MAGOXX® Board

safe, smart and sustainable

Sustainable and fire resistant building solutions

SAFE, SMART & SUSTAINABLE

In the wake of the last climate conference in Paris, we have all realised the need to drastically reduce our CO2 emissions in order to restrict increases in the Earth's temperature. However, one of the most important questions is how quick results can be achieved?

Besides major sources of CO2 emissions, like cars, aviation, (container) ships and coal-fired power stations, there are also less obvious ones, like materials used when constructing buildings. To date, we have relied heavily on concrete when constructing commercial and non-commercial buildings and structures, thus making concrete the most widely used building material in the world.

What many people don't realise is that large amounts of CO2 are released when concrete is being produced and cured. It is safe to assume that the cement and concrete industry is responsible for 5% of global CO2 emissions!

In addition to initiatives that have already been taken to make cement and concrete more environment-friendly, we must continue to look for alternatives and other ways to innovate the building industry. This is particularly important when we take into account burgeoning urbanisation in emerging countries like India, where the government has been forced to develop rigorous plans to restructure 100 of its largest urban centres. These so-called Smart Cities are in desperate need of good and sustainable building materials and can be seen as manifestations of the major building challenges that lie ahead. In this respect, India is in the same league as Nigeria and other African countries.

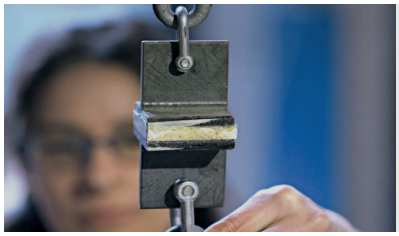
This quest for sustainable innovation, coupled with my own passion for architecture, resulted in SINH Building Solutions being founded. The company offers innovative, sustainable building solutions based on magnesium oxide products. These solutions help to create faster and more flexible methods of constructing commercial and non-commercial buildings and, more importantly, significantly reduce our carbon footprint.

I am thus delighted to invite you to discover how our products can add value to your building projects. And if you'd like more information, or want to your personal experiences, please don't hesitate to contact us.

We'd love to hear from you!

Jan Engels

CONTENT



INNOVATIVE SOLUTIONS

MAGOXX® board is the most important product of SINH™ Building Solutions. These high-performance magnesium oxide boards offer innovative, sustainable building solutions for new-build, renovation and restoration projects. The boards can be easily plastered and are therefore also suitable for interior design. In most situations it is possible to use boards that are 50% thinner than usual. MAGOXX® board offers solutions that:

- Help to realise faster and more flexible building methods
- Allows users to comply with the strictest standards and building codes
- Reduces the total construction costs of building significantly
- Have a positive impact on sustainability
- Reduces the CO2 footprint and water consumption

MAGOXX® board is a higher-performance, 'greener' and smarter alternative for traditional fire resistant board materials like multiplex, gypsum and fiber cement products.

Limitless application purposes

MAGOXX® Board can be used for an almost endless range of indoor and outdoor applications in commercial and non-commercial buildings. The boards can be easily utilised when constructing:

- Interior walls in both dry and wet spaces
- Exterior walls
- Floor and ceiling construction
- Steel columns and beam cladding
- Interior design

Certification

MAGOXX® Board is CE certified. This means that the boards have been thoroughly tested and meet all European directives in the field of health, safety and environment.

CE

ETA 15/0634

Fire safety

MAGOXX® board is incombustible (Class A1). When used correctly, a 9 mm board can easily maintain fire resistance for in excess of 60 minutes (in accordance with EN 1364-1: R015).

Impact resistance

MAGOXX® boards are strong and durable and offer high impact resistance. They are thus ideal for buildings that are exposed to high impacts, like partition walls in schools, hospitals and leisure or public buildings.

Thermal and acoustic insulation

MAGOXX® boards have excellent thermal and acoustic insulation qualities. They are very energy efficient (Rc value: 1.2 K/W per inch) and comply with all acoustic performance standards.

