

MOSO[®] Bamboo X-treme[®]

Decking Toolkit



BRT Architecten
Ronnie Zeemering

MOSO® Bamboo Decking Toolkit

With Bamboo X-treme®, MOSO® has developed a truly **ecological** and **durable** alternative to increasingly scarce tropical hardwood. 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. Discover all about Bamboo X-treme® in this complete Decking Toolkit.

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

	5	4	3
MOSO® Bamboo X-treme®			
Ipé			
Strand Woven Bamboo			
Bangkirai			
Oak			
Scots Pine			

range of durability results

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from bamboo to Bamboo X-treme®

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



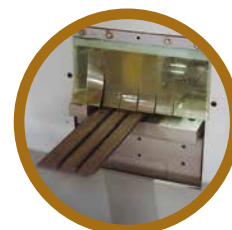
split the Moso
bamboo stems,
remove the
outer skin and
crush the
strips into
strands



compressing
the strands into
Thermo-
Density®
material



creating the final profile
and surface



MOSO® Bamboo X-treme®: material 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					

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.

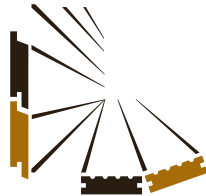
Only MOSO® can ensure you have the original, unique Bamboo X-treme® product. Other products that attempt to copy the original, do not offer the same quality or level of durability, dimensional stability and ecology. With a look-alike product, there is a large risk of claims after installation. **Always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

discover the **Bamboo** X-treme® benefits



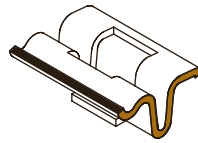
hard & durable

- 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 >9.5 kg/mm² (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.
- Only 5-6 mm expansion 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® Fasteners make it easy to install and uninstall.
- End-match system simplifies the installation by allowing the joint to float between the joists.
- Complementing Thermo-Density® 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.
- Use of hidden MOSO® Fasteners avoids face screwing and plugging.
- Free of knots and natural plant resins.
- Choice between natural greying or retaining the brown colour with an exterior finish.



endless resource

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



CO₂ neutral

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



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® Bamboo X-treme® can be easily applied in public projects without additional protective measures.

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

MOSO[®] Bamboo Inspiration

Jumbo Head Office



Jumbo Head Office

Schiedam, The Netherlands



MVSA Architects
Lior Teitler

MOSO® Bamboo X-treme®
2500 m²



Bamboo terraces around head office

Jumbo Maritime's head office is located along the river Maas, close to the port of Rotterdam. Jumbo is a heavy lift shipping and offshore transportation & installation contractor. Jumbo has been developing pioneering solutions for ocean transportation and is a strong partner in the offshore subsea installation market. Around the head office, installed in 2014, is one of the first large-scale Bamboo X-treme® terraces in the Netherlands. The photography shown in this inspiration project is taken 5 years after installation and shows the extreme high stability and beautiful weathering.





Material choice in line with company philosophy

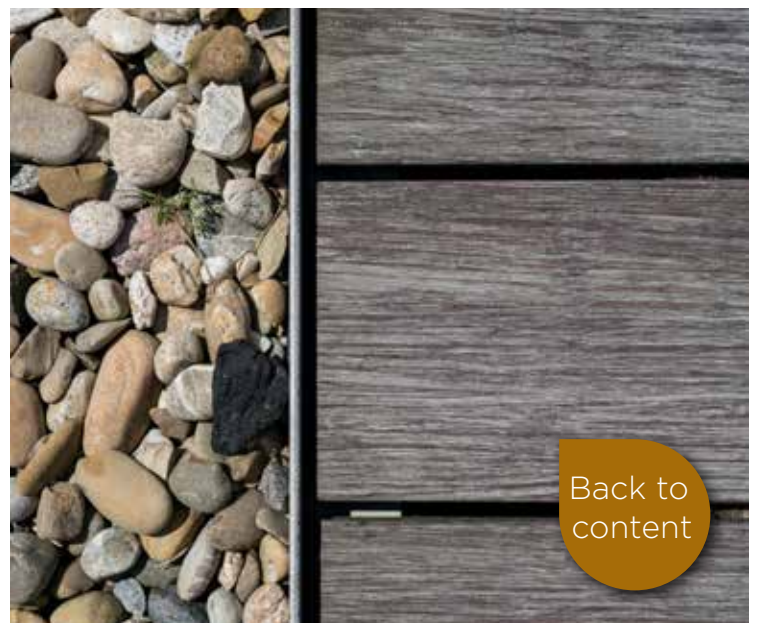
As a Dutch company, Jumbo is an international player with a proven track record. In the company philosophy, engineering, safety awareness and environmental care come first. This is reflected in the investments the company makes in the development of equipment and software, the programmes for employees and certainly in the head office. MVSA Architects designed Jumbo's entire head office, which was greatly inspired by the water and the surrounding ports. The office exudes space and robustness and features numerous bamboo accents.





Pictures taken 5 years after installation

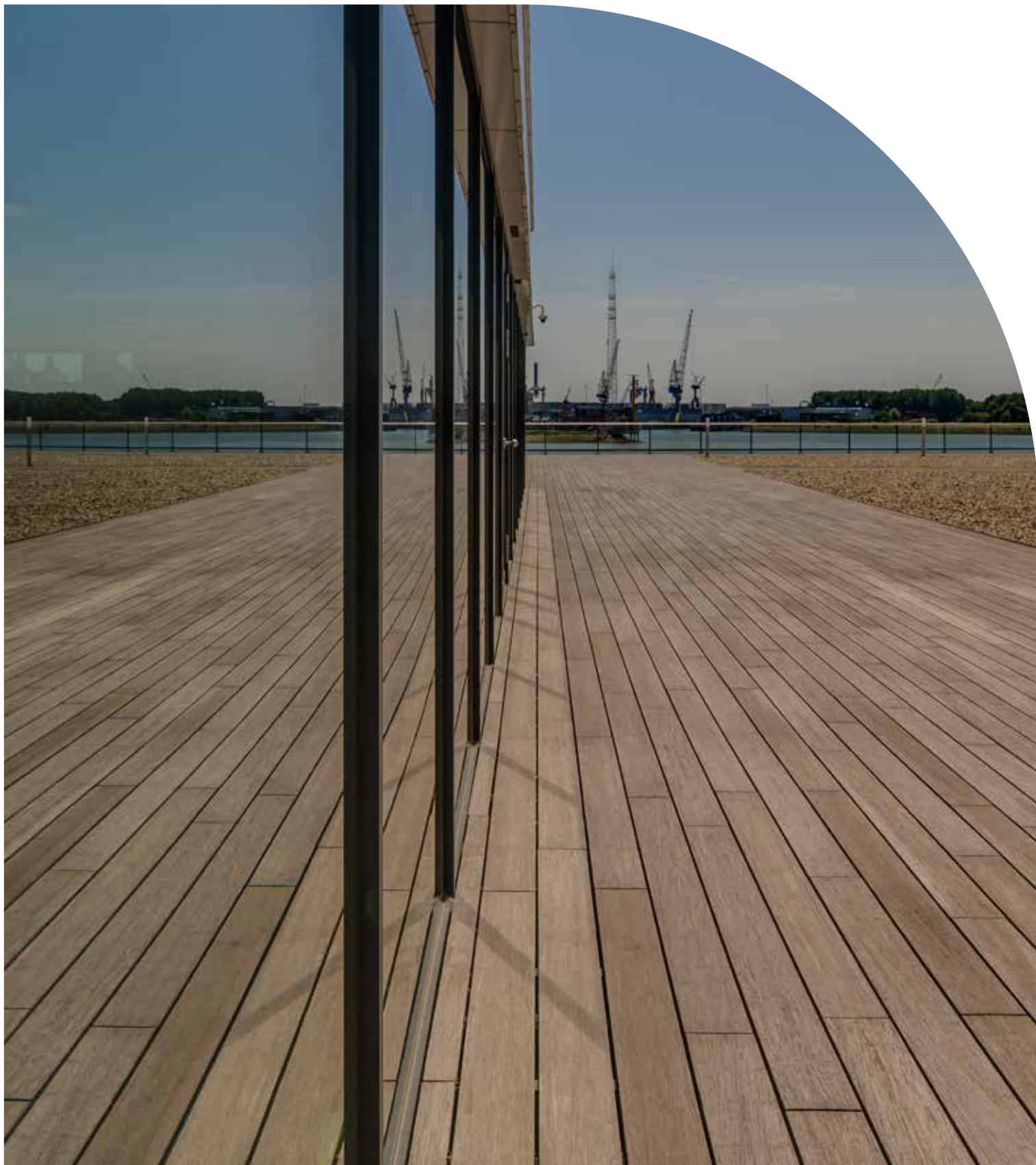
On the Maas, where moisture always plays a role, MVSA Architects were looking for a stable type of wood for the terraces. Both the roof terrace, with a view of the river Maas, and the walkways around the office were designed with wooden decking as the main feature. This gave the roof terrace the feeling of standing on a ship's deck, overlooking the harbours. MOSO® decking was selected and a total of over 2,500 m² of Bamboo X-treme® was installed in March 2013.



