Product data sheet
AERO-THERM®

BASIC TECHNICAL INFORMATION

Form of material	water-based sealant
Function	heat reflection, thermal insulation
Composition	3M filler, aerogel, dispersion, additives
Insulants	3M glass microspheres, aerogel
Application thickness	0.8 to 1.0 mm
Minimum lifetime	25 years provided that application technology is followed

Basic characteristics	Properties/class	Harmonised technical specification
Water vapour permeability EN ISO 7783-2	V2–medium	EN 15824
Water permeability EN 1062-3	W1 high	EN 15824
Adhesion EN 1542	≥ 0,80 MPa	EN 15824
Durability	NPD	EN 15824
Thermal conductivity λ(W/mK) EN 12667	0.047	EN 15824
Reaction to fire EN 13501-1+A1	A2 - s1, d0	EN 15824

Characteristics	Properties /class	Technical specification
Adhesion for application onto structures and parts - Steel - Stainless steel	0.5 ±0.1(Mpa) 0.6 ±0.1(Mpa)	ČSN EN ISO 4624
Heat-storage capacity of the material, drop in temperature of contact and evaluation according to ČSN 730540-2	Complies	ČSN 730540-2
Specific thermal capacity C_p according to ČSN EN ISO 11357-1 at 22 ^{0}C	1.213(J/g.^{0}C)	(ČSN) EN ISO 11357-1 (ČSN) EN ISO 11357-4
Difussion resistance factor **μ**	142,9(-)	(ČSN)EN ISO 7783
Density of water vapour diffusion flow rate resistance **V**	117,21 (g/m^2.d)	ČSN EN ISO 7783-2
Emissivity **ε ,** spherical emissivity at 20 °C (Taylor method)	0.93 (-)	Mid IR Integrat IT /PIKE Technologies/ /diffuse reflectance integrating sphere/
Diffusion equivalent air layer thickness **s_d**	0.19 (m)	(ČSN) EN ISO 7783-2
Fire-technical characteristic – index of flame propagation along the surface of building materials **i_s**	0 (mm/min)	ČSN 73 0863
pH value (at 20°C)	9,5	Manufacturer's Data Sheet
Density (Specific density) **ρ_v** Specific surface density with 1-mm thick layer in dry state **ρ_s**	0.325 g/ml 0.184 kg/m^2	(ČSN) EN ISO 787-10 (ČSN) EN ISO 1183-1, part B (ČSN) EN ISO 2811-1 Manufacturer's Data Sheet
Radionuclide content Specific activity ^{226}Ra, Specific Activity Index use in buildings with rooms intended for living or staying - no more than 150 Bq/kg ,	max. of 1 complies	Decree No. 307/2002 Coll. of the State Office for Nuclear Safety (SÚJB), on Radiation Protection, as amended by Decree No. 499/2005 Coll. and Decree No. 389/2012 Coll.

Emission of volatile organic compounds, Impact on sensory properties of some foodstuffs	within the scope of the performed tests, it meets the requirements for use in interiors of buildings as well as for indirect contact with foodstuffs in interiors of buildings	Regulation No. 1935/2004 of the European Parliament and of the Council
Sensory evaluation of odour (ČSN) EN 1230-1	grade 0	Decree No. 38/2001 Coll. of the Ministry of Health on hygienic requirements for products intended to come into contact with foodstuffs and meals

Further information **Parameters based on comparative measurement #**	**AERO TERM**	
	without applied coating	**with applied coating**
Course of temperatures and time needed to reach 23°C	**10** (K) **41**(min)	**7** (K) **30**(min)
Power consumption while maintaining the same internal temperature (related to a 4-day time interval) - saving	**33.17** **0** (kWh)	**27.2** **5.97** (kWh)
Internal temperature drop of 3°C in the dim mode ČSN 73 0540-2 :2011 Thermal protection of buildings - Part 2 Requirements	**30** (min)	**55** (min)
Comparative measurement results • **thermal comfort level for staying in the room** • **time interval needed to reach 23°C /rise-drop/** • **achieved saving per day** • **thermal stability**	**X**	**higher** **faster-slower** **at least 12.5%** **increased**

 # Note:

Results of measurement focused on determination of thermal-technical qualities of the product and its effects on inside air in a building
Performed by Technical and Test Institute for Construction Prague (TZÚS Praha s.p.), Prague affiliate, Prosecká 811/76a, 190 00 Prague 9 – Prosek.
Certificate No. 010-033223 and Report of April 30th, 2014 - Measurement of the qualities of AERO THERM coating

