




# MOSO®

# Bamboo X-treme®

Certified, sustainable  
and beautiful  
outdoor products



 2130240 kg CO<sub>2</sub>  
 Kengo Kuma  
 Red Sea Global -  
The St. Regis Red Sea Resort



 Stéphane Malka Architecture  
 MOSO®





Bamboo: the fastest growing plant in the world






**certified**

**proven**

Since 2008 over **6.5 million m<sup>2</sup>** installed, in more than **60 countries.**

**durable**  

**fire resistant**  

**sustainable** 



End-match system: enabling easy (endless) connection of the boards



Easy to install: hidden fasteners

# MOSO®

## Bamboo X-treme®

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, staircases, cladding, fencing and outdoor furniture.**

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**Hotel Boutique Aysla**

Santa Ponça, Spain

# From bamboo to Bamboo X-treme®

The fast growth and abundant availability make 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 modification

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 modification, 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 grooves to allow installation with fasteners). As a last step, depending on the customer's request, the boards can be finished.

Ready to harvest after 4-5 years



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



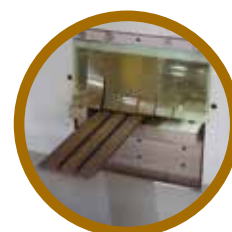
Split the Moso bamboo stems, remove the outer skin and crush the strips into strands



Compressing the strands into Thermo-Density® material



Creating the final profile and surface



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

## Thermo-Density®

We call the combination of compressing and thermally modifying the bamboo strands a Thermo-Density® process. It increases the density from 650-700 kg/m<sup>3</sup> to approx. 1150 kg/m<sup>3</sup> 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
<b>MOSO® Bamboo X-treme®</b>					
Ipé					
Strand Woven Bamboo					
Bangkirai					
Oak					
Scots Pine					

Legend: 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.

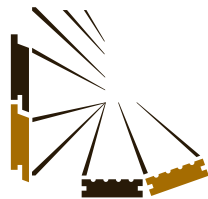
**Only MOSO® can ensure you have the original, unique Bamboo X-treme® product.** Other products that attempt to copy the original, do not offer the same quality or level of durability, dimensional stability and ecology. With a look-alike product, there is a large risk of claims after installation. **Always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

# Discover the **Bamboo** X-treme<sup>®</sup> benefits



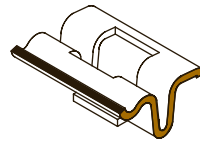
## Hard & durable

- 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<sup>®</sup> provides Bamboo X-treme<sup>®</sup> outdoor products\* with up to 25 years warranty.



## High stability

- Very stable as a result of a unique Thermo-Density<sup>®</sup> process of heat-treatment combined with High Density<sup>®</sup> 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.
- Only 5-6 mm expansion space between the boards.
- Closed cladding profile allows for an installation without space between the boards.



## Easy to install

- Can be installed using hidden fasteners (edge grooved) or face screwed.
- Both sides of the board - grooved or flat - can be used.
- Fixed board length 1850 mm, easy for 1 person to install, no complicated installation plans necessary.
- MOSO<sup>®</sup> Fasteners make it easy to install and uninstall.
- End-match system simplifies the installation by allowing the joint to float between the joists.
- Complementing MOSO<sup>®</sup> Sub frame joists available.



## Economical

- Simple and fast installation: up to 30% savings in installation costs!
- Reduced waste because of the end-matched connection.
- Cost effective transportation because of the fixed 1850 mm length.
- Cost effective and space reducing stocking because of unique multi usable board.



## Beautiful appearance

- A beautiful, natural hardwood look.
- Choice of flat or grooved surface in one reversible board.
- Due to the high stability, no need for expansion joints between the ends of the boards.
- Use of hidden MOSO<sup>®</sup> Fasteners avoids face screwing and plugging.
- Choice between natural greying or retaining the brown colour with an exterior finish.
- Cladding does not require periodic maintenance.



## 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).
- Consisting of approx. 90% natural bamboo.



## Stored Carbon

- 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.
- It is possible to measure (or calculate) the amount of carbon stored in your project, so feel free to contact our bamboo experts to get more information.



## Fire resistant

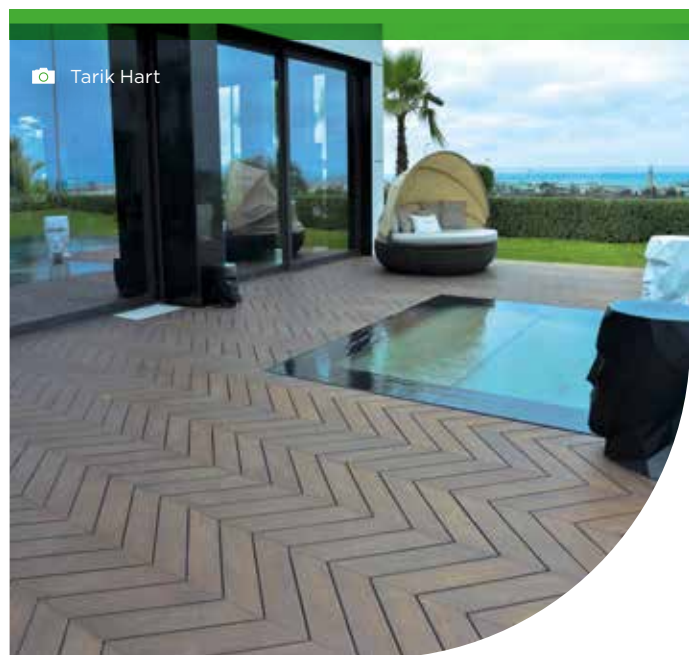
- Achieves fire resistance Class Bfl-s1 (decking) and B-s1-d0 (cladding, fencing, beams) (EN 13501-1) without use of fire retardants.
- Achieves flame spread index Class A following ASTM E84.
- As a result, MOSO<sup>®</sup> Bamboo X-treme<sup>®</sup> can be easily applied in public projects without additional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



WARRANTY  
25  
YEARS

CO<sub>2</sub> 59821 kg CO<sub>2</sub>  
Luxury Frontiers  
Sven Musica

**Madwaleni River Lodge** (2000 m<sup>2</sup>) Babanango Game Reserve (Zululand), South Africa



Tarik Hart

**Private Residence Casablanca**  
Casablanca, Morocco

**Bridge Pont d'Issy Orange Head Office**  
(1200 m<sup>2</sup>) Issy-les-Moulineaux, France



CO<sub>2</sub> 39880 kg CO<sub>2</sub>  
Vigier  
Daniel Osso Photographe

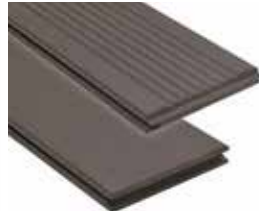
# MOSO® Bamboo X-treme® Outdoor Decking

MOSO® Bamboo X-treme® Decking is a solid, Thermo-Density® 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 (see technical characteristics below) and the compression increases the hardness and stability. A unique feature of MOSO® Bamboo X-treme® is the end-match system: this can only be done with very stable materials and enables the connection of an unlimited number of boards lengthways. The special symmetrical shape of the sides allows the possibility to choose either the grooved or the flat surface, and allows for quick installation with MOSO® Fasteners. Like any tropical hardwood species, when exposed to outdoor conditions, MOSO® Bamboo X-treme® will turn grey over time creating a very natural look.

**Standard Groove / Flat**  
(reversible)



**Standard Groove / Flat Vintage**  
(reversible)



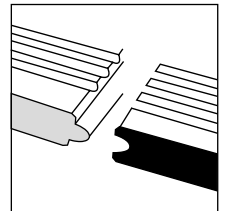
**V-Groove / Brushed**  
(reversible)



**2 Non-slip lines**



End-matched



\*) Ends of the boards are protected with Sikkens Kodrin WV 456 sealer.