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Sustainability of bamboo decking

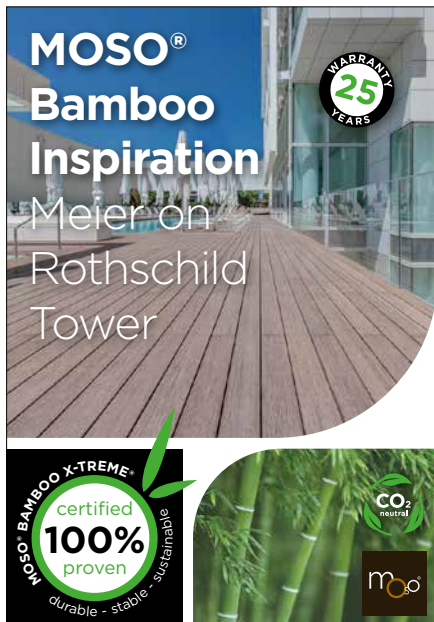
In 2018, more than 5 years after installation, MOSO® visited Jumbo headquarters again to see how Bamboo X-treme® reacts to many years of wind and weather in the port. Results of this can be seen on the pictures in this project report. The bamboo decking boards are completely greyed, but are still as straight in the terraces as they were immediately after installation. The terrace has been cleaned regularly over the years, which gives it its fresh brown-grey colour.



More Bamboo

Decking Inspiration

Downloads



Online

Wellnessresidenz Alpenrose
(300 m²) Maurach/Achensee, Austria



De Banjaard
Noord-Beveland, The Netherlands



Marine Dock Candlewood Lake
(582 m²) Mt. Gilead, Ohio, USA






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 of the test species is compared to the median mass loss of the Beech or Pine references. Hardwoods are compared to Beech, Softwoods are compared to Pine. As Bamboo is neither softwood nor hardwood a comparison is made with both reference wood species Pine sapwood and Beech.


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

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

durability

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

class 1

 Durability of 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

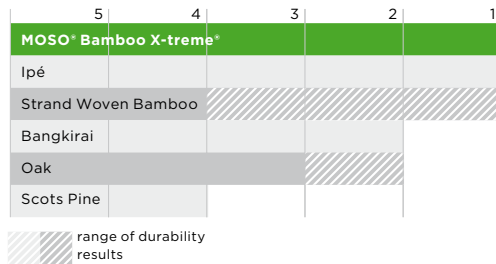
class 0

harder and more durable than almost any other hardwood

durability class

class 1

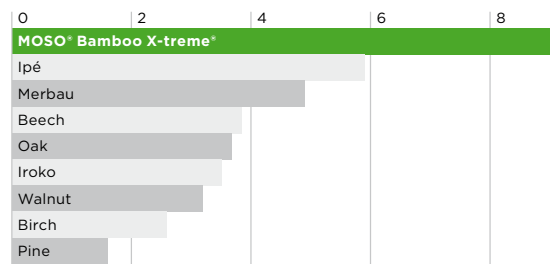
(EN 350 (CEN/TS 15083-2 / CEN/TS 15083-1))



average brinell hardness

9.5 kg/mm²

(EN 1534)



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

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_s
The additional classification in relation to smoke production is:
s1

Reaction to fire classification: B_s - s1

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

decking

class Bfl-s1

cladding, fencing, beams

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 (CO₂eq) per kg final product

Eco-costs (€) per kg final product

Carbon Footprint (CO ₂ eq) per kg final product					Eco-costs (€) per kg final product			
PRODUCTION	END OF LIFE	CO ₂	CO ₂	CO ₂	PRODUCTION	END OF LIFE	ECO-COSTS	ECO-COSTS
CO ₂ footprint	CO ₂ credit	Storage	Total	Neutral	Eco-costs	Eco-costs	CO ₂ storage	Total
CO ₂ eq/kg	CO ₂ eq/kg	CO ₂ eq/kg	CO ₂ eq/kg	Y / N	Euro/kg	Euro/kg	Euro/kg	Euro/kg
1,193	-0,704	-0,607	-0,118	Yes	0,356	-0,132	-0,082	0,142

carbon footprint

ISO 14040/44

CO₂ 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
The full report is available on request.

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Author:
Dr. Vogtlander J.G. (2014). Life Cycle Assessment and Carbon Sequestration - Update 2014 - Bamboo products of Moso International. Associate professor - Design for Sustainability - Delft University of Technology.



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the sustainability of Bamboo X-treme®

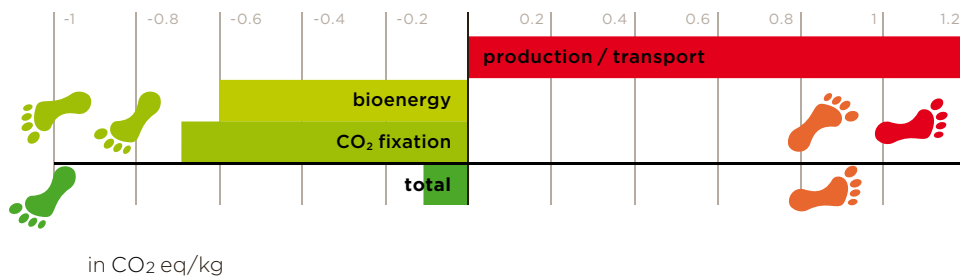
MOSO® Bamboo X-treme® offers clear sustainable advantages and is even proven to be CO₂ neutral during the product lifespan! The inclusion of Bamboo X-treme® contributes to a higher LEED, BREEAM, Green Star, HQE and DGNB certification score for green building projects. That's one of the reasons why you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

