

METABUILDING 2nd GROW / HARVEST CALL : MEET THE WINNERS !

CALSILAM

Additive manufacturing of structures based on hydrated Calcium Silicates for thermal and acoustic insulation elements

SECTORS INVOLVED: Digital Industry & Additive Manufacturing.



Spain



Spain



Czech Republic

TESELA, Materiales Innovación y Patrimonio S.L. (PROJECT COORDINATOR)

- Innovative Spanish technology-based SME (Padul, Granada, Spain).
- Main activity of the company: development of sustainable and advanced materials for the construction sector.
- Area of knowledge: Geology, Chemistry, Construction Sector, Architecture and Heritage.



PRINT4D S.R.O. (PROJECT PARTNER)

- Innovative technology-based SMEs (Czech Republic).
- Main activities of the company: concrete 3D printing systems and design consulting, engineering and final product 3D printing.
- Area of knowledge: Engineering, Building Sector and Architecture.

PRINT4D



CETIM (SERVICE PROVIDER)

- Private non-profit technology centre (A Coruña, Galicia, Spain).
- Main activities of the company: Promote research, technological development and innovation in the different economic sectors and economic activities.
- Area of expertise: sustainable building materials and development of advanced building materials (alternative binders and geopolymer/alkaline cement materials from industrial and mineral waste).



Technological Centre



Role in the project



PROJECT COORDINATOR

Development of materials based on silicates.

Physical and chemical characterization of materials



Technological Centre

SERVICE PROVIDER

Optimization of the formulation developed for 3D printing at laboratory scale.

Characterization of materials (acoustic/thermal behavior)



PROJECT PARTNER

3D printing test of composites.

Study of the extrusion method in large format 3D printing.

CALSILAM. Additive manufacturing of CSH structures

Objective of the Project

Develop an innovative and sustainable material based on hydrated calcium silicates that has thermal and acoustic insulation properties, through additive manufacturing.

Technical objectives

Reduce:

- 25 % water consumption
- 25 % greenhouse gas emissions
- 45 % construction material waste
- Improved thermal and acoustic insulation properties

Cross-cutting nature: Combination of scientific knowledge and industry

Sustainable materials

Advanced robotics



CALSILAM. Additive manufacturing of CSH structures



THE PROBLEM:

- Current methods of building panels and walls.
- Systems based on multilayers: The materials are glued and / or stacked together to achieve a specific requirement in terms of structure, sound insulation, thermal bridges, resistance, etc.



THE SOLUTION:

- Additive manufacturing of CSH structures using large format 3D printing process.
- Innovative material with thermal and acoustic insulation properties (all in one).
- The material will allow the industry to reduce the traditional multilayer wall system.

CALSILAM. Additive manufacturing of CSH structures

PROPOSAL:

Create custom structures with a high degree of reproducibility and with ease of adapting functional structures to different applications (e.g. walls and panels).

MAIN CHALLENGES:

- Formulation of composite materials. (Phase 1)
- Laboratory-scale optimization of the extrusion process. (Phase 2)
- Large scale. Buildability of the composite material. (Phase 3)



3D printer used in laboratory



metabuilding

CALSILAM

Gracias por su atención

www.metabuilding.com



METABUILDING Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 873964. The European Commission and the European Innovation Council and SME Executive Agency (EISMEA) are not responsible for any use that may be made of the information it contains. The sole responsibility for the content of this document lies entirely with the author's view.