Sikkens Cetol*	Unfinished	Surface	Edge groove	End-matched	Length edges	End edges	Dimensions (mm)
BO-DTHT171G-01	BO-DTHT170G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT171G-02		Standard Groove/Flat Vintage	Yes	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT171G-01-AS2		2 Non-slip lines	Yes	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT181G-01	BO-DTHT180G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x137x18
BO-DTHT371-01	BO-DTHT370	Standard Groove/Flat	No	Yes	R3	2 mm x 45°	1850x137x30
BO-DTHT191G-01	BO-DTHT190G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT191G-C-01		Curved	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT191GV-01	BO-DTHT190GV	V-Grooved/Flat	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT191GV-R-01		V-Grooved/Brushed	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT211G-01	BO-DTHT210G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x178x20
BO-DTHT231GV-R-01		V-Groove/Brushed	Yes	Yes	R3	2 mm x 45°	1850x208x20
BO-DTHT163G-CHV-01		Chevron Flat	Yes	No	R3	2 mm x 45°	566(703)x137x30/20

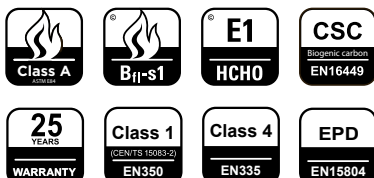
## Installation summary

- Install suitable, fixed, stable and durable sub frame joists. MOSO® recommends the use of MOSO® Thermo-Density® or Outdoor-Density® Sub frame joists.
- Determine which side of the board will be used: the grooved or flat side.
- Fix the boards on the sub frame using fasteners (to be inserted in the grooves of the board) or alternatively with screws (through the surface).
- Use a 1-2% slope and ensure good ventilation.  
Decking boards with the curved surface (BO-DTHT191G-C) are designed to be installed without a slope. Thanks to the curved surface, fast water drainage from the decking boards is guaranteed.
- After installation: make sure proper cleaning and maintenance is done, according to the chosen finish.
- When not applying Sikkens Cetol WF 771 finish regularly, the deck will acquire a grey colour tone and the typical bamboo wood grain structure will become less visible.
- Bamboo X-treme® is available finished or unfinished. Treatment after installation with waterbased Sikkens Cetol WF 771 finish is recommended for all unfinished versions. For decking finished with Sikkens Cetol WF 771 the first maintenance can be performed after one year.
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at ► [www.moso-bamboo.com/x-treme/decking](http://www.moso-bamboo.com/x-treme/decking)
- Installation instructions for chevron decking board available at ► [www.moso-bamboo.com/x-treme/decking-chevron](http://www.moso-bamboo.com/x-treme/decking-chevron)

## Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0.1 %; width + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class Bfl-s1 (EN 13501-1)
- Flame spread index: Class A (ASTM E84)
- Slip resistance - Pendulum friction test: PTV 55 (Standard Groove/Flat, Dry), PTV 29 (Standard Groove/Flat, Wet), PTV 91 (Brushed, Dry), PTV 42 (Brushed, Wet) (CEN/TS 16165 Annex C - CEN/TS 15676)
- Slip resistance - Shod ramp test: R 10 (Standard Groove/Flat), R 11 (Brushed), R 13 (Non-slip) (CEN/TS 16165 Annex B - DIN 51130)
- Slip resistance - Barefoot ramp test: Class C (Standard Groove/Flat) (CEN/TS 16165 Annex A - DIN 51097)
- Thermal emittance: 0.81 (ASTM C1371) <sup>1)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549) <sup>1)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980) <sup>1)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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®), EQ 2, SS 7 v2009: MR 6, MR 7 (FSC®), IEQ 4.3, IEQ 4.4
- Contribution BREEAM: MvAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Guarantee: 25 years

<sup>1)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.



Also available with FSC® certification.



The mark of responsible forestry  
FSC® C002063



breeam

Profile drawings available here ► [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)



# MOSO® Bamboo X-treme® Outdoor Decking

## Installation instructions

### Before installation

- Make sure that the installation of the decking complies with local building regulations and guidelines.
- Waterlogging under the decking must be avoided by preparing a water permeable ground structure. This can be achieved by sand layers and gravel dispersion above.
- Use cement/stone tiles 40-50 mm thick or pedestals, to support the sub frame (see drawing).
- Place a root barrier under the tiles and pedestals to prevent weeds growing under the decking.
- We recommend installing the decking boards with a slope of 1-2% to enable water to run off the surface. Alternatively, the decking can be installed without a slope, but due to the fact that water stays on the surface longer, it is possible more superficial cracks will develop. If the installation is done without a slope, more cleaning will be required.
- The decking with the curved surface BO-DTHT191G-C-01 can be installed without a slope. Thanks to the curved surface, fast drainage from the boards is guaranteed.
- Ensure good ventilation of the decking by keeping at least 20 mm gap from walls and objects and avoid closing the decking at the sides. The gap between the boards must be open to ensure unrestricted ventilation.
- When the surface / soil underneath the decking is not fast drying, there should be at least 100 mm distance between the decking and the surface underneath.
- Use sub frame joists with the minimum size of 40x60 mm. MOSO® recommends the use of MOSO® Sub frame joists, which are specifically produced for use in combination with our decking products. Alternatively, suitable joists are those with the same durability class as the decking; aluminum sub frame joists, stable hardwood joists or pine joists. When using hardwood or pine as joists, make sure the moisture content of these joists is below 12%.

Avoid direct contact with the soil.

- MOSO® Thermo-Density® or Outdoor-Density® Sub frame joists can be installed without gaps, connecting the joists with screws and glue suited for outdoor use. Other sub frame joists should be installed according to the instructions of the supplier.
- In order to create a stable deck frame, the outsides of the frame have to be connected at regular intervals to the ground / structure below. Alternatively cross bracing can be applied.
- Install the boards on sub frame joists with 462.5 mm space between the joists (centre-to-centre) so each board is supported by 5 joists. Always install the ends of the boards exactly on the joist. Distance between sub frame joist depends on category of use. For non-residential use, please contact MOSO®. Other span possibilities see 'Span recommendation' table below.
- If a random installation pattern is preferred, make sure that the sub frame joists (centre-to-centre) are no more than 300 mm apart.
- Always install cut boards on at least 3 sub frame joists.

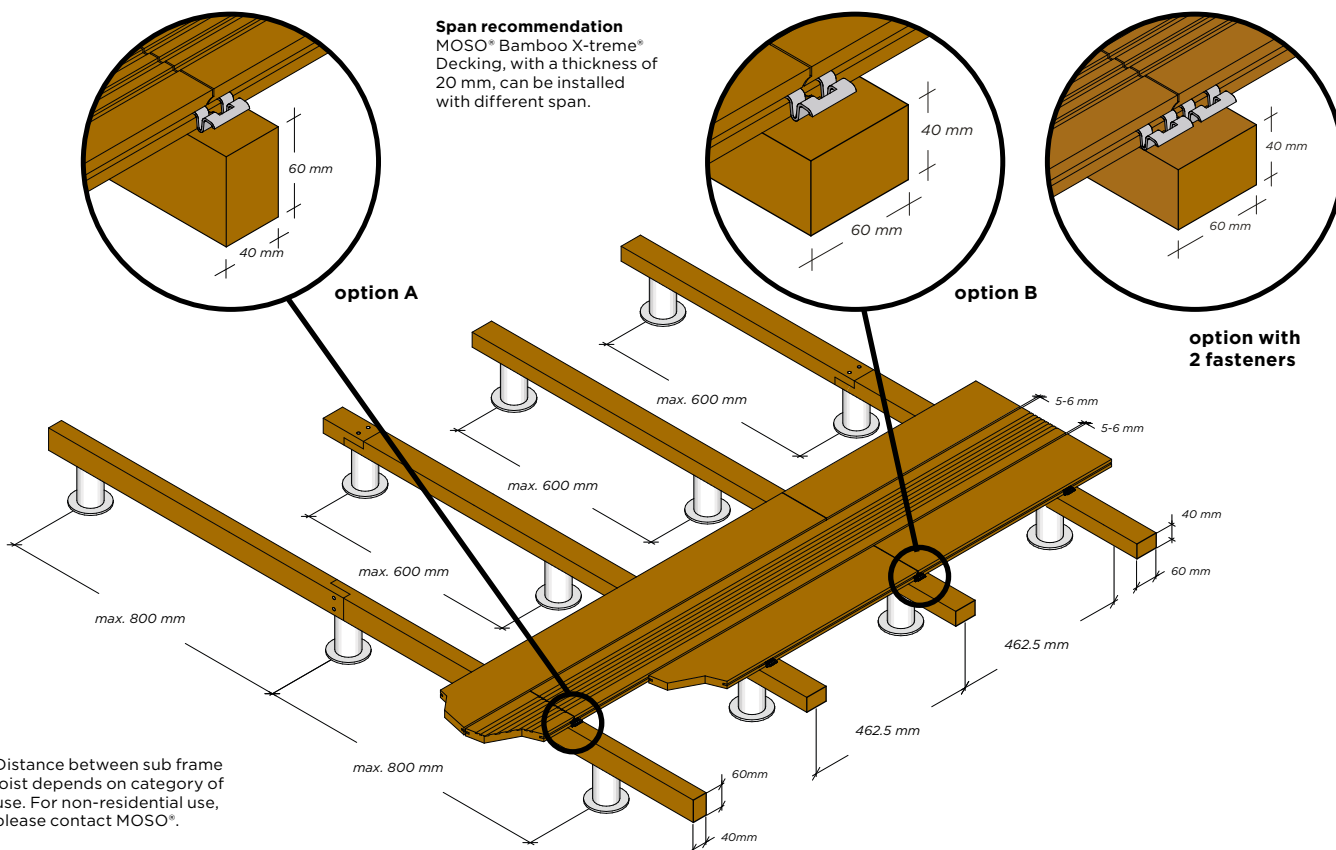
- Small cracks and splinters on the surface and on the end of the boards can arise from the different drying characteristics of the surface and cross cut ends. The surface will also get rougher over time. This phenomenon is normal for most wood species and is minimized for this product by its unique 'Thermo-Density®' production method. Cracks on the board ends can be further minimized by applying sealer to the ends of the boards (see 'the installation').
- Splinters and roughness can be removed by cleaning the surface of the decking with the silicon carbide broom or machine disk which MOSO® supplies. The surface will become smoother and splinters are removed.
- 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 by its unique Thermo-Density® production process.
- When using the flat side of the boards as top surface please note that deformation under influence of climate may be more visible. Some deformation and/or cupping of the material can occur. This phenomenon is normal for outdoor exposed wood and cannot be grounds for a claim.
- If the product is installed in a (partly) closed area, such as a conservatory or a under a canopy, where the ventilation is limited, superficial fungi may appear on the surface. This is a normal phenomenon: the fungi can easily be cleaned with a damp cloth and will not affect the material. To avoid this problem, sufficient ventilation has to be provided in the area.

