

*Beautifully  
sustainable façades*

## BAMBOO CLADDING

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**Office Hesselink (Coffee Roastery)**  
(200 m<sup>2</sup> Varibo) Winterswijk, Netherlands

breeam  
★★★★★  
excellent



**Housing project De Krijgsman**  
(320 m<sup>2</sup> Closed) Muiden, Netherlands



**Leisure Space Burgos**  
(120 m<sup>2</sup>) Villaciencio, Burgos, Spain

A3GM arquitectos  
Javier Bravo



**SPEEHUIS**  
(10.000 m) Oisterwijk, the Netherlands



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Mastering  
bamboo

*Bamboo: the fastest  
growing plant  
in the world*



certified

durable



fire resistant



sustainable



proven

Since 2008 over  
5 million m<sup>2</sup> installed,  
in  
more than  
60 countries.



*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.

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**Private Residence Buenos Aires**  
(100 m<sup>2</sup>) 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.

Harvesting after 4-5 years



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



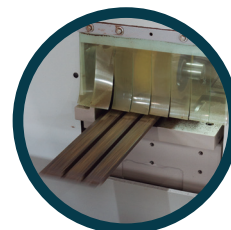
Split the Moso bamboo stems, remove the outer skin and crush the strips into strands



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!


## 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®					
Ipé					
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!**

# 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 rated

- 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.



## CO<sub>2</sub> neutral

- Official LCA and carbon footprint studies (EN 15804) confirm that MOSO® Bamboo X-treme® is CO<sub>2</sub> 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.

\*) MOSO provides Bamboo X-treme® Outdoor Beams with 10 years warranty.  
\*\*) This includes the CO<sub>2</sub> (biogenic carbon - EN 16449) stored in the product.



BRT Architecten  
Awood  
Ronnie Zeemering

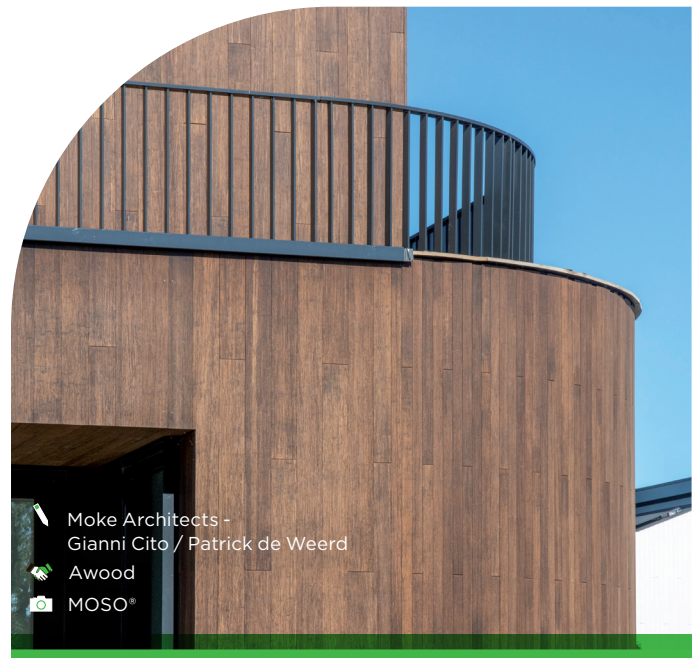
**Notiz Hotel NHL Stenden** (1200 m<sup>2</sup>) Leeuwarden, the Netherlands



