

Wall-ACE

Deliverable

D2.8: Technical datasheets of the developed materials

WP	2	High efficient mineral indoor insulation envelopes
Task	2.7	Examination and testing phases

Dissemination level¹	PU	Due delivery date	24
Nature²		Actual delivery date	24 (draft)

Lead beneficiary	VIMARK
Contributing beneficiaries	TOUPRET

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¹ Dissemination level: **PU** = Public, **PP** = Restricted to other programme participants (including the Commission services), **RE** = Restricted to a group specified by the consortium (including the Commission services), **CO** = Confidential, only for members of the consortium (including the Commission services)

² Nature of the deliverable: **R** = Report, Document, **DEM** = Demonstrator, Prototype, pilot, **DEC** = Websites, patent filings, **O** = Other

³ Creation, modification, final version for evaluation, revised version following evaluation, final

Deliverable abstract

The deliverable aims at describing the technical content that will be part of the technical datasheets of the insulating products for the indoor envelope.
 Final graphic template of the technical datasheets will follow the normal practice of VIMARK's and TOUPRET's products.

Deliverable Review

Reviewer #1:			Reviewer #2:		
Answer	Comments	Type*	Answer	Comments	Type*

Is the deliverable in accordance with

the Description of Action?	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
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Is the quality of the deliverable in a status

that allows it to be sent to European Commission?	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a
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that needs further work by the Partners responsible for the deliverable?	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> M <input type="checkbox"/> m <input type="checkbox"/> a

* Type of comments: M = Major comment; m = minor comment; a = advice

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DRAFT

1. Organization of the content for VIMARK's technical datasheet

The technical datasheet has the function of describing the product, the installation procedure, packaging and storage, to provide specific recommendations and to clearly express characteristics and performances of the products as well as reference norms, standards and labels mandatory and non-mandatory for the country of commercialization.

It is proposed the following content list:

- Product description
- Composition
- Mixing and application
- Indicative amounts required
- Colour
- Packaging
- Storage
- Warnings
- Product data
- Environment, health, and safety (REACH)
- Legal notes

A prototypal technical datasheet for both aerogel based thermal plaster and thermal coating finish is proposed. The content will be fitted into the usual template for VIMARK products once final information will be available.

2. Aerogel based thermal plaster

THERMAL PLASTER

Lightweight thermal insulation plaster mortar containing aerogel.

DESCRIPTION

THERMAL PLASTER is a ready to use premixed plaster mortar, based on special binders and aerogel, with excellent thermal insulation properties that merge in a single product the features of a plaster and a thermal insulating product. It is designed for manual or mechanical installation on internal walls.

Thanks to its excellent performances, it can be used for thermal insulation solutions for walls and ceilings, reduction of thermal bridges and protection from humidity penetration. The product is permeable to water vapour diffusion and due to its full mineral composition, it is particularly suitable for applications that require the use of mineral coatings. Specifically, in the case of bio-architecture, green construction systems and every time comfort and health of users is prioritised. It is also indicated for repairs and insulation of historical buildings and where it is needed to combine improvements of thermal performances and preservation of the cultural value of buildings.

COMPOSITION

THERMAL PLASTER is a premixed plaster mortar based on natural hydraulic lime and special cement, specific aerogel in granules and powder, and additives that improve the performance in terms of workability, permeability and adhesion to substrates.

SUBSTRATE PREPARATION / PRE-TREATMENT

THERMAL PLASTER can be used on any kind of masonry: brick, blockwork, expanded or lightweight concrete, brick-cement, mineralized wooden boards, scrim or metal lath, old plaster, etc.

The surfaces must be resistant, clean, fixed, free from brittle parts, dust, bacterial proliferation, saline efflorescence, oils, grease, wax, residues of previous work, etc. If necessary, clean the surface by sandblasting or pressure washing.

Smooth concrete or non-absorbent and compact surfaces need to be treated first by applying a layer of MICROGIRP to improve plaster mortar adhesion to supports. Plaster has to be applied after 2 hours from the application of the primer coat.

Use THERMAL PLASTER for the preparation and application of intermediate layers. If wooden or metal battens are used, remove them immediately after applying the thermal insulation render mortar, filling the gaps with THERMAL PLASTER.

