A CONSTRUCTION INNOVATIONS COMPANY

# MAGHOR

## OUR PRODUCTS

### STRUCTURAL INSULATED PANELS

# MAGHOR® PORTFOLIO

## MAGHOR® Products

- Structural Insulated Panels
- ArtPoint Crafted Panels
- Outdoor Insulation System
- Concrete-Based Products

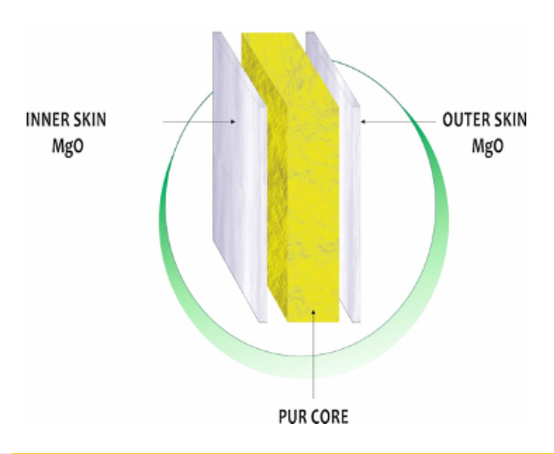
## MAGHOR® Marketplace

- MgO Boards Portfolio
- MgO Accessories
- MgO Products Development
- Wholesale SMB Program
- Warehouse and Logistics

## MAGHOR® Innovation Hub

- Structural Engineering
- Construction Development
- AEROGEL® Consulting
- Innovation Support Services

# ABOUT STRUCTURAL INSULATED PANELS





**MAGHOR® Structural Insulated Panels (SIPs)** are high performance building panels for floors, walls, and roofs in residential and commercial buildings.

Panels are typically made using **Expanded Polystyrene (EPS)**, or **Polyurethane foam (PUR)** insulation, **PIR (polyisocyanurate) insulation**, sandwiched between two structural skins of **Oriented Strand Board (OSB)**, although other surfaces are also available to meet particular needs, such as **metal** and **Magnesium Oxide** facing.

**Designing with SIPs results in a building system that not only offers tremendous design capabilities, but is more energy efficient and stronger than traditional framing systems (i.e. stud framing with common fiberglass insulation).**

## TYPES OF SIPS' ON THE MARKET

**VARIOUS SIP TYPES AVAILABLE:**
**Skins:** Plywood, OSB, Fiber Cement Board, MgO
**Core:** EPS, XPS, PUR, PIR

# MgO BOARDS VS OTHER CONSTRUCTION PANELS*

| MAGHOR® MgO Boards from NevPanel | | Plasterboard | Cement-based panel | Plywood | O.S.B |
|---|---|---|---|---|---|
| **Flame Spread** | None | Low | None | High | High |
| **Sound Insulation** | High | Little | Little | Little | Little |
| **Smoke Development** | None | Little | None | High | High |
| **Water and Damp Effect** | Resistant | No resistant | No resistant | No resistant | No resistant |
| **Fungus-Mold Formation** | None | Yes | None | Yes | Yes |
| **Durability to Termite** | High | Yes | Yes | None | None |
| **Heat Insulation: R-Value** | 1.2 | 0.9 | 0.8 | 1.2 | 1.0 |
| **Impact Strength** | High | Low | Low | Normal | Normal |
| **Inflammableness** | None | Flaming | None | Inflamable | Inflamable |
| **Load-bearing Quality** | Yes | None | None | Yes | Yes |
| **Environmental Quality** | High | Low | Normal | Normal | Low |
| **Icing and Freezing** | Good | Low | Good | Good | Good |

* Evaluations in the table have been obtained from the test results in their own plans of magnesium board producers in America and China

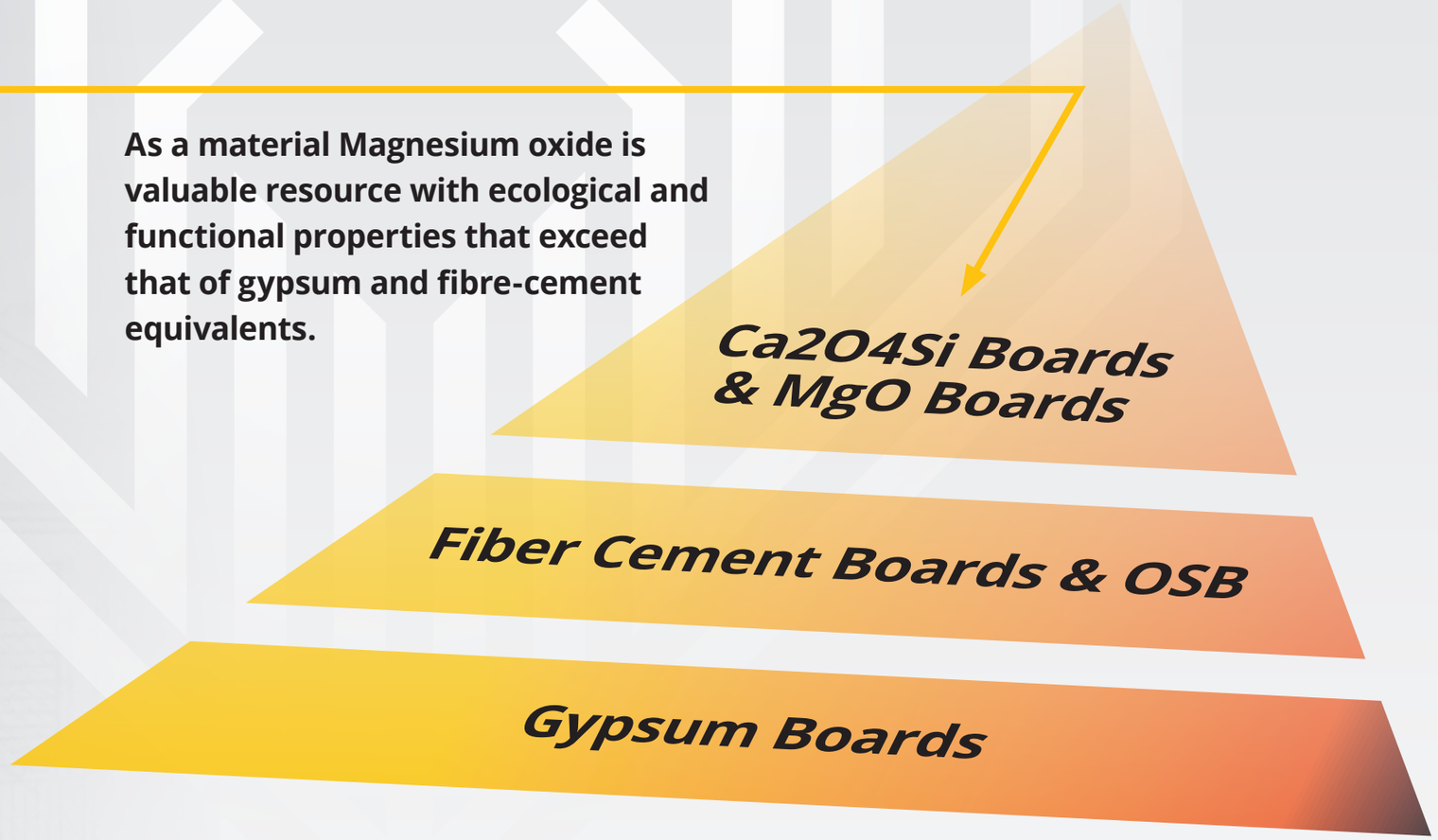
# MAGHOR® SIPS - MgO COMPONENTS


**MAGHOR® MgO Boards** from **NevPanel** are used in our structural insulated panels system.
**Magnesium oxide (MgO) or magnesia**, is a white hygroscopic solid mineral that occurs naturally. Magnesium is the eighth most abundant element in the universe and constitutes about 2% of the Earth's crust. Magnesium is the eleventh most abundant element by mass in the human body and is essential to all cells.