Easy to handle, quick to install

MAGOXX® boards can be easily machined, trimmed, drilled or shaped using ordinary (power) tools. Because the boards are lightweight, they can also be handled and installed easily and quickly. And thanks to its smooth surface and excellent adhesive qualities, MAGOXX® facilitates the finishing process.

Health

MAGOXX® boards are non-toxic, silicate-free and asbestos-free.

Waterproof and damp-proof

MAGOXX® boards are completely water resistant. Furthermore, MAGOXX® boards do not deteriorate when immersed in water or exposed to freezing/thawing cycles.

Comparing alternatives MAGOXX® Board

The overview below (illustration 1) shows how alternative products behave compared to MAGOXX® board.

Characterstic	Material: MAGOXX® Board	Calcium silicate	Chipboard	Fiber cement	Gypsum
Fire resistance	+ +	+ +	- -	+	+ -
Recyclability	+ +	- -	+	-	+
CO_2 emissions	+ +	+	+ +	- -	- -
Space saving	+ +	+ +	- -	-	- -
Moist	+ +	+ -	- -	+ -	- -
Mold forming	+ +	+ +	-	+ +	-
Costs	+ -	- -	+ +	+	+ +

Illustration 1

INTERIOR

MAGOXX® board offers solutions when constructing new buildings. In particular when using steel and wood construction, and with renovation and restoration projects. Especially in housing the use of a much thinner board offers a lot of practical benefits. The boards can be applied in a large number of applications inside as well as outside the building, like:

- Interior walls in both dry and wet spaces
- Floor and ceiling construction
- Steel columns and beam cladding
- Interior design

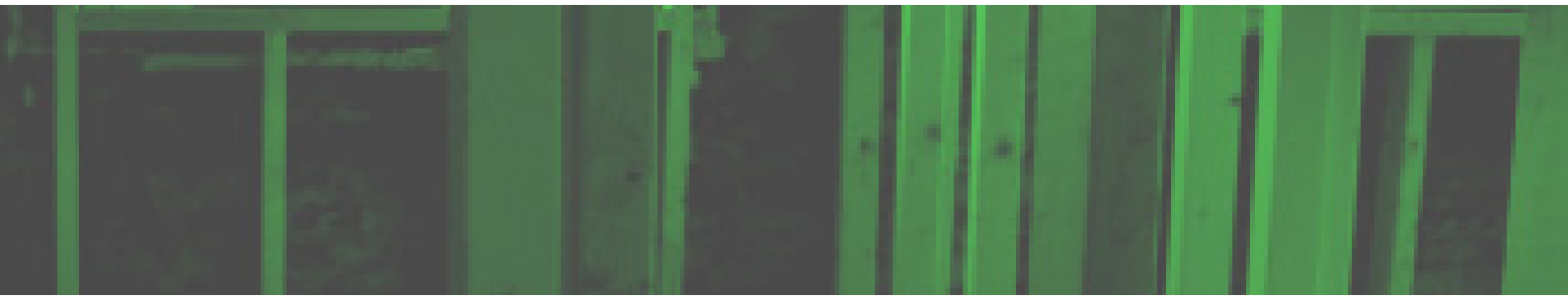
Herewith MAGOXX® board is an excellent alternative for traditional plasterboard.

For big and small professionals

MAGOXX® board is being used by construction companies, renovation- and restoration specialists and producers of prefab housing and (facade) elements. Because of its simple processing it is also very suitable for use in small, simple renovations.

High sustainability performances

MAGOXX® board is an excellent choice for projects where, besides high quality, a low environmental impact is an important aim. The boards are 100% recyclable, insulate well and have a particularly low CO2 emission at the production process (including transport to The Netherlands). This way the use of MAGOXX® board helps achieving high sustainability scores.



Walls

MAGOXX® Board is the ideal product for constructing nonload-bearing interior walls. It is fire and impactresistant, lightweight, highly insulating and ideal for all finishes. Even in the most humid of environments, MAGOXX® Board will not deteriorate or host fungi or insect life. The board is easy to machine and can be mounted on wood-batten or metal-stud frames using ordinary power tools. MAGOXX® board is incombustible (Class A1). When used correctly, a 9 mm board can easily maintain fire resistance for in excess of 60 minutes (in accordance with EN 1364-1: R015). This means building contractors can comply with the strictest fire safety requirements.

