

Long-Term Performance of Super-Insulating Materials in Building Components and Systems

EBC ANNEX 65

Current energy conservation standards often call for space saving insulation technologies, especially for building refurbishment. Therefore, new super insulating materials (SIM), such as types of vacuum insulation panels (VIP), gas filled panels (GFP) and aerogel based products (ABP) have been rapidly spreading in the building insulation market. They have become attractive alternatives that allow a reduction of the insulation thickness by as much as a factor of five. However, besides offering excellent insulation performance, these materials are relatively expensive and there is a lack of information on their durability under different hygrothermal conditions.

This research project investigated the potential long term benefits and risks of newly developed super insulation materials and systems and provided guidelines for their optimal design and use. The target audience of the project outcomes is construction industry partners, architects and building designers, building owners and standardisation organisations.

PROJECT OBJECTIVES

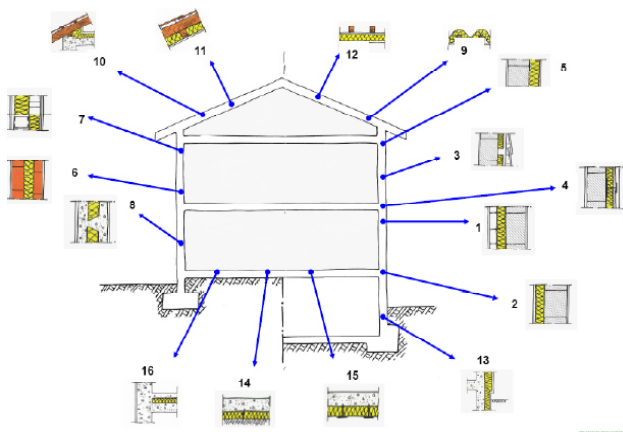
- 1 improving knowledge and confidence of decision makers and planners regarding super-insulating materials,
- 2 providing reliable data on properties, durability and sustainability,
- 3 securing implementation techniques,
- 4 serving as a basis for future standards, and
- 5 providing a clear description of the measurement procedures and the testing methods for ageing tests.

ACHIEVEMENTS

The main outcome from this project included a scientific information report for standardisation bodies dealing with Hydro-Thermal mechanical properties and ageing as well as guidelines for the design, installation and inspection with a special focus on retrofitting.

The following reports have been published as the official project deliverables:

- State of the Art and Case Studies
- Scientific Information for Standardization Bodies dealing with Hydro-thermo Mechanical Properties and Ageing
- Practical Applications Retrofitting at the Building Scale Field scale and Appendices
- Sustainability - Life Cycle Assessment (LCA), Life Cycle Cost (LCC), and Embodied Energy (EE)



Possible applications of new super insulating materials
Source: EBC Annex 65

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

EBC MISSION

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.



Vacuum insulation panel (VIP)



Aerogel based product (ABP)

Project duration

Completed (2013–2019)

Operating Agent

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Further information

www.iea-ebc.org