Prepare corner beads, level guides, etc. before applying the plaster layer on the wall. The edges and openings for doors and windows can be previously prepared with the installation of steel corner beads fastened by screw or plastered in. You can also use wooden battens for edges but with less effective results. In case you need to reinforce the edges obtained, apply on coating layer the PARASPIGOLO CAPPOTTO PVC.

MIXING AND APPLICATION

THERMAL PLASTER can be applied by mechanical spraying, using a plastering machine for pre-mixed products, or by hand.

For manual application, mix the product by adding approx. 30 litres of clean water per bag. Pour water into the cement mixer then add the powder. Mix the product for about 5 minutes until the mixture is smooth and free of lumps. The mixed product is usable within 60 minutes after mixing with water. Use a large trowel to install the product in several layers, until the desired thickness is obtained.

For application by mechanical spray, set up the plastering machine with a large blade helical mixer of a rotor/stator group specific for light-weight products. Apply an initial layer of about 10 mm of

product to the whole surface. Wait for it to set before proceeding with the next layer of thickness (from 4 to 24 hours depending on the conditions of application). To achieving the desired thickness, proceed with the application of successive layers between 20 and 30 mm thickness. Level out and finish the plaster layer with an aluminium screed bar. Any smudges or excess product is to be eliminated by scraping and sanding the supports. The prepared surfaces are then suitable for treating with finishing products.

Some undesired effect may also occur, such as the cracking of the first coat or of the intermediate layers but, note that they will not affect thermal and mechanical performances of the product. Cracking may be due to the water absorption by the substrate, that was not properly treated before installation, or to the warm and dry air of the indoor room that speeds up evaporation and induces shrinkage of the product.

Wait at least 10 days before proceeding with final coating. In order to guarantee a proper adhesion of the coats, a period of curing is necessary to allow the evaporation of 90% of excess water, present in the plaster mortar.

When the coating is applied too early, a web shape cracking may happen as well as the detachment of the coating from the plaster, due to the release of the moisture content of THERMAL PLASTER, and the stress caused by the handmade levelling.

The coating shall be applied to the whole area with a metal trowel in an even thickness of 3 mm minimum. Primed and certified fibreglass ARMANET 4x4 mesh with alkali treatment shall be needed to reinforce the surface. Apply the mesh from top to bottom of the wall, taking care of overlapping strips by at least 10 mm. Once the layer has set, apply a second coat to make the entire surface uniform.

For the interiors, gypsum-based coating can be used. Products having a low breathability are not recommended. The indicated maximum thickness respects the maximum bearing capacity of the THERMAL PLASTER layer, and avoids risks of detachment from the support.

The application of a coating finish is also recommended as mechanical protection in case of collisions or as base for the aesthetics finishing layer, chosen by the customer.

TOOL CLEANING

Clean all equipment and tools with water immediately after use. The hardened material can only be removed by physical scraping.

YIELD / CONSUMPTION

10 L per m² per cm of thickness. 1 m² per 3 cm of thickness @1 bag of 30 L

COLOUR

Pale beige.

PACKAGING

30 L kg bags on disposable pallets of 1800 L (60 bags) protected by plastic stretch wrap.

STORAGE

12 months from the date of production. Keep the product in its original packaging, intact and protected from moisture and frost.

WARNINGS

Do not apply at temperature below +5°C or above +30°C. Do not apply with strong wind, rain and under the direct sunlight. Do not apply on frozen, dusty, uneven and inconsistent surfaces. Product thickness should be from 2 to 12 cm per layer. Thickness of plaster layers should never be less than 20 mm. Avoid application on masonry damaged by water infiltration or on basement retaining walls

without waterproofing membrane towards soil. Avoid application on waterproof surfaces or on those previously treated with paint products. Avoid application on gypsum-based substrates or mineral and organic insulating panels. Protect the applied product from frost, or rapid drying for the first 24 hours after application.

