MŰSZER AUTOMATIKA

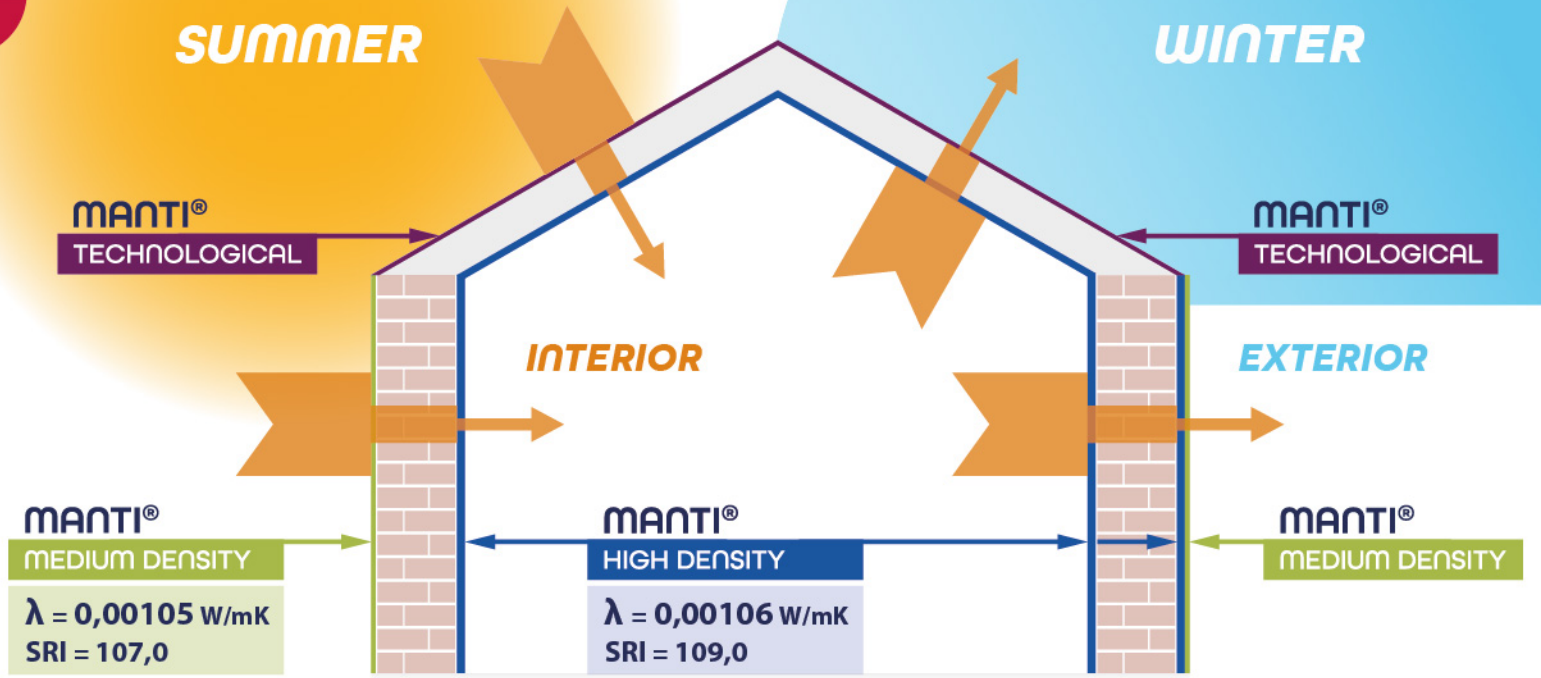
MANTI®
ceramic

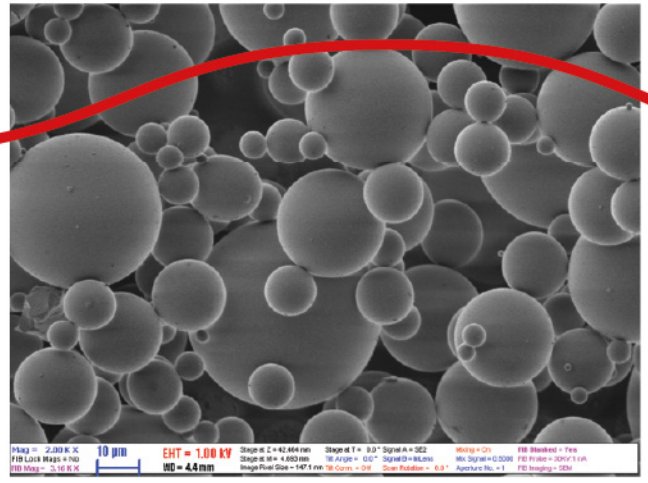
SUPER-THIN HUNGARIAN THERMAL PROTECTION

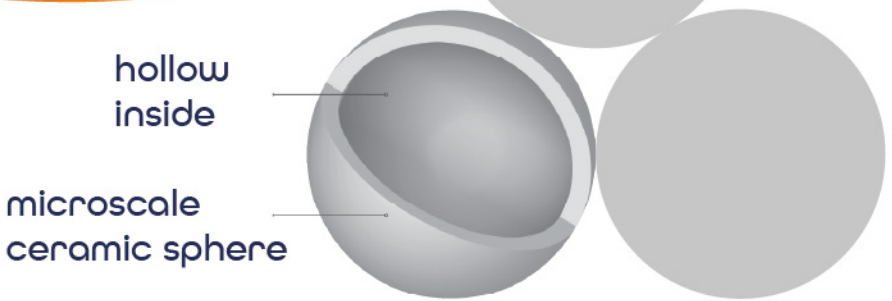
MANTI®
ceramic

INTRODUCTION

MANTI® CERAMIC
is a family of micro-layer thermal barrier materials. Its main components are microscale ceramic spheres, filled with a vacuum cavity, produced with nanotechnology. The hollow vacuum microceramic spheres due to their nano-scale wall thickness almost completely inhibit the flow of heat. Summer heat does not enter the building, while winter heat does notescape.







MANTI® CERAMIC

PRODUCT ADVANTAGES

- own Hungarian controlled development and production
- super thin thickness 600micron-1,5mm
- good adhesion to concrete, brick, stone, glass, plastic, plasterboard, metal, slate, bitumen roof surfaces
- UV and weather resistant
- environmentally friendly
- fast execution
- easy to repair
- continuously controllable efficiency
- decorative white coating
- can be coloured with inorganic pigments, for outstanding colour fastness

- solution for thermal bridges
- also available in resilient, flexible versions (tents, tarpaulins)
- excellent solution for historic buildings

1

MANUFACTURING BASE

CELLDÖMÖLK

1 - MANTI HALL 2 - SAMPLE STORAGE 3 - WAREHOUSE
4 - TEST LABORATORY 5 - MANUFACTURING PLANT

2

3

4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DETAILED PRESENTATION OF MANTI® CERAMIC

The insulation technology developed a lot over the past decades, but overall, the traditional insulation systems have significant cross-section and complex technological layering and therefore their construction is time-consuming and structurally fragile. The essential part of mass of traditional insulation systems becomes waste after some time, the removal and destruction of which is a major environment damaging problem.

The MANTI® CERAMIC thermal protection materials of our company, Műszer Automatika Ltd. based on our own nanotechnology, that has been continuous development which encompasses all the construction industry for indoor and outdoor use, as well as technological coatings for industrial applications.

MANTI® CERAMIC super-thin thermal barrier material (600 microns - 1,5 mm) is quickly and easily applied. It supports sustainable development and environmentally friendly.

Our fundamental recognition is that the total electromagnetic spectrum of solar energy are all wave-like phenomena. They are defined by number of oscillations, frequency and thus wavelength.