carbon footprint

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

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

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



Venco Campus BREEAM

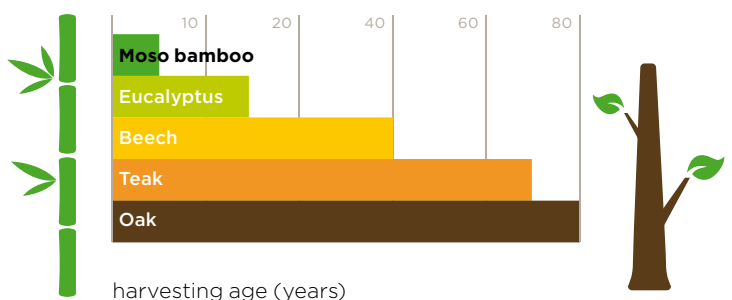
Eersel, the Netherlands



unsurpassed growing speed

bamboo: the fastest growing plant in the world

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





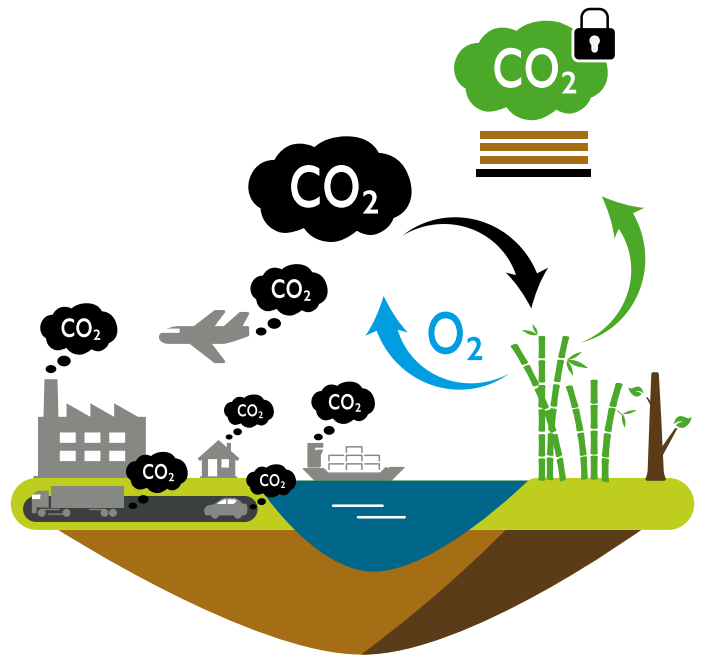
Check out how bamboo can save the world at:
www.moso-bamboo.com/sustainability



carbon storage in bamboo

biobased materials act as CO₂ sinks

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



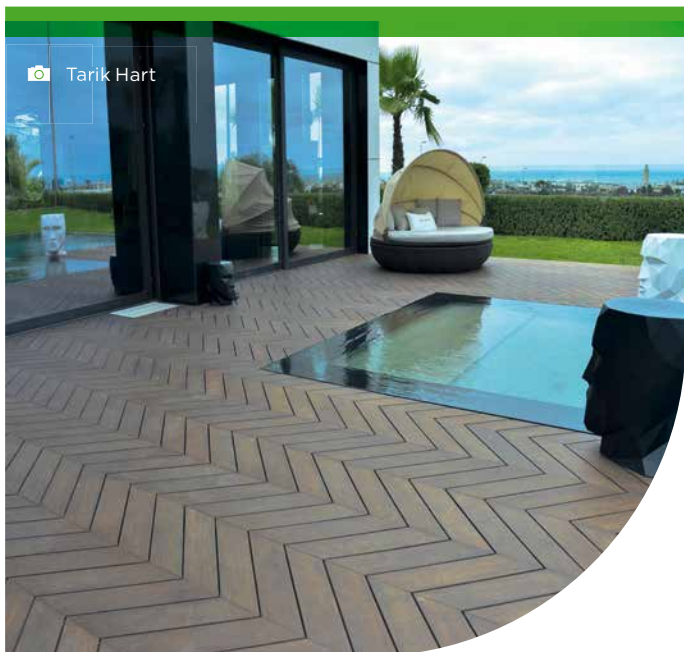
contribution MOSO® Bamboo Products to LEED & BREEAM

LEED BD+C - v4	contribution	flooring	beams, panels & veneer	outdoor (bamboo x-treme®)
MR Credit - Building life-cycle impact reduction	direct	yes (if solid)	yes	yes
MR Credit - Building product disclosure and optimization - environmental product declarations	direct	yes (if solid)	yes	yes
MR Credit - Building product disclosure and optimization - sourcing of raw materials	direct	yes (if requested with FSC®)	yes (if requested with FSC®)	yes (if requested with FSC®)
MR Credit - Building product disclosure and optimization - material ingredients (Reach optimization)	direct	yes	yes	yes
EQ Credit - Low Emitting Materials	direct	yes	yes	
SS Credit - Heat Island Reduction	direct			yes
IN Credit - Innovation	direct	yes (if used in innovative applications or if helps to meet twice the criteria limit)	yes (if used in innovative applications or if helps to meet twice the criteria limit)	yes (if used in innovative applications or if helps to meet twice the criteria limit)
EQ Credit - Interior Lighting	indirect	yes (if natural colour)	yes (if natural colour)	
EQ Credit - Acoustic performance	indirect		yes (optional)	
BREEAM International (2016) credit	contribution	flooring	beams, panels & veneer	outdoor (bamboo x-treme®)
HEA 2 - Indoor Air Quality	direct	yes	yes	yes (if used indoors)
MAT 1 - Life Cycle Impacts	direct	yes (if solid)	yes	yes
MAT 3 - Responsible Sourcing of construction products	direct	yes (if requested with FSC®)	yes (if requested with FSC®)	yes (if requested with FSC®)
MAT 5 - Designing for durability and resilience	direct	yes (if High Density®)	yes (if High Density®)	yes
Innovation	direct	yes (if used in an innovative application)	yes (if used in an innovative application)	yes (if used in an innovative application)
MAN 2 - Life cycle cost and service life planning	indirect	yes (if High Density®)	yes (if High Density®)	yes
HEA 1 - Visual comfort	indirect	yes (if natural colour)	yes (if natural colour)	
HEA 5 - Acoustic performance	indirect		yes (optional)	



📷 Tim Baynham - Wildlife Safety Solutions

Imagine Africa - Luxury Tented Camp (900 m²) South Africa



📷 Tarik Hart

Private Residence Casablanca
Casablanca, Morocco

Bridge Pont d'Issy Orange Head Office
(1200 m²) Issy-les-Moulineaux, France



📷 Viguier
Daniel Osso Photographe

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MOSO® Bamboo X-treme® Outdoor decking

finished with Woca / unfinished

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)



Curved



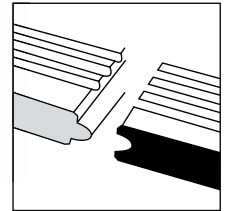
V-Groove / Brushed
(reversible)



2 Non-slip lines



End-matched



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

Oiled Woca*	Unfinished	Surface	Edge groove	End-matched	Length edges	End edges	Dimensions (mm)
BO-DTHT171G	BO-DTHT170G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT171G1	BO-DTHT170G1	Standard Groove/Flat	One side	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT181G		Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x137x18
BO-DTHT171G-AS2		2 Non-slip lines	Yes	Yes	R3	2 mm x 45°	1850x137x20
BO-DTHT371	BO-DTHT370	Standard Groove/Flat	No	Yes	R3	2 mm x 45°	1850x137x30
BO-DTHT191G	BO-DTHT190G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT191G-C		Curved	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT191GV-R		V-Groove/Brushed	Yes	Yes	R3	2 mm x 45°	1850x155x20
BO-DTHT211G	BO-DTHT210G	Standard Groove/Flat	Yes	Yes	R3	2 mm x 45°	1850x178x20
BO-DTHT231GV-R		V-Groove/Brushed	Yes	Yes	R3	2 mm x 45°	1850x208x20
BO-DTHT163G-CHV		Chevron Flat	Yes	No	R3	2 mm x 45°	566(703)x137x20