### Please note

- The MOSO® Bamboo X-treme® Outdoor Decking 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. Occasionally, some bleeding can appear.

Center-to-center span sub frame joists	End-match joint lies	Deflection between joists
462.5 mm	On top of joist	Hardly noticeable
462.5 mm	Between joists, max. 15 cm from one joist	Noticeable
300 mm	Between joists	Hardly noticeable

**Span recommendation**  
MOSO® Bamboo X-treme® Decking, with a thickness of 20 mm, can be installed with different span.



Distance between sub frame joist depends on category of use. For non-residential use, please contact MOSO®.



# MOSO® Bamboo X-treme® Outdoor Decking

## Installation instructions

### The installation

- Keep at least 5-6 mm gap between the boards (in width direction). With MOSO® Fastener installation this is automatically the case.
- Due to the stability of the boards and the end-match system, no expansion gap is needed on the ends of the boards.
- Every cut end has to be treated with board end sealer, to prevent water penetration. A sealer is available from MOSO®.
- In case of unfinished decking board we advise to oil the decking shortly after installation but no later than after the first winter. The best time is 3-4 months after installation when the surface is more open than immediately after installation.

### Installation with MOSO® Asymmetric Fasteners

- Determine the surface side of the boards (grooved or flat surface).
- Press fastener with hooked side in the edge groove of one board.
- Pre-drill the joist screw holes 30 mm deep. On bamboo joists: use a 3.5 mm wide drill bit 110 mm long.
- Fully tighten the screw. Always screw vertically to the joist. Apply low torque with slow screwing speed on the screwing machine. Perform some tests for correct torque and speed adjustment before full installation.
- Install every following board by sliding it under the waved side of the fasteners.
- Use approx. 20/17/14/13 fasteners per m<sup>2</sup>, this depends on the board width. When the tongue and groove are connected on the joist, use 1 fastener (preferably 2 fasteners) to tighten both boards (see drawing page 9 option A / B).
- For bamboo or wood joists only use the included stainless steel decking screws (4.5 x 30 mm).
- Please watch the installation video [www.moso-bamboo.com/youtube/x-treme](http://www.moso-bamboo.com/youtube/x-treme)

### Screw down installation

- Determine the surface side of the boards (grooved or flat surface).
- Pre-drill the screw holes 20 mm from the side of the board. Be sure to pre drill with a large enough drill (80% of screw diameter) to avoid cracking of the decking.
- Always screw both sides (left and right in the width direction) of the board.
- Use at least A2 grade stainless steel screws: approx. 5 x 50 mm for 20 mm thickness decking board. Approx. 5 x 70 mm for 30 mm thickness decking board.

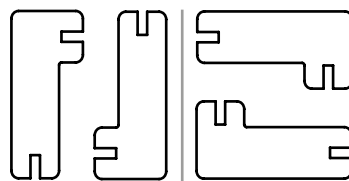
### Chevron installation

It is also possible to install the decking boards in a chevron pattern. Please follow the installation instructions at: [www.moso-bamboo.com/x-treme/decking-chevron](http://www.moso-bamboo.com/x-treme/decking-chevron)

### Edge profile installation

- When finishing the edge of a deck with the MOSO® Bamboo X-treme® Edge profile, it is important to place the hooked side of the MOSO® Fastener in the edge profile grooves (see drawing below).
- The edge profile can also be used for stairs. Standard Bamboo X-treme® stair dimensions are available in the table below. For other dimensions, boards have to be cut to size and either installed screwed down through the board or with fasteners in new edge grooves made on site.
- In case of stair application: Install decking and edge profiles on the decking steps (the numbers refer to the drawing below):
  1. Attach the edge profile(s) in the inner corner of the steps to the sub structure with MOSO® Asymmetric Fasteners. Place fasteners with a maximum centre-to-centre distance of 462,5 mm. Ensure the hooked side of the MOSO® Fastener (see drawing below) is placed in the edge grooves of the edge profile. Fully tighten the screws.
  2. Slide the horizontal decking board(s) in place. Do not fix the other side yet (so no fastener placed).
  3. Slide the vertical decking board(s) in place and attach the top side to the substructure with fasteners. Ensure the waved side of the fastener is placed in the edge groove of the board. Do not fully tighten the screws yet.
  4. Slide the outer corner edge profile(s) in place. Slide MOSO® Asymmetric Fasteners between the decking board(s) (nr. 2 & 3 in the drawing below) and the edge profile(s), ensuring correct orientation of the fasteners. Attach to the sub structure. Fully tighten the screws.
  5. Fully tighten the screws left unsecured in step 3.

### Run/rise dimensions

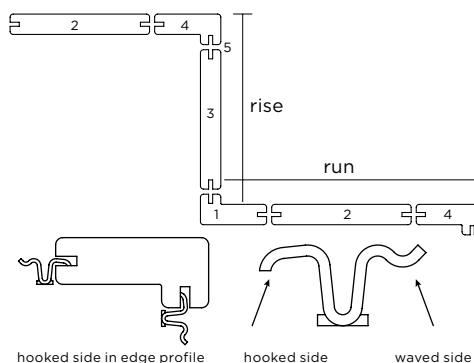


**vertical orientation run (board 2)**  
 137 mm = 189 mm  
 155 mm = 207 mm  
 178 mm = 230 mm

**rise (board 3)**  
 137 mm = 259 mm  
 155 mm = 277 mm  
 178 mm = 300 mm

**horizontal orientation run (board 2)**  
 137 mm = 259 mm  
 155 mm = 277 mm  
 178 mm = 300 mm

**rise (board 3)**  
 137 mm = 189 mm  
 155 mm = 207 mm  
 178 mm = 230 mm



### Cleaning and maintenance

#### Sikkens Cetol finished version

- The MOSO® Bamboo X-treme® Decking is finished with Sikkens Cetol WF 771 finish (waterbased - lpe color) on both sides.
- It is advisable to keep the deck clear of dust and dirt as much as possible (sweep regularly).
- For annual maintenance: use of Woca exterior cleaner is recommended. If the deck is not grey, but just lightly weathered, it is sufficient to just clean with cleaner and brush. After drying, again apply Sikkens Cetol WF 771 finish according MOSO® maintenance instructions. Follow the instructions at: [www.moso-bamboo.com/youtube/x-treme](http://www.moso-bamboo.com/youtube/x-treme)
- Apply one layer new Sikkens Cetol WF 771 finish. This maintenance should be undertaken 1-2 times a year to prevent the bamboo becoming grey and losing its characteristic bamboo grain. Follow instructions at: [www.moso-bamboo.com/youtube/x-treme](http://www.moso-bamboo.com/youtube/x-treme)
- After application of the Sikkens Cetol WF 771 finish allow the deck to dry sufficiently before using it again.
- Bamboo X-treme® Vintage: As with any stained decking there is a chance that the stain will wear off more in the intensively used areas, such as pathways, than in the less used areas. Such differences are normal and cannot be reason for a claim. To remedy this, the boards should be cleaned, possibly sanded, and treated with Sikkens Cetol Savanna. Follow the instructions of the supplier.

#### Unfinished version

- You can leave the decking without any maintenance, but take into consideration that without maintenance and oiling the deck will develop a rougher, fissured surface that will lighten quicker and become grey (similar to most timber).
- Maintenance with Sikkens Cetol WF 771 (lpe colour) is recommended. The best time to do initial oiling is 3 to 4 months after installation, when the surface is more open than immediately after installation.
- Clean the decking with clean water, cleaner and silicon carbide broom or disk.
- Let the decking dry. When the decking is completely dry, apply the Sikkens Cetol WF 771 finish according to MOSO® maintenance instructions.
- After this first application the decking can remain without oil treatment for natural greying. However regular cleaning with the silicon carbide broom or disk is recommended.
- For annual maintenance: Use of Woca Exterior Cleaner is recommended. If the deck is not grey, but just lightly weathered, it is sufficient to just clean with soap and brush. After drying, again apply Sikkens Cetol WF 771 finish according MOSO® maintenance instructions.
- It is advisable to keep the decking free from dust and dirt as much as possible (clean by broom regularly).

### Storing

Store 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 floor 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. **These instructions are subject to change. For the latest version visit: [www.moso-bamboo.com/x-treme/decking](http://www.moso-bamboo.com/x-treme/decking)** Copyright © Nothing from this text may be reproduced without the prior permission in writing from Moso International BV.

