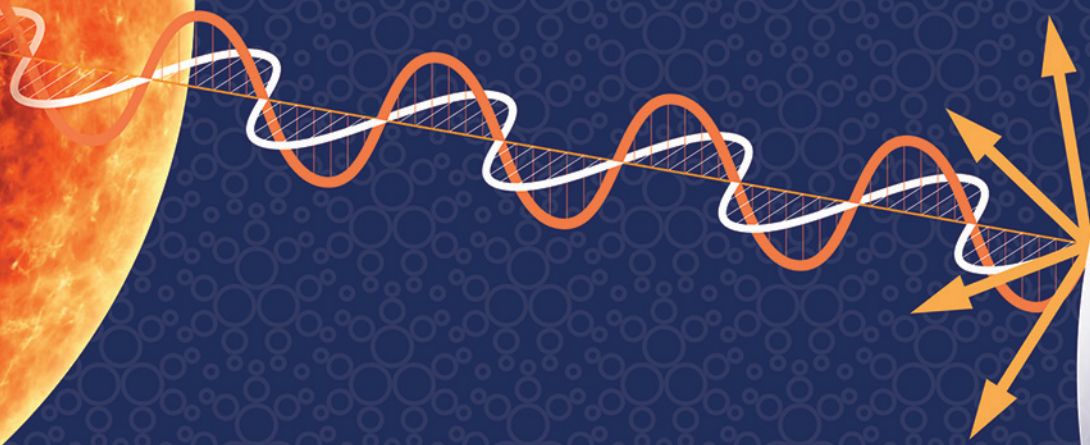




# MŰSZER AUTOMATIKA







SUMMER

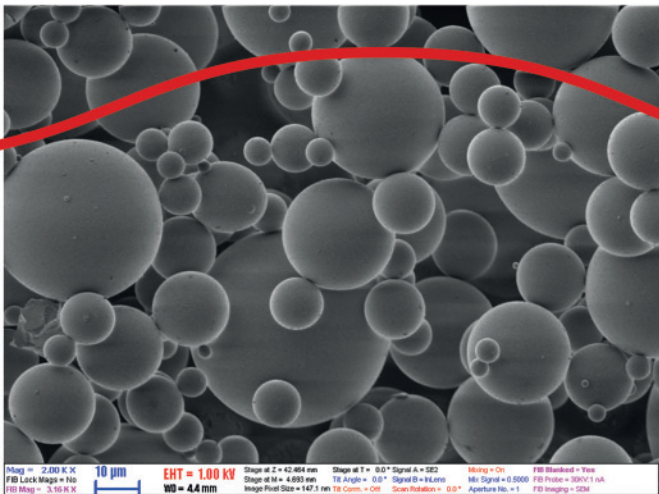
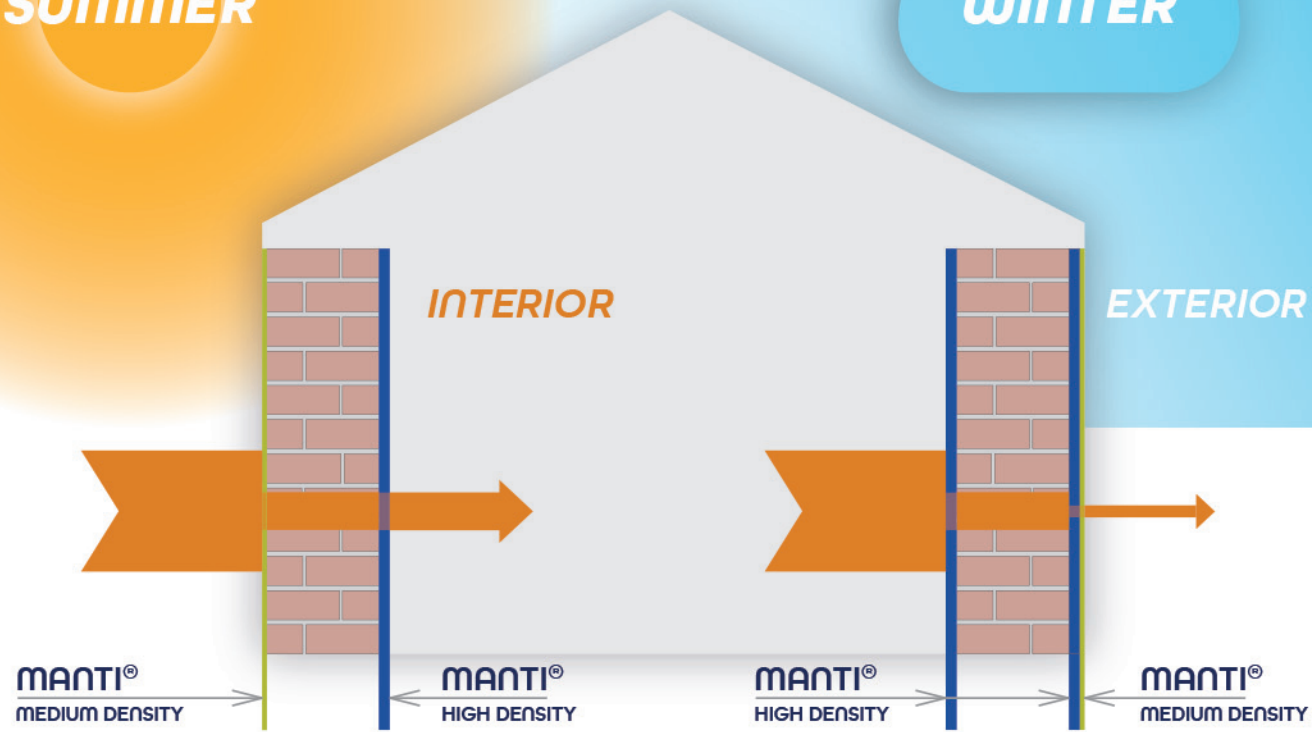
WINTER