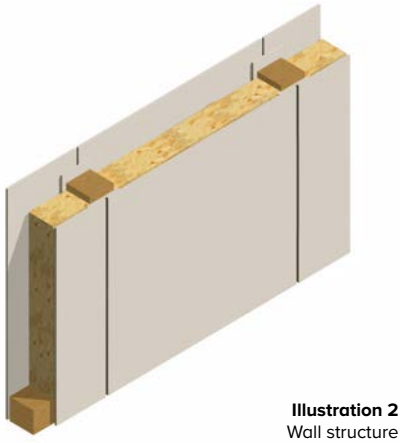


Illustration 2
Wall structure

Floors

De 18mm and 20mm variants of MAGOXX® board are thanks to their superior mechanical properties very suitable as an underlayment floor. In addition, the boards are easy to mill. This way floor heating can be applied in a lot of different shapes.

Illustration 3
Floor structure

Ceilings

Double plasterboard as ceiling? That is now a thing of the past. A floor/ ceiling construction with 9mm MAGOXX® board processed in the ceiling can, according to a fire test (EN12345), easily maintain fire resistance for in excess of 60 minutes. Ideal for renovations of houses with wooden load bearing beams.

MAGOXX® boards can be sawed easily, can be applied fast and are easy to finish off. Compared to normal constructive ceilings the use of MAGOXX® boards will save in time, effort and costs.

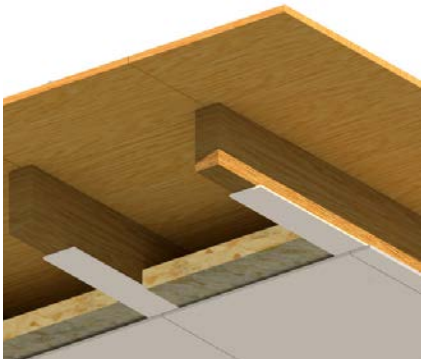


Illustration 4
Ceiling structure

OTHER APPLICATIONS

Steel beams and column cladding

MAGOXX® board is the ideal product for making non-fire resistant materials fire resistant. Although column cladding is the most common application, MAGOXX® board is also ideal when cladding air-conditioning ducts.

Efectis tested multiple steel frames protected with 15 mm MAGOXX® board, and confirmed it to be a very promising new product which enhances the fire resistance for steel constructions.

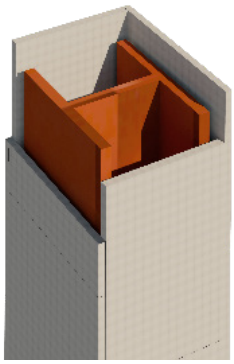


Illustration 5
Steel protection by MAGOXX® Board

Interior design

MAGOXX® boards are easy to process and offer excellent adhesive qualities, and have been widely used for small and large interior design projects like kitchens, bathrooms, decorative façades and indoor climate systems.

Designs based on MAGOXX® board offer an endless flow of architectural possibilities: any kind of laminate (wood, veneer, plastic, stone) can be used, while retaining attractive finishing options and fire resistance. MAGOXX® board can be easily machined with computer numerically controlled (CNC) or water cutting technology, which makes it the ideal product for decorative duct covers.

Illustration 6
Interior design with MAGOXX® Board

Exterior

MAGOXX® board is an ideal fire resistant building material to apply in the facade. The use of the board provides a lot of design freedom as any kind of laminates (wood, veneer, plastic, stone) can be used. This way the advanced properties of the board are combined with an attractive finishing.

Illustration 7
Facade with MAGOXX® Board

REFERENCE PROJECTS

CityHub Rotterdam

Cityhub represents the future of low cost hotels. Traditional hotel rooms have been transformed into futuristic sleeping units, personnel in the lobby has been replaced by an app with a chat function, and guests are able to check in using a digital wrist band. It is the ultimate generation-Y set-up: a generation that is tech-savvy, loves to travel and feels at home in online environments.

