Aerogel based material for blown-in insulation

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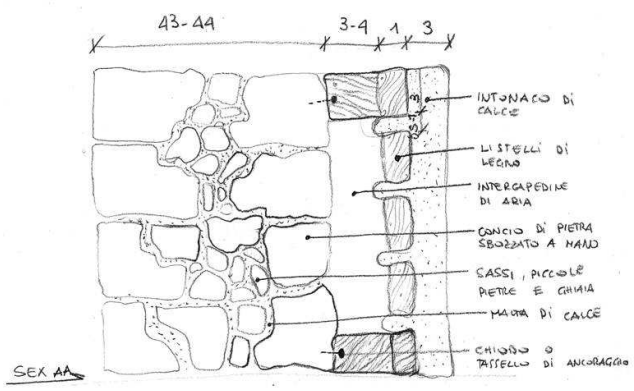
Walls

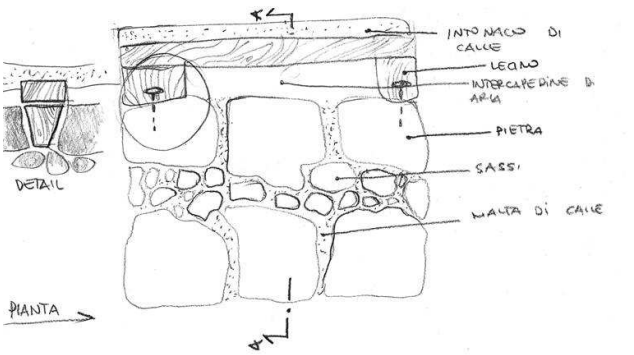
What is the solution?

The solution consists of an innovative material for blown-in insulation. A fibrous polyester material is impregnated with silica aerogel. This blanket is cut in very small pieces and used for the blown-in product. The blown-in insulation can be used in the cavity behind the wall finishes (for example existing paneling or plaster). The product was developed in a research project and it is on the market.

Cross section of the wall build-up, available pictures of the solution:



Cross section, © Elena Lucchi (Eurac)



Installation, © Elena Lucchi (Eurac)

Loose material, © Elena Lucchi (Eurac)

Why does the solution work in terms of compatibility with conservation, moisture safety and energy improvement?

The solution works well for historic buildings because it can be used in cavities behind internal lining without reducing room space. The installation is cost effective, a company specialized in blown-in insulation is needed. The material has good hygrothermal features but should be verified case by case with hygrothermal simulations, as each internal insulation solution.

Description of the context:

The building where the solution was built in is a traditional Scottish tenement building in the district of Glasgow. Only one flat was renovated with this technique. The external walls are traditional stone masonry made with sandstone bedded in mortar.

Pros and cons of the solution:

The possibility to use the cavity behind wall finishes without reducing room space and the cost-effective installation techniques are the main advantages of the solution. The material produces a lot of dust during installation, the installer has to fully protect themselves because the material cannot be breathed neither touched. This brings to difficulties during installation. Another

disadvantage is the high production cost.

Type of data available (level of information, simulation):

The material is a new material that was developed within a research project. The material was tested in a large scale mock up and in a real building. The monitoring and simulation results are published in research papers.

Additional Information:

The following papers related to this material are published: 1. Elena Lucchi, Francesca Becherini, Maria Concetta Di Tuccio, Alexandra Troi, Jürgen Frick, Francesca Roberti, Carsten Hermann, Ian Fairnington, Giulia Mezzasalma, Luc Pockelè, Adriana Bernardi, "Thermal performance evaluation and comfort assessment of advanced aerogel as blown-in insulation for historic buildings", Building and Environment; 2. Elena Lucchi, Francesca Roberti, Troi Alexandra "Definition of an experimental procedure with the hot box method for the thermal performance evaluation of inhomogeneous walls", Energy and Buildings

Is there any related publication? If yes, please provide any available link or document for further reading

https://www.hiberatlas.com/smartedit/projects/138/Thermal performance evaluation and fomfort assessemnt.pdf
Paper -Thermal performance evaluation and comfort assessment of advanced aerogel as blown-in insulation for historic buildings
https://www.hiberatlas.com/smartedit/projects/138/Definition of an experimental procedure with the hot box method.pdf
Paper - Definition of an experimental procedure with the hot box method for the thermal performance evaluation of inhomogeneous walls