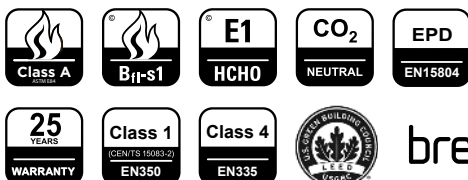
installation summary

- Install suitable, fixed, stable and durable sub frame joists. MOSO recommends the use of MOSO® Bamboo X-treme® Sub frame joists.
- Determine which side of the board will be used: the grooved or flat surface.
- 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. The slope is not necessary for the curved boards.
- After installation: make sure proper cleaning and maintenance is done, according to the chosen finish.
- When not applying outdoor oil 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 pre-oiled or unfinished. In order to maintain the rich brown colour an exterior penetrating oil for hardwoods is recommended to be applied 3 to 4 months after installation. We advise to apply the initial coat 3-4 months after installation.
- For further info: please see the installation/maintenance instructions.
- 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
- Installation instructions for chevron decking board available at ► www.moso-bamboo.com/x-treme/decking-chevron

technical characteristics and certifications

- Density: +/- 1150 kg/m³
- Dimensional stability: length: + 0.1%; width + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Mean value Brinell Hardness: ≥ 9.5 kg/mm² (EN 1534)
- Reaction to fire: Class 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)¹⁾
- Solar Reflectance (SR): 0.32 (ASTM C1549)¹⁾
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)¹⁾
- Modulus of Elasticity: 13565 N/mm² (mean value - EN 408)
- Bending strength: 54.4 N/mm² (characteristic value - EN 408)
- Biological durability: Class 1 (EN 350 / CEN/TS 15083-2), simulated graveyard test / Class 1 (EN 350 / CEN/TS 15083-1)
- Effectiveness against Blue Stain: Class 0 (EN 152)
- Use Class: Class 4 (EN 335)
- CO₂ neutral: LCA report TU Delft (ISO 14040/44) (www.moso-bamboo.com/lca)
- Environmental Product Declaration - EPD (EN 15804) (www.moso-bamboo.com/epd)
- FSC®: Products available with FSC® certification on request.
- Contribution LEED BD+C - v4: MR 1, MR 2, MR 3 (FSC®), EQ 2, SS 7 v2009: MR 6, MR 7 (FSC®), IEQ 4.3, IEQ 4.4
- Contribution BREEAM: MAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Guarantee: 25 years

¹⁾ Tested on 3 years weathered MOSO® Bamboo X-treme®.



The mark of responsible forestry
FSC® C002063

MOSO® Bamboo X-treme® Outdoor decking

finished with Sikkens Cetol / unfinished

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)



Curved



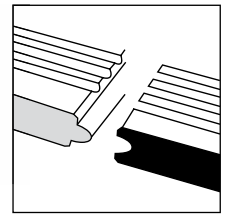
V-Groove / Brushed
(reversible)



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-DTHT171G1-01	BO-DTHT170G1	Standard Groove/Flat	One side	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-DTHT181-01	BO-DTHT180G	Standard Groove/Flat	No - endprofile	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

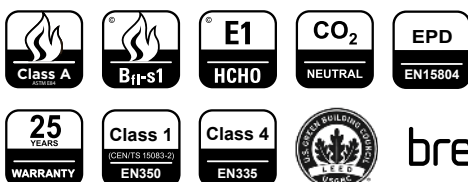
installation summary

- Install suitable, fixed, stable and durable sub frame joists. MOSO advises the use of MOSO® Bamboo X-treme® 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. The slope is not necessary for the curved boards.
- 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
- Installation instructions for chevron decking board available at ► www.moso-bamboo.com/x-treme/decking-chevron

technical characteristics and certifications

- Density: +/- 1150 kg/m³
- Dimensional stability: length: + 0.1 %; width + 0.9% (24 hours in water 20°C)
- Resistance to Indentation - Average Brinell Hardness: ≥ 9.5 kg/mm² (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: R10 (Standard Groove/Flat), R11 (Brushed), R13 (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)¹⁾
- Solar Reflectance (SR): 0.32 (ASTM C1549)¹⁾
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)¹⁾
- Modulus of Elasticity: 13565 N/mm² (mean value - EN 408)
- Bending strength: 54.4 N/mm² (characteristic value - EN 408)
- Biological durability: Class 1 (EN 350 / CEN/TS 15083-2), simulated graveyard test / Class 1 (EN 350 / CEN/TS 15083-1)
- Effectiveness against Blue Stain: Class 0 (EN 152)
- Use Class: Class 4 (EN 335)
- CO₂ neutral: LCA report TU Delft (ISO 14040/44) (www.moso-bamboo.com/lca)
- Environmental Product Declaration - EPD (EN 15804) (www.moso-bamboo.com/epd)
- FSC®: Products available with FSC® certification on request.
- Contribution LEED BD+C - v4: MR 1, MR 2, MR 3 (FSC®), EQ 2, SS 7 v2009: MR 6, MR 7 (FSC®), IEQ 4.3, IEQ 4.4
- Contribution BREEAM: MAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Guarantee: 25 years

¹⁾ Tested on 3 years weathered MOSO® Bamboo X-treme®.



breem

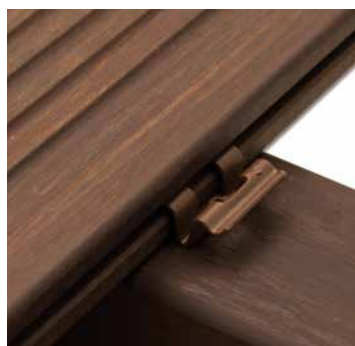


MOSO® Bamboo X-treme® Outdoor Decking & Cladding accessories

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-SCREW-BX08	Fastener Asymmetric with screw (20 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x10.8	4.5x30
CLIP-BX08	Fastener Asymmetric without screw (20 mm)	Stainless steel A2 (AISI304)	Brown	27x22.5x10.8	
CLIP-SCREW-BX801	Fastener Start/End Top with screw (20 mm)	Stainless steel A2 (AISI304)	Brown	29x25x11.2	4.5x30
CLIP-SCREW-BX09	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	
SCREW-BX11-01	Screw for aluminium sub frame joist	Stainless steel S410 (AISI410)	Black*		4x20
CHEVRON-TOOL01	Chevron installation tool	Wood			



recommended number of fasteners/m²

decking*	cladding**
137 mm board width -20 pcs/m ²	137 mm board width -14 pcs/m ²
155 mm board width -17 pcs/m ²	75 mm board width -26 pcs/m ²
178 mm board width -14 pcs/m ²	
208 mm board width -13 pcs/m ²	

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

**) Based on distance of 600 mm between the sub frame joist centres.

CLIP-SCREW-BX08 / BX09
CLIP-BX08 / BX09



CLIP-SCREW-BX801



SCREW-BX11-01
* Only black screw head



BO-SB155



BO-DTHT171G1 / BO-DTHT170G1



BO-DTHTB171G



MOSO® Bamboo X-treme® additional products

The MOSO® Bamboo X-treme® additional products are made of the same material as the decking boards: Thermo-Density® heat-treated bamboo. MOSO® recommends the use of Bamboo X-treme® 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 stairs.