Another CityHub will be opening in Copenhagen in 2019. MAGOXX® is proud to have supplied the units for the Rotterdam hotel. MAGOXX® board turned out to be the ideal product for the design of these units; although the walls are thin (33mm), guests are able to sleep in a silent environment because of the board's excellent insulation qualities. And MAGOXX® boards also offer the highest Fire Classification (A1), thus ensuring the safety of guests.

Renovation project Rotterdam

Four buildings along the Schieweg in Rotterdam have been renovated. The buildings have been completely stripped and rebuild with sustainable building materials and a sustainable energy supply. MAGOXX® board acted as a base for this project. 9mm boards have been applied to the underside of the wooden beams that are between every floor. This created a fire resistance of 60 minutes. Between the beams a layer of 50mm mineral wool was added. The floors consist out of 24mm MAGOXX® board.
Over the entire surface floor heating can be found, which is placed in grooves that were milled on location. The floorheating was covered with a 4mm MAGOXX® board and a screed.

MAGOXX® board has been chosen because of its convenience and flexibility it offers. When working with old buildings you often come across disturbances, corners that are not straight or height differences. Because of the easy processing and applying of the MAGOXX® board, these problems become a lot easier to tackle.

Sawing & Cutting

Processability

MAGOXX® boards can be easily cut, trimmed, drilled or shaped using regular (power) tools and can be easily fixed using nails or screws.

To maximize result with a circle saw, a cutting speed of 45-50 m/s is recommended. When using standard blades - with a diameter of ø 350 mm, and 54 – 80 alternately bevelled sawtooths, RPM of 3000 would be ideal.

Required tools

No special tools are required when processing MAGOXX® board.

Hand drill | Screws | Protection | Drilling machine

Dust

Dust will be released when cutting/sawing the MAGOXX® board. Inhaling excessive dust for longer periods could cause irritation or health issues. We thus recommend avoiding high concentrations of MgO dust by using dust collectors and/or personal protection equipment.

Protection

When working with MAGOXX® boards we recommend using different types of protection.

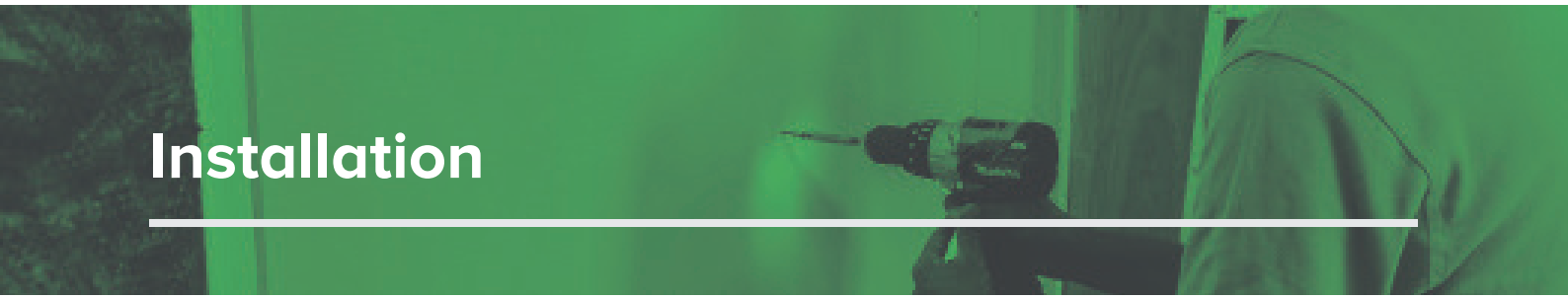
Safety mask | Hearing protection | Safety glasses | Gloves

How to saw and cut MAGOXX® Board:

Cut along the two sides with a sharp (Stanley) knife and break along the cutting edge

Always use a hand circle saw along a guiding rail

MAGOXX® boards can also be processed using regular tools



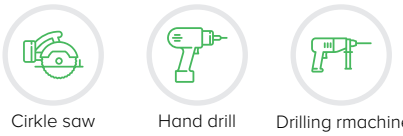
Installation

Positioning

Make sure there is enough space between the MAGOXX® boards when jointed. This helps to avoid cracks. Recommendation:
divide board size by 2 (9mm board / 4mm jointing space).
MAGOXX® boards can be used in combination with C-profiles, U-profiles, M-profiles, galvanized box profiles and wooden battens.

