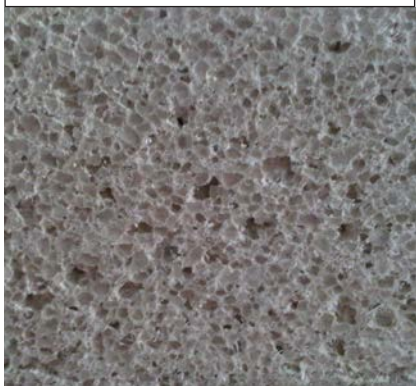
FIXIT®
Schweiz. Suisse. Svizzera.

Aerogel Insulating Plaster System

Application guidelines

What are Aerogels?

Aerogels are manufactured from silicate material and consist almost completely (90 to 98%) of air. The extremely porous microstructure has the effect of entraining air molecules, thus severely limiting its ability to transmit heat. This pure mineral raw material forms the basis for the production of the highest performance insulating material that exists. Fixit 222 Aerogel high-performance insulating plaster was developed in collaboration with EMPA in the course of a project lasting several years. It has been available on the market since 2012.



A cross-section through the hardened high-performance insulating plaster

Focal point: renovating old buildings to improve energy efficiency

Thanks to its outstanding properties Fixit 222 Aerogel high-performance insulating plaster is ideal both for use in renovating old buildings to modern energy standards, as well as for thermally insulating historic buildings and structures. It is equally suitable for indoor and outdoor use. Application onto single layer brick walls dating from the 1950's or existing 2-shell hollow wall masonry will also result in significant improvement in thermal insulation.

Indoor walls can be insulated in the same way without the need for cavities. Since the external application of insulating plaster is not always possible for aesthetic or technical reasons, indoor use is often the only possible solution. In particular, buildings which are only used on a part-time basis (holiday homes, churches and so on) can be quickly heated to a comfortable temperature when treated with Aerogel insulating plaster.

Variant: application to single layer brickwork

In new buildings the high-performance plaster can also be applied to highly insulating brickwork.

A 3 – 4 cm layer of Fixit 222 Aerogel high-performance insulating plaster on a single layer brick wall can result in a reduction of up to 11 cm wall thickness, thereby both saving building costs and increasing the habitable surface of the room. The resulting additional revenue means that pay-back occurs after only about four years, and the building enjoys a growth in value.

Applying a second layer on top of existing composite insulation system facades

Applying additional insulating material on top of an existing facade is time-consuming during the planning phase but pays off quickly during construction, since the existing external insulation material need not be removed and disposed of, bringing large cost savings. In addition the aerogel insulating plaster is not applied in sheets and therefore does not require the use of expansion bolts. The renovated façade is slimmer than it would have been if conventional sheet insulation techniques had been used.

Application guidelines for the Aerogel Insulating Plaster System

General

When working outdoors the scaffolding must be protected against wind and direct sunshine by means of netting or tarpaulin. During application and drying, the air and substrate temperature must not sink below 5° C or exceed 30° C.

If plaster profiles are used to protect corners and edges these must be attached with adhesive covering the whole of their contact surface before the Aerogel insulating plaster is applied.

1 Preparing the Substrate

The substrate must be prepared in advance with an adhesive primer layer. If difficult substrates are to be covered or existing base layers prove impossible to remove, mounting a Welnet is recommended to provide adequate support to the Aerogel plaster. The substrate must be clean, dry and capable of supporting the layer of plaster to be applied.

Substrate	Fixit 211	Fixit 281	Fixit 670	Fixit 462	Fixit 210	Welnet
Brickwork	•	•	•			
Single layer brickwork		•				•
Concrete	•					•
Quarrystone	•	•	•			
Sandstone		•				
Lime plaster		•				•
Gypsum plaster						
Cement plaster	•					•
Wallpaper						
Synthetic plaster				•		•
Blooming					•	•
Exposed masonry						•
Soffits						•
Timber framework		•				•
Vaults, domes, arches						•