Product Code	Material	Finish	Dimensions (mm)
BO-SB155	Sub frame joist	Unfinished	2440x60x40
BO-DTHT170G1	Fascia board, 1 edge groove	Unfinished	1850x137x20
BO-DTHT171G1	Fascia board, 1 edge groove	Woca	1850x137x20
BO-DTHT181	Fascia board	Woca	1850x137x18
BO-DTHTB171G	Edge profile, 2 edge grooves	Woca	1850x65x30/20

Maintenance & cleaning products

Under the influence of wind, rain, sun and snow the decking will weather. MOSO® recommends impregnating and maintaining the pre-oiled decking with Woca maintenance materials. It is recommended to finish the unfinished decking with Woca Exterior Wood Oil right after installation, but no later than after the first winter. The silicon carbide broom and machine disk are perfectly suited to clean and smooth the decking surface of Bamboo X-treme® and to remove splinters due to the capability to sand the surface in addition to cleaning it.

Product Code	Item
SEALER-05	Sealer for ends of boards 250 ml
DISK-01	16" Silicon carbide disk
BROOM-01	Silicon carbide broom
CLEANER-WOCA-01	Woca Exterior Wood Cleaner 2.5 ltr
OIL-WOCA-011	Woca Exterior Wood Oil Teak 2.5 ltr
APPLICATOR	Woca Applicator set for oil

MOSO® Bamboo X-treme® Outdoor Decking

installation instructions

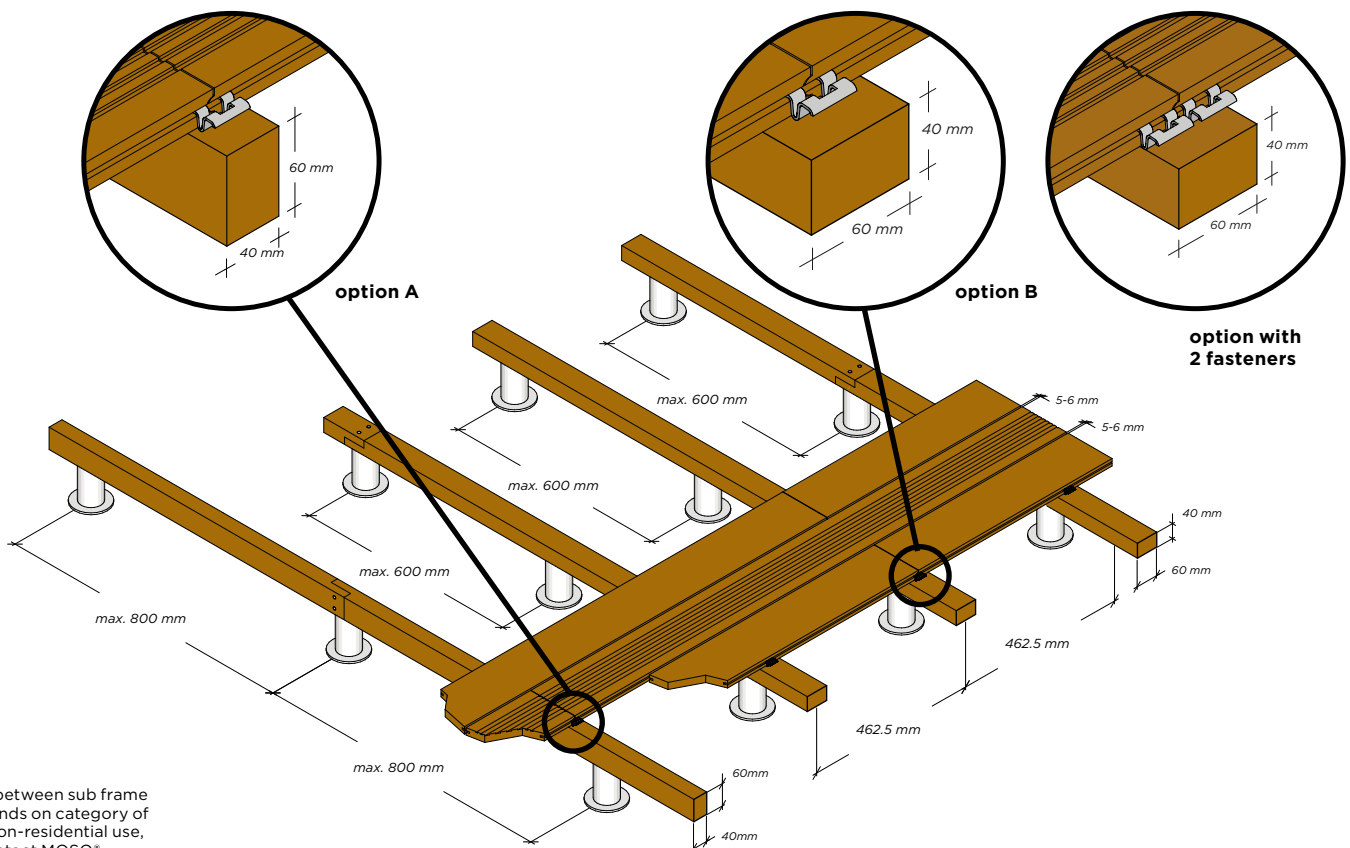
before installation

- 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.
- Install 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 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® Bamboo X-treme® 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® 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.
- 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.

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.
- 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.



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® Bamboo X-treme® Fastener installation this is automatically the case.
- Because of 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.
- 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 m², 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

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 stainless steel quality decking 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

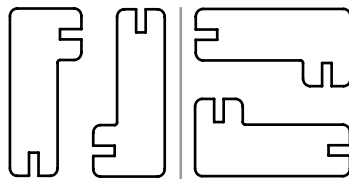
It is also possible to install the decking boards in a chevron pattern. Please follow the installation instructions at:

www.moso-bamboo.com/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 substructure in the following sequence (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 millimeters. 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

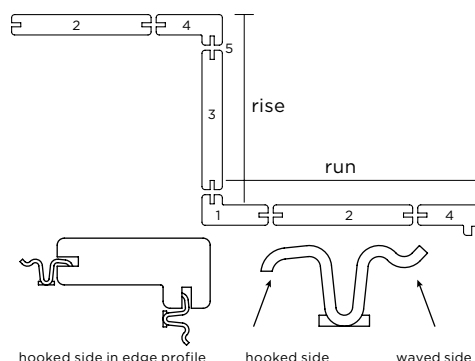


vertical orientation run (board 2)
 137 mm = 189 mm
 155 mm = 207 mm
 178 mm = 230 mm

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

prefinished version

- MOSO® Bamboo X-treme® Outdoor Decking is pre-oiled, double sided, with Woca Exterior Wood Oil (teak colour).
- Clean the floor at least one time per year with Woca Exterior Wood Cleaner and the silicon carbide broom or disk. Follow the instructions at: www.moso-bamboo.com/youtube/x-treme Depending on climate and use it may be necessary to perform cleaning more than once per year.
- Remove the dirt water residue on the boards with clean water and let the surface dry.
- Apply 1-2 new layers of Woca Exterior Wood Oil (teak colour). This maintenance should be undertaken 1-2 times a year to prevent the bamboo becoming grey and losing its characteristic bamboo grain. The best time to do initial oiling is 3 to 4 months after installation, or after the first winter, when the surface is more open than immediately after installation. Follow the instructions at: www.moso-bamboo.com/youtube/x-treme
- It is advisable to keep the decking free from dust and dirt as much as possible (clean by broom regularly).