Required tools

No special tools are required when processing MAGOXX® board.



Screws

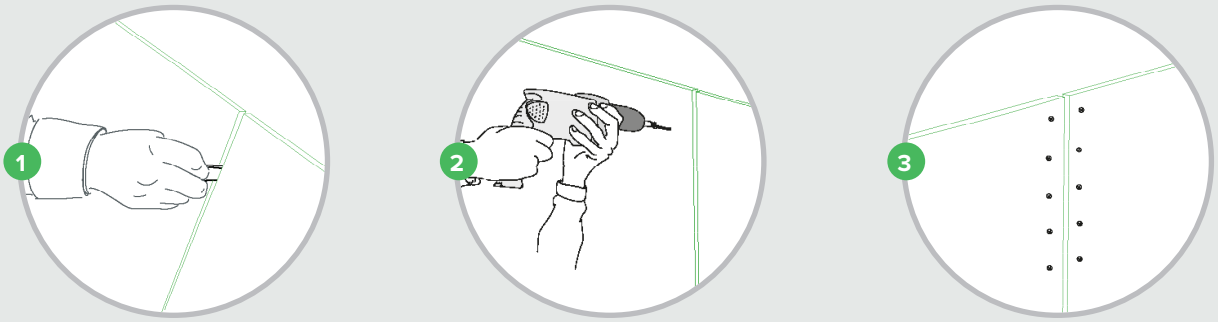
All screws used to install MAGOXX® boards should be corrosionproof, especially when used outdoors. We recommend using standard corrosion-proof drywall screws (DynaPLus), like in our MAGOXX® installation tool set.

Recommended screw sizes DynaPlus:

Board thickness	Screw length	Distance from edge
4 mm	20 mm	15 mm
6 mm	20 mm	15 mm
9 mm	30 mm	15 mm
12 mm	30 mm	20 mm
18 mm	45 mm	20 mm

Make sure screws or nails are sufficiently embedded, so there are no uneven surfaces when finishing the MAGOXX® boards.

How to position and fix MAGOXX® Board:



Make sure there is at least a 3 mm expansion joint between the boards

Insert screws with a screwing machine

Make sure there is a distance of at least 15–20 mm between the screws and the edges

Finishing interior walls

Plastering

Once the MAGOXX® boards have been placed, we recommend filling the joints with Bostik ISR 70-03 kit or similar filler material.

When plastering the whole surface, we recommend using a double layer of Rapid Fassade by Novatio. Use a joint knife to smooth the layers of paste. Always read the product instructions before starting.

Make sure joint finishing paste is applied at an appropriate temperature (between +5 °C to +30 °C).

Required tools

No special tools are required when processing MAGOXX® board.

Painting

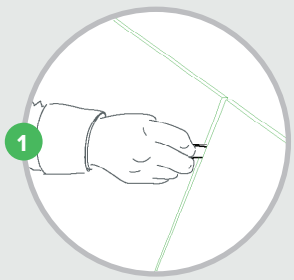
MAGOXX® boards are very absorbent and thus always need a primer layer before they can be painted. Beisser Primer PrimPlaca has proven to be effective. Once Beisser Primer PrimPlaca has been applied to the MAGOXX® board, standard paints can be used to colour the surface. At least two layers are recommended. Every bit of the exposed surface must be primed and painted to avoid moisture-related issues.

Make sure MAGOXX® boards are completely dry and clean before priming and painting.