# MgO BOARDS - MARKET POSITION


**As a material Magnesium oxide is valuable resource with ecological and functional properties that exceed that of gypsum and fibre-cement equivalents.**



# MgO BOARDS - USAGE EXAMPLES

**Taipei 101, one of the tallest buildings in the world.**

All 101 stories use MgO sheeting on the inside and outside of all the walls,fireproofing beams and as the subfloor sheating.

**Birds Nest Stadium:**

MgO sheeting was the „official" specified construction material of the 2008 World Olympics buildings. A project costing over $160 bil. Over 8 million square feet of MgO Sheeting were installed.

# MAGHOR® MgO BOARDS - BENEFITS

**MAGHOR® MgO Board from NevPanel is a refactory material that is physically and chemically stable at high temperatures.**

- ☑ Heat Resistant 1200 ° C
- ☑ Flexible and strong
- ☑ Frost-resistant
- ☑ Waterproof
- ☑ Super white
- ☑ Ecological
- ☑ Antiallergic
- ☑ Reflecting heat
- ☑ Healthy
- ☑ Resistant to fungi
- ☑ Resistant to rodents

# MgO BOARD - MULTIPURPOSE PANEL

- ☑ **Exterior Walls**
- ☑ **Curtain Walls**
- ☑ **Cladding and Façade Applications**
- ☑ **Insulation of Fire Escape Routes**
- ☑ **Parapets**
- ☑ **Roof Underlayment**
- ☑ **Fire Walls**
- ☑ **Fire Barriers**
- ☑ **Insulation of Cooling Towers**
- ☑ **Interior Walls**
- ☑ **Partition Walls**
- ☑ **Suspended Ceilings**
- ☑ **Raised Floor Systems**
- ☑ **Areas exposed to water and damp**
- ☑ **Details requiring fire-heat-sound insulation**
- ☑ **In the production of fire doors, shaft doors,**
- ☑ **Non-flammable furniture**

**MAGHOR® MgO Boards** from NevPanel is a MGO, MGCL2 composite reinforced with fibre glass fabric. The board does not contain any hazardous substances such as asbestos, solvents heavy metals or other toxins.

**MAGHOR® MgO Board** simultaneously fills the function of gypsum, OSB, fibre cement and wood cement boards. In the construction industry, it often happens that individual needs are solved with precisely selected solutions characterized by a very narrow range of applications. Such an ideal adaptation guarantees a whole range of advantages.

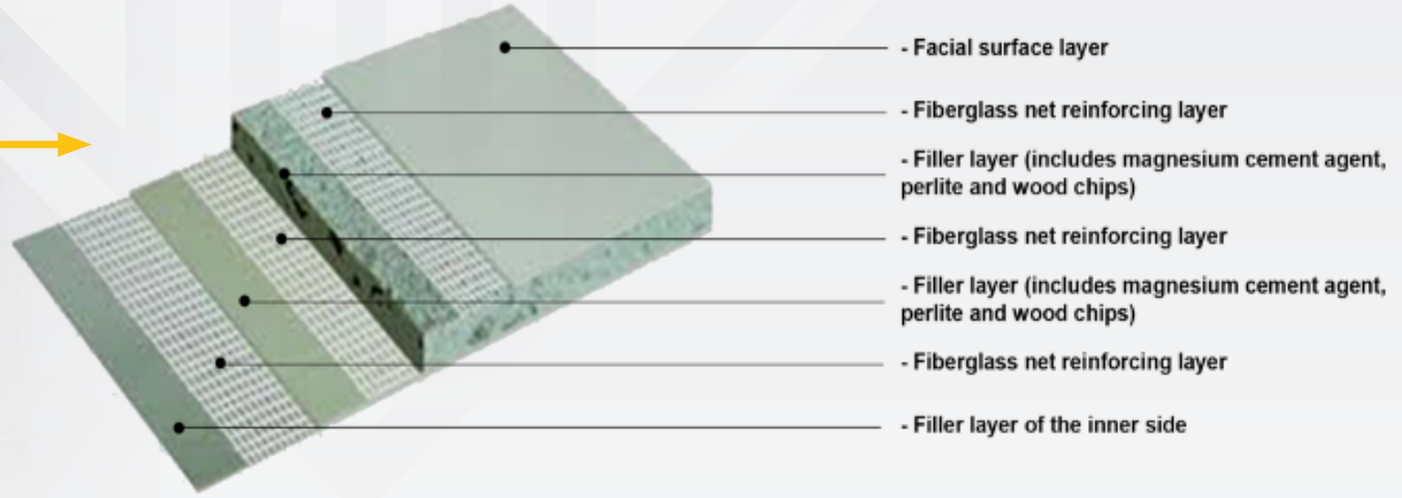
**Sometimes, however, the key advantage is simplicity and versatility, i.e. the ability to solve as many tasks as possible with a single product.**

# MAGHOR® MgO BOARD - TECHNICAL INFO

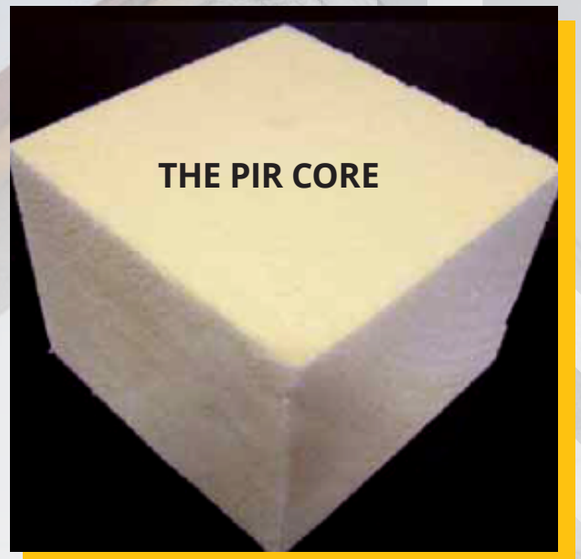
## MAGHOR® MgO Boards Dimensions:

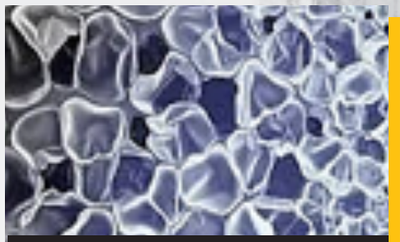

**Customized production is available on demand.**

| | |
|---|---|
| Incombustibility | **A1 class** |
| Density | **1000kg/m3** |
| Flexural Strenght (12mm) | **11,18 MPa** |
| Compression Strenght | **20,71 MPa** |
| Flame Spread | **None** |
| Smoke Development | **No smoke emission** |
| Water and Damp Absorption | **10-12% absorption, No change in form** |
| Heat Conductivity (10cm partition wall section) | **λ = 0,052 w/m.K** |
| Chemical Content | **None** |
| Fungus - Mold Formation | **None** |
| Frost | **Not affected by freezing** |

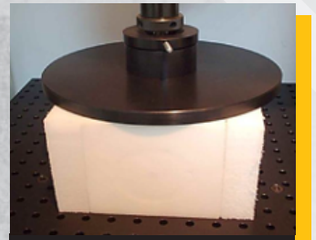


# MAGHOR® SIPS - THE PIR CORE



PIR foam closed cell
Microscopic view 80 ppi.