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 Woca Exterior Wood Oil 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 please follow MOSO® maintenance & cleaning instructions for oiling.
- After this first application the decking can remain without oil treatment for natural greying. However annual cleaning with the silicon carbide broom or disk is obligatory. If you want to keep a darker colour, regular application with Woca Exterior Wood Oil is needed.
- 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 builder

These instructions are subject to char version visit: www.moso-bamboo.com

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Back to content

MOSO® Bamboo X-treme® Outdoor decking maintenance & cleaning with Woca

maintenance Woca

The surface of decking is weathered under influence of wind, rain, frost and sunshine (UV). As a result, the surface turns grey, dirty and cracks/splinters will appear. WoodCare Denmark has developed different outdoor cleaning and maintenance products. Woca Exterior Wood Cleaner loosens dirt and removes green growth from the surface, without damaging it.

maintenance of flat surface

Please be aware 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 with Woca Exterior Wood Oil, 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 (see accessories). 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 oil

- Apply in dry weather only. Avoid direct sunlight and high temperatures.
- Stir the oil thoroughly before use. Apply an even thin coat of oil with an applicator (see accessories) or a brush (decking with non slip grit only with a brush).
- The oil is cream-coloured when it is wet.
- After a few minutes, the material has an oily appearance as the water is evaporating.
- Wipe off any excess oil with clean cotton cloths after no more than 5-10 minutes.
- Take particular care to remove excess oil from joints and grooves.
- Repeat the above process.
- When the material is dry, it may be polished with a polishing pad or polishing machine to ensure an extra hard-wearing surface. It takes 24 to 48 hours for the oil to harden thoroughly, depending on weather conditions and outdoor temperature. The material should not be exposed to water during this period.
- 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.
- Woca Exterior Wood Oil: 12 - 15 m² / litre.

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.

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

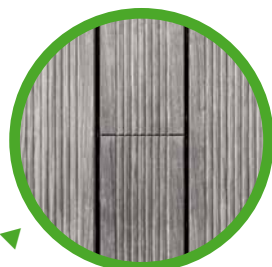
new, non-weathered decking



after 3 months of weathering



after 18 months of weathering



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

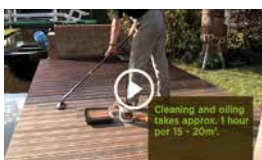
weathered, dirty decking



re-oiled decking



weathered, cleaned decking



Check out the maintenance and cleaning movie at:
www.moso-bamboo.com/youtube/x-treme

MOSO® Bamboo X-treme® Outdoor decking maintenance & cleaning with Sikken's Cetol

maintenance Sikken's Cetol WF 771

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. Sikken's 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 (see accessories). 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 Sikken's 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 Sikken's 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.
- Sikken's Cetol WF 771 Ipe - for the first treatment: 10 - 12 m² / litre (for 1 coat of finish).
- Sikken's Cetol WF 771 - for periodic maintenance: 14 - 15 m² / 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.

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:

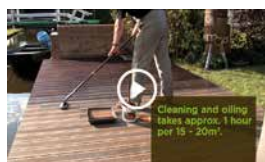
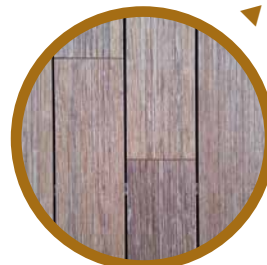
weathered, dirty decking



re-oiled decking



weathered, cleaned decking





Check out the maintenance and cleaning movie at:
www.moso-bamboo.com/youtube/x-treme




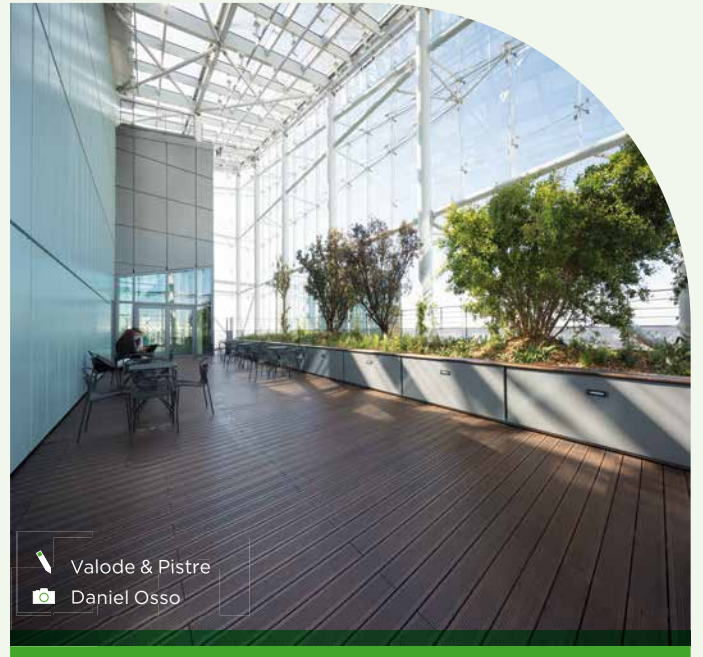
Riberach Hotel photo taken 8 years after installation
(1.200 m²) Bélesta, France

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



Tour Saint Gobain - La Défense
 LEED / BREEAM / HQE - (1000 m²) Paris, France
 



*Contributes to
the leading green
building certification
programs worldwide*




Fünf Morgen Dahlem Urban Village
 (1750 m²) 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 Woca Exterior Wood Oil or a comparable waterbased oil/saturator with teak colour pigments.

Directly after installation, but even better after 3-4 months, 1 coat of oil (pre-oiled version) or 2 layers of oil (unfinished version) have to be applied. 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.

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 oil (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.

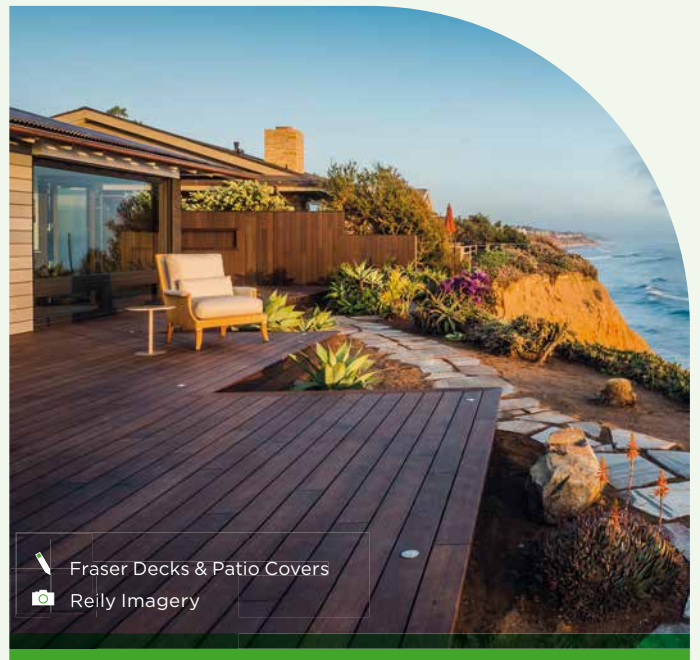
wet condition



dry condition



Private Residence Solana Beach low clearance decking installed near a cliff edge by the sea - (325 m²) California, USA



Endless possibilities with

MOSO® Bamboo

X-treme®



Altmühltherme Wellness decking with FSC® certification installed on a steel structure - (1000 m²) Treuchtlingen, Germany