PRODUCT DATA

Appearance	Powder	
Colour	Pale beige	
Dry bulk density	~ 136 kg/m ³	EN 1015-10
Maximum aggregate size	≤ 1.3 mm	
Water content of mix	100-105%	
Mixing ratio	1 bag + 30-31.5 litres of water	
Minimum application temperature	+ 5°C	
Maximum application temperature	+ 30°C	
Working time	~ 60 minutes	
Bulk density of the fresh mortar	~ 450 kg/m ³	EN 1015-6
Bulk density of the hardened mortar	~ 140 kg/m ³	EN 1015-10
Water vapour permeability coefficient	≤ μ 10	EN 1015-19
Thermal conductivity	≤ 0.028 W/mK	EN 12667
Reaction to fire	Class A1	EN 13501-1
Durability	Evaluation based on the provisions valid in the intended place of use of the mortar	EN 998-1
Hazardous substances	See MSDS	EN 998-1

ENVIRONMENT, HEALTH, AND SAFETY (REACH)

For further information and advice on the handling, storage and safe disposal of the material, the user must consult the latest version of the Safety Data Sheet (SDS) available on the VIMARK's website, at www.vimark.com, which contains information on the physical characteristics, ecological and toxicological products, together with other safety information.

Product complies with the provisions of the Regulation (EC) no. 1907/2006 (REACH) and Annex XVII, item 47 and subsequent amendments and additions.

PRODUCT FOR PROFESSIONAL USE.

LEGAL NOTES

The research was developed within the framework of the EU Horizon 2020 project Wall-ACE under Grant Agreement Number 723574. Responsibility for the information and views set out in this technical data sheet lies entirely with the authors. The data and prescriptions shown in this sheet, based on the best practical and laboratory experience, refer to laboratory tests and are to be considered in any case as indicative. The information and, in particular, the instructions concerning the application and final use of Vimark products are provided in good faith based on the current knowledge and experience of Vimark on the products provided they are properly stored, handled and used under normal conditions and observing Vimark's recommendations. Considering the different conditions of use and external factors that are independent of Vimark (support, environmental conditions, laying technique directions, etc.), those wishing to use them must therefore decide whether or not the product is suitable for use. Our warranty guarantee is therefore

limited to the quality and consistency of the same with regard to the finished product, and exclusively for the above reported data. The company Vimark reserves itself the right to make technical changes without prior notice. Users must always refer to the latest version of the local data sheet relating to the product in question, copies of which will be provided upon request.

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3. Aerogel based thermal coating finish

THERMAL COATING FINISH

Lightweight thermal insulation coating containing aerogel

DESCRIPTION

THERMAL COATING is a pre-mixed coating mortar, made up of special binders and aerogel. Due to its excellent insulating performance, it is suitable for insulation of internal walls and ceilings, contributing to energy efficiency strategies for buildings. It allows a fast and efficient restoration of internal walls without major inconvenience for occupants. The product prevents mould and fungi development and growth and helps maintaining a healthy home environment.

Its application reduces heat losses through walls and ceilings, corrects thermal bridges, increases the surface temperature, thus inhibiting the formation of surface condensation, and reduces the cold sensation of occupants in the room.

COMPOSITION

THERMAL COATING is a pre-mixed coating mortar made up of special hydraulic binders, specific aerogel powder or grains and additives that improve the quality of the product in terms of workability, insulation, mechanical strength and adhesion to substrates.

SUBSTRATE PREPARATION / PRE-TREATMENT

THERMAL COATING can be applied to any traditional mineral surface: traditional lime plaster, pre-mixed plaster, lime-cement mortar, plasterboard, painted surfaces, or traditional supports.

The surfaces to be treated must be smooth, stable, clean, consistent, free of dust, bacteria proliferation, efflorescence, salt, oil, grease, wax, residue of previous work etc.

Before applying THERMAL COATING make sure that the surface is solid, sufficiently resistant and seasoned and it is not subject to movement or shrinking. Smooth and humid surfaces must be cleaned with specific products according to the type of material on the substrate or properly sanded. A layer of MONOGRIP is recommended to prepare the surface. The primer must be applied to the whole surface at least 12 hours before the installation of THERMAL COATING.

MIXING AND APPLICATION

Mix a 30 litres bag of THERMAL COATING with approx. 30-31 litres of clean water using an electric mixer until the blend is smooth and free of lumps. Let set for 3 minutes and mix again before applying. The product can be used within the next 60 minutes.

