Aerogel Insulating Plaster System
Handling Guidelines

\[ \lambda = 0.028 \text{ W/mK} \]

- Mineral based
- Easy to use
Efficient building insulation using space technology

Aerogel high-performance insulating plaster – a world first!
Fixit 222 Aerogel high-performance insulating plaster is the innovation in the field of building insulation. It achieves a thermal conductivity of 0.028 W/mK, which is two to three times better than conventional insulating plasters.

Lightweight Aerogel granulate is the primary additive used in this high-performance lime-based insulating plaster. For the first time an insulating plaster is now commercially available which uses the highest performance insulating material in existence – Aerogel.

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.

In new buildings the high-performance plaster can also be used on highly insulating brickwork. Depending on the bricks used, a 3 to 5 cm layer of Fixit 222 is sufficient to achieve Minergie-standard insulating levels.

Mineral-based plaster systems – optimal structural properties
Fixit 222 Aerogel high-performance insulating plaster is best used in conjunction with other Fixit products. Because of its mineral-based composition, the Fixit Aerogel insulating system offers optimal structural properties. Permeability to water vapour is absolutely guaranteed, thereby practically excluding the possibility of surface condensation or mildew growth. The low water absorption and water repellent properties of the high-performance plaster provide a long-term guarantee of its superb insulating characteristics.

Fire resistance
Fixit 222 Aerogel high-performance insulating plaster and system components are non-flammable (Fire Classification 6q3, Flammability Rating A2), thereby making an active contribution to building fire safety.

What are Aerogels?
Aerogels were originally developed for space applications such as insulating spacesuits, and also as a storage medium for gaseous fuels. Aerogels consist almost completely (90 to 98%) of air.

The raw material used to manufacture Aerogels is amorphous silica, known in the building industry as sodium silicate or simply silicate. This pure mineral raw material forms the basis for the production of the highest performance insulating material that exists. Not only does Aerogel hold the world record for the material with the lowest thermal conductivity, it is also the lightest solid in existence. Its extremely porous microstructure has the effect of entraining air molecules, thus severely limiting its ability to transmit heat.

Cooperative research project: Empa and Fixit AG
Fixit 222 Aerogel high-performance insulating plaster was developed in the course of a R&D project supported by the Swiss Innovation Promotion Agency (CTI). Working together for several years, Empa researchers and Fixit product developers have successfully launched this innovative new product onto the market.
Handling Guidelines for the Aerogel Insulating Plaster System

Substrate preparation with Fixit 211 or Fixit 670 roughcast rendering

The substrate must be prepared in advance with an adhesive primer layer to rough the surface and reduce absorption.

- Natural stone and masonry walls: Fixit 211 cement roughcast with adhesive additive
- Bricks and insulated brickwork: Fixit 670 extended cement roughcast

Plaster application with Fixit 222 Aerogel high-performance insulating plaster

Apply Fixit 222 Aerogel high-performance insulating plaster with a plastering machine equipped for use with insulating plaster (e.g. PFT G4 or Mai 4ever).

Layer thicknesses of 60 to 80 mm can be applied in a single step without difficulty. If several layers are required the surface must be roughened before it hardens or coarsely applied (e.g. using a coarse toothed trowel). The next plaster layer should be applied on the following day, but not later than the third day. Level the Fixit 222 Aerogel high-performance insulating plaster with a wooden or aluminium batten and after it has begun to set use a scraper and a V-end batten to score the surface evenly. In order to avoid shrinkage cracks caused by the surface drying out too quickly, Fixit 222 Aerogel high-performance insulating plaster must be kept moist for at least a week. This can be achieved by spraying with water or using curtains of moist jute or a plastic film.

If additional work or corrections are anticipated, add 10% Fixit 497 plaster and mortar emulsion to the mixing water used for 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.

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.

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 dried. Ideally this step should be carried out 24 hours before embedding the reinforcing fabric mesh. Fixit 493 mineral-based undercoat stabilizer should be diluted 1:3 with water and applied with a roller.
3 Embedding the reinforcing fabric mesh and leveling with Fixit 223 special embedding mortar

In order to create a crack free, solid and level plaster surface it is necessary to add an embedded layer of fabric reinforcement. This is achieved by embedding a white, coarse mesh reinforcing fabric in a layer of Fixit 223 special embedding mortar which is at least 3 to 5 mm thick.

Depending on the chosen finishing coat, Fixit 223 special embedding mortar is either roughened horizontally with a brush or applied smoothly with the plastering trowel. Allow at least 10 days drying time.

4 Finishing coat with Fixit mineral finishing coats

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

When using hydraulic lime finishing coats and lime cement plaster, the Fixit 223 special embedding mortar must be roughened horizontally with a brush, thereby ensuring adequate keying. Additionally, mix 0.5 to 1 liter of Fixit 497 plaster and mortar emulsion per sack to enhance adhesion and improve workability of the finishing plaster.

Prior to applying finishing plasters such as Fixit 777 extra white finishing plaster or Fixit 732 silicate plaster APS, an appropriate primer or undercoat should be used.

5 Paint coat with Fixit mineral colors

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 either Fixit 783 silicate colour, Fixit 784 silicate colour APS or Fixit 785 evo mineral colour.

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

Constituent materials

- Aerogel granulate as insulating material
- Lightweight mineral aggregate
- Natural hydraulic lime
- White cement (chromate free)
- White calcium hydroxide

Properties

- Highly insulating, lambda value $\lambda = 0.028$ W/mK
- Permeable to water vapour – Water vapour can pass unhindered through the plaster coat so there is no danger of surface condensation or mildew growth, resulting in enhanced comfort
- Water repellent – no loss of insulating qualities due to humidity absorption
- Resistant to algae, fungus and insects thanks to its mineral components
- Acoustically damping thanks to its highly porous structure
- Non-flammable and heat resistant
- Very high yield, 1 kg produces 5 liters of fresh mortar

The advantages at a glance

- Lowest coefficient of thermal conductivity, 0.028 W/mK
- Efficient thermal insulation with only thin layers (2 or 3 times thinner than conventional insulating plasters)
- Ultra light, dry bulk density 220 kg/m$^3$
- Does not contain Portland cement, ideal for use in old buildings and historically significant structures
- Permeable to water vapour, preventing surface condensation and mildew growth
- Joint-free insulating layers, reduction of thermal bridges
- True-to-original wall reconstruction possible
- Easy to use, machine or hand application
- Variable layer thicknesses possible, prior levelling not necessary
- Suitable for both indoor and outdoor use
- Large selection of mineral finishing coats available from Fixit

Simple and economic machine application

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

Fixit Aerogel high-performance insulating plaster can be applied simply and efficiently with a plastering machine equipped for insulating plaster application (lightweight plaster mixer and double performance spiral casing). The mixture is workable for 45 to 60 minutes.

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

Fixit Aerogel high-performance insulating plaster is manufactured in a specialized factory in Weiach, Switzerland, in accordance with stringent quality guidelines and is continually tested in our on-site quality control laboratory.
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