# MOSO® Bamboo X-treme® Outdoor Decking & Cladding

## Accessories

### MOSO® Fasteners

With these fasteners MOSO® Bamboo X-treme® Decking and Cladding can be easily installed. When installed correctly, 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 (not provided by MOSO®), special screws are available.

Product Code	Item	Material	Colour	Dimensions fastener (mm)	Dimensions screw (mm)
CLIP-SCREWBX08	Fastener Asymmetric with screw (20 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x10.8	4.5x30
CLIP-SCREWBX08-316	Fastener Asymmetric with screw (20 mm)	Stainless steel A4 (AISI316)	Brown	27x22.5x10.8	4.5x30
CLIP-BX08	Fastener Asymmetric without screw (20 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x10.8	
CLIP-BX08-316	Fasteners Asymmetric without screws (20 mm)	Stainless steel A4 (AISI316)	Brown	27x22.5x10.8	
CLIP-SCREWBX802	Fastener Start/End Top with screw (20 mm)	Stainless steel A2 (AISI304)	Brown	29x25x11.2	4.5x30
CLIP-SCREWBX802-316	Fastener Start/End Top with screw (20 mm)	Stainless steel A4 (AISI316)	Brown	29x25x11.2	4.5x30
CLIP-SCREWBX09	Fastener Asymmetric with screw (18 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x9.8	4.5x30
CLIP-BX09	Fastener Asymmetric without screw (18 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x10.8	
CLIP-SCREWBX902	Fastener Start/End Top with screw (18 mm)	Stainless steel A2 (AISI304)	Brown	29x25x11.2	4.5x30
SCREW-09	Screw for aluminium sub frame joist	Stainless steel A2 (AISI304)	Brown		4.2x20
SCREW-09-316	Screw for aluminium sub frame joist	Stainless steel A4 (AISI316)	Brown		4.2x20
CHEVRON-TOOL01	Chevron installation tool	Wood			

CLIP-SCREWBX08 / BX09  
CLIP-BX08 / BX09



SCREW-09



CLIP-SCREWBX802 / BX902



CHEVRON-TOOL01



### Recommended number of fasteners/m<sup>2</sup>

Board width	Decking*	Cladding**
65 mm	-	~29 pcs/m <sup>2</sup>
75 mm	-	~26 pcs/m <sup>2</sup>
100 mm	-	~19 pcs/m <sup>2</sup>
137 mm	~20 pcs/m <sup>2</sup>	~14 pcs/m <sup>2</sup>
155 mm	~17 pcs/m <sup>2</sup>	
178 mm	~14 pcs/m <sup>2</sup>	
208 mm	~11 pcs/m <sup>2</sup>	



\*) Based on distance of 462.5 mm between the sub frame joist centres.  
\*\*) Based on distance of 616.7 mm between the sub frame joist centres.

### MOSO® Bamboo Outdoor additional products

MOSO® recommends the use of Bamboo Thermo-Density® or Outdoor-Density® Sub frame joists, which are specifically produced for use in combination with MOSO® Decking. The MOSO® Bamboo X-treme® Fascia board and Edge profile are intended for an elegant finish of the sides of the decking. Fascia boards are installed vertically against the sides of the deck to cover the sub frame joists. Edge profiles can also be used to create staircases, in combination with panels.



Product Code	Item	Finish	Dimensions (mm)
BO-SB155	Sub frame joist Thermo-Density®	Unfinished	2440x60x40
BO-SB355	Sub frame joist Outdoor-Density®	Unfinished	2440x60x40
BO-DTHT170G1	Fascia board, 1 edge groove	Unfinished	1850x137x20
BO-DTHT171G1-01	Fascia board, 1 edge groove	Sikkens	1850x137x20
BO-DTHT180	Fascia board	Unfinished	1850x137x18
BO-DTHT181-01	Fascia board	Sikkens	1850x137x18
BO-DTHTBN171G-01	Edge profile, 2 edge grooves, 20 mm	Sikkens	1850x65x30/20
BO-DTHTBN500	Edge profile, no edge grooves, 18 mm	Unfinished	1850x40x40
BP-DTHT1080	Panel, square edge	Unfinished	2440x320x38

Information about cleaning & maintenance products please see the product datasheet 'MOSO® Bamboo Outdoor Decking - Cleaning & maintenance': ►



# MOSO® Bamboo X-treme® Outdoor Decking

## Maintenance & cleaning

### Maintenance Sikkens Cetol

The maintenance and cleaning of the MOSO® Bamboo X-treme® Decking is similar to other tropical wood, with the difference that water-based finish oils provide greater protection than traditional oils. Sikkens Cetol WF 771 water-based finish is recommended for optimal protection.

### Maintenance of flat surface

Please be aware of the fact that on the flat surface, irregularities in the surface (e.g. cracks, splinters) may be more visible than on the grooved surface. With regular maintenance, using a waterbased decking finish, this will be reduced.

### Cleaning

- Soak MOSO® Bamboo X-treme® with plenty of water and leave it for 10 min. If possible use a garden hose. Do not use high-pressure cleaners.
- Mix Woca Exterior Wood Cleaner with water in the ratio 1:2 and apply it. If the decking is extremely dirty, exterior cleaner may be used undiluted. Clean the decking with a silicon carbide broom or machine disk. Scrub the soaked material lengthwise following the

bamboo grain until the material appears clean. If the decking has been installed flat side up, first scrub at an angle of 45 degrees before scrubbing in the length direction. When using a machine disk this is not necessary. Repeat the cleaning if necessary. Clean the surface carefully with water.

- Leave MOSO® Bamboo X-treme® to dry for approx. 24 hours. The material must be completely dry before oil treatment can be done.

### Application of finish

- Always make sure the decking is clean, dry, free of dust or dirt, and without any coating. Never work on a deck in direct sun.
- In areas where Sikkens Cetol finish remains after cleaning, we recommend sanding (100 grit). If the area to be sanded is too large, use a polishing machine with a silicon carbide disk or a 100 grit sanding paper disk.
- Stir the Sikkens Cetol before and during the application to avoid colour variation.
- Apply a thin layer of finish with a pad, a brush, or with an air gun (35 to 65 bar) on the working surface (decking with non slip grit only with a brush).

- Important: remove any excess product before it dries, to avoid any dripping or glossy areas. The finish must penetrate the material and not remain on the surface, so that it dries leaving a matt look.
- Pay attention to the ends of the joists and cut ends of the boards, which tend to absorb more water, and finish well to minimise water ingress. A sealer is available from MOSO.

### Theoretical consumption

- Mix Woca Exterior Wood Cleaner with water in the ratio 1:2 and apply it. If the decking is extremely dirty, exterior cleaner may be used undiluted.
- Sikkens Cetol WF 771 Ipe - for the first treatment: 10 - 12 m<sup>2</sup> / litre (for 1 coat of finish).
- Sikkens Cetol WF 771 - for periodic maintenance: 14 - 15 m<sup>2</sup> / litre (for 1 coat of finish).

### Risk of self-ignition

Due to the risk of self-ignition it is important that oil-wetted cloths are soaked in water and are disposed in a tightly closed container after use. For more details, check the instructions of the finish supplier.

**SEALER-05**  
Sealer for ends of boards 250 ml



**DISK-02**  
16" Silicon carbide disk



**BROOM-02**  
Silicon carbide broom



**CLEANER-WOCA-01**  
Woca Exterior Wood Cleaner 2.5 ltr



**SATURATOR-SIK01**  
Sikkens Cetol WF 771 Ipe colour 10 ltr  
**SATURATOR-SIK02**  
Ipe colour 2.5 ltr



**SATURATOR-SIK04**  
Sikkens Cetol WF 771 Savanna colour 2.5 ltr



Gradual greying of MOSO® Bamboo X-treme® over time:

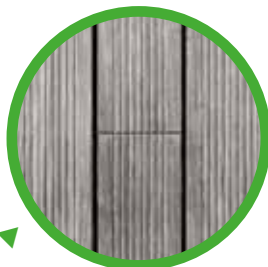
new, non-weathered decking



after 3 months of weathering

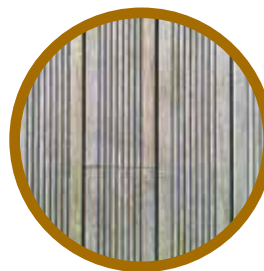


after 18 months of weathering



Surface of MOSO® Bamboo X-treme® with different maintenance and cleaning scenarios:

weathered, dirty decking



weathered, cleaned decking



re-oiled decking



Check out the maintenance and cleaning movie at:  
[www.moso-bamboo.com/youtube/x-treme](http://www.moso-bamboo.com/youtube/x-treme)









CO<sub>2</sub> 40603 kg CO<sub>2</sub>

🔧 Landmark Vastgoed Management BV

📷 Hans Gorter

**MOSO® Headoffice** (1100 m<sup>2</sup>) Zwaag, the Netherlands



CO<sub>2</sub> 1795 kg CO<sub>2</sub>

🔧 Wouter Bink

📷 Peter Brugmans Fotografie

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

**Leisure space Burgos**

Villacienzo, Burgos, Spain



🔧 A3GM Arquitectos

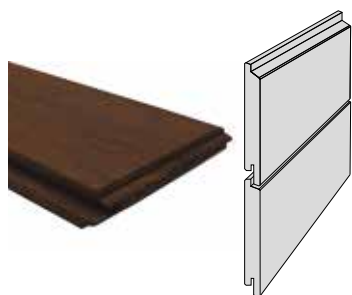
📷 Javier Bravo

# MOSO® Bamboo X-treme® Outdoor Cladding

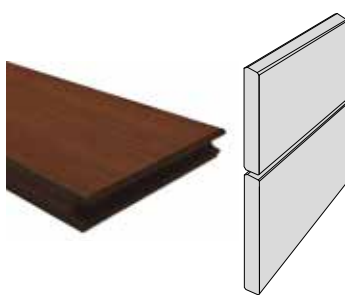
## Rebated & Trapezium profile

MOSO® Bamboo X-treme® Outdoor Cladding are solid boards in various widths for exterior applications. The boards are 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<sup>1)</sup> (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. A closed profile is also available for fast and easy installation with hidden screws. Like any tropical hardwood species, when exposed to outdoor conditions, MOSO® Bamboo X-treme® will turn grey over time creating a natural look.