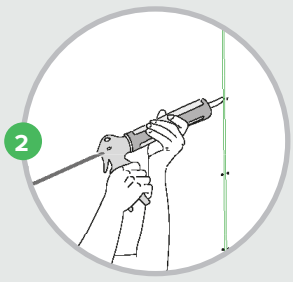
Finishing tape

We recommend using an alkali-resistant finishing tape.

How to finish an interior wall:

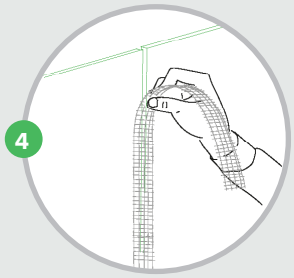


Before finishing joint gaps, make sure the surface of the MAGOXX® board is clean and dry

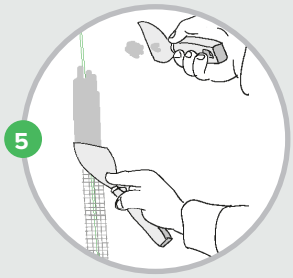


Fill the joints with Bostik ISR 70-03 kit or a similar filling material

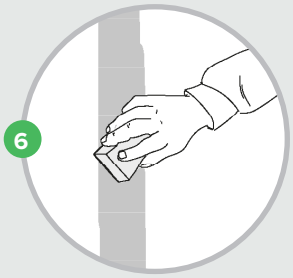
Cover the entire surface with a primer before painting the wall or when in a wet space



Apply alkali-resistant finishing tape to cover the joint gaps



Also use joint paste or another filling material to conceal screw/nail heads. Allow the filler material to dry for 3 hours

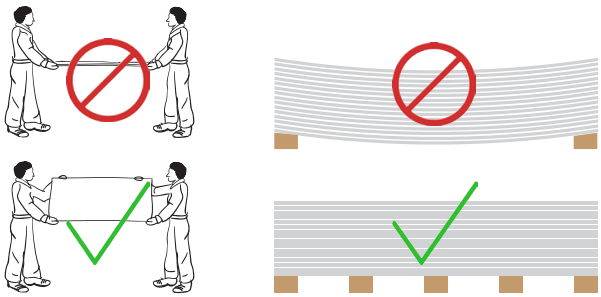


Create a smooth surface by using a sanding block to feather each layer of joint paste. Add additional filler material if necessary

Storage, transport & safety

Transport & storage

Pallets should be stored on a flat surface, in a dry, covered, frost-proof and well ventilated area. Products should preferably be covered during transport.



Care should be taken when handling heavy boards. The boards are non load bearing.

Health

Standard engineering procedures should be followed to control dust emissions. If possible, activities likely to generate dust should be carried out in well ventilated areas (i.e. outside). Effective exhaust ventilation must be ensured when drilling or cutting. Avoid dust inhalation. We recommend using dust-reducing circular saws with a suitable blade and vacuum extraction.

Accidental release measures

No special precautions are needed when clearing away dropped products.

Cleaning procedure

Atomized water can be used to suppress dust during sweeping activities. We believe an industrial vacuum cleaner, fitted with an effective filter, is more effective than manual sweeping.

Safety

Eyes: Use safety goggles/glasses that offer dust protection during cutting/drilling activities.

Skin: Wear a long sleeved shirt, long trousers, a cap and gloves to make sure dust and debris do not come into contact with the skin.

Inhalation: If machines and work practices are ineffective in controlling dust emissions, wear suitable, approved personal protective equipment, i.e. a mask with dust filter type P2 (for fine dust). Filters have an expiry date and may need to be replaced. Read the information provided by the supplier.

Workplace: Dust will be released when cutting/sawing the MAGOXX® board. Inhaling excessive dust for longer periods could cause irritation or health issues. We thus recommend avoiding high concentrations of MgO dust by using dust collectors and/or personal protection equipment.

Waste Dispose of waste in accordance with local regulations and conditions for normal waste. MAGOXX® boards do not contain asbestos. Please see our Material Safety & Data Sheet for extensive waste disposal advice.