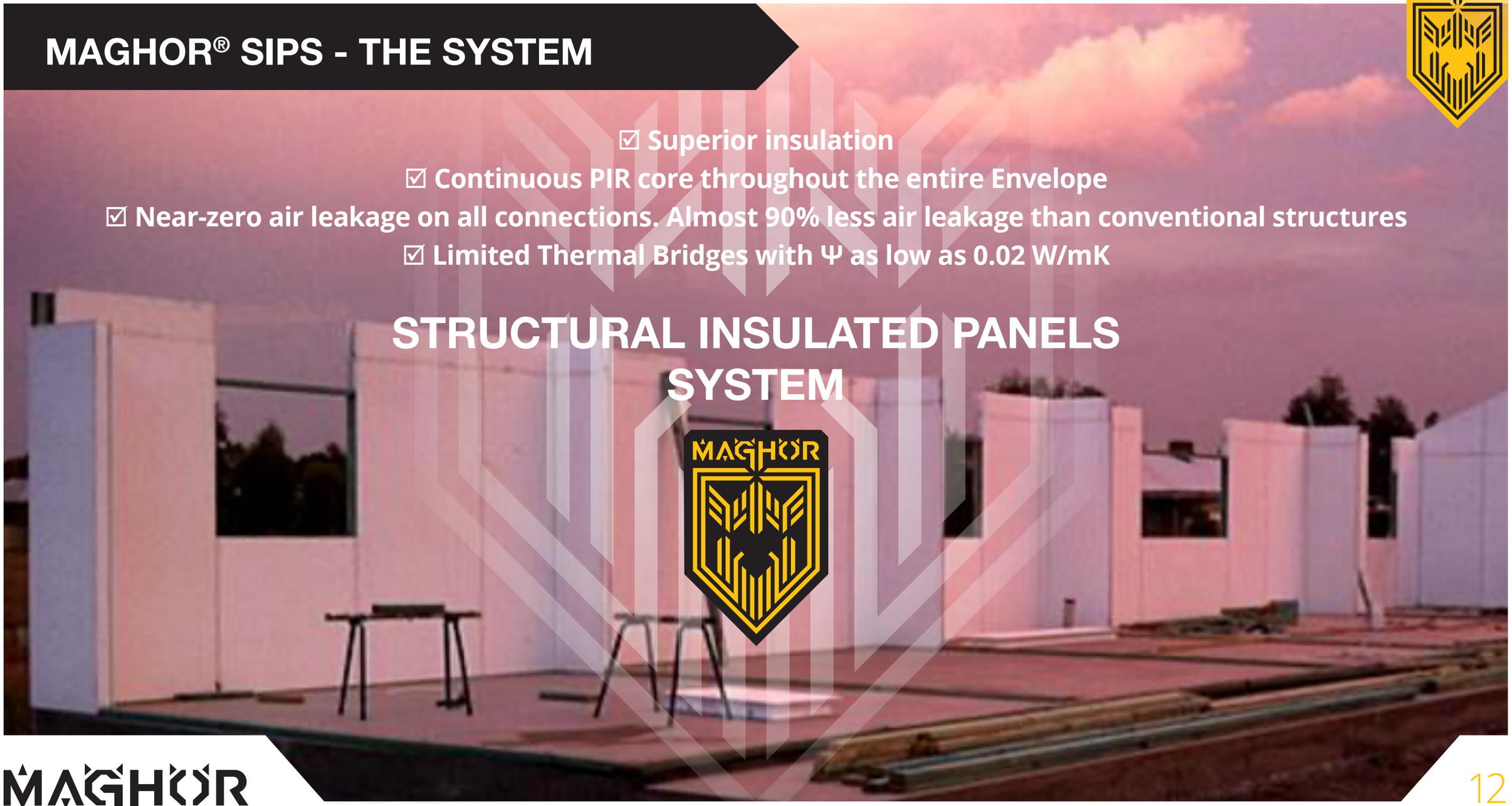
Compression test.
σm = 255 kPa

**Although SIPs are available with either a PIR foam core or EPS core, PIR foam is a far better insulator and offers the best physical properties.** PIR foam has a **stable R and U'- value per cm** of thickness with a relatively thin panel. **PIR foam is not a volatile organic compound(VOC)** and, hence, does not contribute to ozone depletion (OD). **Safe and easy to use, PIR foam also has better fire, flame and smoke characteristics and will not melt.** It can withstand constant high service temperatures and will only char **up to 450°C,** unlike EPS which tends to melt at 125°C. The production process of PIR uses an excess of the MDI component. It differs a PIR from PUR. In the presence of an appropriate catalyst, the excess MDI reacts with itself to form isocyanurate, which means more excellent heat stability. PIR is known for use as a low-moisture barrier. The most notable differentiating factor for PIR is its flame and smoke resistance. PIR slows the spread of flames and reduces the smoke emitted from the fire when compared to PUR products.

**ADDITIONAL BENEFITS OF PIR CORE INCLUDE:**

- ☑ **Helps avoid mold and mildew growth**
- ☑ **Does not support nesting by vermin**
- ☑ **Contains no formaldehyde**
- ☑ **Aids in maintaining indoor comfort level**
- ☑ **Reduces materials needed for construction of energy-efficient buildings**
- ☑ **Reduces fuel consumption and infiltration of noise**
- ☑ **Durable with excellent tensile strength and adhesion**
- ☑ **Provides consistent performance for the service life of the structure**

# MAGHOR® SIPS - THE SYSTEM



☑ Superior insulation
☑ Continuous PIR core throughout the entire Envelope
☑ Near-zero air leakage on all connections. Almost 90% less air leakage than conventional structures
☑ Limited Thermal Bridges with Ψ as low as 0.02 W/mK