The electromagnetic energy coming from the sun, propagating in the form of waves, has a specific wavelength distribution, which is known as the spectral distribution.

To prepare effective thermal barrier material, first of all, it is necessary to know the electromagnetic frequency band, that interacts with our thermal protective material coated surface, so that by the coat created with suitable material components, the transformation of electromagnetic energy into heat can be prevented or significantly reduced by means of resonances created by wave interference thus achieving the desired thermal protection.

In nano-scale porosity thermal control materials no longer follow the usual laws and correlations of heat dissipation, therefore development of completely unconventional measurement methods were necessary.

The development that requires continuous research and innovation, requires reliable control, which is ensured in our production base in Celldömölk by using our own permanent

VE PROPAGATION

laboratory measurements and using external, audited research facilities.

Our results are published in our references and certified by international certificates, including ÉMI-TÜV SÜD certification.

By using MANTI® CERAMIC thermal protection material, significant energy consumption reduction can be achieved in summer which is very important these days!

MANTI® CERAMIC micro-coating family which is suitable for both construction industry and technological application is of particular interest to the Hungarian agricultural sector, where improvement of production indicators and therefore the precise adjustment of thermal protection is a critical need, such as livestock buildings, slaughterhouses, cold stores, agricultural buildings, hydroglobus, grain storage, siloes, tanks, etc.

Extreme requirements of technological heat ptotection are also met whether you want 150 C° steam pipes or other pipelines, ducts, industrial fittings, water heaters, boilers, heat exchangers, vehicle bodies, boats, ferries, containers etc.

On customer request, in MANTI® CERAMIC thermal protection coat family, pore sealing and breathing products are also available.

Significant export activity growth is a good indication that our partners abroad have also recognised the climate impact of our thermal protective coating.

To one of our partners sold in Italy, in 2022 the majority of more than 1.500.000 liters of MANTI® CERAMIC thermal protection material was plaster, adapted to their needs, which is particularly suitable for the protection of historic buildings, in view of the fact that its use does not alter the appearance of the facades.

PRODUCTS

MANTI ceramic

MEDIUM DENSITY ARCHITECTURAL

- *medium density product for exterior and interior thermal protection in the construction industry*
- *application with AIR-LESS equipment, in 600 microns - 1,5mm layer thickness*
- *20 liter pack, can be coloured with inorganic pigments*

MANTI ceramic

HIGH DENSITY ARCHITECTURAL

- *high density product for exterior and interior thermal protection in the construction industry*
- *application by plastering techniques, in thicknesses from 3 to 10 mm*
- *20 liter pack, we recommend MEDIUM DENSITY as a covering coat*

PRODUCTS

MANTI® ceramic

TECHNOLOGICAL

- technological thermal protection, typically for metal surfaces and non vapour permeable surfaces
- application with AIR-LESS equipment, in 600 microns - 1,5mm layer thickness
- 20 liter pack

MANTI® ceramic

PRIMER FIX

- adhesion improving, deep priming product
- application by brush, roller, spray
- 5 and 10 liter packs

OFFICE BUILDING CONSTRUCTION

MANTI® ceramic


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OFFICE BUILDING CONSTRUCTION

MANTI® QUALITY CONSTRUCTION WITH GRACO® SPRAYING EQUIPMENT

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ceramic

FAST EXECUTION!

