



Ronnie Zeemering
BRT Architecten
Awood

BAMBOO CLADDING BROCHURE



Office Hesselink (Coffee Roastery)
(200 m² Varibo) Winterswijk, Netherlands



breeam
★★★★★
excellent

Housing project De Krijgsman
(320 m² Closed) Muiden, Netherlands



Moke Architects

Leisure Space Burgos
(120 m²) Villacienco, Burgos, Spain



A3GM arquitectos
Javier Bravo

SPEEHUIS
(10.000 m) Oisterwijk, the Netherlands



SPEE Architects
Awood
Ossip van Duivenbode



Bamboo: the fastest growing plant in the world

MOSO® BAMBOO X-TREME®

certified
100%
proven

durable - stable - sustainable

certified

Class 1
EN13350

Class 4
EN335

Class A
EN13350

B1-s1

CO₂
NEUTRAL

proven

Since 2008 over
5 million m² installed,
in
more than
60 countries.



For further product information, or to discuss any project requirements, please get in touch with us:

www.gripsure.co.uk
+44 (0)1726 844616
info@gripsure.co.uk

Unit 2 Rockhill Business Park, Bugle, Cornwall, PL26 8RA



High stability, fast installation and hidden fasteners

MOSO® Bamboo and Gripsure

With Bamboo X-treme®, MOSO® has developed a truly **ecological** and **durable** alternative to increasingly scarce tropical hardwood and non-renewable materials. MOSO® uses a **unique Thermo-Density® process** of heat-treatment at 200°C followed by High Density® compression to enhance the **hardness, dimensional stability, fire resistance** and **durability** to a level **superior** to the best tropical hardwood species. MOSO® Bamboo X-treme® can be used for **outdoor decking, cladding, fencing and outdoor furniture**.

Gripsure, the UK's exclusive distributor of MOSO® Bamboo decking, are excited to now supply MOSO® Bamboo cladding offering a complete sustainable solution, with an attractive finish, for both commercial and residential projects.

Table of contents

From bamboo to MOSO® Bamboo	4
Benefits of MOSO® Bamboo cladding	5
MOSO® Bamboo cladding Rebated	7
MOSO® Bamboo cladding range	8
MOSO® Rebated installation instructions	11
MOSO® Rebated maintenance & cleaning	13
MOSO® Bamboo X-treme® test results	15
The sustainability of MOSO® Bamboo	18
MOSO® Bamboo user information	19



Private Residence Buenos Aires
(100 m²) Buenos Aires, Argentina

From bamboo to MOSO® Bamboo

Moso bamboo is one of the fastest growing plants on earth. The bamboo stems grow from an underground root system and after 4-5 years a stem can be harvested, while the others continue to grow. This means the bamboo can be used without destroying the forest. The fast growth and abundant availability makes bamboo a rapidly renewable resource, and a perfect material for many applications in and around buildings. With good reason, it's often called '**the building material of the future**'. However, bamboo as a raw material cannot be used outdoors without a protective treatment. Due to its high "sugar"-components, bamboo is more susceptible to being attacked by micro-organisms and fungi. Let us explain how we get from the raw bamboo material to the final product, MOSO® Bamboo X-treme®, through a production process called Thermo-Density®.

Stem to strands

After harvesting, the mature bamboo stems are split in a longitudinal direction and the outer and inner skins are removed. The strips are then crushed using a number of incision rollers which create cross linked strands. The untreated strands are a light yellow colour.

Thermal treatment

In several steps, the strands are heated up to 200°C in the presence of saturated steam (to protect the wood from charring or burning) and cooled down. During thermal processing, the moisture content changes and the sugar content is removed from the material. Furthermore, this process changes the colour of the bamboo from white/yellow to deep/dark brown.

From strands to product

The dark bamboo strands are dipped into phenolic glue (< 10% of the weight of the bamboo). After drying, the strands are put into a mould, and are then compressed under high temperature and pressure to cure the glue. The output is a large panel, which is cut into smaller sections (boards or beams). These are then further processed and profiled to become the required shape (for example, for decking: a grooved surface and edge grooved to allow installation with fasteners). As a last step, depending on the customer's request, the boards can be prefinished.

Thermo-Density®

We call the combination of compressing and thermally treating strands a Thermo-Density® process. It increases the density from 650-700 kg/m³ to approx. 1.150 kg/m³ and improves the hardness of this product significantly. After pressing, the material is stronger and harder than almost any other hardwood in the world. At the same time, the dimensional stability of bamboo is improved by approximately 50%.

Besides stability and hardness improvements, the durability is improved to the best durability class possible, from Class 5 to Class 1: Class 1 (EN 350) CEN/TS 15083-2 - simulated graveyard test and Class 1 (EN 350) CEN/TS 15083-1.

durability class according to EN 350 (CEN/TS 15083-2 / CEN/TS 15083-1)

	5	4	3	2	1
MOSO® Bamboo X-treme®					
Ipe					
Strand Woven Bamboo					
Bangkirai					
Oak					
Scots Pine					

range of durability results

MOSO® Bamboo X-treme® is also well protected against superficial fungi Class 0 (EN 152), and achieves the use/risk Class 4 according to EN 335.

Only MOSO® can ensure you have the original, unique Bamboo X-treme® product. Other products that attempt to copy the original, do not offer the same quality or level of durability, dimensional stability and ecology. With a look-alike product, there is a large risk of claims after installation. **Always ask for the original, certified MOSO® Bamboo X-treme® products!**

Harvesting after 4-5 years



Modifying the bamboo strands with a heat-treatment at 200°C



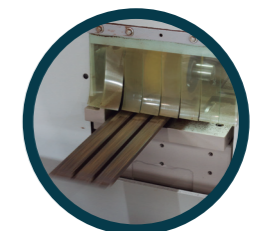
Split the Moso bamboo stems, remove the outer skin and crush the strips into strands



Compressing the strands into Thermo-Density® material



Creating the final profile and surface



MOSO® Bamboo X-treme®: material is more stable, harder and stronger than almost any other hardwood in the world!

Benefits of MOSO® Bamboo cladding



Hard & durable

- Biological durability Class 1 (EN 350 / CEN/TS 15083-2), simulated graveyard test / Class 1 (EN 350 / CEN/TS 15083-1).
- Use Class 4 in accordance with EN 335.
- Effectiveness against blue stain Class 0 (EN 152).
- Exceptionally hard: Brinell $\pm 9.5 \text{ kg/mm}^2$ (harder than any tropical hardwood available).
- MOSO provides Bamboo X-treme® outdoor products* with up to 25 years warranty.