# INTRODUCTION

MANTI<sup>®</sup> 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 not escape.



hollow inside

microscale ceramic sphere



- *own Hungarian controlled development and production*
- *super thin thickness 600micron-1,5mm*
- *good adhesion to concrete, brick, stone, glass, plastic, plasterboard, metal, wood, 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*





# MANUFACTURING BASE

CELLDÖMÖLK

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







ceramic







## DETAILED PRESENTATION OF MANTI<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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 Celldömök 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 protection 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



## MEDIUM DENSITY ARCHITECTURAL

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



## HIGH DENSITY ARCHITECTURAL

- o *high density product for exterior and interior thermal protection in the construction industry*
- o *application by plastering techniques, in thicknesses from 2mm to 6mm*
- o *20 liter pack, we recommend MEDIUM DENSITY as a covering coat*



# PRODUCTS



## TECHNOLOGICAL

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



## PRIMER FIX

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







*MANTI<sup>®</sup> QUALITY CONSTRUCTION WITH GRACO<sup>®</sup> SPRAYING EQUIPMENT*







**FAST EXECUTION!**

+36 20 359 9339

[manti@manti.hu](mailto:manti@manti.hu)





# COMPARATIVE MEASUREMENT RESULTS

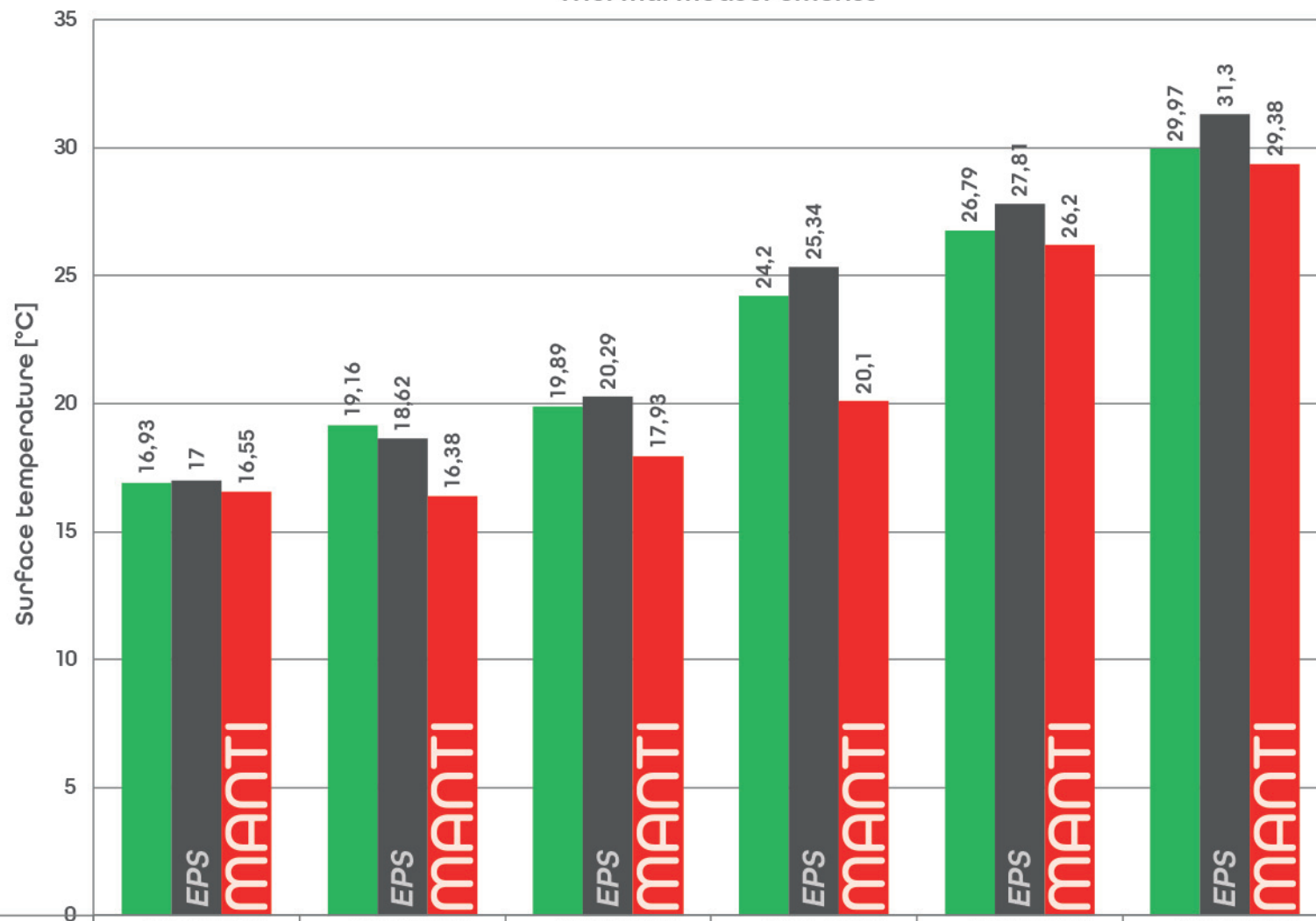
1mm MANTI<sup>®</sup> CERAMIC and 10cm POLYSTYRENE HEAT INSULATION

Based on our measurements:

1mm of MANTI<sup>®</sup> corresponds to  
15cm of rock wool or  
10cm of polystyrene insulation