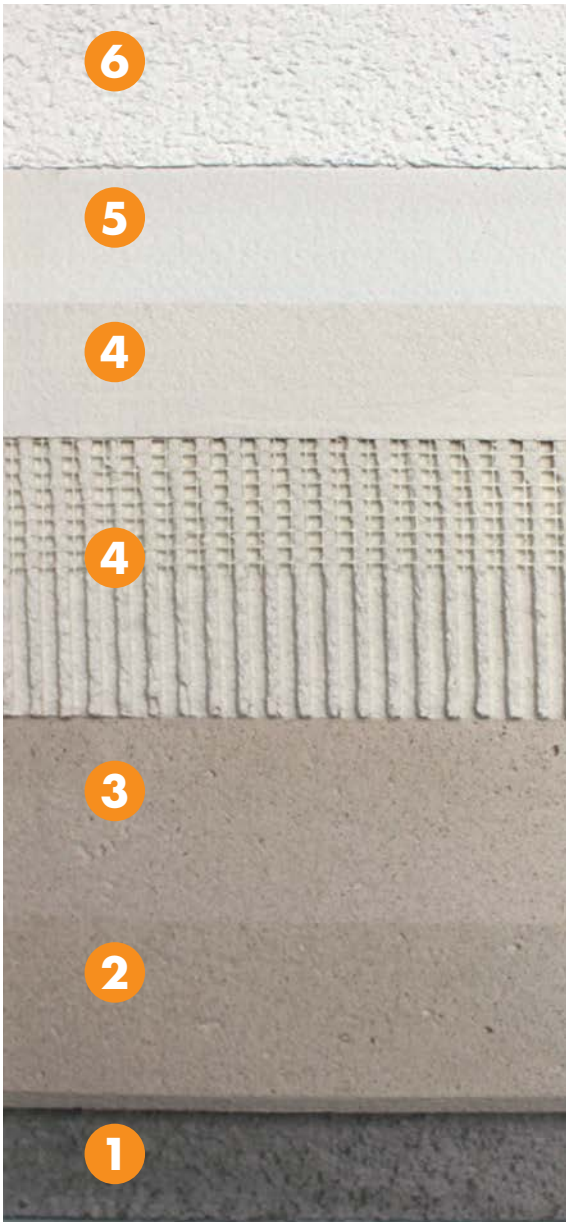
2 Plaster application with Fixit 222 Aerogel high-performance insulating plaster

Fixit 222 Aerogel high-performance insulating plaster should be applied with a plastering machine equipped for use with insulating plaster (double performance spiral casing and plaster spiral for insulating plaster). Where pedestal, balcony and floor joint lines occur, or in situations where standing water exists, then pedestal insulation panels must be fitted in advance to the base of the wall to a height of between 10 cm (minimum) and 20 cm (maximum) above ground level. This jointing work near to floor level must be executed in accordance with detailed construction drawings relating to Fixit 222 aerogel insulating plaster.

If several layers are required the freshly dried surface must be very well roughened. We recommend drifting Swedish-cut saw across the wall to give the necessary roughness. The next plaster layer should be applied on the following day. In order to avoid shrinkage-cracking caused by the surface drying out too quickly, Fixit 222 Aerogel high-performance insulating plaster must be kept moist for at least a week.

Drying time depends on local conditions and weather. As a rule under ideal conditions a drying rate of 3 mm per day is expected. In order to allow adequate structural strength to develop, do not apply further coatings to the Fixit 222 Aerogel high-performance insulating plaster for at least three weeks.

If additional work or correction is required, add 10 % Fixit 497 plaster and mortar emulsion to the mixing water used to prepare the Fixit 222 Aerogel high-performance insulating plaster. This improves substrate adhesion and makes working easier. Also apply Fixit 497 plaster and mortar emulsion to critical areas to ensure optimal plaster adhesion to the substrate. Only roughen the Aerogel high-performance insulating plaster just before further layers are applied.



3 Surface stabilization with Fixit 493 mineral-based undercoat stabilizer

In order to create a sufficiently strong surface layer on the Fixit 222 Aerogel high-performance insulating plaster, Fixit 493 mineral-based undercoat stabilizer must be applied to the surface after it has been adequately vacuum-cleaned of dust and particle residue. Ideally this step should be carried out 24 hours before embedding the reinforcing fabric mesh. Fixit 493 should be diluted 1:1 with water, spray-applied (saturated wet-in-wet) and then worked in with a roller.