## STRUCTURAL INSULATED PANELS SYSTEM

# MAGHOR® SIPS - PANEL CHARACTERISTICS

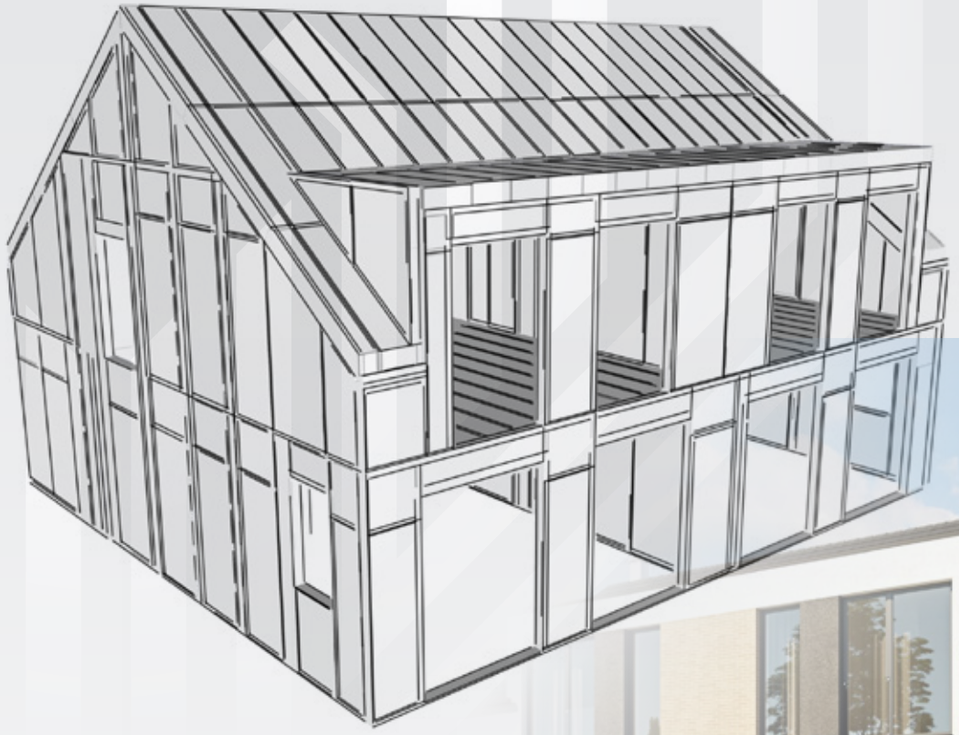

**Dimensions:** H x L = 2440;2750;3000 x 1220 mm
**Thicknesses:** 100, 165, 205, 270 mm
**Panel face board thickness**: T = 12.5 mm
**Core thickness:** C = D - 2*T= 125 mm
**MgO density:** ρ = 888.57 kg/m³
**PIR Core density:** ρ = 42.75 kg/m³
**Panel weight:** Wp = 31kg/m²

## SIPS PANEL MAIN ADVANTAGES

- ☑ **The standard panel can be used for walls, floor and roofs.**
- ☑ **Suitable for ALL Residential, Commercial, Industrial and Institutional Construction**
- ☑ **Lightweight material with structural characteristics similar to a steel I-Beam. The PIR core provides rigidity and the MgO outer skin provides tremendous tensile and compressive strength.**
- ☑ **Superior thermal insulation with U values as low as 0.12 W/m²K**
- ☑ **Fire resistant up to 89 min.**
- ☑ **Breathable material that helps regulate the air moisture content within the structure while preventing the development of mold/mildew.**
- ☑ **Waterproof material due to the closed cell PIR foam cell.**
- ☑ **Best acoustic properties in SIPs with 38 dB noise reduction.**
- ☑ **Reduced need of wet trades making it suitable for winter construction**

# MAGHOR® SIPS - BUILDING KIT

Custom corner pieces
Up to 1200x1200x2700mm
Exact angles



- Standard and custom made connections to meet the project's exact needs
- Wood composite profiles
- Galvanized metal profiles