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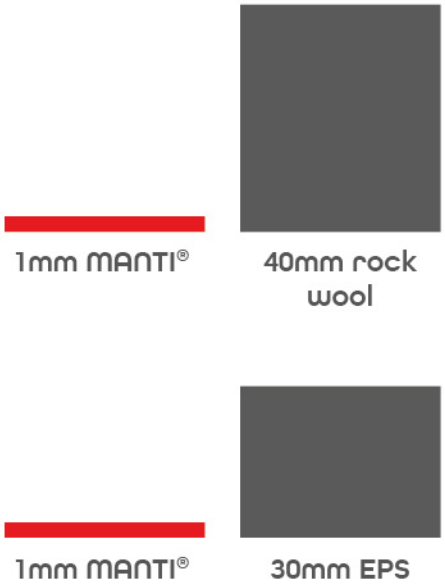
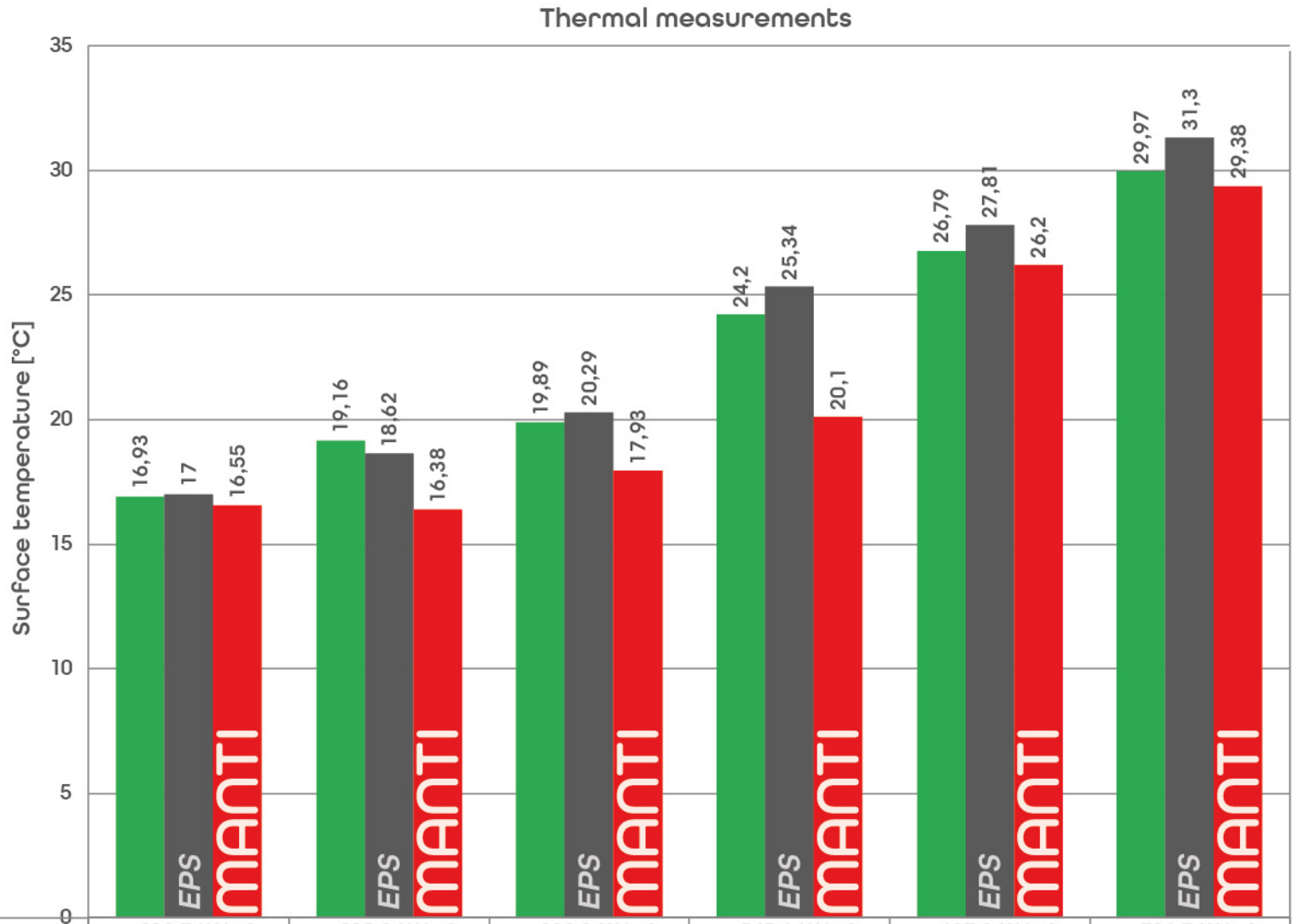
COMPARATIVE MEASUREMENT RESULTS