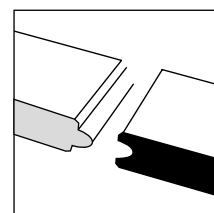
Rebated profile



Trapezium profile



End-matched



Product Code	Profile	Finish	Surface	End-matched	Length edges	End edges	Effective width (mm)*	Dimensions (mm)
BO-DTHT500G	Rebated profile	Unfinished	Flat	Yes	R3	2 mm x 45°	125	1850x137x18
BO-DTHT505G	Rebated profile	Unfinished	Flat	Yes	R3	2 mm x 45°	63	1850x75x18
BO-DTHT510	Trapezium profile	Unfinished	Flat	Yes	R3	2 mm x 45°	132	1850x137x18
BO-DTHT515	Trapezium profile	Unfinished	Flat	Yes	R3	2 mm x 45°	70	1850x75x18
BO-DTHT525	Trapezium profile	Unfinished	Flat	No	R1	1.5 mm x 45°	70	1850x75x12

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

### Installation

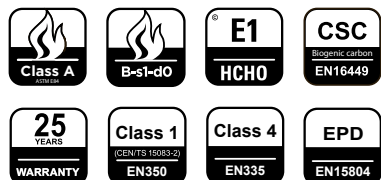
- MOSO® guarantees the bamboo material and the mounting materials (fastener/screw) it supplies but does not guarantee the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the screws used match such materials during the full lifetime of the product.
- For installation with fasteners, the MOSO® Fasteners CLIP-SCREWBX09 with screws and MOSO® Fasteners CLIP-BX09 without screws are available. More information about the MOSO® Fasteners can be found: ▶ [www.moso-bamboo.com/x-treme/accessories](http://www.moso-bamboo.com/x-treme/accessories)
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at: ▶ [www.moso-bamboo.com/x-treme/cladding](http://www.moso-bamboo.com/x-treme/cladding)

### Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0.1 %; width: + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1)<sup>1)</sup>
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)<sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549)<sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)<sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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

<sup>1)</sup> Tested on 18 mm thickness, without gaps between boards, with ventilation space behind boards.

<sup>2)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.



Also available with FSC® certification.



bream

Profile drawings available here ▶ [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)





CO<sub>2</sub> 155533 kg CO<sub>2</sub>

The Roofs is a development by Provast, designed by MVRDV, realised by J.P. van Eesteren & Besix, photographed by Daria Scagliola.

**The Roofs residential Towers** (2200 m<sup>2</sup>) The Hague, the Netherlands



CO<sub>2</sub> 17946 kg CO<sub>2</sub>

MVD Architecture  
Awood

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

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



CO<sub>2</sub> 35892 kg CO<sub>2</sub>

BRT Architecten  
Awood  
Ronnie Zeemering



# MOSO® Bamboo X-treme® Varibo Outdoor Cladding

## Closed profile

MOSO® Bamboo X-treme® Closed Cladding are solid boards in various widths for exterior applications. The boards are 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-d0 <sup>1)</sup> (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. The Vintage colour gives the cladding boards a beautiful grey appearance, similar to the natural weathered grey of Bamboo X-treme®. It will provide the entire façade a more homogenous appearance as the boards age naturally.

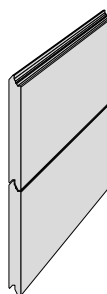
**Closed profile**  
65 mm



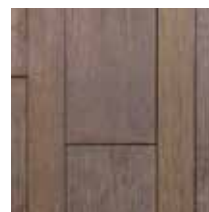
**Closed profile - Vintage**  
137 mm



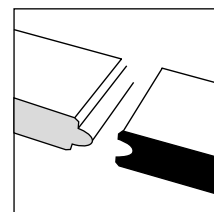
**Closed Cinco profile**  
155 mm



**Varibo Closed profile**



**End-matched**



Product Code	Profile	Finish	Surface	End-matched	Length edges	End edges	Effective width (mm)	Dimensions (mm)
BO-DTHT537	Closed	Unfinished	Flat	Yes	R1	2 mm x 45°	52,5	1850x65x18
BO-DTHT537-02	Closed	Vintage	Flat	Yes	R1	2 mm x 45°	52,5	1850x65x18
BO-DTHT536	Closed	Unfinished	Flat	Yes	R1	2 mm x 45°	87,5	1850x100x18
BO-DTHT536-02	Closed	Vintage	Flat	Yes	R1	2 mm x 45°	87,5	1850x100x18
BO-DTHT530	Closed	Unfinished	Flat	Yes	R1	2 mm x 45°	124,5	1850x137x18
BO-DTHT531-02	Closed	Vintage	Flat	Yes	R1	2 mm x 45°	124,5	1850x137x18
BO-DTHT538	Closed	Unfinished	Flat	Yes	R1	2 mm x 45°	142,5	1850x155x18
BO-DTHT538-2	Closed	Unfinished	Flat with false groove	Yes	R1	2 mm x 45°	142,5	1850x155x18
BO-DTHT550	Closed Cinco	Unfinished	Flat with false groove	Yes	R1	2 mm x 45°	142,5	1850x155x18

### Installation

- MOSO® guarantees the bamboo material and the mounting materials (screw) it supplies but does not guarantee the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the screws used match such materials during the full lifetime of the product.
- It is not necessary to reapply the Vintage colour to the cladding boards.
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at: ► [www.moso-bamboo.com/closed](http://www.moso-bamboo.com/closed)

<sup>3)</sup> For more information about the Grad® system please see the product datasheet Bamboo X-treme® Outdoor Cladding Grad® profile or check our website: ► [www.moso-bamboo.com/cladding/grad](http://www.moso-bamboo.com/cladding/grad)

### Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0.1 %; width: + 0.9 % (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1) <sup>1)</sup>
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371) <sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549) <sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980) <sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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

<sup>1)</sup> Tested on Bamboo X-treme® Closed profile 137x18 mm, with ventilation space behind the boards.  
<sup>2)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.



Also available with FSC® certification.



The mark of responsible forestry  
FSC® C002063



breeam

Profile drawings available here ► [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)





- 4487 kg CO<sub>2</sub>
- Studio Osiris Hertman
- Awood
- Jurrit van der Waal

**Villa by Studio Osiris Hertman** (150 m<sup>2</sup>) The Netherlands



- Barten Projecten B.V.
- Awood

**Showroom Varios Beautiful products**  
Hoek van Holland, the Netherlands

**Hostel Stayokay**  
Noordwijk, the Netherlands



- Awood

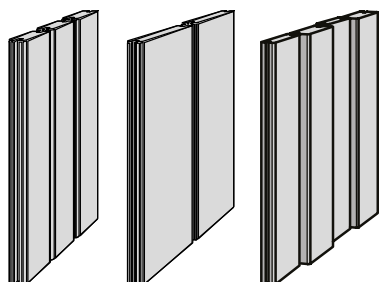
# MOSO® Bamboo X-treme® Varibo Outdoor Cladding

MOSO® Bamboo X-treme® Varibo Cladding are solid boards in various widths and thicknesses for exterior applications. The boards are 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-d0<sup>1)</sup> (EN 13501-1) without impregnation with expensive and eco-damaging 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



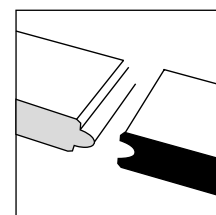
Varibo Flat boards



Varibo



End-matched



Product Code	Finish	Surface	End-matched	Length edges	End edges	Effective width (mm)*	Dimensions (mm)
BO-DTHT187G	Unfinished	Flat	Yes	R3	2 mm x 45°	65	1850x65x18
BO-DTHT186G	Unfinished	Flat	Yes	R3	2 mm x 45°	100	1850x100x18
BO-DTHT185G	Unfinished	Flat	Yes	R3	2 mm x 45°	137	1850x137x18
BO-DTHT218G	Unfinished	Flat	Yes	R3	2 mm x 45°	178	1850x178x18
BO-DTHT387G	Unfinished	Flat	Yes	R3	2 mm x 45°	65	1850x65x30
BO-DTHT386G	Unfinished	Flat	Yes	R3	2 mm x 45°	100	1850x100x30

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

## Installation

- MOSO® guarantees the bamboo material and the mounting materials (fastener/screw) it supplies but does not guarantee the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the screws used match such materials during the full lifetime of the product.
- For installation with fasteners, the MOSO® Fasteners CLIP-SCREWBX09 with screws and MOSO® Fasteners CLIP-BX09 without screws are available. More information about the MOSO® Fasteners can be found: ▶ [www.moso-bamboo.com/x-treme/accessories](http://www.moso-bamboo.com/x-treme/accessories)
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at: ▶ [www.moso-bamboo.com/varibo](http://www.moso-bamboo.com/varibo)

## Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0.1 %; width: + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1)<sup>1)</sup>
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)<sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549)<sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)<sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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

<sup>1)</sup> Tested on 18 mm thickness, without gaps between boards, with ventilation space behind boards.