# MAGHOR® SIPS - APPLICATIONS

## LOW COST RESIDENTIAL, MODULAR AND AFFORDABLE

# MAGHOR® SIPS - APPLICATIONS

## HIGH END RESIDENTIAL

# MAGHOR® SIPS - APPLICATIONS

## VACATION HOUSES

# MAGHOR® SIPS - APPLICATIONS

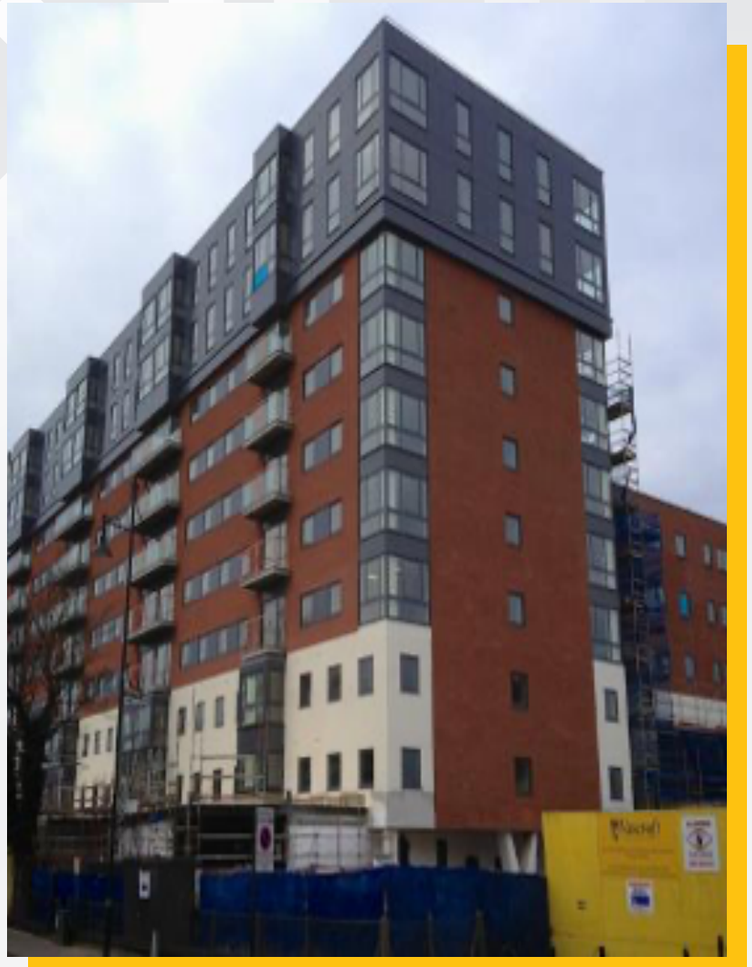
## AWARD WINNING DESIGNS

# MAGHOR® SIPS - APPLICATIONS

## AWARD WINNING DESIGNS

# MAGHOR® SIPS - APPLICATIONS

## BUILDING ADDITIONS



# MAGHOR® SIPS - APPLICATIONS

## INFILL

# MAGHOR® SIPS - APPLICATIONS

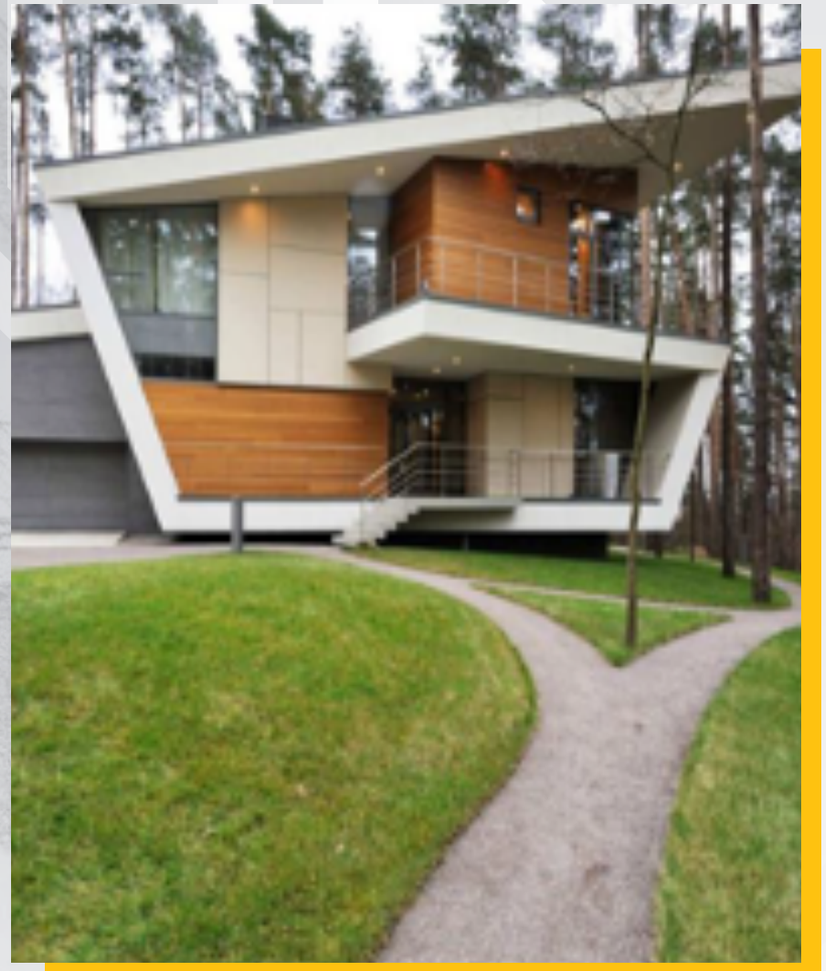
## PARTITIONS

# MAGHOR® SIPS - APPLICATIONS

## TO THE RADICAL

# MAGHOR® SIPS - APPLICATIONS

## AND EXTRAVAGANT



# DESIGNING WITH SIP MADE EASY


- ☑ Complete technical workbook and profile manual
- ☑ We assist our customers with the design in all stages
- ☑ Full 3D CAD model of your design in SIPs and connections is created
- ☑ Every element is carefully designed and optimized prior to manufacture
- ☑ Building procedures are taken into consideration in design and everything is optimized for a fast assembly on site
- ☑ On and off site-training
- ☑ A 24/7 technical support line for any „under-construction" customers, so wherever the project is being constructed in the world the solution to the problem is only a phone-call away
- ☑ Full technical support on site is an option for the challenging projects

## FABRICATING THE BUILDING KIT

- ☑ Every piece is cut to final dimensions according to the plans
- ☑ Every element of the Building Kit receives a label
- ☑ After fabrication every element receives a quality check
- ☑ All the elements are verified and pre-assembled
- ☑ Every piece of the Kit is carefully stacked in pallets
- ☑ The pallets are labeled and shipped in the exact order needed on site in order to eliminate dead-times. This ensures a fast assembly.
- ☑ Lists of items are issued and handed alongside the Building Kit

# MAGHOR® SIPS - ADVANTAGES FOR BUYERS

**Extremely strong structure.**
There is considerable evidence that homes with SIP wall and ceilings have survived natural disasters like hurricanes, tornadoes, straight-line winds and earthquakes better than traditional stick-framed homes right next door.

**“Freeze Proof.”**
What happens if the power goes down? During the late 1990s, several New England SIP homes survived over a week without power or a wood stove and never came close to freezing.

**Lower energy bills.**
Discounting the "human factor"-thermostat settings and so forth-a number of side-by-side tests show that between 15% and 40% less energy should be needed to heat and cool a home with SIP wall and ceiling panels.

In tests by Oak Ridge National Laboratory, SIP walls outperform fiberglass walls by over 55%.

**Precise building costs.**
Thanks to the pre-cut panels used for every element of the building differences between the estimation and the final bill shouldn’t exceed 3%

**Improved comfort.**
Thanks to lower U’-values and tight construction, the wall and ceiling surfaces in a SIP home will stay warmer than in stick-framed homes. The warmer those surfaces are the more comfortable the home is.

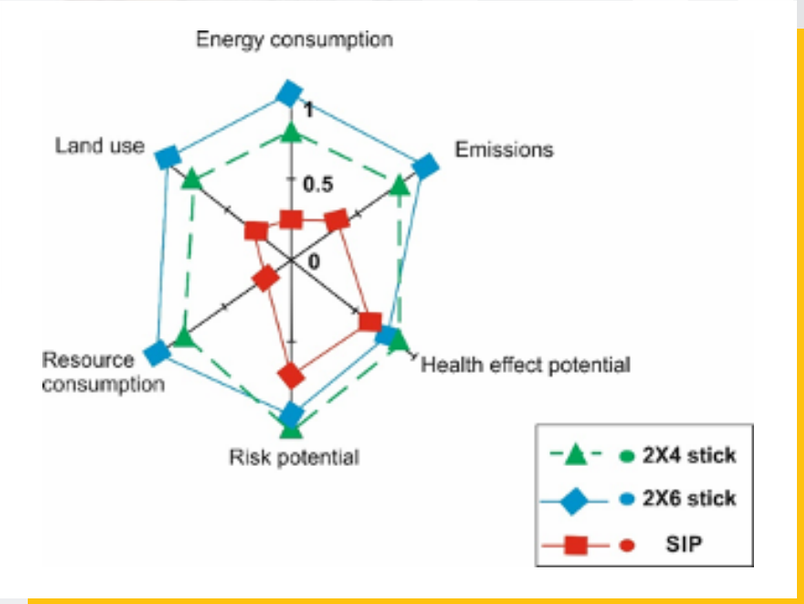
**More space.**
Another great advantage of the SIPs is that the panels are thinner than conventional construction thus giving you more extra living space on the same footprint.

**Indoor Air Quality.**
Homes built with SIPs are tight enough that builders can’t ignore upgrading mechanical ventilation compared to that found in a standard home. In many studies, the best indoor air quality is found in homes that are tight and equipped with upgraded mechanical ventilation.

**Green building product.**
On a life-cycle basis, a more energy-efficient house built with SIPs will be less damaging to the environment, in terms of overall resource consumption.

**Quieter.**
The insulation quality is so great that outside sound does not resonate in the structures making it quieter and more comfortable for the occupants.

# MAGHOR® SIPS - SUSTAINABILITY




**Overall ecological footprint results by insulation system. 1.0 = worst position (the lower the score, the higher the eco-efficiency)**

The award-winning BASF Eco-Efficiency Analysis studies alternative solutions to include a total cost determination and the calculation of economic and ecological impact over the entire lifecycle of a product or system.

**SIPs-built structures with PU foam cores were clear winners. Key contributors in this study include:**

- ☑ **Low environmental impact of materials**
- ☑ **Low maintenance requirements**
- ☑ **Lightweight materials reduce transportation fuel use**
- ☑ **Reduced heating and cooling loads over lifetime of home**
- ☑ **High R-value**
- ☑ **Low air leakage rate**

## MAGHOR® SIPS AND EURO 20/20/20 PLAN

The 2020 energy goals are to have:

- ☑ **-20% (even -30%)reduction on CO2 emissions**
- ☑ **+20% renewable energy**
- ☑ **+20% increase in energy efficiency**

MAGHOR® SIPS help raise the social, economic and environmental responsibility of homes and buildings, making a significant contribution toward true sustainability.

# ABOUT MAGHOR®

**MAGHOR is a construction innovations company** with a global customer portfolio reach. Our **vision is to search and find affordable solutions** tailored to the needs of our clients **together with sustainable living qualities**.

**Constructions are our passion** and that's why we have decided to **use fast and affordable wooden structures as our core weapon** against concrete and steel structures which are heavy CO2 emissions dependend.

# ABOUT MAGHOR®

**Building a home is one of the biggest financial decisions most of us will make.** Many times the decision is well-placed, but not always and this is when problems arise.

Many of us have **limited knowledge of what materials to use** and as such we are often dependent on the decisions of **architects, contractors and friends or family** to use the correct material in the correct place.

# ABOUT MAGHOR®

**The speed of building construction** with innovative **Maghor Haus panel**, helps to implement the parameters of the masonry structure together with the flexibility of the wooden structure.

That is why we have invested in intermediate storage and are preparing the ground for a network of sellers of new modern solutions.