Thermal measurements

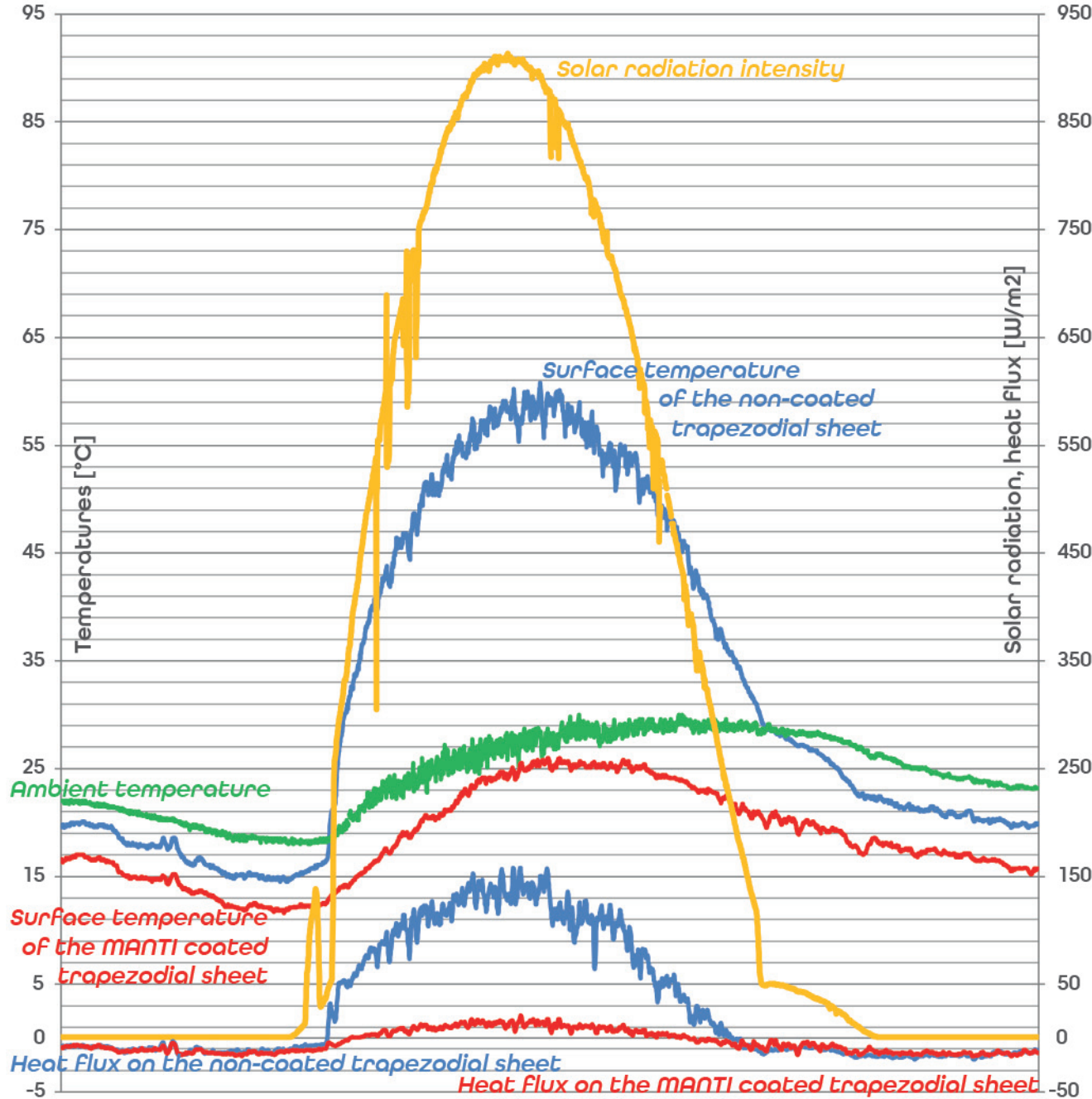


Solar radiation intensity [W/m <sup>2</sup> ]	219,7 W/m <sup>2</sup>	311,9 W/m <sup>2</sup>	393,2 W/m <sup>2</sup>	545,6 W/m <sup>2</sup>	607,2 W/m <sup>2</sup>	706,7 W/m <sup>2</sup>
Ambient temperature	16,93	19,16	19,89	24,2	26,79	29,97
10cm Dryvit coated EPS coated board Inner surface temperature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



# MANTI<sup>®</sup> 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<sup>®</sup> 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/m<sup>2</sup>. The uncoated trapezoidal sheet heated up to 60°C, the heat flux approx. 160W/m<sup>2</sup>. The MANTI coated trapezoidal sheet heated up to only 26°C and its heat flux was only approx. 18W/m<sup>2</sup>.

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*







**CONDOMINIUMS**  
*THERMAL PROTECTION*







## ITALY and MALTA

*REFERENCE BUILDINGS*







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







**TINTED**

*MANTI<sup>®</sup> CERAMIC COLOURED WITH INORGANIC PIGMENTS*









**TECHNOLOGICAL**  
*SOLUTIONS*



2

7

4





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





# MANTI



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







## 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.*



Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

**MANTI® CERAMIC Architectural Medium Density**  
from **Müszér Automatika Ltd.**

Programme: The International EPD System, www.ecoportal.com  
 Programme sponsor: EPD International AB  
 EPD registration number: 04-01209  
 Publication date: 2023-11-08  
 Valid until: 2023-11-08

An EPD should provide clear information on the product's carbon footprint. The data's validity is therefore subject to the consistent registration and publication of www.ecoportal.com