Physical features and benefits

A surface treated with the AERO-THERM coating helps to create and maintain thermal comfort. Particularly, thanks to good combination of properties such as heat-storage capacity, heat reflection
and thermal insulation. Time proven use of 3M glass microspheres, which form a basic component of the thermoactive coating, together with unique combination of aerogel, the best insulant in the world, creates an effective thermoactive layer whose thickness is less than 1.00 mm. The thermoactive coating is used to affect radiation temperature of the treated surface (ceilings and perimeter walls) or to reduce the amount of condensed air humidity, particularly in corners and in other rooms where the surface temperature drops under the dew point temperature.
The AERO-THERM thermoactive coating is a water-based sealant that can be applied to the surface of walls, ceilings or floors (if used properly, it also brings benefits to the inside of the layer complex). Easy and fast application, minimum waste, whole-area application right onto a surface, prepared in an ordinary way, without the need for fixing structures.
The AERO-THERM can be applied to any shape and material.

Application area
Residential buildings, public buildings, company premises, industrial plants including the food ones, technological equipment.

Areas to which the AERO-THERM cannot be applied

It is not possible to guarantee effectiveness and lifetime of the AERO-THERM on walls through which moisture moves upwards by capillary action. On such surface, the thermoactive coating gets damp, which is followed by reduction of qualities, or, in some cases, it can even fall off (together with its base).

AERO-THERM and water
The areas where the thermoactive coating comes into direct contact with water must be provided with a suitable protective coat.

AERO-THERM and water vapour
The AERO-THERM, after being applied to a surface, forms an anti-condensation layer. Structures are thus protected against excessive moisture, occurrence of moulds is limited (impact on the quality of inside air) and parameters of the structures themselves are enhanced (lifetime, heat-insulating properties).

Fast heating and accumulation
A surface treated with the AERO-THERM coating responds to temperature changes very fast. Thermal comfort comes before the base structure reaches the needed temperature. Considering the thickness of the applied layer, the AERO-THERM does not make a barrier that would prevent transmission of heat by conduction. Therefore, the base structure can accumulate the heat. Analogous properties of the AERO-THERM apply to ventilation. The above mentioned properties can be easily checked if your hand touches the coating applied to the cold base. You will not feel the cold of the base, on the contrary, you will feel warmth of your hand that will warm the AERO-THERM layer immediately.
After the interior equipment has been warmed (floors, partitions, furniture etc.), the performance of the heating system can be decreased, or heating can be completely stopped. A heating mode can be set according to thermal capacity of the interior and the way of its use, which leads to saving comparable to e.g. external insulation. ATTENTION – it is not possible to compare only particular parameters of the perimeter structure, but the building as a whole must be evaluated, including its use!

Heating saving
The AERO-THERM applied to perimeter walls, ceiling or floor forms conditions enabling to change a heating mode. As with standard heat-insulating materials, the extent of saving depends on the user. The user can gradually optimize regulation of the heating system according to his needs. If the user is not willing to change the heating system mode, then the saving will be minimum. Most of the users only reduced the heating performance and they save 15 to 20 % of the energy. Rigorous users managed to reduce their power consumption by 40, in some cases by 60 %.

APPLICATION

PREPARATION OF THE BASE
It is necessary to remove moulds from the base before the AERO-THERM thermoactive coating is applied.

Old plasters: old paints, non-cohesive layers and stale plaster must be scraped off and then coated with AT-bonding primer. As for old masonry to which more coatings were applied in the past, or if there are unidentifiable stains on walls, the AT-bonding primer must be applied twice, or a depth vapour-permeable bonding primer must be used. Cracks, holes and unevenness of the masonry must be repaired so that the consumption of the material would not be so high, pay attention to the sand protruding from the plaster (smooth it down), it would destroy the AERO-THERM layer.

New plasters: apply the AT-bonding primer to the smooth surface of newly plastered walls. On walls that have already been painted, it is necessary to find out how strong the adhesion of the paint to its base is – wet a small part of the wall with water and try to scrape it off. If the paint peels off easily, remove it. If the paint has adhered well to the surface, just apply the AT-bonding primer to the wall before applying the AERO-THERM. The AERO-THERM thermoactive coating can

replace the last layer on newly plastered walls (such as stucco etc.)