# ABOUT MAGHOR®

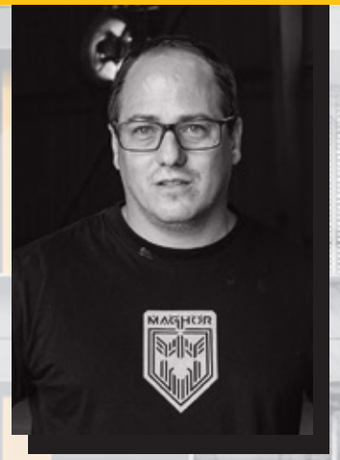
**MAGHOR®** is derived from the English word "**Magnesium**" and its Slovak equivalent "**Horcik**" and constitutes the essence of our business.

**Hint:**
*As a raw mineral it can be found abundantly in Eastern Slovakia and has many applications. One such application is the creation of Magnesium oxide which can be used to make durable construction boards.*

# MEET THE MAGHOR® TEAM

## Ing. Clayton STONE, PhD.

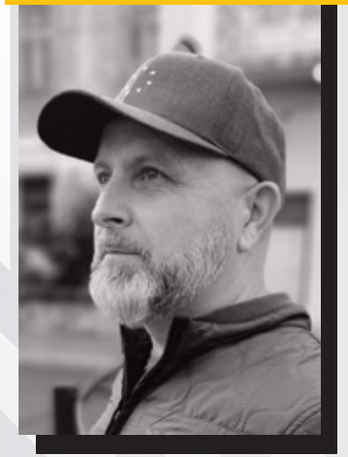
Innovations and Engineering



Clayton has a 10+ year track record in R&D and Innovation, Post graduate degree in Civil Engineering at Technical University of Kosice, where he worked as Researcher and Deputy lab manager and leads the strategic alliance with universities. His most recent role for more than 5 years was a Chief Innovations Officer at Helske Energy Save.

## Zsolt MÁTÉ

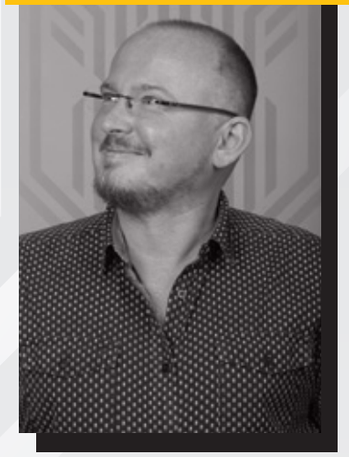
Constructions and Development



Zsolt has 16+ years of experience in construction business and owns a successful construction company, which carries out construction and development activities in the Kosice region. He has a strong passion in lightweight roof constructions.

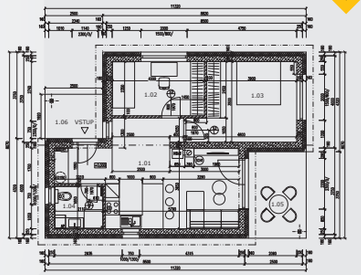
## Slavomír KRESTIAN

Strategy and Product Innovations



Slavomir has 20+ years of experience in marketing and creative industry, as a chief creative director with clients from all over the Europe. His last role for 5 years was a VP of Marketing at international holding company HELSKE Group. He has a strong passion for content creation and excels in brand development strategies.

# MAGHOR® M86



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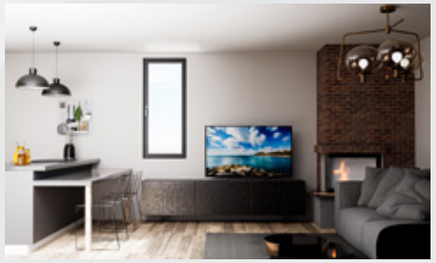

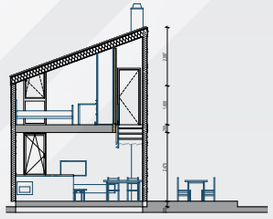

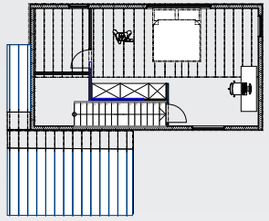

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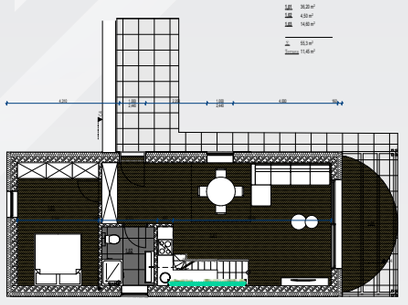

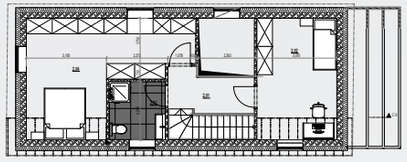

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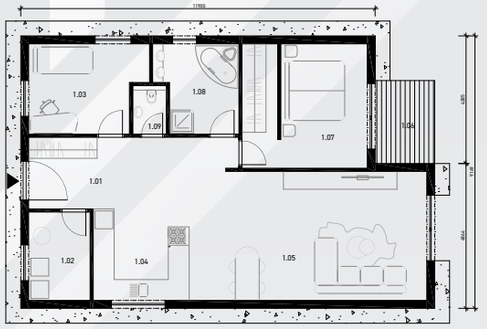


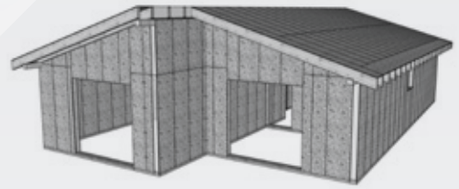
| Č.M | NÁZOV MIESTNOSTI | PLOCHA [m²] |
|---|---|---|
| 1.01 | ZÁDVERIE | 4,56 |
| 1.02 | TECH.MIESTNOSŤ | 6,32 |
| 1.03 | IZBA | 11,17 |
| 1.04 | KUCHYŇA | 18,35 |
| 1.05 | OBÝVACIA IZBA S JEDÁLŇOU | 32,67 |
| 1.06 | TERASA | 8,07 |
| 1.07 | SPÁLŇA | 16,40 |
| 1.08 | KÚPEĽŇA | 7,82 |
| 1.08 | WC | 1,59 |

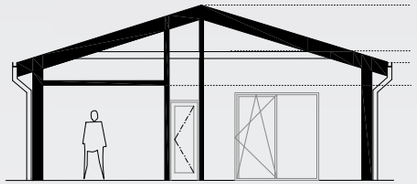
INFORMÁCIA O OBJEKTE

| | |
|---|---|
| PLOCHA SPOLU | 131,32 m² |
| ÚŽITKOVÁ PLOCHA 1 NP | 106,90 m² |

POZNÁMKY:

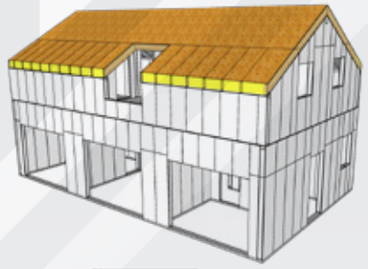
▼ HLAVNÝ VSTUP DO OBJEKTU

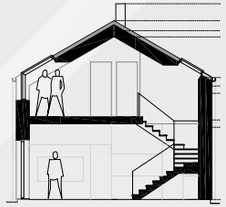


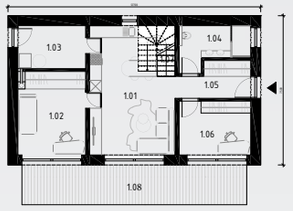


MAGHOR

# MAGHOR® M143









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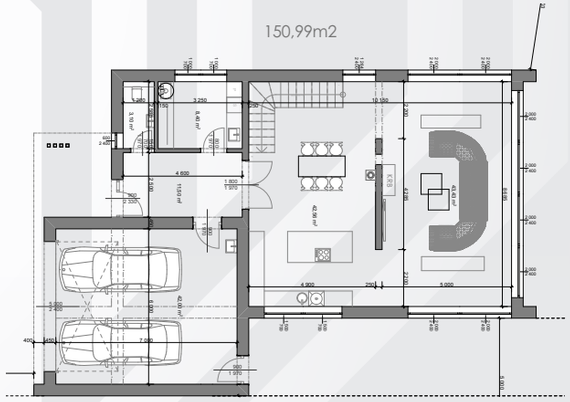
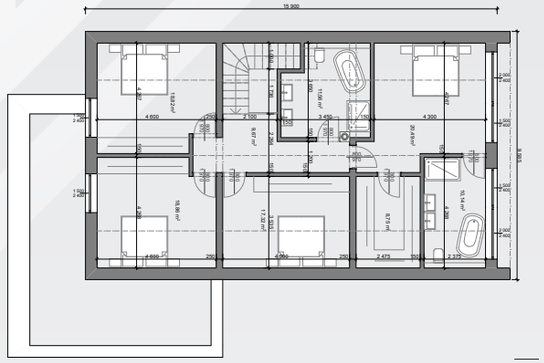
# MAGHOR® M256