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

**MANTI® CERAMIC Architectural High Density**  
from **Müszér Automatika Ltd.**

Programme: The International EPD System, www.ecoportal.com  
 Programme sponsor: EPD International AB  
 EPD registration number: 04-01210  
 Publication date: 2023-11-08  
 Valid until: 2023-11-08

An EPD should provide clear information on the product's carbon footprint. The data's validity is therefore subject to the consistent registration and publication of www.ecoportal.com

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

**MANTI® CERAMIC Technological**  
from **Müszér Automatika Ltd.**

Programme: The International EPD System, www.ecoportal.com  
 Programme sponsor: EPD International AB  
 EPD registration number: 04-01208  
 Publication date: 2023-11-08  
 Valid until: 2023-11-08

An EPD should provide clear information on the product's carbon footprint. The data's validity is therefore subject to the consistent registration and publication of www.ecoportal.com





**ibuild**

**proidea**

**TERC-ETALON**

**AAA**  
Highest Creditworthiness  
**2022**

**Műszer Automatika Kft.**  
Adószám: 10536212-2-13 | D-U-N-S szám: 644726960

A vállalkozásai körébe tartozó cégek kapcsolatai, kivétel nélkül, pénzügyi hitelezési rendszereinek, azaz a magánvállalkozások azon körébe tartozók, mely megfelelnek a Dun & Bradstreet nemzetközi minősítési rendszerének a vállalkozásokról készített felméréseknek.

Több száz vállalatot figyelembe véve, meghatározott szempontok alapján, az országspecifikus sajátosságok beépítésével kerülnek kiválasztásra azon vállalatok, melyekkel az üzleti életben a legbiztosabb, azaz a legmagasabb pénzügyi megbízhatóságú vállalkozások közé tartoznak.

*Nesajj Sahai*  
Nesajj Sahai  
Enhok, Dun & Bradstreet International  
2022. november 9.

dun & bradstreet

**INNOVÁCIÓS DIJÁBAN**  
A Szellemi Tulajdon Nemzeti Hivatala  
2021. évi  
**INNOVÁCIÓS DIJÁBAN**  
a Műszer Automatika Kft. részére  
a MANTI hűvösödő anyagcsaládjáért.

2022. március 24.

Dr. Pálvölgyi László  
Elnök, Szellemi Tulajdon Nemzeti Hivatala  
Dr. Vesseli Gyula  
Elnök, Magyar Innovációs Akadémia