Additional information

Product performance

All our products are tested to European quality standards in accordance with ETAG 018: GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL OF FIRE PROTECTIVE PRODUCTS. This means all our products have been thoroughly tested and meet all European directives in the field of health, safety and the environment.

Test tensile strength
Executed by RDA Bouwtechnologie Utrecht

Performance tests	
CE certified (NB 0620)	ETA 15/0643
Flexural strength	ETAG 18-1 / 18-4, EN 12467 norm 5.2.4 & 7.3.2
Tensile strength (perpendicular to the plane of the board)	EN 326-1, EN 319
Tensile strength (parallel to the plane of the board)	ETAG 18-1 / 18-4, EN 789 norm 9
Compressive strength	ETAG 18-1 / 18-4, EN 789 norm 8
Fire resistant wall construction (wood & metal stud, 60 minutes)	EN 1364-1:2015
Fire resistant steel columns & beams (60 minutes)	EN 13381-4
Water resistance	EN 12467: 2012
Sound transmission class	ASTM E90 & ASTM E413

Technical specifications MAGOXX® Board

	MAGOXX® 4 mm	MAGOXX® 6 mm	MAGOXX® 9 mm	MAGOXX® 12 mm	MAGOXX® 18 mm
Density	1.000 kg/m³	1.000 kg/m³	1.000 kg/m³	1.000 kg/m³	1.000 kg/m³
Construction material fire class	A1	A1	A1	A1	A1
Moisture content (20 °C, 65% RV)	18,1%	18,1%	18,1%	18,1%	18,1%
Thermal conductivity			0,213 W/(m*K)	0,231 W/(m*K)	
Acoustic conductivity (single sheet)			26 dB	27 dB	28 dB
Flexural strength	27,48 N/mm²	19,81 N/mm²	13,4 N/mm²	12,33 N/mm²	8,02 N/mm²
Modulus of elasticity	7.682 N/mm²	5.315 N/mm²	4.599 N/mm²	4.317 N/mm²	4.288 N/mm²
Tensile strength	7,48 N/mm²	4,81 N/mm²	2,61 N/mm²	2,80 N/m²	2,95 N/mm²
Compressive strentgh	13,43 N/mm²	11,50 N/mm²	10,58 N/mm²	10,06 N/mm²	14,36 N/mm²
Resistance to nail head pull-through			394,5 N		

Technical specifications MAGOXX® Board

Quality Assurance

SINH Building Solutions takes great pride in delivering premium quality products as well as prompt technical and customer service. SINH Building Solutions ensures this by implementing strict quality controls in all its product lines. Production batches are marked with a unique serial number and the official MAGOXX® trademark.

Green Choice

MAGOXX® boards are very energy-efficient and non-toxic, and are free of mould, asbestos and silicates. Moreover, they are 100 percent recyclable and have a low carbon footprint. These “green” features mean our products directly contribute to the sustainability of all projects in which they are used.

Availability

MAGOXX® handles the following sizes and thicknesses for the MAGOXX® Board. Each size can be combined with each thickness. The standard colour of the board is white, but delivery of other colours can be discussed.

Length x width (mm)	Thickness (mm)	Colour
2.700 x 1.200 mm 3.000 x 1.200 mm	4 mm 9 mm 18 mm 6 mm 12 mm	White (standard)

Availability program MAGOXX® Board

Finishing

MAGOXX® boards always come with a smooth front side. Clients are free to decide whether or not they want to sand the reverse surface. Thickness inequalities can be prevented when the back of MAGOXX® boards is sanded.

Technical Support

Please contact our technical support team for product or installation support concerning any MAGOXX® product or service. You can also visit our website, where you will find a wealth of useful information about our products, their benefits and how to use them.

www.magoxx.com:

SINH™ Building Solutions B.V.
Saturnusstraat 60 Unit 68
2516 AH Den Haag
Nederland

T: +31 (0) 88 3748400
info@magoxx.com
www.magoxx.com

SINH™ (Ningbo) Construction Material Co. Ltd.

MAGOXX® Board

safe, smart and sustainable