MVD Architecture  
Awood

**Water Authority Limburg**  
(600 m<sup>2</sup>) Roermond, the Netherlands

**Housing project De Krijgsman**  
(1200 m<sup>2</sup>) Muiden, the Netherlands

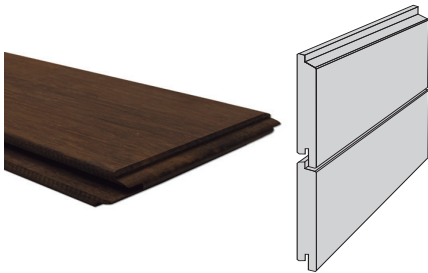


Moke Architects -  
Gianni Cito / Patrick de Weerd  
Awood  
MOSO®

# MOSO® Bamboo

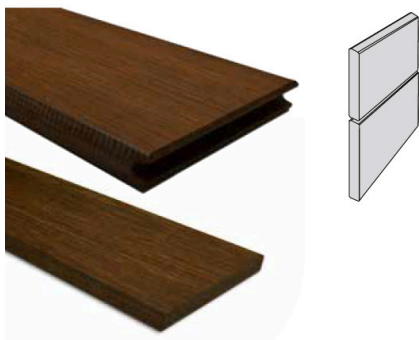
## cladding range

MOSO® Bamboo X-treme® Cladding is a solid, Thermo-Density® exterior board, made from compressed bamboo strips. A special, unique Thermo-Density® process at 200°C provides MOSO® Bamboo X-treme® 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 achieves fire resistance Class B-s1-d0 (EN 13501-1) without impregnation with expensive and eco-damaging fire retardants. MOSO® Bamboo X-treme® Cladding is maintenance free and will turn grey over time creating a very natural look.



### Bamboo X-treme® Cladding Board Rebated Profile

Ends	End match system
Installation	With fasteners
Finish	Unfinished
Edges	Longitudinal sides with radius, end sides beveled
Dimensions	1850 x 137(125) x 18 mm
Product code	<b>BO-DTHT500G</b>
Board	1.85 m <sup>1</sup> - 4.95 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1100kg



### Bamboo X-treme® Cladding Board Trapezium Profile

Ends	End match system
Installation	With screws
Finish	Unfinished
Edges	Longitudinal sides with radius, end sides beveled
Dimensions	1850 x 137(132) x 18 mm
Product code	<b>BO-DTHT510</b>
Board	1.85 m <sup>1</sup> - 4.95 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1100kg



### Bamboo X-treme® Cladding Board Closed Profile

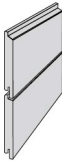
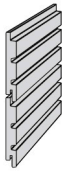
Ends	End match system
Installation	With screws - hidden in Closed profile
Finish	Unfinished
Edges	Longitudinal sides with radius, end sides beveled
Dimensions	1850 x 137(124.5) x 18 mm
Product code	<b>BO-DTHT530</b>
Board	1.85 m <sup>1</sup> - 5.34 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1100kg

# MOSO® Bamboo

## cladding range

### Rhombus Cladding

MOSO® developed a very complete range of Bamboo X-treme® cladding profiles to offer freedom in design for architects and project developers. Bamboo X-treme® Rhombus profiles can be installed with MOSO® Fasteners or in a screwed down installation.

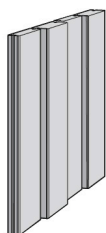


#### Bamboo X-treme® Cladding Board Rhombus Profile

Ends	End match system
Installation	With fasteners
Finish	Unfinished
Edges	Longitudinal sides with radius, end sides beveled
Dimensions	1850 x 137(129) x 20 mm
Surface	Triple Thombus - Flat with 2 grooves
Product code	<b>BO-DTHT520G</b>
Board	1.85 m <sup>1</sup> - 5.93 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1280kg
Dimensions	1850 x 137(129) x 20 mm
Profile	Double Rhombus - Flat with 1 groove
Product code	<b>BO-DTHT520G-2</b>
Board	1.85 m <sup>1</sup> - 5.93 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1280kg
Dimensions	1850 x 137(129) x 20 mm
Profile	Single Rhombus - Flat
Product code	<b>BO-DTHT520G-1</b>
Board	1.85 m <sup>1</sup> - 5.93 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1280kg

### Varibo Cladding

MOSO® developed a very complete range of Bamboo X-treme® cladding profiles to offer freedom in design for architects and project developers. It was clear that architects were looking for a product that stood out, something unique without jeopardizing the high quality. With this aim in mind, Bamboo X-treme® Varibo was created and has since been further developed based on the market demand. Bamboo X-treme® Varibo Cladding can be installed with MOSO® Fasteners or in a screwed down installation.