Do not add water or mix to use the product after this period. It is advisable to apply the first coat of THERMAL COATING using an 8x8 mm or a 10x10 mm trowel with rivets. Apply a thin layer first using the flat side of the trowel to the surface, then proceed to apply the successive coating with the riveted side of trowel.

Setting phase completed, apply a second hand of coating to unify the whole surface. For the final layer, an even thickness and smoothness is reached by using a stainless steel trowel. Suggested coating thicknesses are between 5 and 10 mm. After 72 hours the surface will be ready for one of the Vimark's finishes.

TOOL CLEANING

Clean all equipment and tools with water immediately after use. The hardened material can only be removed by physical scraping.

YIELD / CONSUMPTION

10 L per m² per cm of thickness. 6 m² per 5 mm of thickness @1 bag of 10 L

COLOUR

Pale beige.

PACKAGING

30 L kg bags on disposable pallets of 1800 L (60 bags) protected by plastic stretch wrap.

STORAGE

12 months from the date of production. Keep the product in its original packaging, intact and protected from moisture and frost.

WARNINGS

Do not apply at temperature below +5°C or above +30°C. Do not apply on frozen, dusty, uneven and inconsistent surfaces. Product thickness should be from 3 to 30 mm per layer. Thickness should never be less than 3 mm. Avoid application on masonry damaged by water infiltration and/or ground water raise. Avoid application on waterproof surfaces or on those previously treated with paint products. Avoid application on gypsum-based substrates or mineral and organic insulating panels. Protect the applied product from frost and rapid drying for the first 24 hours after application.

PRODUCT DATA

Appearance	Powder	
Colour	Pale beige	
Dry bulk density	~ 120 kg/m ³	EN 1015-10
Maximum aggregate size	≤ 0.6 mm	
Water content of mix	100-105%	
Mixing ratio	1 bag + 30-31.5 litres of water	
Minimum application temperature	+ 5°C	
Maximum application temperature	+ 30°C	
Working time	~ 60 minutes	
Bulk density of the fresh mortar	~ 450 kg/m ³	EN 1015-6
Bulk density of the hardened mortar	~ 134 kg/m ³	EN 1015-10
Water vapour permeability coefficient	≤ μ 10	EN 1015-19
Thermal conductivity	≤ 0.027 W/mK	EN 12667
Reaction to fire	Class A1	EN 13501-1
Durability	Evaluation based on the provisions valid in the intended place of use of the mortar	EN 998-1
Hazardous substances	See MSDS	EN 998-1

ENVIRONMENT, HEALTH, AND SAFETY (REACH)

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Product complies with the provisions of the Regulation (EC) no. 1907/2006 (REACH) and Annex XVII, item 47 and subsequent amendments and additions.

PRODUCT FOR PROFESSIONAL USE.

LEGAL NOTES

The research was developed within the framework of the EU Horizon 2020 project Wall-ACE under Grant Agreement Number 723574. Responsibility for the information and views set out in this technical data sheet lies entirely with the authors. The data and prescriptions shown in this sheet,

based on the best practical and laboratory experience, refer to laboratory tests and are to be considered in any case as indicative. The information and, in particular, the instructions concerning the application and final use of Vimark products are provided in good faith based on the current knowledge and experience of Vimark on the products provided they are properly stored, handled and used under normal conditions and observing Vimark's recommendations. Considering the different conditions of use and external factors that are independent of Vimark (support, environmental conditions, laying technique directions, etc.), those wishing to use them must therefore decide whether or not the product is suitable for use. Our warranty guarantee is therefore limited to the quality and consistency of the same with regard to the finished product, and exclusively for the above reported data. The company Vimark reserves itself the right to make technical changes without prior notice. Users must always refer to the latest version of the local data sheet relating to the product in question, copies of which will be provided upon request.

