WALL-ACE – Nouvel Wall Insulation Systems

Real scale testing of aerogel based wall products
Need for new solutions

- Develop high energy efficient mineral based materials
- Strongly reduce the energy consumption and CO2 emission
- Improve indoor air quality
- Improved durability and sustainability
- Develop affordable and high replication potential for Europe
- Test, asset the products and systems in real condition and at building scale
- Certification and standardization of high efficient new systems
Development of 5 mineral insulation products based on:

- Silica Aerogel technology
- Enersens (absolute insulation)

Product properties:
- Top insulation performance
- Summer comfort
- Preserves indoor air quality
- Non-flammable mineral material
- Sustainable

Duration: 36 months
October 2016 – September 2019
Budget: €6,258,000
Silica aerogel

Kwark® is a high performance silica aerogel material developed and made by ENERSENS according to a patented process. It is an exceptional material resulting from many years of research and is the best thermal insulation material. Comprised of a very light amorphous silica structure, it contains more than 95% captured air in nanometer-sized pores. This air-filled structure gives it the lowest thermal conductivity “λ” known to date.

Advantages:
- Low thermal conductivity
- Wide temperature range
- Hydrophone
- Respiring
- Low density
- Acoustic insulation

0.012 W/(m.K)
-160 à 350 °C
70 kg/m³
The 5 innovative products

- External High Performance Insulating Render
- Insulating Bricks
- Internal High Performance Insulating Plaster
- Thermal Coating Finishing
- Insulating Patching Filler
Products

**KWARK AEROGEL**
- Low thermal conductivity
- Wide temperature range
- Hydrophobic
- Breathable
- Low density
- Sound attenuation

**EXTERNAL HIGH PERFORMANCE INSULATING RENDER**
- Non-flammable material
- High resistance
- Extreme low thermal conductivity
- Completely mineral

**HIGH PERFORMANCE INSULATION MATERIALS FILLED BRICKS**
- Construction of modern low-energy and passive houses
- Increase in the energy efficiency of the brick units
- Lower production costs
- Space savings

**INTERNAL HIGH PERFORMANCE INSULATING PLASTER**
- Low thermal transmittance
- Rapid installation
- For new and existing buildings
- No VOC emissions

**THERMAL COATING FINISHING**
- Reduction of cold wall sensation
- Thermal comfort
- Control of surface vapor condensation
- Mold growth limitation
- Low thermal transmittance

**INSULATING INTERIOR PATCHING FILLER**
- Fix all minor and major defects and imperfections
- Delete thermal bridges
- Two times more efficient than standard patching fillers
- No VOC emissions: product based on mineral compounds
Measurement of hygrothermal performance

- Hygrothermal performance
- Water vapor permeability
- Indoor air quality
- Sustainability
Demonstration on real buildings

Flat retrofitting
Italy- Turin

BRE’s Innovation Park
Scotland- Glasgow

INCAS house at CEA
France - Chambéry

Current identified building (still modifiable)
AGITEC
Switzerland
1ST Installation of Aerogel Plaster at Vimark Factory

• Vimark reached the first formulation of the aerogel-based thermal insulating plaster and of the aerogel-based coating finish. The first installation test at VIMARK factory demonstrated that the thermal plaster is ready to be optimized for industrial production and it is suitable for pumping machine application. The material can reach high thicknesses, > 5 cm, without sliding or detaching.

• Several types of Kwark particle size have been tested to reach the perfect combination of mechanical resistance and thermal performance. The final product is designed to show a thermal performance 30% better than non-aerogel based insulating plasters on the market.

• The product is specifically designed for application in indoor environment, and it is suitable for historical and heritage buildings.
1st demonstration at ATC’s building in Torino, Italy

• In 2017 installation of indoor thermal plaster in an apartment by Vimark

• Thermal performance test by POLITO
Project perspectives

Project’s end: October 2019

➤ Industrial partners willing to reach the market quickly

Tools:

➤ Marketing mix
➤ Users’ guide supply for clients and end users
➤ Communication plans
➤ LCA
➤ Certification of new products
➤ Business plan at the end of the project for further collaboration between industrial partners
Thank you for your attention

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