#### Bamboo X-treme® Cladding Board Varibo Profile

Ends	End match system
Installation	With fasteners
Finish	Unfinished
Edges	Longitudinal sides with radius, end sides beveled
Dimensions	1850 x 137 x 18 mm
Product code	<b>BO-DTHT185G</b>
Board	1.85 m <sup>1</sup> - 4.95 kg
Pallet content	216 pcs. - 399.6 m <sup>1</sup> - ca. 1100kg

# MOSO® Bamboo

## accessories

### Fasteners and screws

MOSO® Bamboo Decking can be easily installed with MOSO® Fasteners, alternatively screwed down. When installed with fasteners, there will be 5-6 mm gaps between the boards. The fasteners are supplied with matching stainless steel screws (square bit). For installation on aluminium sub frame joist, special screws are available.



© Moso

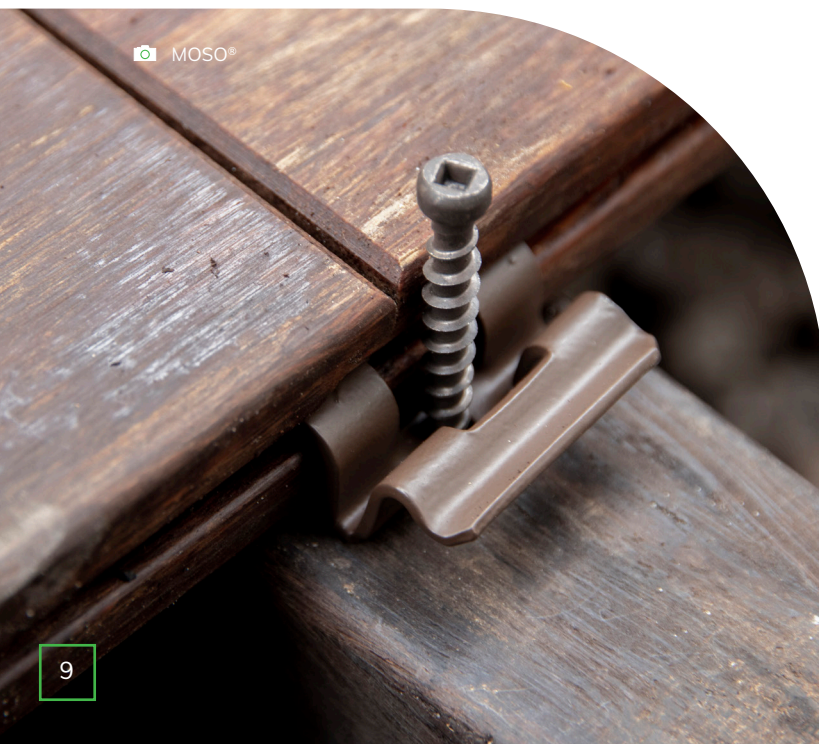
#### Fasteners Asymmetric with Screws

Material	Stainless Steel A2 (AISI304)
Colour	Brown
Fastener dimensions	27 x 22.5 x 9.8 mm
Screwn dimensions	4.5 x 30 mm
For boards	18 mm
Product code	<b>CLIP - SCREWBX09</b>
Sales unit	90 pcs. In each box 1 screw bit (square) is supplied.

Recommended quantity\*

137 mm - 14 Pcs./m<sup>2</sup>

\* Based on distance of ca.617 mm between the sub frame joist axes.