 BRT Architecten
 Awood
 Ronnie Zeemering

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




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

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

Leisure space Burgos
Villaciencio, Burgos, Spain



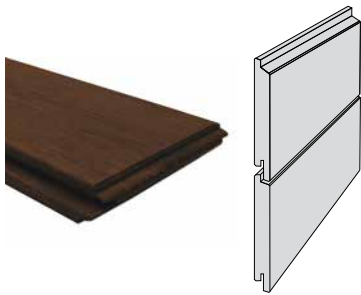
 A3GM Arquitectos
 Javier Bravo

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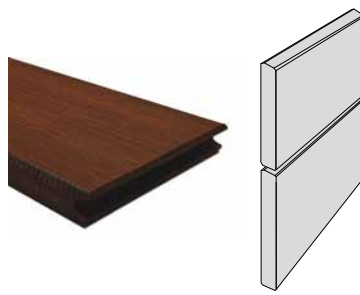
MOSO® Bamboo X-treme® Outdoor Cladding

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

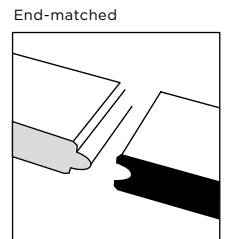
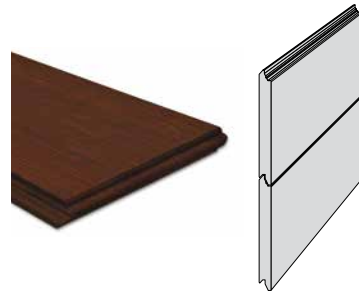
Rebated profile



Trapezium profile



Closed profile



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

Product Code	Shape	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°	128	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
BO-DTHT530	Closed profile	Unfinished	Flat	Yes	R1	2 mm x 45°	124.5	1850x137x18

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 used screw matches such materials during the full lifetime of the product.
- 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

technical characteristics and certifications

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

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

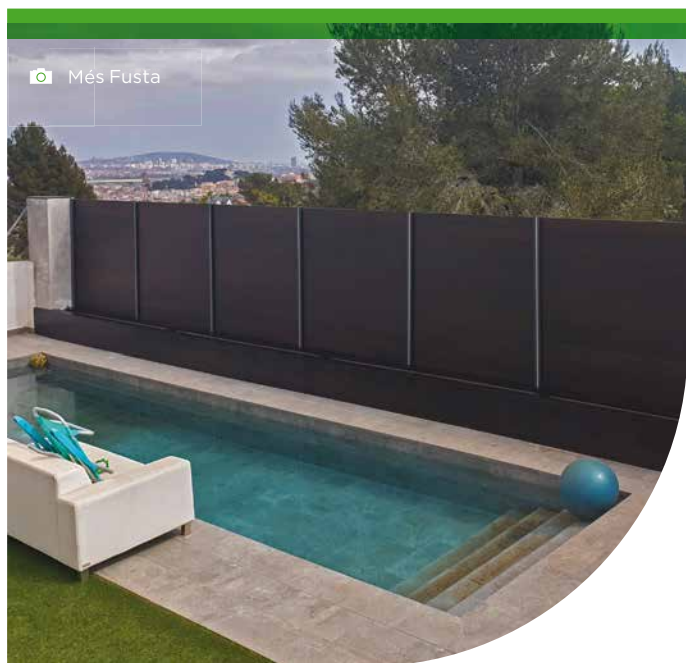
²⁾ Tested on 3 years weathered MOSO® Bamboo X-treme®.



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FSC® C002063



MOSO Office (35 m²) Barcelona, Spain



Private Residence
(30 m²) Sant Boi del Llobregat, Spain

The Versailles Apartment Complex
(418 m²) Philadelphia, United States of America



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.

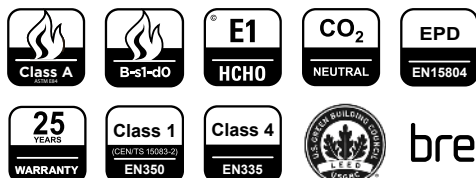


Product Code	Edge groove	Finish	Surface	Lenght edges	End edges	End-matched	Effective width (mm)	Dimensions (mm)
BO-DTHT30ITG	Tongue/Groove	Woca	Flat	2 mm x 45°	1 mm x 45°	No	131	1800x137x20

technical characteristics and certifications


- Density: +/- 1150 kg/m³
- Dimensional stability: length: + 0,1%; width + 0,9% (24 hours in water 20°C)
- Resistance to Indentation - Mean value Brinell Hardness: ≥ 9.5 kg/mm² (EN 1534)
- Reaction to fire: Class B-s1-d0¹⁾ (EN 13501-1)
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)²⁾
- Solar Reflectance (SR): 0.32 (ASTM C1549)²⁾
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)²⁾
- Modulus of Elasticity: 13565 N/mm² (mean value - EN 408)
- Bending strength: 54.4 N/mm² (characteristic value - EN 408)
- Biological durability: Class 1 (EN 350 / CEN/TS 15083-2), simulated graveyard test Class 1 (EN 350 / CEN/TS 15083-1)
- Effectiveness against Blue Stain: Class 0 (EN 152)
- Use Class: Class 4 (EN 335)
- CO₂ neutral: LCA report TU Delft (ISO 14040/44) (www.moso-bamboo.com/lca)
- Environmental Product Declaration - EPD (EN 15804) (www.moso-bamboo.com/epd)
- FSC®: Products available with FSC® certification on request.
- Contribution LEED BD+C - v4: MR 1, MR 2, MR 3 (FSC®), SS 7 v2009: MR 6, MR 7 (FSC®)
- Contribution BREEAM: MAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Guarantee: 25 years

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

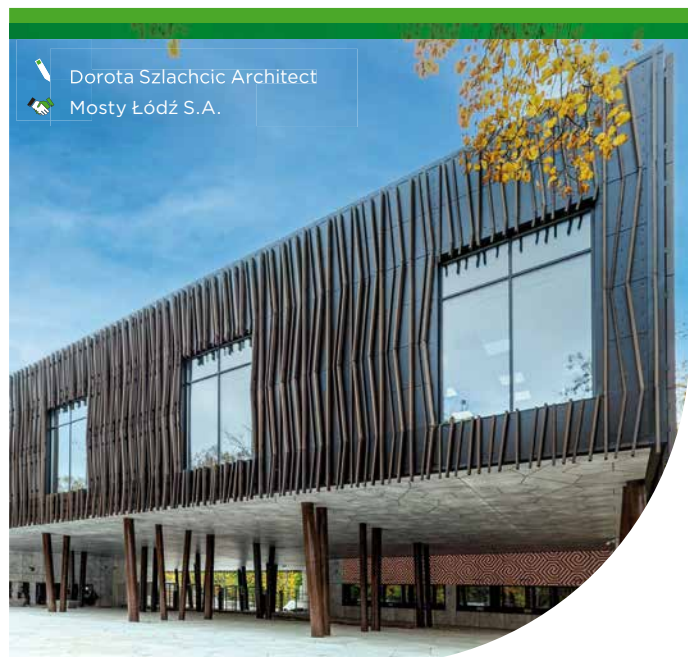




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 SPEE Architects
 Awood
 Ossip van Duivenbode

SPEEHUIS (10.000 m) The Netherlands



 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

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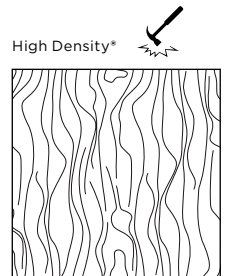
MOSO® Bamboo X-treme® Outdoor Beams

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 products. 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
2000 x 80 x 40 mm