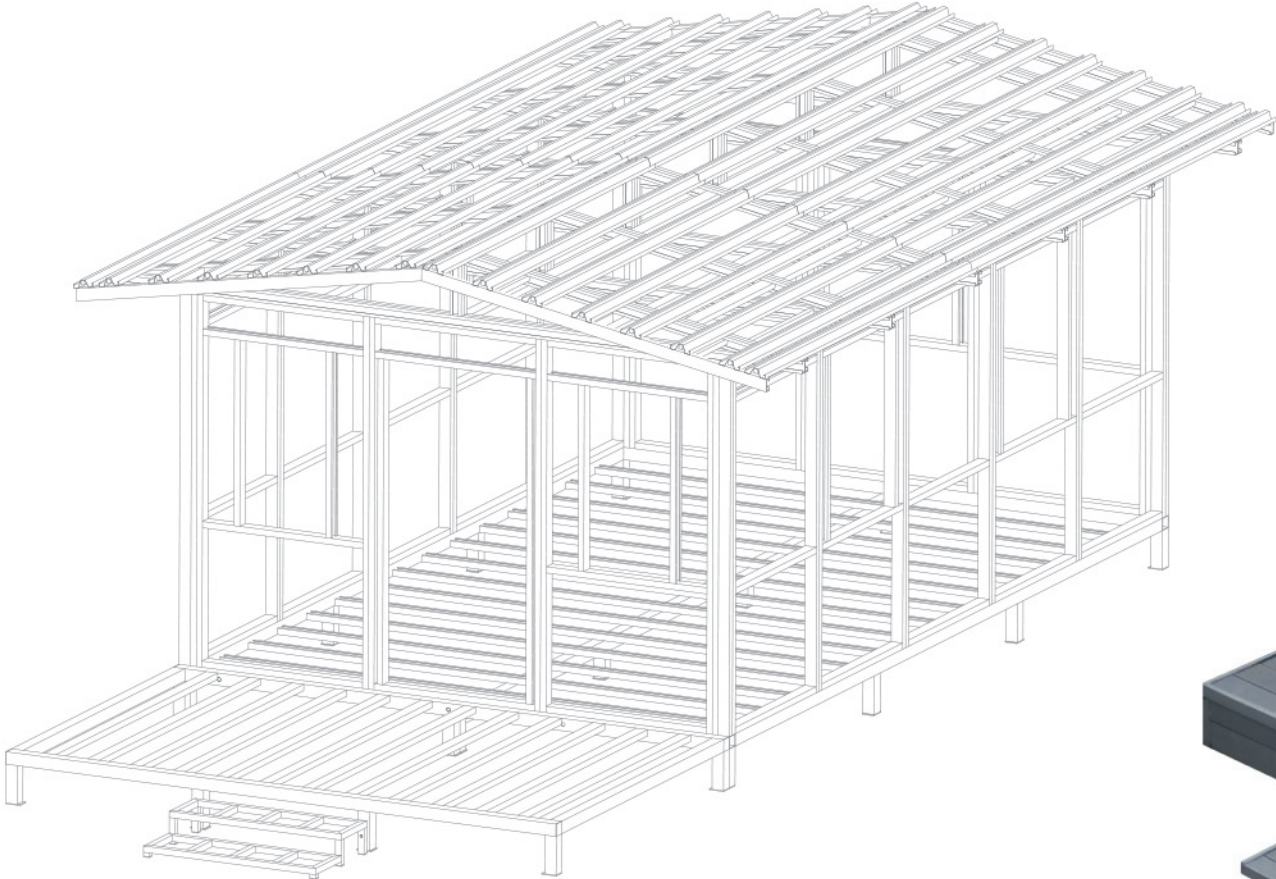
Dr. Árkai János  
Magyar Innovációs Akadémia  
Elnök, Magyar Innovációs Akadémia







Together with our new, innovative, super-thin MANTI® CERAMIC thermal protection product group our company has also developed our MAMÉP® - Műszer Automatika Modular Building System as a new in-house manufactured, fast, modular construction profile system which makes fast, light-frame modular building construction possible.