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4. Aerogel based thermal patching filler

DESCRIPTION	AEROGEL BASED THERMAL PATCHING FILLER is a white powder coating, highly breathable with high insulating capacity for restoration and insulation of internal walls and ceilings. The product contributes to optimizing energy efficiency in buildings thanks to its insulation and breathable properties.
COMPOSITION	AEROGEL BASED THERMAL PATCHING FILLER is made up of cement, Kwark® aerogel, and glass bubbles, recycled light selected, special hydrophobic mass and specific additives that improve the quality of the product in terms of workability, breathability, insulation strength and adhesion to substrates.
SUBSTRATE PREPARATION	THERMAL FILLER can be applied on any internal substrate either unpainted or painted, Gypsum plaster, plaster tiles, plasterboards, Old painted surfaces, Cement, concrete, cellular concrete, Breeze blocks, bricks, stones, Primed wood. Substrates to be prepared as per the current trade practices. Substrates must be hard, cohesive, clean, sound and dry.
MIXING AND APPLICATION	THERMAL FILLER can be applied manually with a coating knife, smoothing blade or trowel. Mix a 15 l of Aerogel based thermal patching filler with approx. 5.2 liters of clean water using an electric mixer until smooth and free of lumps. Leave it for about 3 minutes and mix again before applying. The prepared product is usable for about 30 - 45 minutes. Do not add water or mix to use again after this period. can be over coated by any TOUPRET filler, any conventional paint or wall covering.
TOOL CLEANING	The product residues are to be rubbed off when dry. Water cleaning is unnecessary.
YIELD / CONSUMPTION	0.183 kg powder powder allows to fill a volume of 1 litre
COLOR	White
PACKAGING	15 L kg bags on disposable pallets of 900 L (60 bags) protected by plastic stretch wrap.
EXPIRATION / CONSERVATION	Product guaranteed 12 months, from the original purchase invoice date as evidence, in its original sealed packaging and stored away from humidity.
WARNINGS:	Do not apply on polystyrene, nor on adhesive coverings nor on exterior substrates. <ul style="list-style-type: none">• Do not apply under a temperature < 8 °C and > 35 °C nor under an hygrometry rate over 70%.• Do not apply on warm/overheated surfaces.• Do not apply on damp surfaces.• Do not mix the paste any longer once it has begun to set.

PRODUCT DATA

▪ Characterization	Family III class 3	NFT 36-005
▪ Codification	G3S2V0W0A0C0R0	EN 16-566
▪ Application thickness	no thickness limitation	
▪ Second coat	once the filler is dry	
▪ Overcoating	once the filler is dry	
▪ Appearance	Powder	
▪ Colour	White	
▪ Dry bulk density	~ 183 kg/m ³	EN 1015-10
▪ Maximum aggregate size	≤ 300µ	
▪ I.A.Q. class	A+	

APPLICATION DATA

▪ Water content of mix	189%	
▪ Mixing ratio	1 bag + 5,2L litres of water	
▪ Minimum application temperature	+ 5°C	
▪ Maximum application temperature	+ 30°C	
▪ Working time	~ 30' - 45 minutes	
▪ French DTU	59.1 Building paint works	NFP 74-201
▪ French DTU	59.4 Setting up of wall papers and wall coatings	NFP 74-204

TECHNICAL DATA

▪ Adhesion	≥ 0.5 MPa	EN 16-556
▪ Compressive strength	≥ N/mm ²	EN 1015-11
▪ Flexural strength	≥ N/mm ²	EN 1015-11
▪ Water vapour permeability coefficient	≤ µ	EN 16-556
▪ Thermal conductivity	0.038 W/mK	EN 12667
▪ Specific heat capacity	kJ/kgK	EN 1745, A.12
▪ Reaction to fire	Class	EN 13501-1

ENVIRONMENT, HEALTH, AND SAFETY(REACH)

No danger tag. Safety data sheets available on www.toupret.com or on www.quickfds.fr
The data sheet information, especially the guidelines relevant to the application and final use are provided in good faith and result from the knowledge of the products and experience of TOUPRET company.

The product is required to be used as per the trade practices rules book and in reference to our recommendations.

The information provided is relevant to applications processed under a temperature of 20°C, a hygrometry rate of 50 % and on normal-absorbent substrates. The times mentioned are only indicative and depend on the substrate, the coat thickness, and the ambient conditions.

For further information and advice on the handling, storage and safe disposal of the material, the user must consult the latest version of the Safety Data Sheet (SDS) available on the TOUPRET's website, at www.toupret.com, which contains information on the physical characteristics, ecological and toxicological products, together with other safety information.