150,99m2

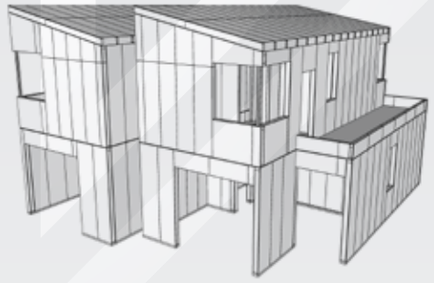


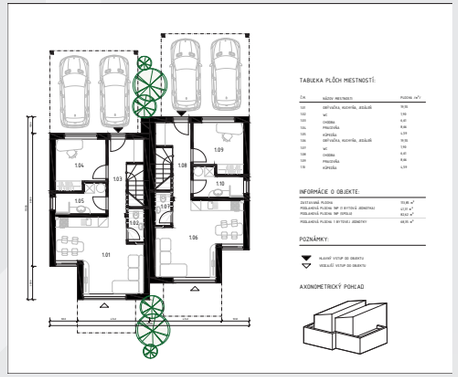
115,61m2

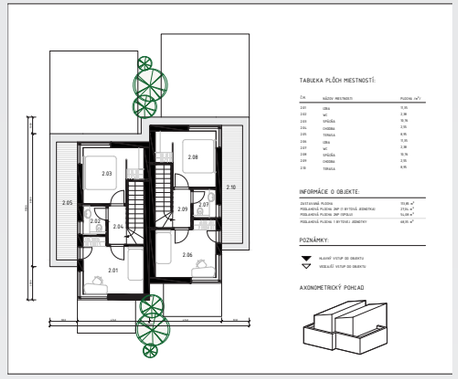


# MAGHOR® MD1

# MAGHOR® MD2





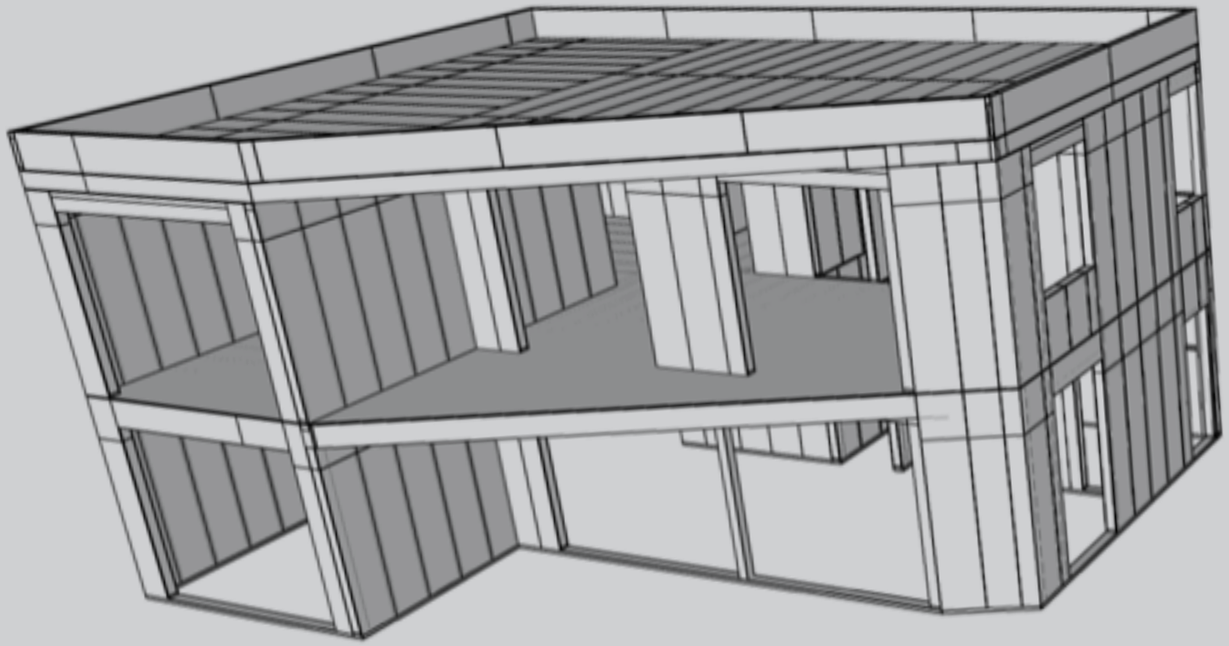
# MAGHOR® M20

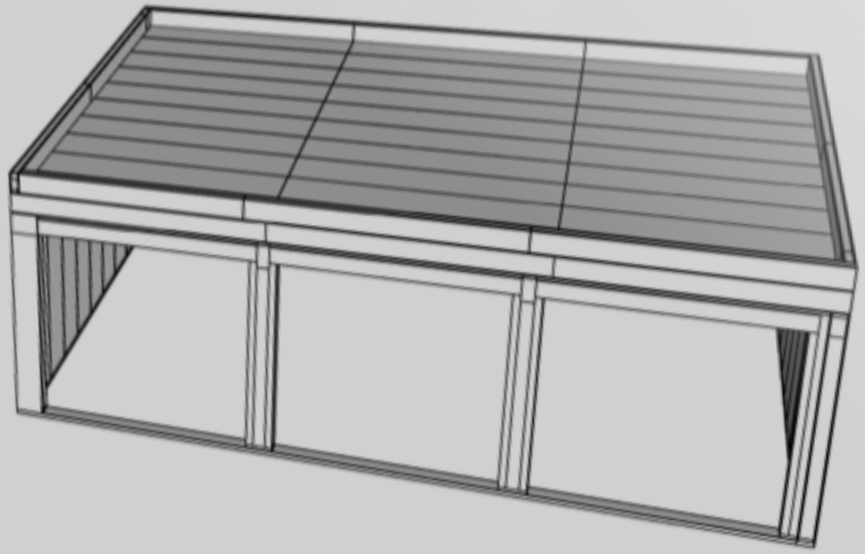
# MAGHOR® G49

# MAGHOR® M25

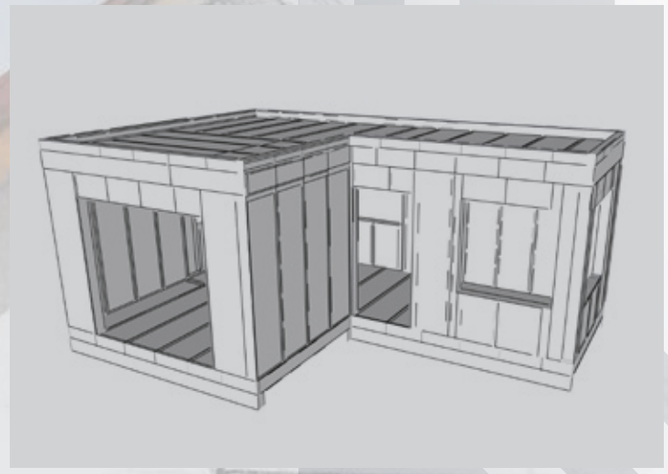
# MAGHOR® M26

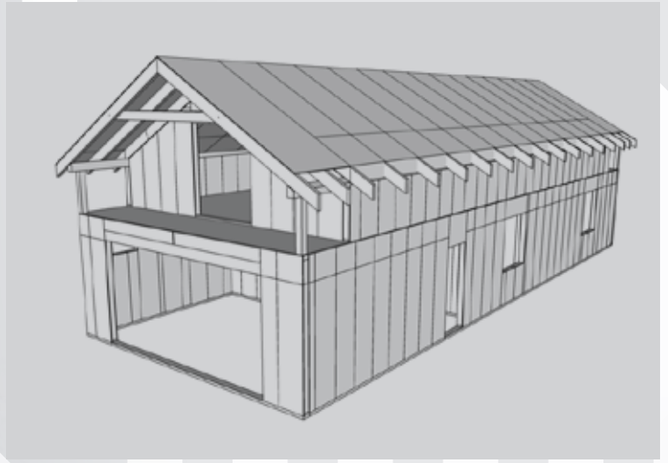
# MAGHOR® OUR PROJECTS

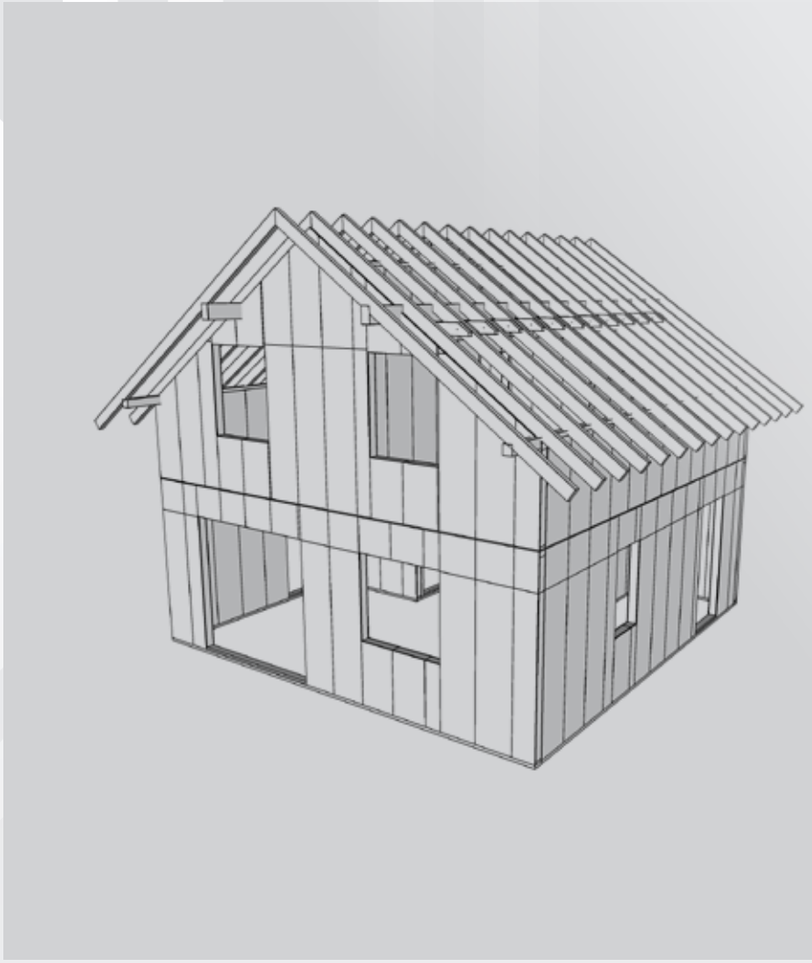


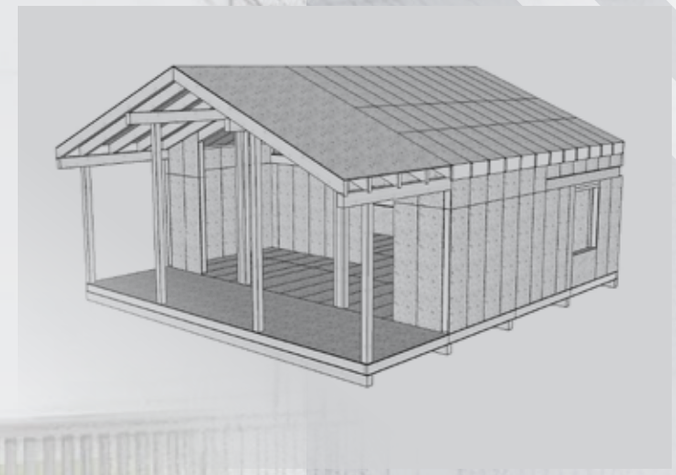


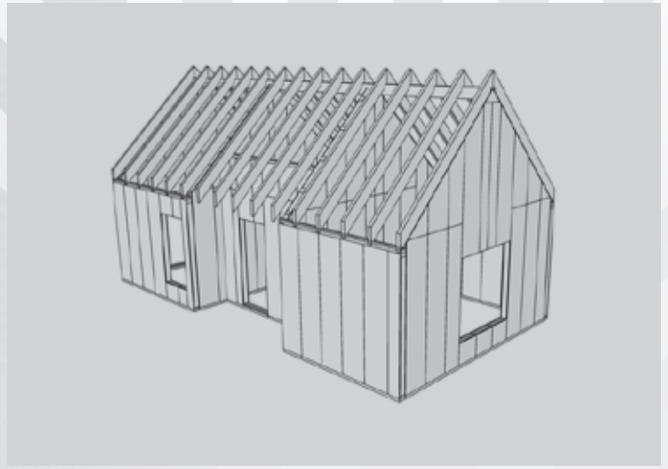
# MAGHOR® OUR PROJECTS











# MAGHOR® CONTACTS

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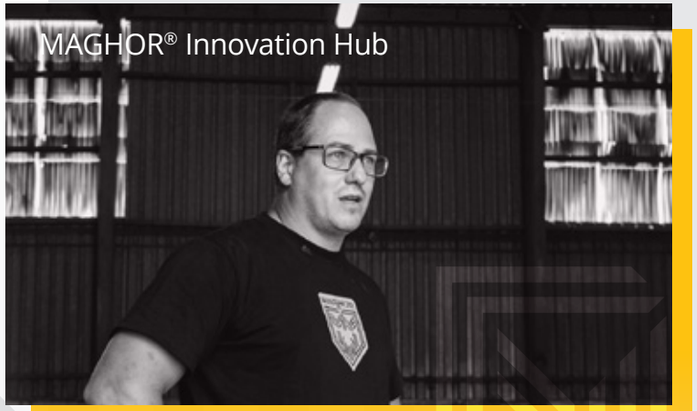


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