

MOSO[®] Bamboo X-treme[®] Outdoor Cladding



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 SPEE Architecten  Ossip van Duivenbode



mOSO[®]

from bamboo to Bamboo X-treme®

The fast growth and abundant availability makes bamboo a perfect source 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 Moso 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 slice gaps into the strips and then (by pressure) grind the strips to loose strands. The untreated strands are a light yellow colour.

thermal treatment

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

from strands to product

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

Thermo-Density®

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

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

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

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

 range of durability results

harvesting after
4-5 years



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



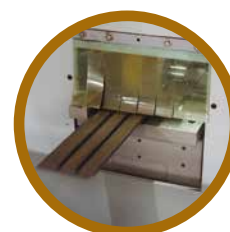
split the Moso
bamboo stems,
remove the
outer skin and
crush the
strips into
strands



compressing
the strands into
Thermo-
Density®
material



finally creating the final
profile and surface



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

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.

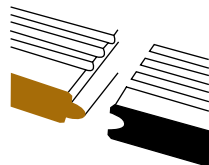
Only MOSO® can ensure you have the original, unique Bamboo X-treme® product. Other products that attempt to copy the original, do not offer the same quality or level of durability, dimensional stability and ecology. With a look-alike product, there is a large risk of claims after installation. **Always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

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



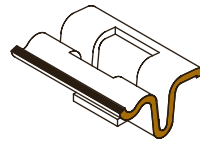
hard & durable

- Bamboo decking with Durability Class 1 (EN 350) tested following CEN/TS 15083-2 class (simulated graveyard test).
- Use Class 4 in accordance with EN 335.
- Fungi resistance Class 0 in accordance with 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.
- Possible to use pressure treated lumber or metal for joists.



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-match system.
- 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 fasteners avoids face screwing and plugging.
- Free of knots and natural plant resins.
- Choice for natural fading, resulting in a natural grey colour or maintaining the rich brown colour using an exterior finish.



endless resource

- Made from Moso 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 by Technical University Delft according to ISO 14040/44 confirm that MOSO® Bamboo X-treme® is CO₂ neutral over the full life cycle.
- No use of fungicide in the production.



fire resistant

- Achieves fire resistance Class Bfl-s1 (decking) and B-s1-d0 (cladding, fencing, beams) following 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.



 Adam Bacher Photography

Union Station (8,000 sqft) Vancouver, United States of America



 John Leonfflu

Private Residence Del Mar
(2,474 sqft) California, United States of America

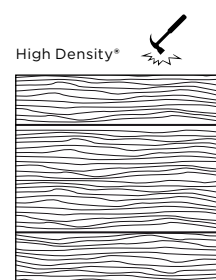
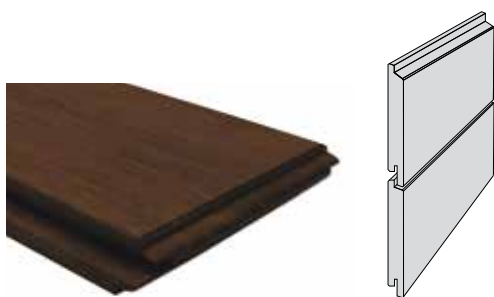
Private Residence Kjeller
Kjeller, Norway



 Hover Imagery

MOSO® Bamboo X-treme® Outdoor Siding

MOSO® Bamboo X-treme® siding is a solid, Thermo-Density® exterior board, made from compressed bamboo strips. A special, heat-treatment process at 392°F (200°C) provides MOSO® Bamboo X-treme® the highest durability class possible in the appropriate European standard, increases the stability and density, and consequently the hardness. Furthermore, contrary to other wood products, this product achieves fire resistance Class A (ASTM E84) without impregnation with expensive and eco-damaging fire retardants. MOSO® Bamboo X-treme® siding is available as a shiplap profile and can be installed with fasteners or screws. Bamboo X-treme® will weather over time to a silver patina.



*) Also on ends.