Gypsum board: gypsum board walls must always be coated with AT-bonding primer to reduce the absorption capacity of the surface. If the wall has already been painted, it is necessary to find out how strong the adhesion of the paint to its base is. A quality, firm paint that has completely adhered to its base should only be coated with the AT-bonding primer. Otherwise, the old paint must be removed!
Oriented strand boards (OSB): the AERO-THERM thermoactive coating completely adheres to wood-chip base, such as oriented strand boards. The surface of such boards must always be coated with the AT-bonding primer before applying the AERO-THERM. It is necessary to ensure precise jointing (removal of gaps) of the particular OSB boards of walls and ceilings to which we want to apply the AERO-THERM and to prevent, from the structural point of view, movements of the particular boards. Otherwise, it cannot be guaranteed that the joints will be prevented from cracking. The individual joints should be strengthened with a gypsum board joint tape. The joints shall be bound with AERO-THERM. Then a 1-mm thick layer of the thermoactive coating can be applied to the joints that have been strengthened in the described way.

APPLYING THE AERO-THERM
Apply a 1-mm thick layer of the coating, pay attention to details. Attention! - there must not be any uncovered areas, or areas with a discontinuous or insufficient applied layer (it happens during smoothing down). When applying the coating on whole walls or ceiling, put it also on a part of the adjacent walls so that there would not be any heat transfer resulting in condensation of moisture in the cold transition area in corners. Apply the AERO-THERM with the laps of 40 cm.
First, always mix the AERO-THERM itself – Put a necessary amount into a clean vessel, then gradually add clean water as needed. Mix until it has thickened to cream-like consistency. ATTENTION – use low revolutions to mix the AERO-THERM, you will not damage the filler (glass mickospheres).

IF YOU ADD ANYTHING ELSE BUT WATER TO THE AERO-THERM, YOU WILL IMPAIR ITS PROPERTIES!

Applying with a notched trowel: you will achieve a flat plaster-like appearance thanks to pasting with a notched trowel. According to the absorption capacity of the base, you can gradually mix clean water into the coating in a ratio of 0.05 l of water to 1 litre of the AERO-THERM.
Apply the first layer with a stainless notched trowel (6mm grooves for masonry, 4mm grooves for gypsum board) and then smooth it down with the straight side of the trowel. This will produce a compact 1mm layer also on uneven walls. We do not recommend getting back to small deficiencies (from edges of the trowel) – the material would tear. Allow the surface dry for approx. 18 to 24 hours.
After it has polymerized, smooth down with sandpaper No. 240 attached to a rubi rubber trowel with a double sided adhesive tape.
The finishing AERO-THERM layer is not designed to add thickness, but to fill in any unevenness produced during applying the first layer. If needed, smooth down 12 hours later.

Applying with a paint roller: applying with a paint roller will always leave a textured surface – from thin to thick texture.
Use a texture roller (flock) to apply the coating. The AERO-THERM can be diluted with water in various ratios to produce various textured surfaces, the more water, the thinner texture (dilution from 5 to 35 %).
Apply 2 – 3 coats with a paint roller to create a compact 1mm layer. Dilute the material in the ratio of 1.5 dl of water to 1 litre of the AERO-THERM to apply the first layer, do not exert pressure to the roller, you will thus achieve that a maximum amount of the material will be applied to a wall. Once dry, the second layer can be applied – do not dilute the AERO-THERM so much. If you do not want a thick textured surface, then, after the coat has dried up (approx. 10 minutes later), you can low the textured surface thickness with a washed roller dampened with water and moved over the surface in the top-down direction.
Applying with a spraying machine The AERO-THERM can be applied with a low-pressure spraying machine that does not use mechanical parts to pressurize the material, otherwise it could damage the filler (glass microspheres). Working pressure of the applied material should not exceed 5 MPa.
Dilution: 1 litre of water to 5 litres of the AERO-THERM.

AERO-THERM surface finish
The surface can be further painted; according to the manufacturer, it can be repainted more than 10 times without the need for scraping the coats off. On the AERO-THERM surface, you can also put wallpaper, tiling, floor tiling and gypsum boards, or you can make some other modifications of walls and ceilings.
Apply a special damp-proof polymer-based coat to a surface that is exposed to water and moisture.

Applying AERO-THERM to floors:
Base for the thermoactive coating – concrete, anhydride floors, plaster boards, poured floors, OSB boards, wooden floors etc.