1mm MANTI® CERAMIC and 10cm POLYSTYRENE HEAT INSULATION

Based on our measurements:

1mm of MANTI® corresponds to
40mm of rock wool or
30mm of polystyrene insulation

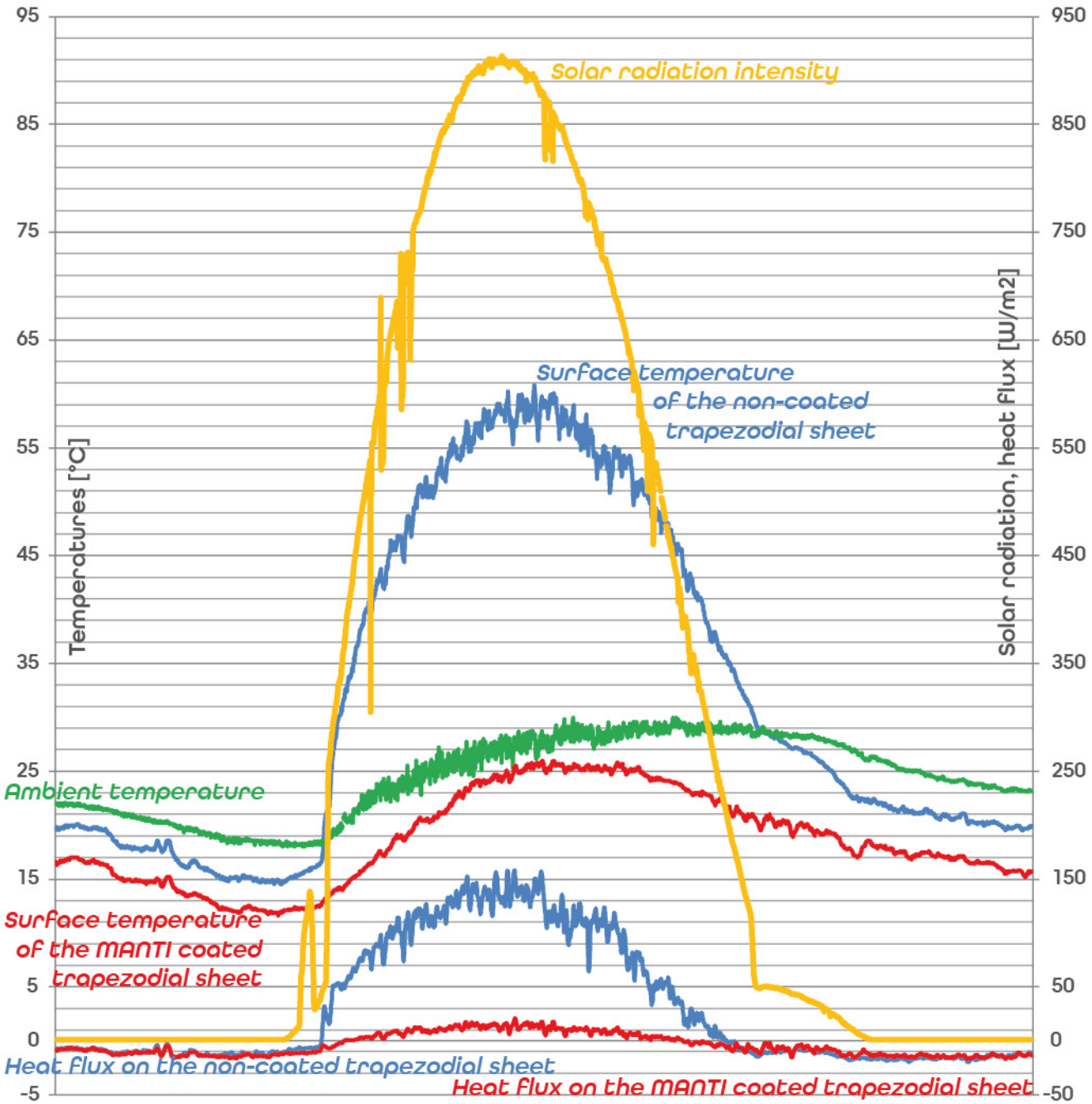




Solar radiation intensity [W/m²]	219,7 W/m²	311,9 W/m²	393,2 W/m²	545,6 W/m²	607,2 W/m²	706,7 W/m²
Ambient temperature	16,93	19,16	19,89	24,2	26,79	29,97
10cm Dryvit coated EPS coated board inner surface temperature	17	18,62	20,29	25,34	27,81	31,3
MANTI® CERAMIC coated sheet inner surface temperature	16,55	16,38	17,93	20,1	26,2	29,38

MANTI® CERAMIC COATED and NON-COATED

MEASUREMENT RESULTS FOR TRAPEZOIDAL SHEET ROOFS - 09.08.2021.



One of the two roof structures with trapezoidal sheets was coated with MANTI® CERAMIC TECHNOLOGICAL coating, while the other was left intact. Thermometers and heat flow meters were placed under the roof plates and the irradiance, heat flux and temperature data have been recorded for a month. The graph shows the data measured on 09.08.2021.

The total solar irradiance approx.910W/m2. The uncoated trapezoidal sheet heated up to 60°C, the heat flux approx.160W/m2. The MANTI coated trapezoidal sheet heated up to only 26°C and its heat flux was only approx.18W/m2.

So the MANTI coating resulted in a temperature difference of 34°C and it did not allow to pass through 90% of the thermal power of the solar radiation.

It can also be seen that during the day the MANTI coated plate is 4-6°C colder than the ambient air temperature. The cosmic radiation coming in through the spherical window cools also the uncoated plate below the ambient air temperature in the absence of solar radiation. The MANTI coated sheet is capable to produce this under strong sunlight, during the day too.