High stability

- Very stable as a result of a unique Thermo-Density® process of heat-treatment combined with High Density® compression.
- Far more stable than tropical hardwoods - enabling an end-match system (tongue & groove on ends).
- Limited tendency to torsion.
- No gap between the ends of the boards necessary.
- Closed profile allows for an installation without space between the boards.



Maintenance-free

- Does not require periodic maintenance.
- Choice between natural greying or retaining the brown colour with an exterior finish.



Fire resistant

- Achieves fire resistance Class B-s1-d0 (EN 13501-1) without use of fire retardants.
- Achieves flame spread index Class A following ASTM E84.
- As a result, MOSO® Bamboo X-treme® can be easily applied in public projects without additional protective measures.



Beautiful appearance

- A beautiful, natural hardwood look.
- Use of hidden MOSO® Fasteners avoids face screwing and plugging.
- Free of knots and natural plant resins.



Endless resource

- Made from bamboo; with a growing speed of up to 1 meter per day it is the fastest growing plant on earth.
- Ready to harvest after 4-5 years (compared to up to 100 years for hardwood species) - no deforestation.
- Consisting of approx. 90% natural bamboo.



CO₂ neutral

- Official LCA and carbon footprint studies (EN 15804) confirm that MOSO® Bamboo X-treme® is CO₂ neutral during the product lifespan**.
- No use of fungicide in the production.



Economical

- Simple and fast installation.
- Reduced waste because of the end-matched connection.
- Cost effective transportation because of the fixed 1850 mm length.



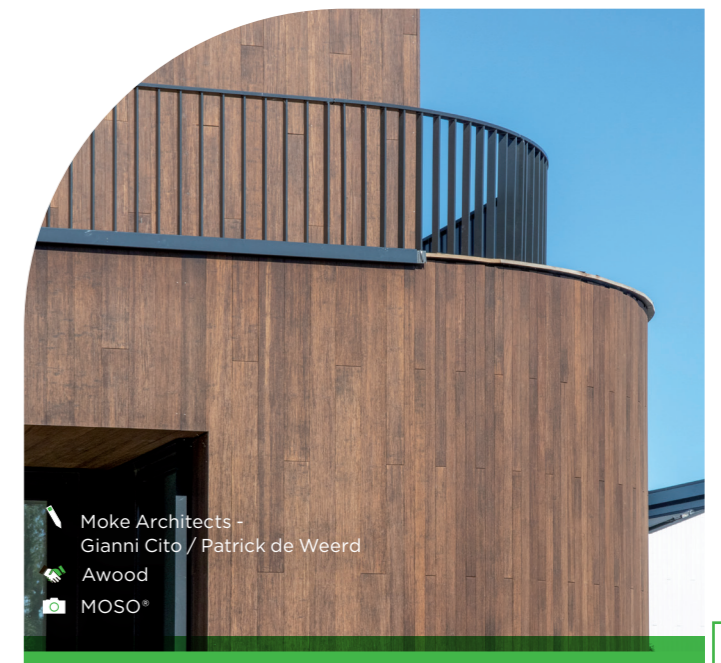
BRT Architecten
Awood
Ronnie Zeemering

Notiz Hotel NHL Stenden (1200 m²) Leeuwarden, the Netherlands

Housing project De Krijgsman
(1200 m²) Muiden, the Netherlands



Water Authority Limburg
(600 m²) Roermond, the Netherlands



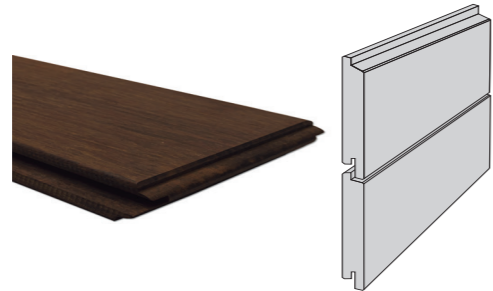
Moke Architects -
Gianni Cito / Patrick de Weerd
Awood
MOSO®

*) MOSO provides Bamboo X-treme® Outdoor Beams with 10 years warranty.
**) This includes the CO₂ (biogenic carbon - EN 16449) stored in the product.

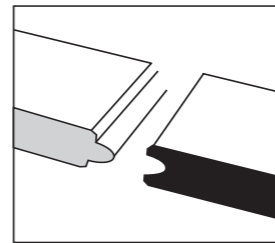
MOSO® Bamboo cladding **Rebated**

MOSO® Bamboo X-treme® Outdoor Cladding is a solid board for exterior applications made from bamboo strips that have been compressed and thermally modified at 200°C. This unique Thermo-Density® process provides MOSO® Bamboo X-treme® with the highest durability class possible in the appropriate EU norms, increases the stability and density, and consequently the hardness. Furthermore, contrary to other wood products, this material can achieve fire resistance Class B-s1-d0 (EN 13501-1) without impregnation with expensive and eco-damaging fire retardants. Bamboo X-treme® Cladding with the Rebated profile is made for installation with MOSO® Fasteners (18 mm) and screws. Like any tropical hardwood species, when exposed to outdoor conditions, MOSO® Bamboo X-treme® will turn grey over time creating a natural look.

Rebated profile



End matched



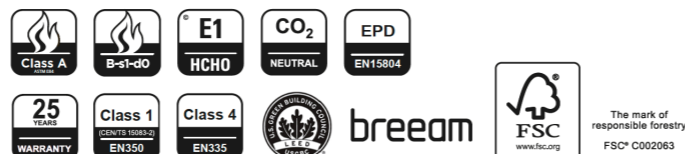
Technical characteristics and certifications

- Density: +/- 1150 kg/m³
- Dimensional stability: length: + 0.1 %; width: + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Mean value Brinell Hardness: ±9.5 kg/mm² (EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1) 1)
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371) 2)
- Solar Reflectance (SR): 0.32 (ASTM C1549) 2)
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980) 2)
- Modulus of Elasticity: 13565 N/mm² (mean value - EN 408)
- Bending strength: 54.4 N/mm² (characteristic value - EN 408)
- Biological durability: Class 1 (EN 350 / CEN/TS 15083-2), simulated graveyard test / Class 1 (EN 350 / CEN/TS 15083-1)
- Effectiveness against Blue Stain: Class 0 (EN 152)
- Use Class: Class 4 (EN 335)
- CO2 neutral: LCA report TU Delft (ISO 14040/44) (www.moso-bamboo.com/lca)
- Environmental Product Declaration - EPD (EN 15804) (www.moso-bamboo.com/epd)
- FSC®: Products available with FSC® certification on request.
- Contribution LEED BD+C - v4: MR 1, MR 2, MR 3 (FSC®), SS 7 v2009: MR 6, MR 7 (FSC®)
- Contribution BREEAM: MAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Guarantee: 25 years

1) Tested on 18 mm thickness, without gaps between boards, with ventilation space behind boards.
2) Tested on 3 years weathered MOSO® Bamboo X-treme®.