MOSO®



A3GM Arquitectos  
Javier Bravo

**Leisure Space Burgos** Villacienzo, Burgos, Spain



Wouter Bink  
Peter Brugmans Fotografie

**Garden House by Wouter Bink**  
(60 m<sup>2</sup>) Amersfoort, the Netherlands



Moke Architects  
MOSO

**Public Elementary School "IKC"**  
(320 m<sup>2</sup>) Amsterdam, The Netherlands

# Installation instructions

## Rebated profile

### 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®.

### 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.

diagram 1 - normal pattern

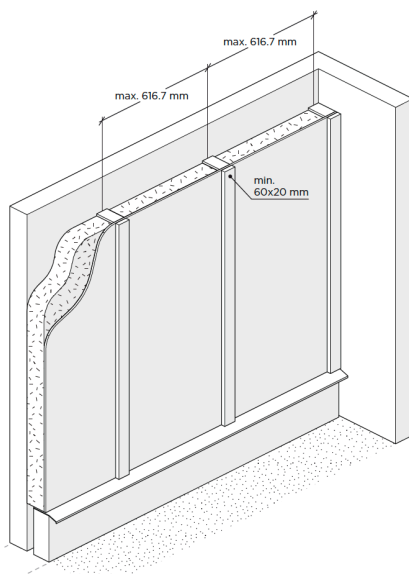
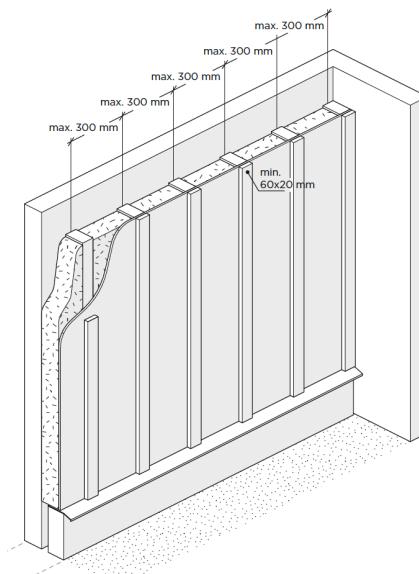


diagram 2 - random pattern



# Installation instructions

## Rebated profile

### 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.

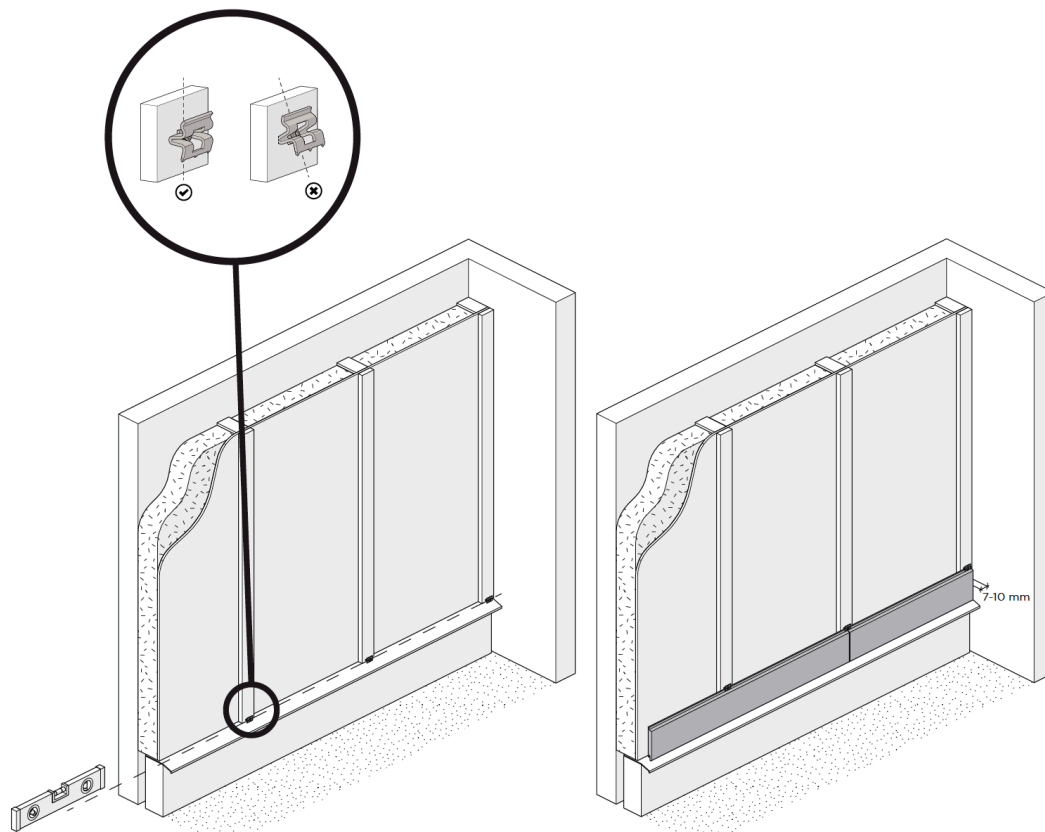
- Make sure you keep a ventilation gap (7-10 mm) on the edge of the cladding.