<sup>2)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.



Also available with FSC® certification.



The mark of responsible forestry  
FSC® C002063



breeam

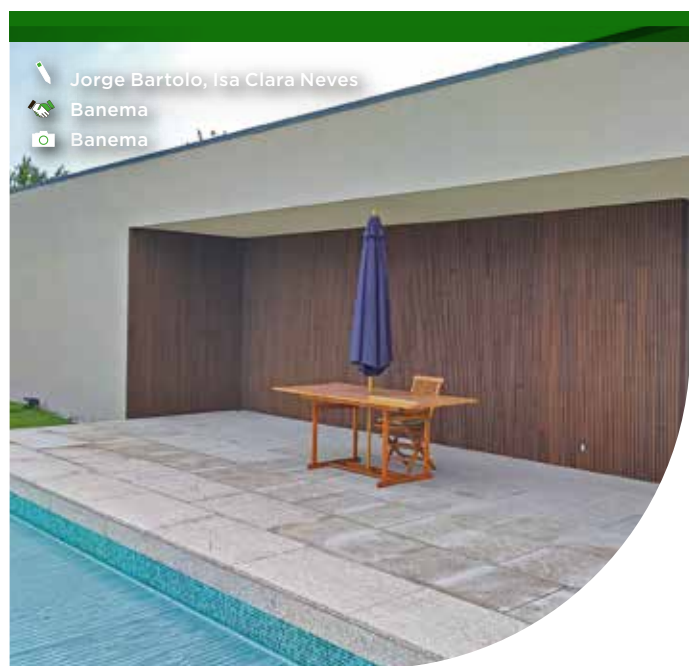
Profile drawings available here ▶ [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)





- Team CASA
- Awood
- Team CASA

**CASA 1.0** Helmond, the Netherlands



- Jorge Bartolo, Isa Clara Neves
- Banema
- Banema

**Villa Vila do Conde**  
(120 m<sup>2</sup>) Portugal



**City garden**  
(45 m<sup>2</sup>) Hoorn, The Netherlands

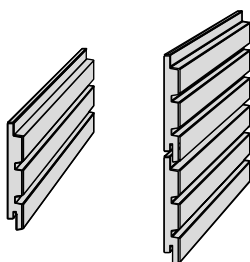
- 1496 kg CO<sub>2</sub>
- MOSO®

# MOSO® Bamboo X-treme® Outdoor Cladding

## Rhombus profile

MOSO® Bamboo X-treme® Rhombus Outdoor Cladding is a range of solid, Thermo-Density® exterior boards, 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-d0 <sup>1)</sup> (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 (20 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



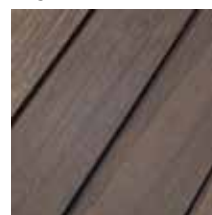
Triple Rhombus



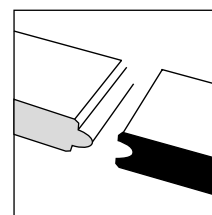
Double Rhombus



Single Rhombus



End-matched



Product Code	Profile	Finish	Surface	End-matched	Length edges	End edges	Effective width (mm)*	Dimensions (mm)
BO-DTHT520G	Triple Rhombus	Unfinished	Flat with 2 grooves	Yes	R1	2 mm x 45°	129	1850x137x20
BO-DTHT520G-2	Double Rhombus	Unfinished	Flat with 1 groove	Yes	R1	2 mm x 45°	129	1850x137x20
BO-DTHT520G-1	Single Rhombus	Unfinished	Flat	Yes	R1	2 mm x 45°	129	1850x137x20

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

### Installation

- MOSO® guarantees the bamboo material and the mounting materials (fastener/screw) it supplies but does not guarantee the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the screws used match such materials during the full lifetime of the product.
- For installation with fasteners, the MOSO® Fasteners CLIP-SCREWBX08 with screws and MOSO® Fasteners CLIP-BX08 without screws are available. More information about the MOSO® Fasteners can be found: ▶ [www.moso-bamboo.com/x-treme/accessories](http://www.moso-bamboo.com/x-treme/accessories)
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at: ▶ [www.moso-bamboo.com/rhombus](http://www.moso-bamboo.com/rhombus)

### Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0.1 %; width: + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1) <sup>1)</sup>
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371) <sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549) <sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980) <sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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

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



Also available with FSC® certification.






breem

Profile drawings available here ▶ [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)








-  14955 kg CO<sub>2</sub>
-  SPEE Architects
-  Awood
-  Ossip van Duivenbode

**SPEEHUIS** (10.000 m) The Netherlands






-  257238 kg CO<sub>2</sub>
-  Dorota Szlachcic Architect
-  Mosty Łódź S.A.

**Orientalium in the Municipal Zoological Garden**  
(43.000 m) Łódź, Poland

**Haarlerbergpark for ING**  
Amsterdam, the Netherlands



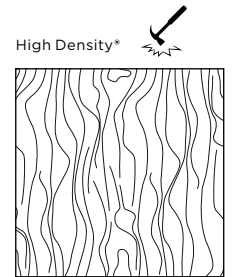
-  Donker Design
-  FURNS & Awood
-  FURNS

# MOSO® Bamboo X-treme® Outdoor Beams

A unique heat-treatment process at 200°C and compression of the bamboo strips to increase the density make the MOSO® Bamboo X-treme® material extremely durable and stable. This durability and stability, and the pre-profiled rounded edges, make MOSO® Bamboo X-treme® Beams ideal for use in outdoor furniture and facades. The elaborate manufacturing process provides MOSO® Bamboo X-treme® Outdoor Beams with the highest durability class possible in the applicable EU norms. As with tropical hardwoods, the colour of the material changes under the influence of wind, rain, frost and sunshine (UV-light). This results in a typical weathered natural grey-tone. Regular cleaning and maintenance with a finish/sealer protects the material against this weather related discolouration.

**BO-DTHT2171-2-01-FP**  
2000 x 80 x 40 mm

**BO-DTHT2173-2-01-FP**  
2000 x 40 x 40 mm



Product Code	Finish	Edges (also on ends)	Dimensions (mm)
BO-DTHT2170-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x115x40
BO-DTHT2175-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x90x40
BO-DTHT2171-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x80x40
BO-DTHT2172-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x60x40
BO-DTHT2174-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x55x40
BO-DTHT2173-2-01-FP	Sikkens Cetol WF 771 lpe	R4	2000x40x40

Other dimensions, bevel and finish can be produced custom made.

## Installation summary

- To allow natural shrink- and swell behaviour, install beams with a minimum of 4 mm distance.
- MOSO® Bamboo X-treme® Beams must be mechanically fixed, using screws/bolts. The fixing method depends on the application.
- Use stainless steel A2 screws/bolts.
- For all our standard size beams, except 40x40 mm, we advise a minimum of 2 screws per fixing point. 40x40 mm beams can be fixed with 1 screw per fixing point.
- Horizontal installation:
  - The number of fixing points is depending on the application and applicable load.
  - In general, a 2 meter beam should at least have 3 fixing points (2 on the sides and 1 connection in the middle).
- Vertical installation:
  - End of the beam should be angled (min. 15°) to improve water drainage.
  - Beams longer than 1 meter have to be fixed in at least 3 points.
- To avoid cracks caused by excessive water uptake, the (cut) ends of the beams must be treated with a sealer (SEALER-05).
- When not applying Sikkens Cetol WF 771 (SATURATOR-SIKO2) finish regularly, the beams will acquire a grey colour tone and the typical bamboo wood grain structure will become less visible. More information about cleaning and maintenance:
  - [www.moso-bamboo.com/x-treme/beams/cleaning-maintenance](http://www.moso-bamboo.com/x-treme/beams/cleaning-maintenance)
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.
- Full version available at ► [www.moso-bamboo.com/x-treme/beams](http://www.moso-bamboo.com/x-treme/beams)

## Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0,1 %; width + 0,9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 1534)
- Reaction to fire: Class B-s1-d0<sup>1)</sup> (EN 13501-1), applicable as a material test
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)<sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549)<sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)<sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://www.moso-bamboo.com/epd))
- FSC\*: With FSC® certification
- 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: 10 years

<sup>1)</sup> Tested on panel material with 18 mm thickness, without gaps between boards, with ventilation space behind boards.