Product code	BO-DTHT500G	BODTHT505G
Finish	Unfinished	Unfinished
Surface	Flat	Flat
End matched	Yes	Yes
Length edges	R3	R3
End edges	2 mm x 45 °	2 mm x 45 °
Effective width (mm)*	128	63
Dimensions (mm)	1850 x 137 x 18	1850 x 75 x 18

* Effective width without gap between the boards, recommended gap 6 mm.

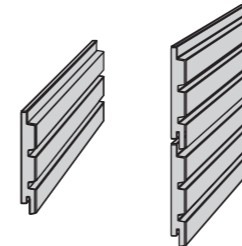


MOSO® Bamboo cladding **range**

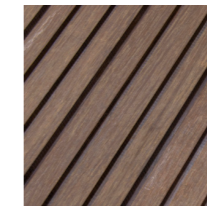
Rhombus profile

MOSO® Bamboo X-treme® Rhombus Outdoor Cladding is a solid, Thermo-Density® exterior board, made from compressed bamboo strips. A special, unique heat-treatment process at 200°C provides MOSO® Bamboo X-treme® with the highest durability class possible in the appropriate EU norms, increases the stability and density, and consequently the hardness. Furthermore, contrary to other wood products, this material can achieve fire resistance Class B-s1-d01) (EN 13501-1) without impregnation with expensive and eco-damaging fire retardants. MOSO® Bamboo X-treme® Cladding with Rhombus profile can be fixed with MOSO® Fasteners (18 mm). Like any tropical hardwood species, when exposed to outdoor conditions, Bamboo X-treme® will turn grey over time creating a very natural look.

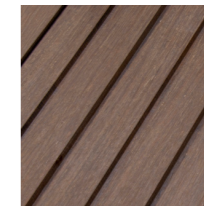
Triple Rhombus profile



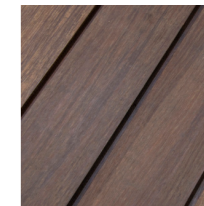
Triple Rhombus



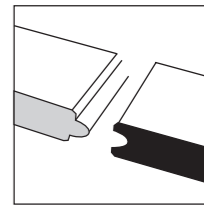
Double Rhombus



Single Rhombus



End-matched



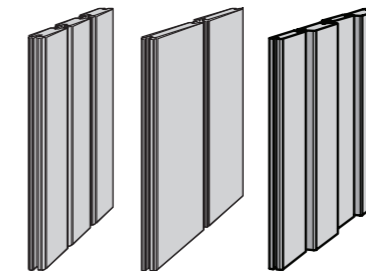
Varibo profile

MOSO® Bamboo X-treme® Varibo Cladding are solid boards in various widths, for exterior applications made from bamboo strips that have been compressed and thermally modified at 200°C. This unique Thermo-Density® process provides MOSO® Bamboo X-treme® with the highest durability class possible in the appropriate EU norms, increases the stability and density, and consequently the hardness. Furthermore, contrary to wood products, this material can achieve fire resistance Class B-s1-d01) (EN 13501-1) without impregnation with expensive and ecodamaging fire retardants. MOSO® Bamboo X-treme® Varibo Cladding is available in various dimensions. The Varibo boards can be fixed with MOSO® Fasteners (18 mm). Like any tropical hardwood species, when exposed to outdoor conditions, Bamboo X-treme® will turn grey over time creating a very natural look.

Varibo profile 100 mm



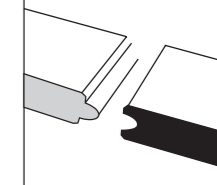
Varibo Flat boards



Varibo



End-matched

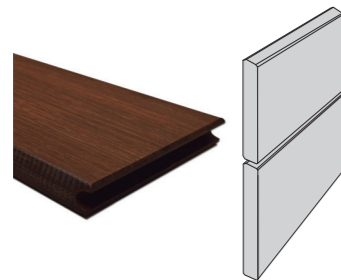


MOSO® Bamboo cladding range

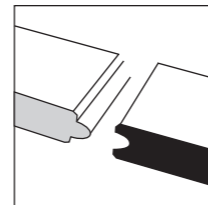
Trapezium profile

MOSO® Bamboo X-treme® Outdoor Cladding is a solid board for exterior applications made from bamboo strips that have been compressed and thermally modified at 200°C. This unique Thermo-Density® process provides MOSO® Bamboo X-treme® with the highest durability class possible in the appropriate EU norms, increases the stability and density, and consequently the hardness. Furthermore, contrary to other wood products, this material can achieve fire resistance Class B-s1-d0 (EN 13501-1) without impregnation with expensive and eco-damaging fire retardants. Bamboo X-treme® Cladding with the Rebated profile is made for installation with MOSO® Fasteners (18 mm) and screws and the Trapezium profile is made for installation with screws. Like any tropical hardwood species, when exposed to outdoor conditions, MOSO® Bamboo X-treme® will turn grey over time creating a natural look.

Trapezium profile



End-matched



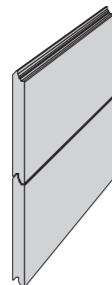
Closed profile

MOSO® Bamboo X-treme® Closed Cladding are solid boards in various widths, for exterior applications made from bamboo strips that have been compressed and thermally modified at 200°C. This unique Thermo-Density® process provides MOSO® Bamboo X-treme® with the highest durability class possible in the appropriate EU norms, increases the stability and density, and consequently the hardness. Furthermore, contrary to wood products, this material achieves fire resistance Class B-s1-d01 (EN 13501-1) without impregnation with expensive and eco-damaging fire retardants. MOSO® Bamboo X-treme® Cladding with the Closed profile is developed to meet the highest fire requirements and is installed with a hidden screw. A closed profile is also available for fast and easy installation with the Grad system*. Like any tropical hardwood species, when exposed to outdoor conditions, Bamboo X-treme® will turn grey over time creating a very natural look.