#### 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® Bamboo

## 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 Sikkens 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

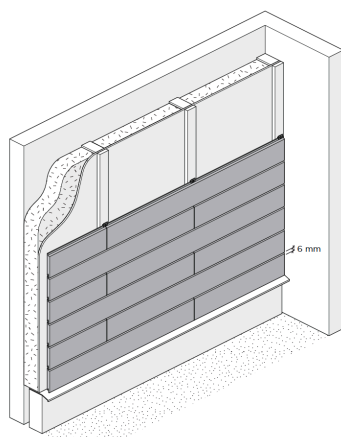
Whilst all due care is taken to ensure the accuracy of the installation instructions, individual circumstances (location, sub structure and installation procedures) may vary and are beyond the manufacturer's control. In case of doubt, therefore, consult the distributor. Always follow the local building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

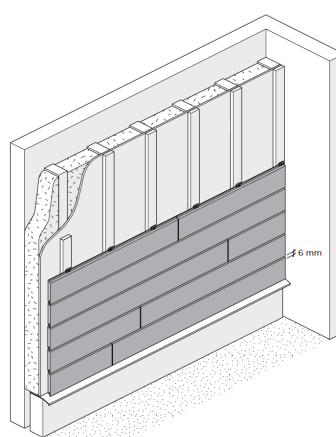
These instructions are subject to change. For the latest version visit [www.moso-bamboo.com/x-treme/cladding](http://www.moso-bamboo.com/x-treme/cladding)

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normal pattern



random pattern





Since 2008 over  
5 million m<sup>2</sup> decking  
and cladding installed in  
more than 60 countries

Moke Architects  
MOSO

**Public Elementary School "IKC"** Photo taken 5 years  
after installation - (320 m<sup>2</sup>) Amsterdam, The Netherlands

**Jumbo Head office** Photo taken 5 years after installation  
(2.500 m<sup>2</sup>) Schiedam, The Netherlands



MVSA Architects  
Lior Teitler



Luc Richard

**Riberach Hotel** Photo taken 8 years after installation  
(1.200 m<sup>2</sup>) 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!

**SHR** 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 or 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

**SHR** Durability of het 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

**SHR** 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

# harder and more durable than almost any other hardwood

## durability class

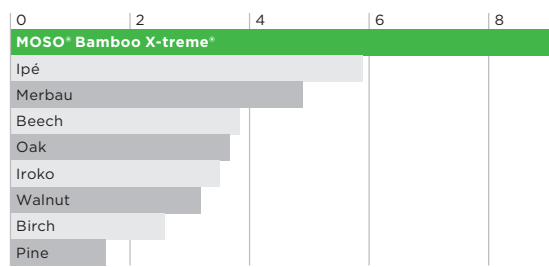
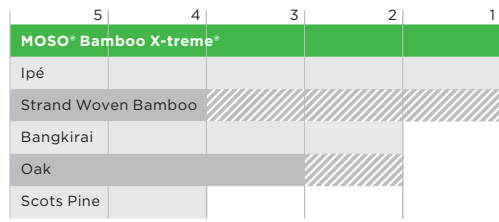
class 1

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

## average brinell hardness

±9.5 kg/mm<sup>2</sup>

(EN 1534)



range of durability results

### Classification Durability Class

Use 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.

