

## Next-generation insulation promises large energy efficiency gains

***An EU-funded consortium has developed a next-generation insulation system using lightweight nano-cellular foam in combination with active moisture monitoring and control technology. The aim is to improve the thermal performance, longevity and sustainability of new and retrofitted buildings.***



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Partners in the FoAM-BUILD project, including leading European construction materials firms, say their advanced external thermal insulation composite system achieves 30 % lower thermal conductivity than conventional insulation panels using materials that are lighter and up to 30 % thinner. The system also obviates the need for potentially harmful chemical substances and coatings, while increasing the maintenance-free lifespan of building exteriors through active moisture management.

“In FoAM-BUILD, we have addressed many key challenges for improving building insulation, leading to the development of an external thermal insulation composite system that goes beyond the current state of the art,” says project coordinator Christoph Mack at Fraunhofer Institute for Chemical Technology ICT in Germany. “Building demonstrators have been set up, some of the materials are already being commercialised and further research is being conducted to bring the main results to market.”

FoAM-BUILD’s innovative thermoplastic particle foam panels, in combination with aerogels, feature nano-scale structures that enhance insulation properties, enabling a substantial reduction in energy use and costs for building heating and cooling.

Because the composite panels are thinner and lighter than conventional panels, manufacturing them should reduce raw material use and cut environmentally harmful emissions. Their size and features also provide a greater degree of architectural freedom, while enabling faster and less labour-intensive installation via new assembly techniques, mortars and tools developed in the project.

“A standards-compliant flame-retardant formulation which was developed and implemented in the foam will ensure a healthier environment due to the absence of halogen chemicals such as bromine. This, in turn, results in an insulation material with high recyclability and fire safety,” Mack says.

## Smart, active moisture control

In another significant innovation, the FoAM-BUILD team have also managed to eliminate the need for anti-fungal and anti-algae chemical coatings, conventionally applied in the form of paints that contain environmentally harmful substances and need to be reapplied every few years.

“A main aim of FoAM-BUILD was to improve the long-term behaviour of exterior insulation systems through the development of moisture-control technology to prevent the growth of algae and fungi,” the project coordinator continues. “The innovation consists of a low-cost sensor network, data acquisition and smart processing technology, and a ventilation system that enables targeted drying of wet areas of façades, resulting in a healthier environment without the use of algaecides or fungicides.”

The sensor package and façade-monitoring solution is designed to be low cost and energy efficient, with the ventilation system only operating when moisture is detected. This results in a more sustainable solution compared to fungicide or algaecide paints which typically need to be reapplied every two to five years to maintain their effectiveness, especially in wet climates.

A large-scale demonstrator of the ventilation system has been set up and is currently running at a test building in Germany belonging to project partner DAW, a leading manufacturer of innovative coating and insulation systems.

“A patent for the moisture-prevention system has been applied for, while some materials such as new mortars developed in the project have already been commercialised. Other results are being taken up within other projects to overcome the last hurdles before commercialisation,” Mack says.

### Project details

- Project acronym: **FOAM-BUILD**
- Participants: Germany (Coordinator), Austria, France, Netherlands, Norway, Greece, Spain, UK,
- Project N°: 609200
- Total costs: € 4 941 983
- EU contribution: € 3 519 576
- Duration: September 2013 to August 2017

### See also

**Project website:** <http://www.foambuild.eu/>

**Project details:**

[https://cordis.europa.eu/project/rcn/109596\\_en.html](https://cordis.europa.eu/project/rcn/109596_en.html)

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