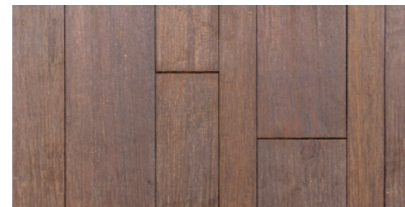
Closed profile 65 mm



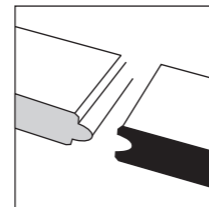
Closed profile 137 mm



Varibo Closed profile



End-matched



A3GM Arquitectos
Javier Bravo

Leisure Space Burgos Villacienzo, Burgos, Spain



Garden House by Wouter Bink
(60 m²) Amersfoort, the Netherlands

Public Elementary School "IKC"
(320 m²) Amsterdam, The Netherlands



Moke Architects
MOSO

MOSO® Rebated installation instructions

Important

- The MOSO® Bamboo X-treme® outdoor cladding board is a natural product, some variation in colour, grain and appearance is normal. Colour can change fast from dark brown to brown or grey, depending on the climatic conditions and maintenance schedule.
- Small cracks and splinters on the surface and on the board ends can arise from the different drying characteristics of the surface and ends.
- The surface will also become rougher over time. This phenomenon is normal for most wood species and is minimized for this product through the unique 'Thermo-Density®' production method. Cracks on the ends can be further minimized by applying sealer.
- Slight dimensional changes or cupping of the boards can occur after installation. This phenomenon is normal for most wood species and is minimized for this product through the unique 'Thermo-Density®' production method.
- Keep at least a 5-6 mm ventilation gap between the boards. Installation with MOSO® Asymmetric Fasteners ensures correct spacing automatically.
- Due to the stability of the boards and the shape of the end-match system, no expansion gap is needed where the boards connect.
- We recommend applying sealer on every (cut) end to prevent water penetration. A sealer is available from MOSO®.

diagram 1 - normal pattern

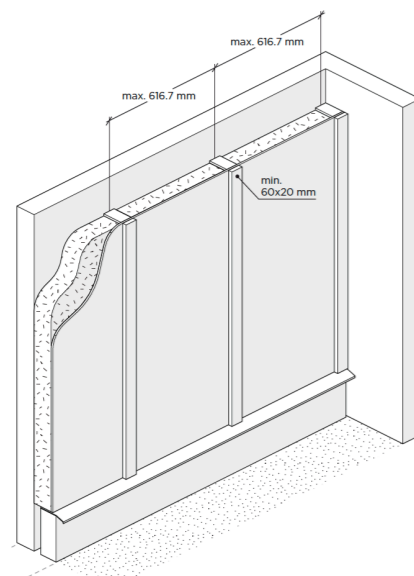
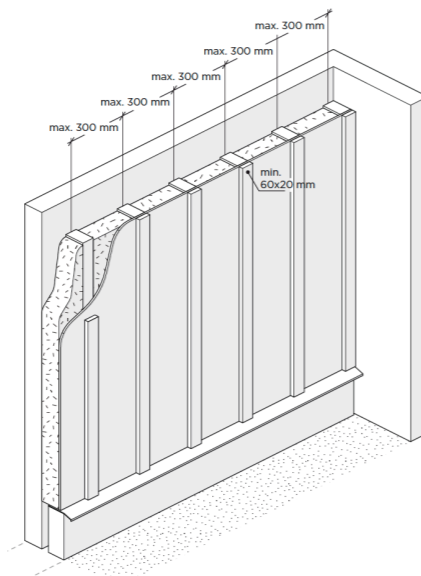


diagram 2 - random pattern



Before horizontal installation

- Fix the vertical battens (at least 20 mm thick, 60 mm wide) using screws going through the membrane into the wall construction behind. This creates a rigid/flat surface for installation of the boards.
- Each board should be fixed to at least 3 battens: so the maximum centre-to-centre spacing between the battens is 616.7 mm (1850 mm/3) (diagram 1 - normal pattern). Always install the ends of the boards exactly on the battens.
- The cladding boards should be fixed using the MOSO® Asymmetric Fasteners (18 mm). Make sure the MOSO® Fastener is screwed in the middle of the batten so that it is fully supported. Make sure to drive the screw deep enough into the supporting construction for proper fixing.
- Please note: At the edges of the cladding, keep a gap of 7-10 mm from adjacent materials, to allow for sufficient ventilation.
- At the top of the façade, a rooftrim should be installed to avoid direct (rain)water behind the cladding installation.
- If a random joint pattern is desired, the spacing between battens can be maximum 300 mm (diagram 2 - random pattern) and each board must be fixed on at least 2 battens.

MOSO® Rebated installation instructions

Horizontal installation

STEP 1 - levelling first row of fasteners

- Start with the lowest row of fasteners (MOSO® Asymmetric Fastener with waved side up) and make sure they are placed fully level (using a spirit level).
- Avoid overtightening the screws as this can pull the fastener slightly into the wood, making it difficult to place the board onto the fastener.

STEP 2 - install first row of boards

- Place the board onto the row of fasteners. The waved side of the fastener enables an easy grip into the groove of the board.
- Make sure that the fasteners engage deep enough in the groove so that the boards lay level. Tapping the boards should be done carefully, preferably with a rubber mallet.