<sup>2)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.






breeam

Profile drawings available here ► [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)





-  TIM Exclusive Gardens
-  Awood
-  Olivr



**Luxurious garden** Arnhem, the Netherlands



**Villa Martini**  
Castiglioncello - Toscana, Italy

**MOSO Office**  
(35 m<sup>2</sup>) Barcelona, Spain

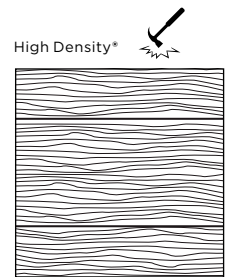
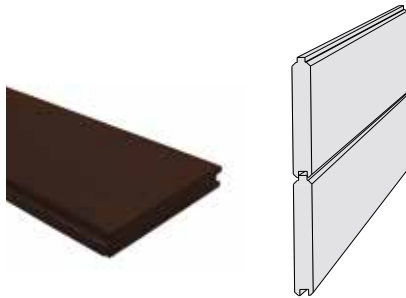


 1163 kg CO<sub>2</sub>  
 MOSO®



# MOSO® Bamboo X-treme® Fencing

MOSO® Bamboo X-treme® Fence boards are solid, Thermo-Density® exterior boards, 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 (see technical characteristics below) and the compression increases the hardness and stability. The fence boards, equipped with a tongue/groove connection, are mounted between posts with U-profiles (not provided by MOSO®). Like any untreated tropical hardwood species, when exposed to outdoor conditions, MOSO® Bamboo X-treme® will turn grey over time creating a very natural look.



Product Code	Edge groove	Finish	Surface	Length edges	End edges	End-matched	Effective width (mm)	Dimensions (mm)
BO-DTHT301TG	Tongue/Groove	Woca	Flat	2 mm x 45°	1 mm x 45°	No	131	1800x137x20

## Recommendation:

MOSO® Bamboo X-treme® Cladding profiles are also very suitable for making a fence. For example, consider installing the MOSO® Bamboo X-treme® Triple Rhombus profile vertically. ► [www.moso-bamboo.com/rhombus](http://www.moso-bamboo.com/rhombus).



## Technical characteristics and certifications

- Density: ± 1150 kg/m<sup>3</sup>
- Dimensional stability: length: + 0,1 %; width + 0,9% (24 hours in water 20°C)
- Resistance to Indentation - Brinell Hardness: ± 9.5 kg/mm<sup>2</sup> (average value - EN 15334)
- Reaction to fire: Class B-s1-d0<sup>1)</sup> (EN 13501-1)
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)<sup>2)</sup>
- Solar Reflectance (SR): 0.32 (ASTM C1549)<sup>2)</sup>
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)<sup>2)</sup>
- Modulus of Elasticity: 17366 N/mm<sup>2</sup> (20 mm), 15986 N/mm<sup>2</sup> (40 mm) (mean value - EN 408)
- Bending strength: 84.4 N/mm<sup>2</sup> (20 mm), 57.3 N/mm<sup>2</sup> (40 mm) (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)
- Effectiveness against European Termites: Class M (EN 350 / EN 117 - Coptotermes gestroi)
- Durability against larvae: Durable (EN 350 / EN 49-2)
- Use Class: Class 4 (EN 335)
- Environmental Product Declaration - EPD (EN 15804) ([www.moso-bamboo.com/epd](http://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

<sup>1)</sup> Tested on 18 mm thickness, without gaps between boards, with ventilation space behind boards.

<sup>2)</sup> Tested on 3 years weathered MOSO® Bamboo X-treme®.



Also available with FSC® certification.



The mark of responsible forestry  
FSC® C002063



breeam

Profile drawings available here ► [www.moso-bamboo.com/outdoor-profile-drawings](http://www.moso-bamboo.com/outdoor-profile-drawings)




# 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!

 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


 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

 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

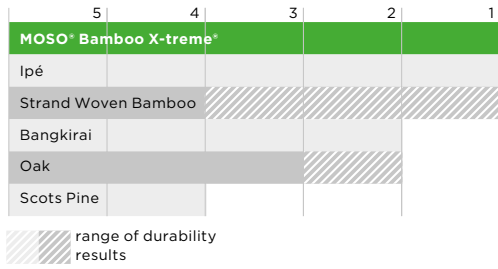
class 0

# Harder and more durable than almost any other hardwood

## Durability class

Class 1

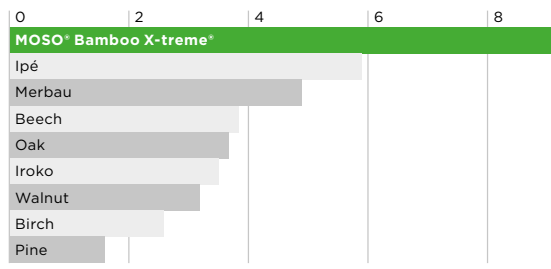
(EN 350 (CEN/TS 15083-2 / CEN/TS 15083-1))



## Average brinell hardness

± 9.5 kg/mm<sup>2</sup>

(EN 1534)



## Classification Durability Class

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

- Natural durability sufficient.
- (○) Natural durability normally sufficient, but for certain end uses treatment may be advisable.
- (○)-(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

**4. Classification and field of application**

**4.1 Reference of classification**  
This classification has been carried out in accordance with clause 12 of EN 13501-1:2007+A1:2009.

**4.2 Classification**  
The product, **BAMBOO X-TREME™ DECKING**, in relation to its reaction to fire behaviour is classified:  
**B<sub>s</sub>**  
The additional classification in relation to smoke production is:  
**s1**

**Reaction to fire classification: B<sub>s</sub> - s1**

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:  
**ds**

**Reaction to fire classification: B - s1, ds**

## Fire resistance

EN 13501-1

decking

class Bfl-s1

cladding, fencing, beams

class B-s1-d0

## Classification ASTM E84

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

## Reaction to fire

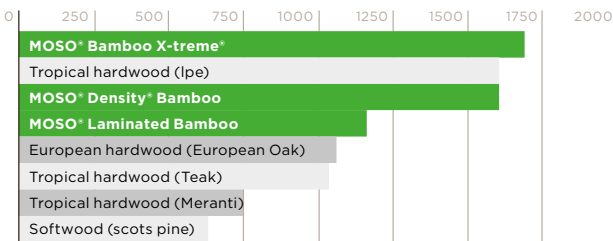
(FSI 25 / SDI 45)

ASTM E84

class A

WUI approved

CAN/ULC-S102



## Carbon footprint

CSC (Construction Stored Carbon)

EN 16449 - biogenic carbon

1.662 kg CO<sub>2</sub> per m<sup>3</sup>

in kg CO<sub>2</sub> eq/m<sup>3</sup> product

Carbon footprint (kg CO <sub>2</sub> eq.) per m <sup>2</sup> during product lifespan				Carbon footprint (kg CO <sub>2</sub> eq.) per m <sup>2</sup> after incineration		
CSC*	PRODUCTION**	TRANSPORT	TOTAL	CSC RELEASED	END OF LIFE***	TOTAL
-31,84	24,457	5,198	-2,185	31,84	-6,003	23,65

\* Construction Stored Carbon  
 \*\* Production includes all elements of making 1 m<sup>2</sup> of product, such as the raw materials, transportation to factory, production processes, waste.  
 \*\*\* End of Life takes all elements of the end of life into consideration, such as the credit received for energy recovery as well as the negative impact of incineration.

In line with circular economy principles, MOSO\* always recommends trying to upcycle or repurpose your bamboo products at the end of their life and looks at incineration as a worst case scenario. In 2021 MOSO\* fully investigated bamboo incineration for green energy production together with Renewi (Dutch waste company) and confirmed that MOSO\* Bamboo Products are classified as B grade wood (in the Netherlands) and can be safely burnt in an incineration plant for energy recovery.

CO<sub>2</sub> neutral during lifespan

EN 15804

Environmental Product Declaration (EPD)

# The sustainability of Bamboo X-treme®

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® Bamboo Products in many sustainable reference projects all over the world. FSC® is globally recognised as one of the best and most stringent responsible forestry certification system in the wood industry. MOSO® can provide, on request, all solid bamboo products with an FSC®-certification.

## Carbon footprint

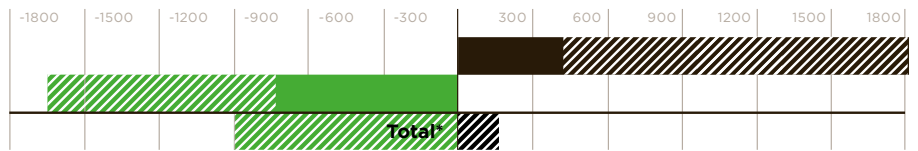
### MOSO® Bamboo X-treme®: CO<sub>2</sub> neutral during the product lifespan\*

MOSO® has conducted several LCA studies, including carbon footprint studies, together with Delft University of Technology (TU Delft) and NIBE (LCA experts). The 2015 LCA report, available at [www.moso-bamboo.com/lca](http://www.moso-bamboo.com/lca), was the first of its kind and resulted in many new findings about the carbon footprint of bamboo products. The environmental impact of MOSO® Bamboo Products, excluding the carbon sequestration effect, has also been published in 2016 and updated in 2022 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.