Preparation of the base
The base must be firm, bearing, with no imperfections that would penetrate through a 1mm layer of the AERO-THERM and create thermal bridges. If the base is rough and porous, then a self-levelling layer should be applied, so that the thermoactive coating would not be used to level the base. Before applying the AERO-THERM, use the AT-bonding primer to strengthen the base and to reduce its absorption capacity and ensure easier applying the thermoactive coating.
OSB boards and wooden floors – if there are no large gaps between individual parts, which would need an excessive

amount of the AERO-THERM, it can thus be applied to a clean, dry and firm base to which the AT-bonding primer had been applied. Large gaps must be sealed and only then the thermoactive coating can be applied.

Possible methods of applying
The AERO-THERM can be applied to floors by pouring, pasting with a notched trowel, using a paint roller or a spraying machine. The thermoactive layer thickness is 1 mm. Pouring, pasting with a notched trowel and spraying can create a 1mm thick layer
within one working procedure. Drying time of an applied coat is approx. 18 to 30 hours (time depends on the temperature of the air, on base and on quantity of water used for dilution of the material). Dilution of the thermoactive coating depends on the absorption capacity of the base. The aim is to achieve a compact layer. When applying with a paint roller, the material must be diluted more so that a thick textured surface that could not produce a compact layer would not be created.

AERO-THERM surface finishing of various types of flooring
Floor tiling: apply a top coat of primer to a hardened AERO-THERM surface to decrease the absorption capacity, and then floor tiling can be laid.
Floating floors: put impact sound insulation on the thermoactive coating, only then a floating floor and various self-supporting floors can be laid.
PVC floors, carpets: before laying PVC floors, carpets and other soft flooring, apply a self-levelling compound to the thermoactive insulation in order to spread point load.
Preparation of the base for a self-levelling compound: do not apply a primer to the hardened AERO-THERM surface to reduce the absorption capacity, the self-levelling coating will thus completely adhere to the thermoactive coating. A self-levelling coating must not dry up and move over the AERO-THERM coating surface. The self-levelling coating created in this way cannot protect the thermoactive coating against excessive stress. It is necessary to use a high quality levelling compound that does not dry up, is flexible and has high strength and durability.
Surfaces of metal structures and parts: applying to steel and stainless structures and parts, without surface preparation, cleaned, grease free and dry, in compliance with conditions for usual application, e.g. temperature and humidity of the surrounding air for using the coating.

In case of doubts feel free to ask the manufacturer for further information and potential technical support!

Applying and consumption
- pasting with a notched trowel - smooth surface 1 litre/m^2
- applying with a paint roller - from thin to thick textured surface 1 litre/m^2
- applying with a spraying machine - from smooth to sharp textured surfaces 1 litre/m^2 + 10% overspray

Dilution
According to the absorption capacity of the base and work method, water can be gradually added as follows:

- for applying with a notched trowel: maximum of 0.05 litre of water to 1litre of the AERO-THERM
- for applying with a spraying machine: maximum of 0.20 litre of water to 1litre of the AERO-THERM.

Application temperature and drying time
The recommended air and base temperature during application is +5 ˚C to +65 ˚C. The drying time depends on air and base temperature and humidity.
The average drying time is 18 to 24 hours. The coating will take 14 days to reach its final state (hardening, drying up and decrease in absorption capacity).

Cleaning tools
Tools as wells as the rest of the material that was not removed in a wet state can be washed with warm water.

Transport and storage
Maintain the transport and storage temperature that is between +5 ˚C and +25 ˚C, the material must not freeze. Protect from direct sunshine and high temperatures!
The guarantee period is 2 years in original unopened packaging. Once opened and diluted, use as soon as possible.

Packaging
3 L , 5 L , 12 L and 30 L

Logistic convenience
Low weight, approx. 0.4 kg/dm^3
High yield from volume per m^2 of the applied surface
The yield from 1m^3 of the AERO-THERM with 1 mm application thickness is 1000 m^2

Safety and hygiene at work
The coating is neither classified, nor marked as dangerous to health.

When applying, ventilate the area adequately.
Use suitable personal protective equipment, do not eat, drink or smoke!
When spraying and smoothing a surface down, use a respirator made of filtering material resistant to dust and goggles or a face shield!
In case of contact with eyes wash abundantly with water and seek medical help immediately for further treatment!!

After work wash your hands with warm soapy water and apply suitable regenerating preparations.

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Construction-technical certificate
and product certificate