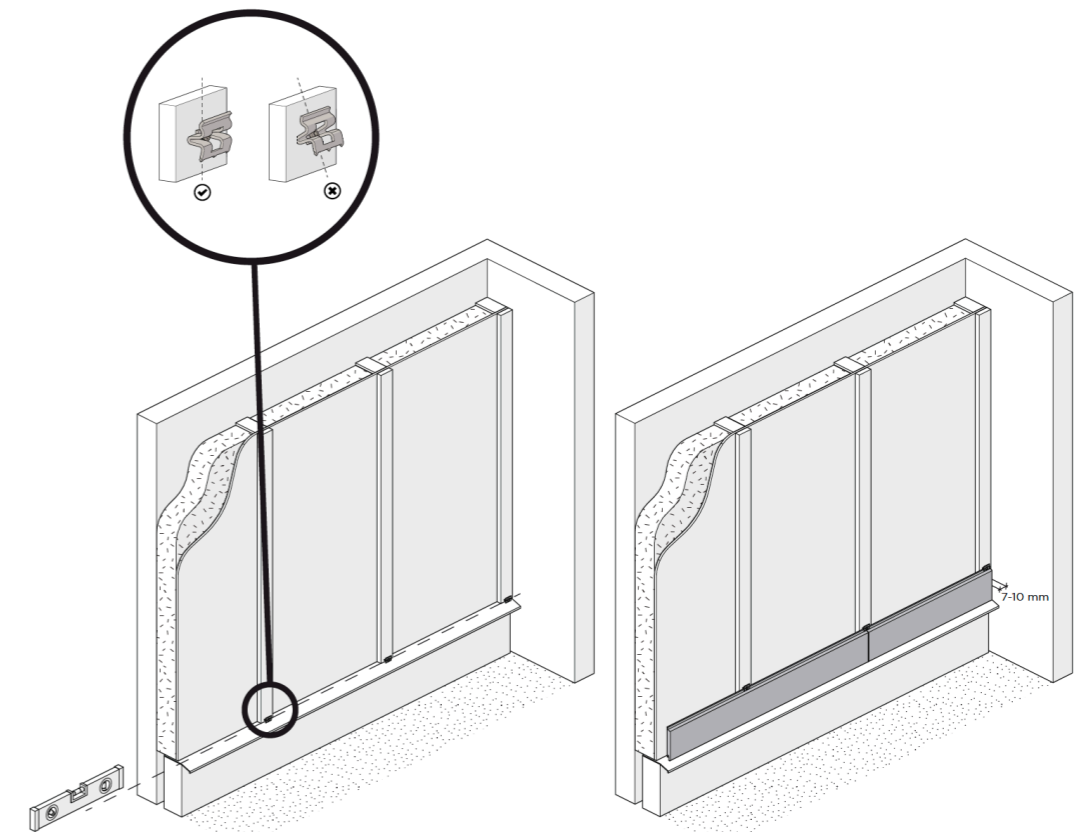
- We recommend fixing the 2 adjacent board ends on a batten/beam using 1 fastener per board end.
- Make sure you keep a ventilation gap (7-10 mm) on the edge of the cladding.

STEP 3 - second row

- Install the second row of fasteners (MOSO® Asymmetric Fastener with the waved side up), pushing them down on the tongue of the first row of boards. Install second row of boards.

STEP 4 - continue with the rest

- Continue to install the cladding boards in this way to cover the full surface.



MOSO® Rebated maintenance & cleaning

Cleaning and maintenance

You can leave the cladding without any maintenance, but take into consideration that without maintenance and oiling the cladding will develop a rougher, fissured surface that will lighten quicker and become grey (similar to most timber).

If you want to keep a darker colour, regular application of Woca or Sikksens maintenance materials is needed:

- Clean the cladding with water.
- Let the cladding dry. When the cladding is completely dry apply the finish according to the supplier's instructions.

Normal phenomena

Cracks on the surface and on the ends of the boards can occur due to the different drying characteristics of the surface and board ends. This does not affect the stability or durability of the board.

The surface side of the boards will become rougher over time and can form (small) splinters as a result of continuous water absorption and desorption due to dry and wet weather periods. Dimensional change or cupping of the boards can occur after installation. These phenomena are normal for most hardwood species and MOSO® Bamboo X-treme®.

After installation, there might be some bleeding or leaching of colour from the bamboo material when it gets wet, e.g. when it rains.

This possible bleeding is typical for wood and will disappear over time. The Bamboo X-treme® material, however controlled water drainage and prevention of splash water is required to prevent any discoloration of surrounding or underlying building components.

Storing

Store MOSO® Bamboo X-treme® in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.

Additional note

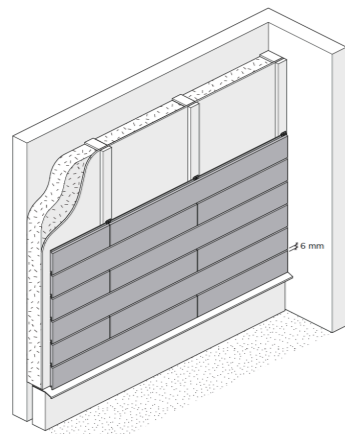
Whilst all due care is taken to ensure the accuracy of the installation instructions, individual circumstances (location, sub structure and installation procedures) may vary and are beyond the manufacturer's control. In case of doubt, therefore, consult the distributor. Always follow the local building code.

MOSO warrants the bamboo material and the mounting materials (fasteners/screws) it supplies but does not warrant the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the used screw matches such materials during the full lifetime of the product.

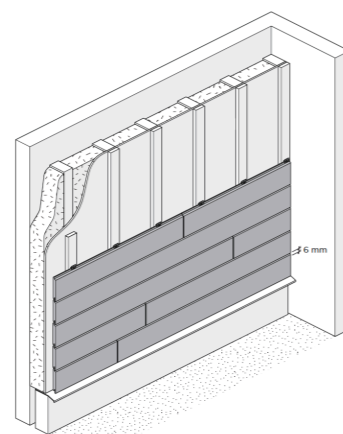
These instructions are subject to change. For the latest version visit www.moso-bamboo.com/x-treme/cladding

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normal pattern

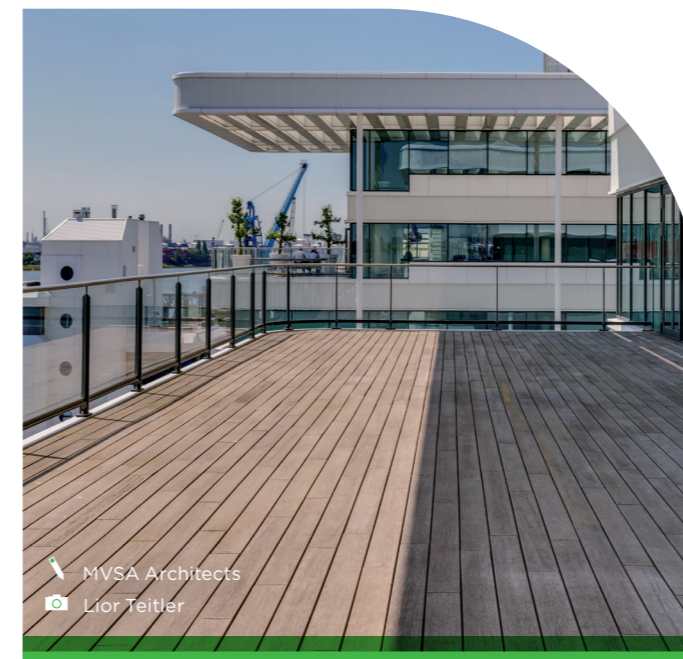


random pattern



Public Elementary School "IKC" Photo taken 5 years after installation - (320 m²) Amsterdam, The Netherlands