## durability

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

class 1

## use/risk class

EN 335

class 4

**Efectis** | Efectis Nederland BV  
2014-Edinla-20221q(Rev 2)  
February 2020  
MOSO International BV | **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**

## fire resistance

EN 13501-1

class B-s1-d0

### Classification ASTM E84

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

## reaction to fire

(FSI 25 / SDI 45)

ASTM E84

class A

WUI approved

CAN/ULC-S102

### Carbon Footprint (CO<sub>2</sub>eq) per kg final product

### Eco-costs (€) per kg final product

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

## carbon footprint

ISO 14040/44

CO<sub>2</sub> neutral



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

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WARRANTY  
25  
YEARS

TIM Exclusive Gardens  
Awood  
Olivr

**Luxurious garden with a touch of Bali** Arnhem, the Netherlands

**Oker Meeting Venue**  
(125 m<sup>2</sup>) Schipluiden, the Netherlands



SPEE Architects  
Awood  
Ossip van Duijvenbode



Restauro Architecten  
Awood

# The sustainability of MOSO® Bamboo

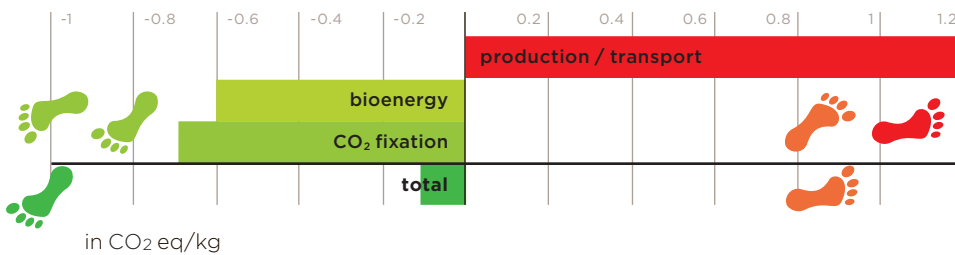
MOSO® Bamboo X-treme® offers clear sustainable advantages and is even proven to be CO<sub>2</sub> neutral during the product lifespan! The inclusion of Bamboo X-treme® contributes to a higher LEED, BREEAM, Green Star, HQE and DGNB certification score for green building projects. That's one of the reasons 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®: CO<sub>2</sub> 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](http://www.moso-bamboo.com/lca)) concludes that all assessed MOSO® Products (all solid bamboo flooring, decking, beams, panels and veneer) are CO<sub>2</sub> 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](http://www.moso-bamboo.com/epd)).

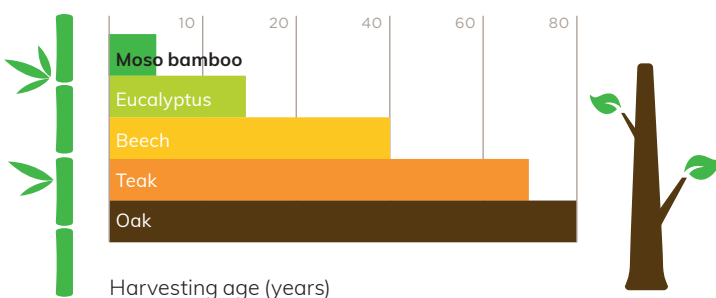
\*) This includes the CO<sub>2</sub> (biogenic carbon - EN 16449) stored in the product.



## 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 CO<sub>2</sub> are captured in the bamboo forests and products ([www.inbar.int/understanding-bamboos-climate-change-potential](http://www.inbar.int/understanding-bamboos-climate-change-potential)).