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



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

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

installation summary

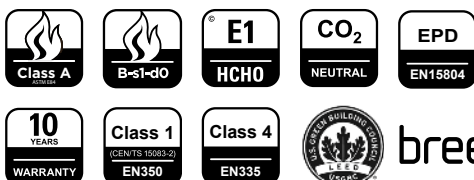
- To allow natural shrink- and swell behaviour, install beams with a minimum of 4 mm distance.
- MOSO® Bamboo X-treme® Beams must be mechanically fixed, using screws/bolts. The fixing method depends on the application.
- Use stainless steel A2 screws/bolts.
- For all our standard size beams, except 40x40 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 depends 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, end of the beam must be treated with a sealer.
- 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

technical characteristics and certifications

- Density: +/- 1150 kg/m³
- Dimensional stability: length: + 0,1%; width + 0,9% (24 hours in water 20°C)
- Resistance to Indentation - Mean value Brinell Hardness: ≥ 9.5 kg/mm² (EN 1534)
- Reaction to fire: Class B-s1-d0¹⁾ (EN 13501-1), applicable as a material test
- Flame spread index: Class A (ASTM E84)
- Thermal emittance: 0.81 (ASTM C1371)²⁾
- Solar Reflectance (SR): 0.32 (ASTM C1549)²⁾
- Solar Reflectance Index (SRI): Low 27, Medium 30, High 33 (ASTM E1980)²⁾
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- Use Class: Class 4 (EN 335)
- CO₂ neutral: LCA report TU Delft (ISO 14040/44) (www.moso-bamboo.com/lca)
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- 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: 10 years

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

²⁾ Tested on 3 years weathered MOSO® Bamboo X-treme®.



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FSC® C002063

MOSO® Bamboo Decking BIM files

"The potential of bamboo lies merely in the limitations of the designer, architect or builder working with it."

Dr. ir. Pablo van der Lugt,
Sustainability Manager
MOSO International BV

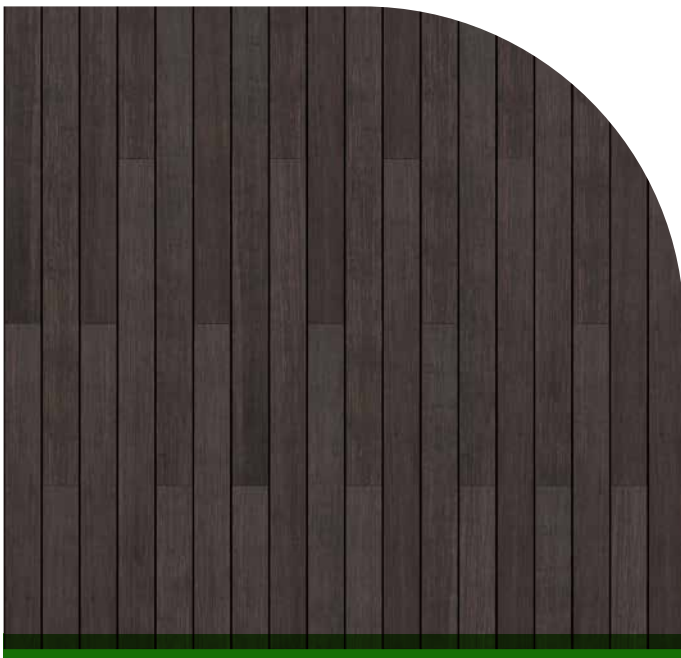
To support you in your project, our bamboo experts can provide you with specifications and texture files for Revit and Archicad formats, to be integrated into your project plans and designs. Several products are available in the BIM Object library. Based on your demand, MOSO® continues to make more BIM files available. Currently, for decking and cladding, textures are available with new and weathered optics, in three different patterns.

MOSO® BIM Object library

Request files from MOSO®

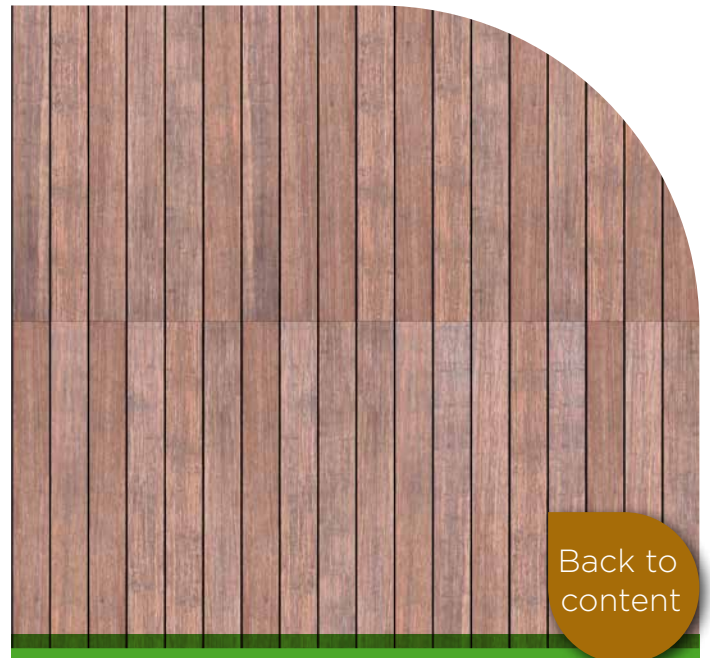
Bamboo X-treme® Texture New

New material - right after installation (decking & cladding)



Bamboo X-treme® Texture Weathered

Weathered - ca. 1 year after installation (decking & cladding)



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Since 2008 over 5 million m² decking and cladding installed in more than 60 countries

Mayslits Kassif Architects
Lior Teitler

2.5 km Central Beach Promenade photo taken 3 years after installation - (700 m²) Tel Aviv, Israel

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



Moke Architects
MOSO®



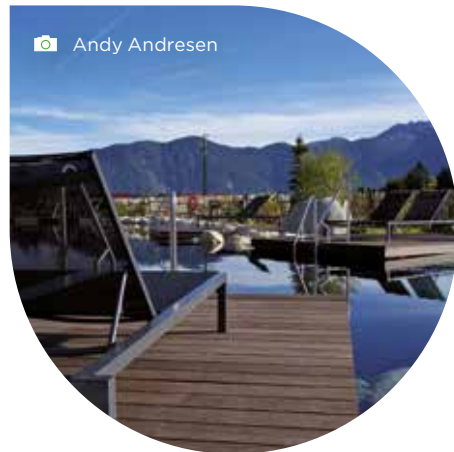
Luc Richard

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

Inspiration

Wellnessresidenz Alpenrose

(300 m²) Maurach/Achensee, Austria



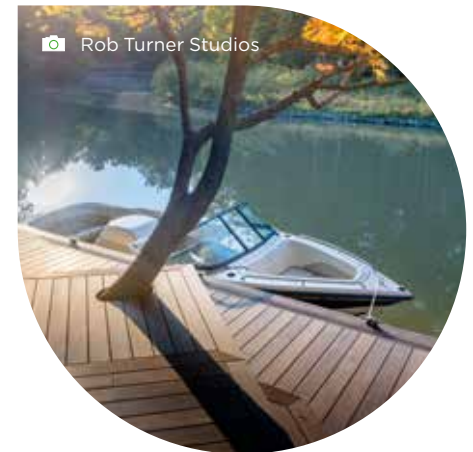
De Banjaard

Noord-Beveland, The Netherlands



Marine Dock Candlewood Lake

(582 m²) Mt. Gilead, Ohio, USA



Order your samples online



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Mastering
bamboo