Jumbo Head office Photo taken 5 years after installation (2.500 m²) Schiedam, The Netherlands



Riberach Hotel Photo taken 8 years after installation (1.200 m²) Bélesta, France

MOSO® Bamboo



X-treme® test results

The excellent performance of MOSO® Bamboo X-treme® has been extensively tested by acknowledged research institutes. Find a summary of the most important test results below. Full reports are available upon request. **Only MOSO® can ensure you have the original, unique Bamboo X-treme® product.** Other products that copy the original do not offer the same hardness and level of durability, dimensional stability and ecology. With a look-alike product, there is a large risk of claims after installation. Always ask for the original, certified MOSO® Bamboo X-treme® products!

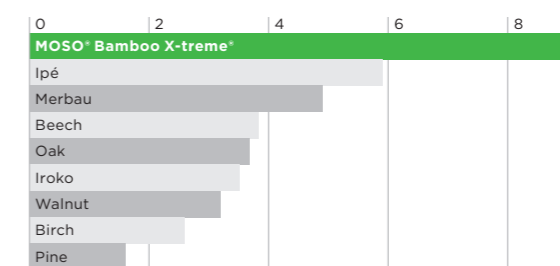
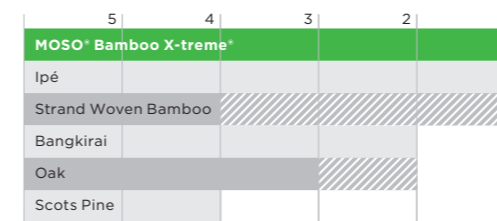
harder and more durable than almost any other hardwood

durability class

class 1
(EN 350 (CEN/TS 15083-2 / CEN/TS 15083-1))

average brinell hardness

±9.5 kg/mm²
(EN 1534)



Use Class	Classification Durability Class				
	1. very durable	2. durable	3. moderately durable	4. slightly durable	5. not durable
1 interior	o	o	o	o	o
2 moist interior	o	o	o	(o)	(o)
3 exterior, above ground	o	o	(o)	(o)-(x)	(o)-(x)
4 ground contact / fresh water	o	(o)	(x)	x	x
5 salt water	*	(x)	(x)	x	x

- o Natural durability sufficient.
- (o) Natural durability normally sufficient, but for certain end uses treatment may be advisable.
- (o)-(x) Natural durability may be sufficient, but depending on end use, preservative treatment may be necessary.
- (x) Preservative treatment is normally advisable.
- x Preservative treatment necessary.
- * Natural durability of Bamboo X-treme® not tested in salt water.

Efectis CLASSIFICATION

4.2 CLASSIFICATION
The product, MOSO® Bamboo X-treme, in relation to its reaction to fire behaviour is classified:
B
The additional classification in relation to smoke production is:
s1
The additional classification in relation to flaming droplets / particles is:
d0
Reaction to fire classification: B - s1, d0

Classification	Classification ASTM E84	
	Flame Spread Index	Smoke Developed Index
A	0 - 25	0 - 450
B	26 - 75	0 - 450
C	76 - 200	0 - 450

Carbon Footprint (CO ₂ eq) per kg final product					Eco-costs (€) per kg final product			
PRODUCTION	END OF LIFE	CO ₂	CO ₂	CO ₂	PRODUCTION	END OF LIFE	ECO-COSTS	ECO-COSTS
CO ₂ footprint	CO ₂ credit	Storage	Total	Neutral	Eco-costs	Eco-costs	CO ₂ storage	Total
CO ₂ eq/kg	CO ₂ eq/kg	CO ₂ eq/kg	CO ₂ eq/kg	Y / N	Euro/kg	Euro/kg	Euro/kg	Euro/kg
1.193	-0.704	-0.607	-0.118	Yes	0.356	-0.132	-0.082	0.142

The life cycle and the carbon footprint of MOSO products are evaluated according to ISO 14040/44. For more information: www.moso.eu/lca
The full report is available on request.

Confidential - This information is the property of MOSO International BV, Zwaag, the Netherlands. Any use or reproduction without permission will be prosecuted.



Durability of MOSO Bamboo X-treme, Heat Treated Strand Woven Bamboo: resistance against soft-rotting micro fungi according to CEN/TS 15083-2

Report code: 17.0083-C Date: 29 March 2017 Page: 8/14

According to EN 350, the durability class is determined based on the x-value. To calculate the x-value, the median mass loss of the test species is compared to the median mass loss of the Beech or Pine references. Hardwoods are compared to Beech, Softwoods are compared to Pine. As Bamboo is neither softwood nor hardwood a comparison is made with both reference wood species Pine sapwood and Beech.

Based on the mass loss found and the comparison to Beech and Pine, the tested MOSO Bamboo X-treme, Heat Treated Strand Woven Bamboo, can be classified in durability class 1 when using the method described in EN 350.

MOSO Bamboo X-treme, Heat Treated Strand Woven Bamboo, performs comparable to Azobé and Merbau. Little variance is found between the different boards.

durability

CEN/TS 15083-2
(ENV 807) /
EN 350

class 1



Durability of heat treated strand woven bamboo: resistance against degradation by Basidiomycetes according to EN 350 and CEN/TS 15083-1

Report code: 17.0083-B Date: 29 March 2017 Page: 8/14

According to EN 350, the durability class is calculated based on the mass loss obtained with the fungus resulting in the highest median mass loss. For all fungi the mass loss is less than 5%. This implies that, when using the EN 350 to determine the durability, MOSO Bamboo X-treme, Heat Treated Strand Woven Bamboo can be classified in durability class 1.

durability

CEN/TS 15083-1
(EN 113) /
EN 350

class 1



Resistance of Heat Treated Strand Woven Bamboo against blue staining fungi

Report code: 9.061-E 8 September, 2009 Page: 10/10

4 Conclusion

On behalf of Moso International BV an EN 152 blue stain test was performed on Heat Treated Strand Woven bamboo. UV- weathering was used as preconditioning of part of the samples. The combination of UV light and water spray resulted in strong discoloration of the surfaces of both the bamboo samples and the Pine sapwood reference samples.