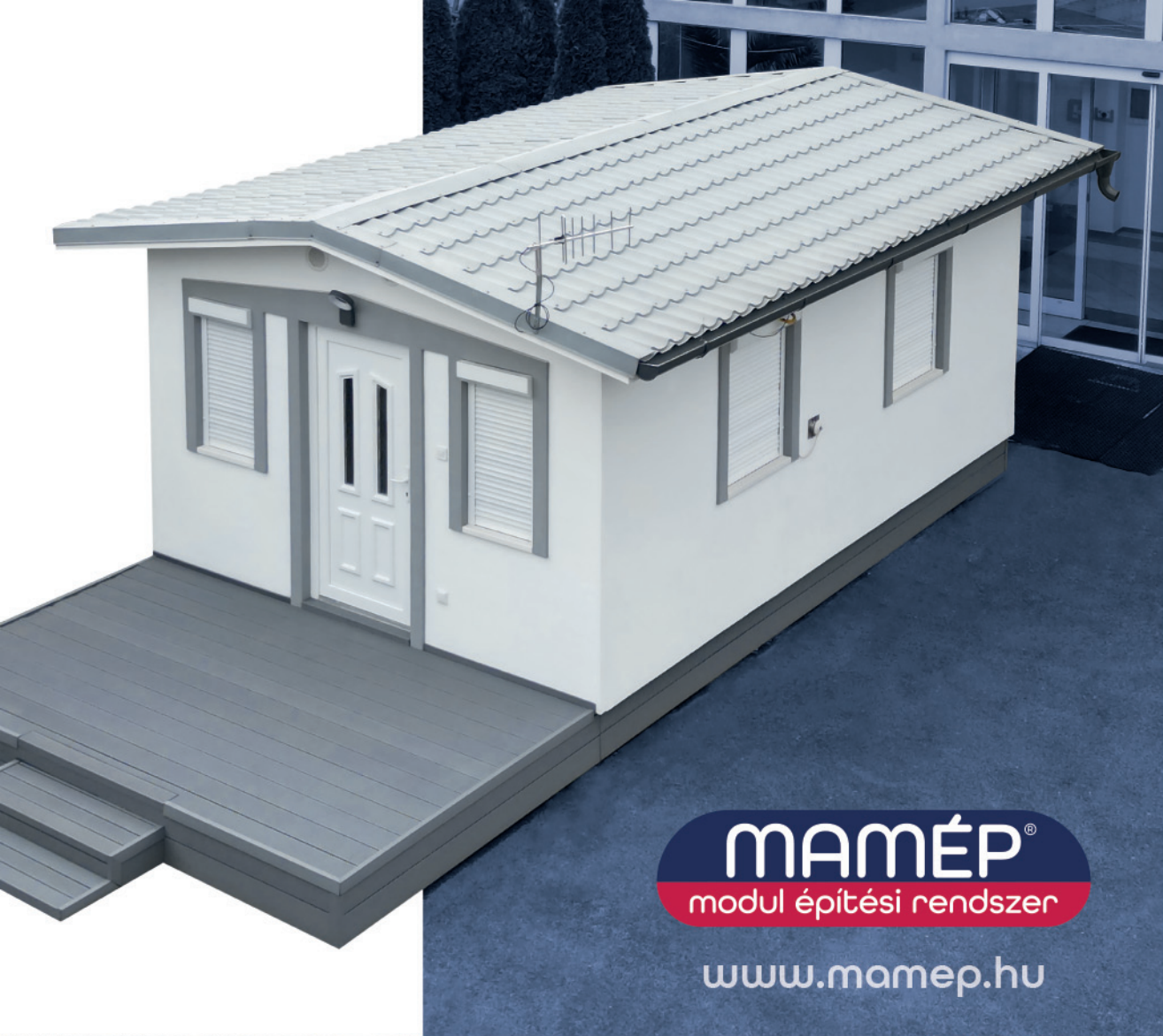
## CONSTRUCTION SYSTEM LEVELS

- 1 **PROFILES**
- 2 **MODULES**
- 3 **COMPLETE FRAME STRUCTURES**
- 4 **REMAINING FORMWORK WALL/SLAB STRUCTURES**
- 5 **LIGHTWEIGHT CONCRETE INFILL**
- 6 **DRY TECHNOLOGICAL CONSTRUCTION**

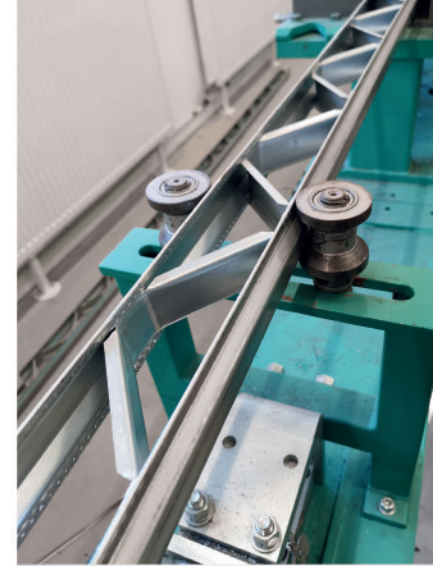
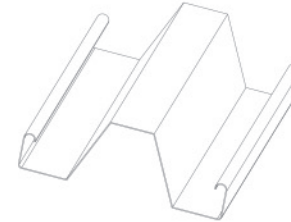
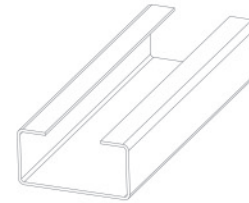
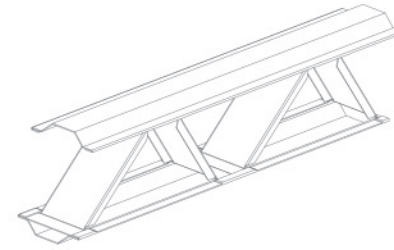
**FAST MODULAR CONSTRUCTION**







**MAMÉP**<sup>®</sup>  
modul építési rendszer  
[www.mamep.hu](http://www.mamep.hu)







# MŰSZER AUTOMATIKA



*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.*