MONUMENTS *THERMAL PROTECTION WITH UNCHANGED ARCHITECTURE*

FAMILY HOUSES *THERMAL PROTECTION*

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CONDOMINIUMS

THERMAL PROTECTION


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2


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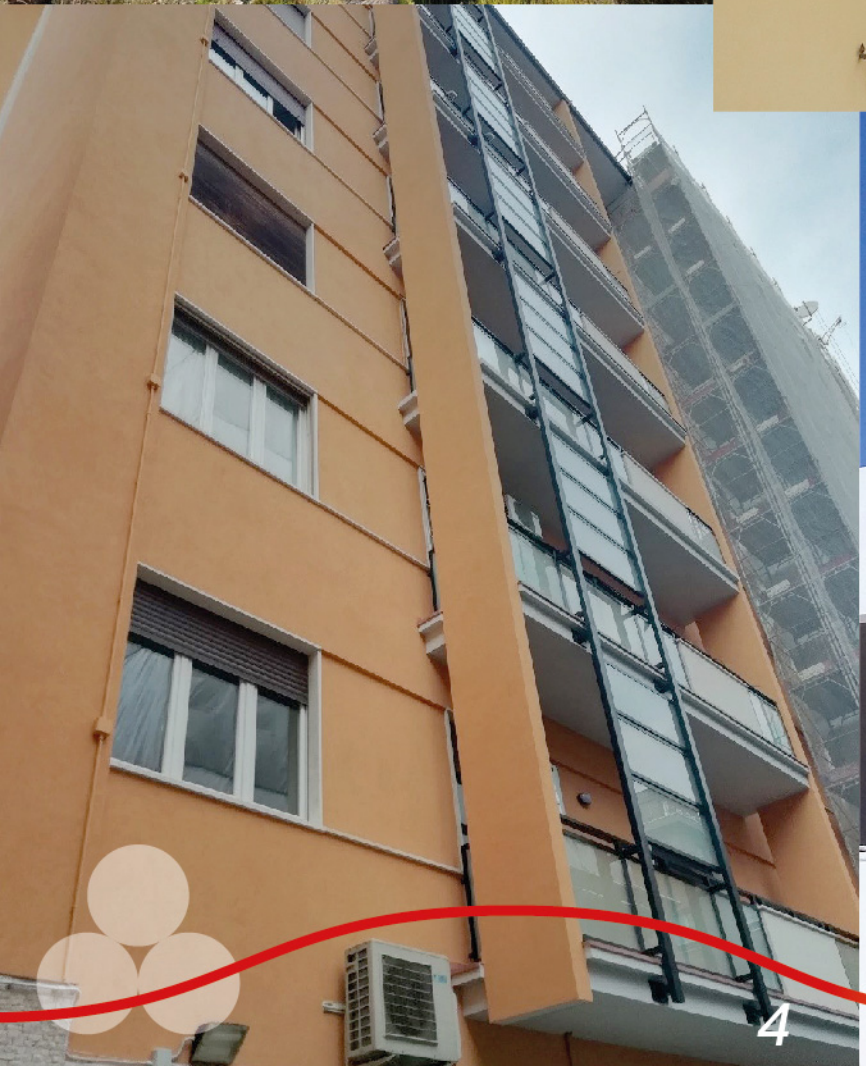
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ITALY and MALTA

REFERENCE BUILDINGS


5

1 - LIGURIA 2 - MODENA 3 - VALDAGNO 4 - MILANO 5 - MALTA
6 - SAN PIETRO IN CAMPIANO 7 - VARESE 8 - TRENTO 9 - RIMINI

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TINTED

MANTI® CERAMIC COLOURED WITH INORGANIC PIGMENTS


1


2

TECHNOLOGICAL
SOLUTIONS


4

1 - WATER TOWER 2 - ILLUMINATED WINDOW 3 - COOLING HOUSE
4 - STEAM PIPE 5 - SLAUGHTERHOUSE 6 - STEEL PLATE

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MANTI

REFURBISHMENT AND THERMAL PROTECTION OF FLAT AND CORRUGATED SLATE ROOFS AND BITUMEN SHINGLES

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SPECIAL
APPLICATIONS

1 - KOSSUTH FERRY 2 - BITUMEN SHINGLES 3 - BEE HIVE

CERTIFICATES

EPD® System - environmental statement from the international ECO Platform on the life cycle environmental performance of our MANTI® CERAMIC thermal barrier coatings.

EPD®

ECO PLATFORM EPD VERIFIED


Environmental Product Declaration

EPD®

MANTI® CERAMIC Architectural Medium Density

from

Műszer Automatika Ltd.


Environmental Product Declaration

EPD®

MANTI® CERAMIC Architectural High Density

from

Műszer Automatika Ltd.


Environmental Product Declaration

EPD®

MANTI® CERAMIC Technological

from

Műszer Automatika Ltd.

HUNGARIAN INNOVATION AWARD 2021

TERC-ETALON

ibuild proidea

TÜV SÜD

CE

SYSTEM CERTIFICATION ISO 9001 SGS

SYSTEM CERTIFICATION ISO 14001 SGS

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The MANTI® CERAMIC thermal protective coating family is an independent development of Műszer Automatika Kft.
The Hungarian privately owned company was founded in 1982.
As a result of continuous innovation, research and development, the company is a market leader in several fields.
Other areas of activity include railway control and safety technology, transport automation, development, production and servicing of gas and solvent sensors for public and industrial applications.

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