Neither on the weathered nor on the original Bamboo samples discoloration of the blue stain fungi or the hyphae of the blue stain fungi could be observed. As a result it can be concluded that the susceptibility of this Heat Treated Strand Woven Bamboo towards blue stain is very low.

resistance against blue staining fungi

EN 152

class 0

durability

EN 350 (CEN/TS 15083-2 /
CEN/TS 15083-1)

class 1

use/risk class

EN 335

class 4

fire resistance

EN 13501-1

class B-s1-d0

reaction to fire

(FSI 25 / SDI 45)

ASTM E84

class A

WUI approved

CAN/ULC-S102

carbon footprint

ISO 14040/44

CO₂ neutral



WARRANTY
25
YEARS

TIM Exclusive Gardens
Awood
Olivr

Luxurious garden with a touch of Bali Arnhem, the Netherlands

The sustainability of MOSO® Bamboo

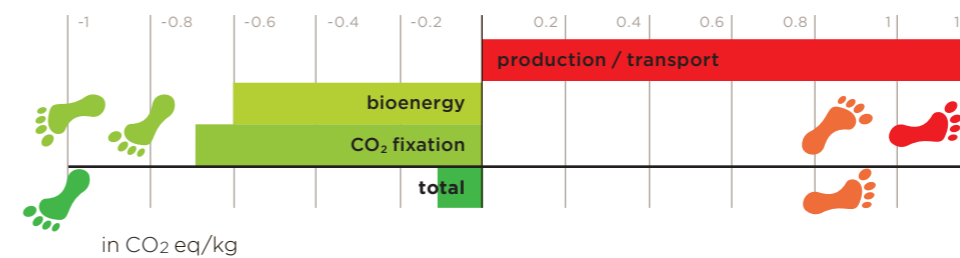
MOSO® Bamboo X-treme® offers clear sustainable advantages and is even proven to be CO₂ neutral during the product lifespan! The inclusion of Bamboo X-treme® contributes to a higher LEED, BREEAM, Green Star, HQE and DGNB certification score for green building projects. That's one of the reasons why you can find MOSO® Bamboo X-treme® and other MOSO® products in many sustainable reference projects all over the world.

Carbon footprint

MOSO® Bamboo X-treme®: CO₂ neutral during the product lifespan*

MOSO® has conducted an LCA and carbon footprint study together with Delft University of Technology (TU Delft) and INBAR. The report (www.moso-bamboo.com/lca) concludes that all assessed MOSO® Products (all solid bamboo flooring, decking, beams, panels and veneer) are CO₂ negative during the product lifespan ("cradle till grave"). In this result the high growth rate of Moso bamboo has not even been taken into account, and can be perceived as additional environmental benefit. The environmental impact of MOSO® Products, excluding carbon sequestration effect, was also published in an official Environmental Product Declaration (EPD) following EN 15804 (www.moso-bamboo.com/epd).

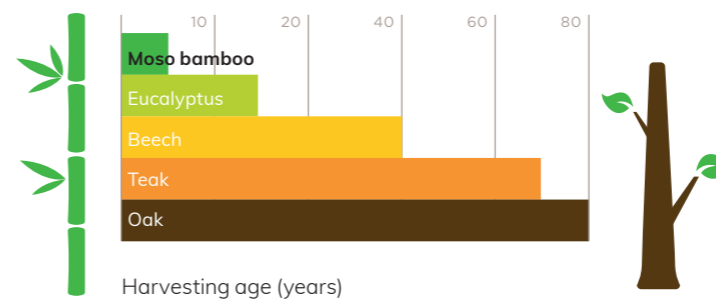
*) This includes the CO₂ (biogenic carbon - EN 16449) stored in the product.



Unsurpassed growing speed

Bamboo: the fastest growing plant in the world

Because of the fast growth, Moso bamboo is managed as an agricultural crop: the annual harvest of the 4 to 5-year-old stems – compared to 60-80 years for tropical hardwood! – provides a steady annual income to farmers and stimulates the bamboo plant to reproduce even faster. Therefore, by default, no deforestation occurs with production of MOSO® Bamboo X-treme®, while large amounts of CO₂ are captured in the bamboo forests and products (www.inbar.int/understanding-bamboos-climate-change-potential).



Oker Meeting Venue

(125 m²) Schipluiden, the Netherlands



Restauro Architecten
Awood

Office Hesselink Koffie (Coffee Roastery)
BREEAM - Winterswijk, the Netherlands

breeam
★★★★
excellent



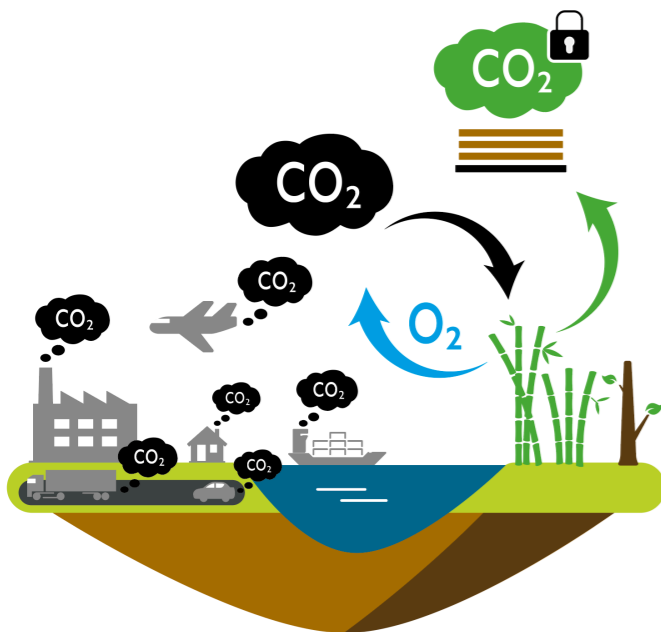
Het Fundament Architectuur
Awood



Carbon storage in bamboo

Biobased materials act as CO₂ sinks

Through photosynthesis, plants absorb carbon dioxide (CO₂) and convert it into glucose (building block for biomass) and oxygen. The CO₂ is stored in the material for the lifetime of the product, and even longer if the product is recycled into new, durable products. Due to the fast growth – and related high yields - Moso bamboo locks far more CO₂ in durable products compared to wood species. The locked amount of CO₂ can be calculated rather simply by looking at the density of the material and taking into account the biobased content. For example, Bamboo X-treme® locks almost 1.660 kg CO₂ per m³ of bamboo, which is the equivalent of the CO₂ emissions of 14.000 km driven by a mid-range car.



