Fiber cement panels
- Insulating materials
- Bricks and tiles
- Restoration of historical monuments
- Paintings
- Ceramics, tiles, sanitary porcelain
- Asphalt shingles
- Aerated concrete

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BUILDING MARKET

Lhoist in France: BCB

- BCB Center of expertise for building material
- One laboratoire for R&D: Formulated lime, Lime caracterisation
- Production
- Lime distribution
- Production site and distribution platforms

Subsidiaries in Spain: DECSA

REGION NORESTE

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Diseminado s/n PONT MAJOR GERONA GERONA

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• HEMPSEC
Pre-fabricated, pre-dried panelised system of hemp-lime construction

• ECO-SEE
Study of the use of innovative eco-building materials that will address poor air quality, while also radically improving the energy efficiency of buildings

• ISOBIO
Combination of existing technologies in order to develop bio-based panels and renders with high insulating properties, low embodied energy, low embodied carbon and hygrothermally efficient
LIME AS PART OF AN ETICS SYSTEM

- Bi-components lime based render (lime + hemp) + lime based plaster (lime+sand)
  - Part of an external thermal composite system
LIME AS PART OF AN ETICS SYSTEM

• Bsp: formulated aerial lime to comply with standard NF EN459

• The hemplime render will be validated in the professional rules of construction with hemp

• Dosage for base coat: 25% weight Hemp + 75% weight lime

• Dosage for the finishing: 1 volum of lime for 2-3,5 volums of sand (depending on the type of sand)
IMPLEMENTATION

• Hemp and lime mixed on site according to the technical datasheet
• Substrate: biobased panel, hempcrete, aerated concrete, wood concrete...
• Application between 5°C and 35°C
• Implementation method: spraying machine and hand tools

• Thickness: 20mm basecoat + 5 mm finishing coat
• Application of the finishing at least 48h after the basecoat
• Drying time: one week for 2 cm
• Lightweight solution: dry density of the whole solution around 1000kg/m³
## TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>Base coat</th>
<th>Finishing coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lime render/plaster (%volume)</td>
<td>67</td>
<td>35</td>
</tr>
<tr>
<td>Bio based aggregates (%volume)</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>Mineral aggregates (%volume)</td>
<td>0</td>
<td>65</td>
</tr>
<tr>
<td>Dry density (kg/m³)</td>
<td>560</td>
<td>1.4 to 1.9</td>
</tr>
<tr>
<td>Mixing</td>
<td>On site</td>
<td>On site</td>
</tr>
<tr>
<td>Implementation method</td>
<td>spraying or hand tools</td>
<td>spraying and hand tools</td>
</tr>
<tr>
<td>Thickness (mm)</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Capillarity coefficient class NF EN 998</td>
<td>W0</td>
<td>W2</td>
</tr>
<tr>
<td>Adhesion to CAVAC Panel NF EN 998 (N/mm²)</td>
<td>0.35</td>
<td>NA</td>
</tr>
<tr>
<td>Vapour resistance factor (µ)</td>
<td>9.7</td>
<td>11</td>
</tr>
<tr>
<td>Thermal conductivity (W/m. K)</td>
<td>0.14</td>
<td>&lt;0.18</td>
</tr>
<tr>
<td>Compressive strength (MPa)</td>
<td>1.20</td>
<td>1.27</td>
</tr>
<tr>
<td>Ageing under UV</td>
<td>No significant colour change, no obvious effect on the microstructure</td>
<td>No significant colour change, no obvious effect on the microstructure</td>
</tr>
<tr>
<td>Fire reaction</td>
<td>On going</td>
<td>On going</td>
</tr>
</tbody>
</table>
BENEFITS OF THE NEW PRODUCT

- Lightweight solution
- Ensure the structure continuity and accentuates the original inertia of the wall and the hygrothermal properties
- Strong adhesion of mineral and vegetable based product
- Can be coloured
- Sequestration of CO2 during lime carbonation
- Good reaction under fire expected: our latest hygrothermal renders are classified B s1 d0.
Thank you for your attention.

Any questions?