4 Embedding the reinforcing fabric mesh and levelling with Fixit 223 special embedding mortar

In order to create a robust and level plaster surface it is necessary to add an embedded layer of fabric reinforcement. This is achieved by embedding a white, coarse glass fibre reinforcing mesh in a layer of Fixit 223 special embedding mortar which is at least 5 to 8 mm (maximum) thick.

Depending on the chosen final render, Fixit 223 special embedding mortar is either roughened with a brush (for mineral-based finishing coats) or applied smoothly with the plastering trowel (for silicate-based finishing coats). In the pedestal region the perimeter insulating boards must be roughened beforehand. Allow at least 10 days drying time.

Application

5 Undercoats for Fixit mineral-based finishing coats

The following Fixit products provide ideally matched undercoats for mineral-based final renders:
Fixit 471 Plaster base Premium
Fixit 475 Primer for mineral-based final renderings

Smoothing

6 Final renders and paint coatings with mineral based coatings and Fixit colours

Only mineral-based finishing coats and colours may be applied to Aerogel insulating plaster components.

The most frequently used finishing coats are:
Fixit 203 Render with hydraulic lime
Fixit 208 Basic mixture for restauration work
Fixit 740 Silicate/silicone render
Fixit 746 Silicone finishing plaster
Fixit 763 White chalk cement render
Fixit 764 Roughcast finishing render
Fixit 777 Finishing render extra white

The service lifetime of a façade created with the Fixit aerogel insulating plaster system is significantly lengthened by the application of two coats of mineral-based paint.

We recommend for this purpose:
Fixit 784 Silicate roll-on colour
Fixit 785 evo biocide-free mineral colour
Fixit 786 Si Silicone resin roll-on colour

Hard final renders such as washable or scratch resistant coatings should not be used on Fixit aerogel insulating plaster as the surface stress is too high and adequate adhesion cannot be guaranteed.

Embedding the glass fibre reinforcing mesh

Further information including technical data and a product video can be found on our website at www.fixit.ch/aerogel
In addition we draw your attention to the general rules of building construction and the applicable guidelines of the Swiss Painters and Plasterers Association (SMGV) as well as the SIA Standard 242.

Fixit 222 Aerogel high-performance insulating plaster

Properties

- **Highly insulating, lambda value λ 0.028 W/mK**, enabling thin layers to be applied
- **Permeable to water vapour** – indoor room air humidity can pass unhindered through the plaster coat to outside
- **Water repellent**, for good building insulation
- **Resistant to algae, fungus and insects**, for a pleasant and healthy room climate
- **Acoustically damping** thanks to its highly porous structure
- **Non-flammable** for enhanced personal safety
- **Joint-free insulating layers**, for a uniform appearance over the façade surface
- **Easy to handle**, allowing façades to be renovated economically
- **Variable layer thicknesses possible**, prior levelling not necessary
- **True-to-original wall reconstruction possible**, preserving the appearance of historic buildings for future generations and staying within the requirements of preservation orders
- **Use as indoor thermal insulation** when outdoor insulation improvement techniques cannot be applied

Simple and economic application

The preparation and use of Fixit 222 Aerogel high-performance insulating plaster differs only slightly from that of conventional insulating plasters containing polystyrene or mineral lightweight aggregate.

Fixit 222 Aerogel high-performance insulating plaster can be applied simply and efficiently with a plastering machine equipped for insulating plaster application (lightweight plaster mixer and two stage spiral casing). The mixture is workable for 20 to 30 minutes. Delivery pipework should not exceed 35m in length.

The Aerogel insulating plaster can be roughened using either a «Schleifwunder®» trowel or a FLEX Giraffe® with vacuum cleaner attachment.

It is essential, however, that the handling guidelines given in the Technical Datasheet and the information on how to correctly use the Fixit aerogel insulating plaster system in this brochure are followed closely.

MADE SWISS

Fixit Aerogel high-performance insulating plaster is manufactured in Switzerland and is continually tested in our on-site quality control laboratory. Product quality is, in addition, independently monitored and the lambda value is guaranteed with confirmation by the SIA, the Swiss Society of Engineers and Architects. Confirmation documentation is available on request from the SIA.

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