Check out how bamboo can save the world at:
www.moso-bamboo.com/sustainability



Notiz Hotel NHL Stenden - Green Key Award Gold
 (1200 m²) Leeuwarden, the Netherlands



BRT Architecten
 Awood
 Ronnie Zeemering

*Contributes to
 the leading green
 building certification
 programs worldwide*



STOFANEL
 Detlef Kloss

Alfonso X residential building - ASPRIMA-SIMA Award
 (5100 m) Madrid, Spain

Luxurious garden Cladding installed with Grad's invisible rail
 installation system - Arnhem, the Netherlands



TIM Exclusive Gardens
 Olivr

*Endless possibilities
 with MOSO®
 Bamboo X-treme®*



MVRDV
 Haagse Hoogbouw

Grotius residential towers Closed cladding installed at the
 crown of the buildings - The Hague, the Netherlands

MOSO® Bamboo user information

Appearance and colour

MOSO® Bamboo X-treme® is a natural product, which can vary in colour, grain and appearance. Colour will change over time depending on the maintenance schedule. The boards have a brown to dark brown colour when installed, which turns into a lighter caramel colour several weeks after installation. Without further maintenance the colour gets greyish relatively fast (similar to most other wood species).

If a brown colour is preferred, maintenance should be done with an exterior finish. For further details see the installation instructions.

MOSO® Bamboo X-treme® shows similarity to other hardwoods in grain and structure. The characteristic bamboo nodes however can still be recognised and provide the product with a special and lively look.

Normal phenomena

Cracks on the surface and on the ends of the boards can occur due to the different drying characteristics of the surface and board ends. This does not affect the stability or durability of the board.

The surface side of the boards will become rougher over time and can form (small) splinters as a result of continuous water absorption and desorption due to dry and wet weather periods. Dimensional change or cupping of the boards can occur after installation. These phenomena are normal for most hardwood species and MOSO® Bamboo X-treme®.

After installation, there might be some bleeding or leaching of colour from the bamboo material when it gets wet, e.g. when it rains. This possible bleeding is typical for wood and will disappear over time. The brownish liquid can easily be cleaned from the Bamboo X-treme® material, however controlled water drainage and prevention of splash water is required to prevent any discoloration of surrounding or underlying building components.

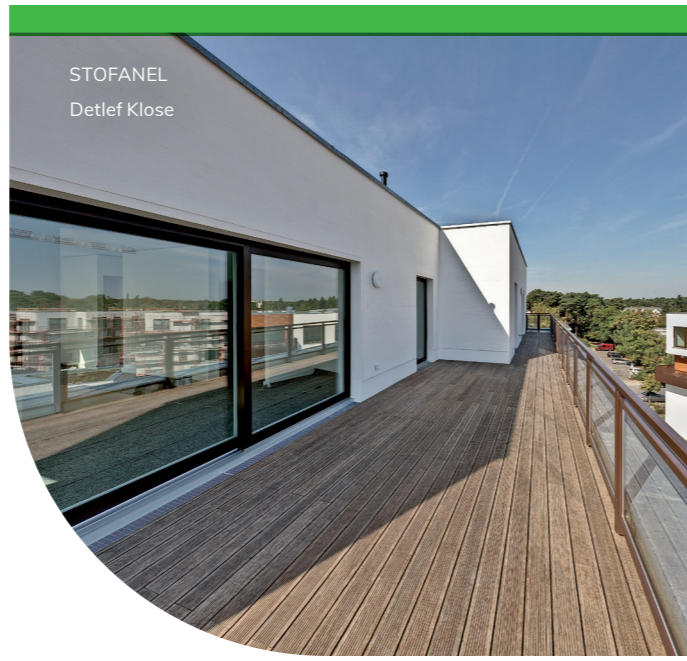


Briga Company
Lior Teitler

Briga Towers Penthouses & Apartments (10.000 m²) Netanya, Israel



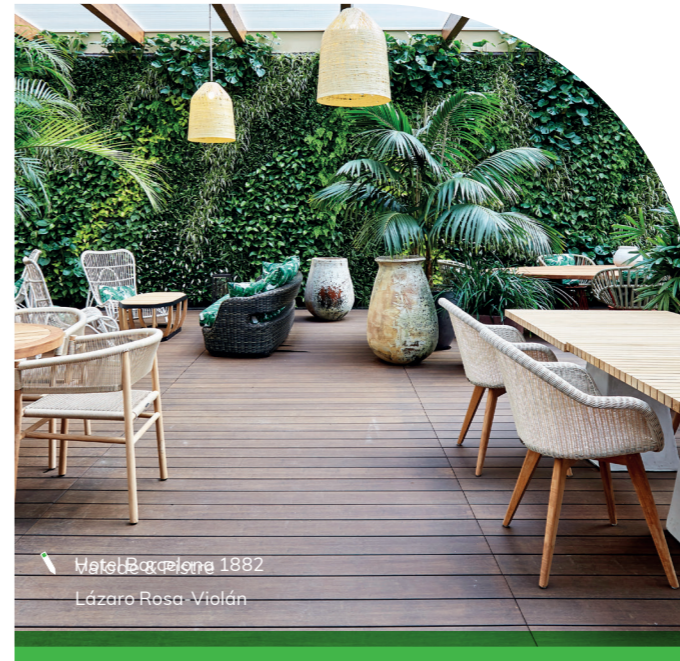
John Leonff



STOFANEL
Detlef Klose



Fünf Morgen Dahlem Urban Village
(1750 m²) Berlin, Germany



Hotel Bagdad 1882
Lázaro Rosa-Violán

Apartments De Drie Hofsteden
(20.000 m) Courtrai, Belgium





📍 Stéphane Malka Architecture
📷 David Ducastel (Philéas Fotos)

Event complex Oxygen La Défense (5500 m) Paris, France



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