### Construction Stored Carbon (CSC) vs. production and transport

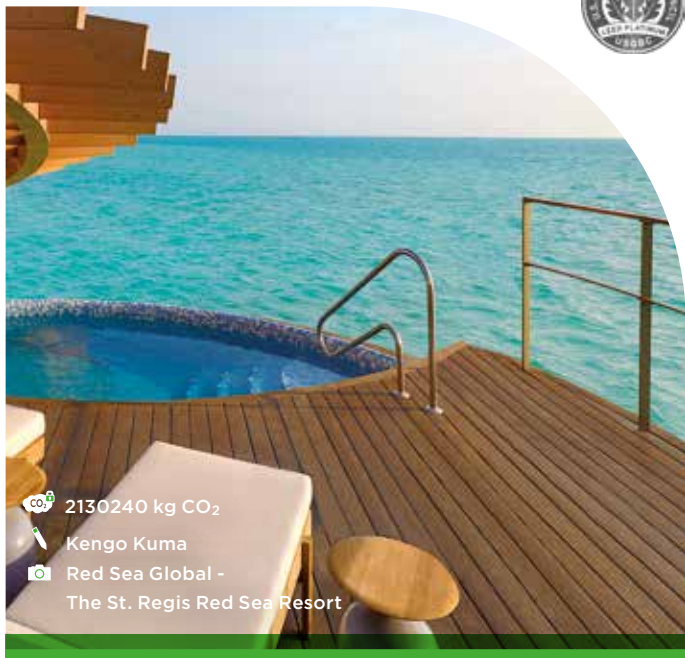


in kg CO<sub>2</sub> eq/m<sup>3</sup> product

\*) Result depending on MOSO® Product assessed

range of product results

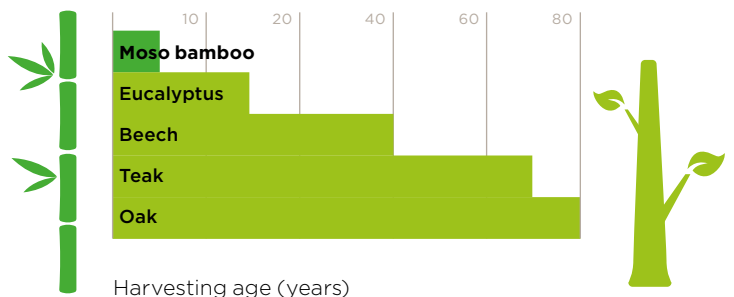
### The Red Sea - The St. Regis Red Sea Resort LEED (42445 m<sup>2</sup>) Red Sea, Saudi Arabia



## 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)).

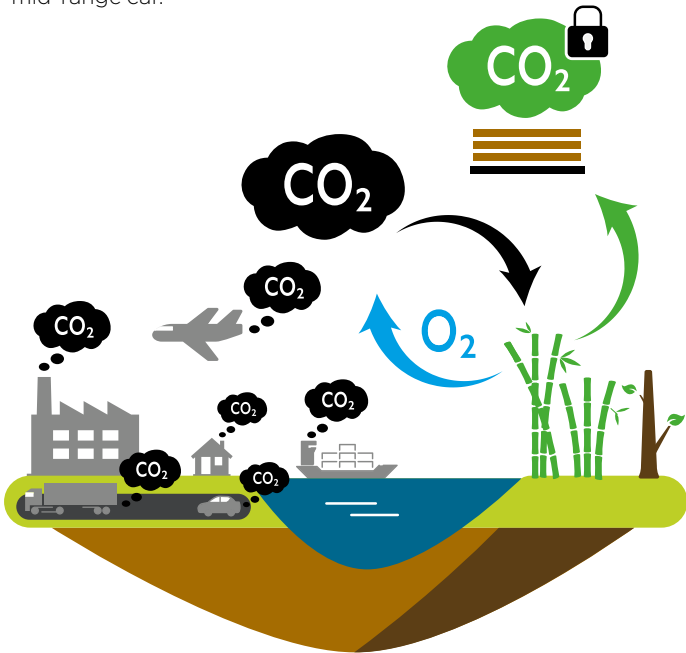




## Carbon storage in bamboo

### 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 just over 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)



breem  
 ★★★★★  
 outstanding

### Tower Saint Gobain - La Défense

LEED / BREEAM / HQE - (1000 m<sup>2</sup>) Paris, France



CO<sub>2</sub> 33234 kg CO<sub>2</sub>  
 Valode & Pistre  
 Daniel Osso

*Contributes to  
 the leading green  
 building certification  
 programs worldwide*



CO<sub>2</sub> 58159 kg CO<sub>2</sub>  
 STOFANEL  
 Detlef Klose



### Fünf Morgen Dahlem Urban Village

(1750 m<sup>2</sup>) Berlin, Germany

# MOSO®

## Bamboo X-treme®

### 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 Sikkens Cetol WF 771 finish (Ipe colour) or a comparable waterbased finish with Ipé colour pigments.

Directly after decking installation, 1 coat of Sikkens Cetol WF 771 is recommended for the unfinished version. For further details see the decking 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.

#### Decking around a swimming pool

If MOSO® Bamboo X-treme® Outdoor Decking is to be used around swimming pool areas, the following has to be taken into account: MOSO® Bamboo X-treme® is a natural (wood like) product. As with any wooden product used outdoors, there is always a risk of formation of splinters, however splinters from MOSO® Bamboo X-treme® are normally smaller than (tropical) hard wood splinters. A regular application of a finish (more frequently necessary around swimming pools) is required to reduce the formation of splinters. Furthermore, regular maintenance with the silicon carbide broom or disk is required to effectively remove splinters and smooth the surface. The boards must be installed in such a way that the surface water cannot flow directly into the pool. Also bear in mind that treated swimming pool water contains salt and chlorine which can cause the boards around the pool to "weather" and become bleached faster than the boards in areas not exposed to the swimming pool water.

#### 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.

wet condition



dry condition



**Private Residence Sardegna** decking installed near a cliff edge by the sea - Portobello di Gallura - Sardegna, Italy



Progetto di Ar.En. Studio Associato - architetti Paola Rita Farè e Luca Michelon

Endless possibilities with

## MOSO® Bamboo

## X-treme®



CO<sub>2</sub> 155533 kg CO<sub>2</sub>

MVRDV

Haagse Hoogbouw

**The Roofs residential towers** Closed cladding installed at the crown of the buildings - (2200 m<sup>2</sup>) The Hague, the Netherlands

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

CO<sub>2</sub> 83084 kg CO<sub>2</sub>  
MVSA Architects  
Lior Teitler

**Jumbo Head Office** photo taken 5 years  
after installation - (2500 m<sup>2</sup>) Schiedam, The Netherlands

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



**Riberach Hotel** photo taken 8 years after installation  
(1,200 m<sup>2</sup>) Bélesta, France

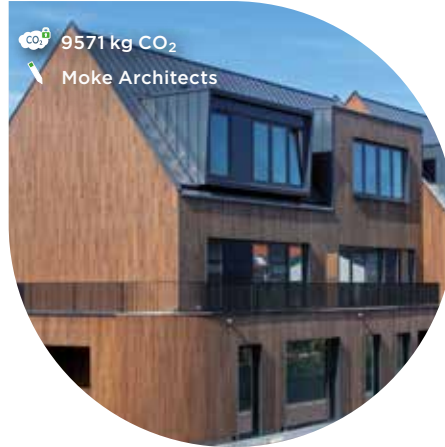
## Hotel Marqués de Riscal

(700 m<sup>2</sup>) Álava, Spain



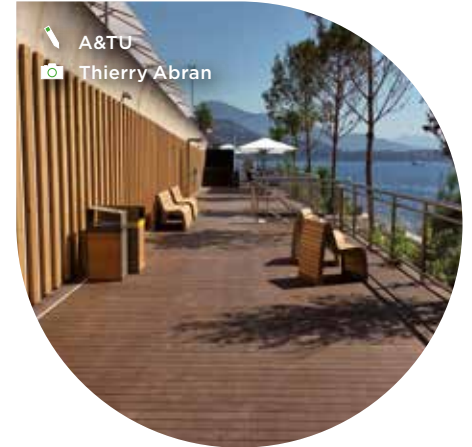
## Housing project De Krijgsman

(320 m<sup>2</sup> Closed) Muiden, Netherlands



## Solarium Beach

Monaco



See the ease of installation, cleaning and maintenance of **MOSO® Bamboo X-treme®**

**Decking** at:

[www.moso-bamboo.com/youtube/x-treme](http://www.moso-bamboo.com/youtube/x-treme)

More information about

**MOSO® Bamboo X-treme® Cladding** at:

[www.moso-bamboo.com/bamboo-cladding](http://www.moso-bamboo.com/bamboo-cladding)



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Mastering  
bamboo