### Office Hesselink Koffie (Coffee Roastery)

BREEAM - Winterswijk, the Netherlands

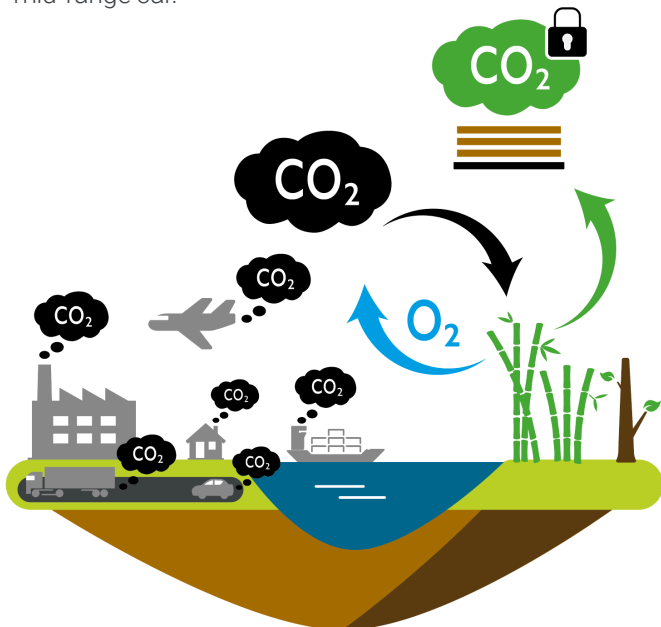




## Carbon storage in bamboo

### Biobased materials act as CO<sub>2</sub> sinks

Through photosynthesis, plants absorb carbon dioxide (CO<sub>2</sub>) and convert it into glucose (building block for biomass) and oxygen. The CO<sub>2</sub> 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 CO<sub>2</sub> in durable products compared to wood species. The locked amount of CO<sub>2</sub> 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 CO<sub>2</sub> per m<sup>3</sup> of bamboo, which is the equivalent of the CO<sub>2</sub> 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](http://www.moso-bamboo.com/sustainability)



**Notiz Hotel NHL Stenden** - Green Key Award Gold  
 (1200 m<sup>2</sup>) Leeuwarden, the Netherlands



BRT Architecten  
 Awood  
 Ronnie Zeemering

*Contributes to  
 the leading green  
 building certification  
 programs worldwide*



**Alfonso X residential building** - ASPRIMA-SIMA Award  
 (5100 m<sup>2</sup>) 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.

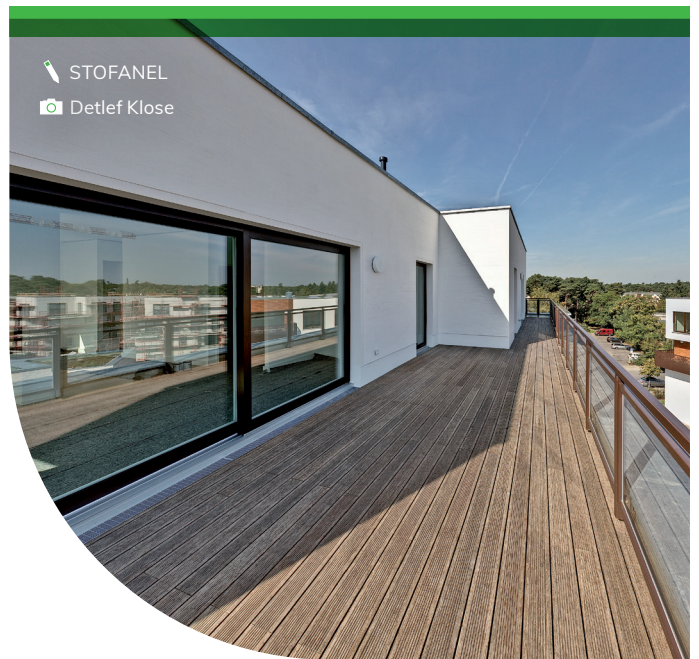


Briga Company  
Lior Teitler

**Briga Towers Penthouses & Apartments** (10.000 m<sup>2</sup>) Netanya, Israel



John Leonffy



STOFANEL  
Detlef Klose



**Fünf Morgen Dahlem Urban Village**  
(1750 m<sup>2</sup>) Berlin, Germany



**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



**GRIPSURE**<sup>®</sup>

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

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