Unfinished	Edges*	Surface	End-matched	Size	Dimensions (")	Actual width (mm)	Dimensions (mm)
BO-SID18-137	Macro Bevel	Smooth	Yes	1 x 6 x 6	3/4 X 5-3/8 X 73	128	18 x 137 x 1850
BO-SID18-178	Macro Bevel	Smooth	Yes	1 x 8 x 6	3/4 x 7 x 73	173	18 x 178 x 1850

installation summary

- Apply a waterproof membrane to the wall and screw vertical battens onto that.
- Each board should be fixed on at least 3 battens: so the maximum centre-to-centre distance between the battens / beams is 24".
- Install the first, bottom, row of fasteners on the battens and place the first row of boards onto them.
- Place the second row of fasteners/boards and continue like this with the whole surface.
- Don't forget to make sure you float a fastener at the end-match when floating the joint. The fastener will provide added support and maintain proper spacing between the boards.
- Don't forget to make sure that when installing the Bamboo X-treme® Siding vertically you put a mechanical fastener through the bottom of the board for extra support.
- For further info: please see the installation / maintenance instructions.
- MOSO warrants the bamboo material and the mounting materials (fastener/screw) it supplies but does not warrant the connection with other materials (such as sub frame joists/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/siding

technical characteristics and certifications

- Density: +/- 71.79 lbs/ft³
- Dimensional stability: length: + 0.1 %; width + 0.9 % (24 hours in water 68°F)
- Resistance to Indentation - Brinell Hardness: ≥ 65.5 psi (EN 1534)
- Reaction to fire: Class B-s1-d0 (EN 13501-1) ¹⁾
- Flame spread index: Flame spread 25, Smoke developed 45 Class A (ASTM E84) / CAN/ULC S102 (WUI approved)
- 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 MPa (EN 408, equivalent ASTM D 198)
- Bending strength: 54.4 MPa (EN 408, equivalent ASTM D 198)
- 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®)
- Contribution BREEAM: MAT 1, MAT 3 (FSC®), MAT 5 (HD)
- Warranty: 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®.



Only available on special request.



The mark of responsible forestry
FSC® C002063



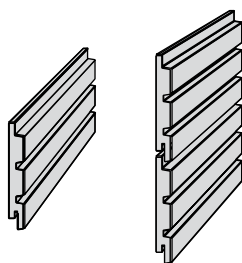
breeam

MOSO® Bamboo X-treme® Outdoor Cladding

Rhombus

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

Triple Rhombus profile



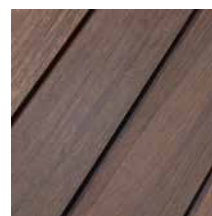
Triple Rhombus



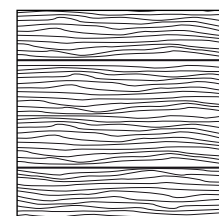
Double Rhombus



Single Rhombus



High Density*



Product Code	Shape	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 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 - 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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breeam



EN-202107

MOSO® Bamboo X-treme® Outdoor Siding

installation instructions

storage and handling

Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.

safety

Drilling, sawing, sanding, and machining Bamboo X-treme® generates dust. Avoid inhaling dust by wearing a dust mask. Visit www.moso-bamboo.com for MSDS information.

please note

- Local building codes must always be consulted. Most counties require building permits.
- MOSO® Bamboo X-treme® is a natural product, which varies in color, grain and appearance. Color can change fast from dark brown to brown or gray, depending on the maintenance schedule.

required tools

- Drill
- Drill bits
- A four foot and eight-foot level
- Safety glasses
- Power screw gun with ratcheting torque setting
- Chop saw
- Bamboo X-treme® can be crosscut with a quality chop saw, using a carbide-tipped blade. Ripping can be done on a standard table saw, using a properly aligned quality fence with a carbide-tipped blade.
- Anchorseal-2 Wood Sealer or equivalent is strongly recommended on cross-cut ends to minimize the effects of weather on these exposed ends.
- Bamboo X-treme® can be routed or planed with high-speed steel or carbide cutters. When required, only sand in the direction of the grain—i.e. belt sander. Never use an orbital sander.

before installation

- Bamboo X-treme® Siding should not be installed in contact with the ground at grade level, a concrete slab, deck materials or standing water. Allow a minimum of 1" - 2" clearance between the bottom edges of the rain screen and the ground, slab, or deck to allow for adequate ventilation.
- Each board should be fixed on at least 3 battens so the maximum centre-to-centre distance in between is 2 ft (616.7 mm / 24") (diagram 1 - random pattern).
- Keep at least 3/16" ventilation space between the boards (in vertical direction). Installation with MOSO® Asymmetric Fasteners ensures correct spacing automatically.
- Because of the stability of the boards and the shape of the end-match system no expansion space is needed on the length (board ends).
- We recommend applying end sealer on every cut end to prevent water penetration. Failure to end seal the boards at the time of installation may lead to checking which is not covered by the warranty.
- At the edges of the siding, keep a distance of 1/4" - 1/2" from adjacent materials, to allow for sufficient ventilation.
- If a random joint pattern is desired, the distance between the battens should be maximum 300 mm / 12" (diagram 2 - random pattern).

diagram 1 - normal pattern

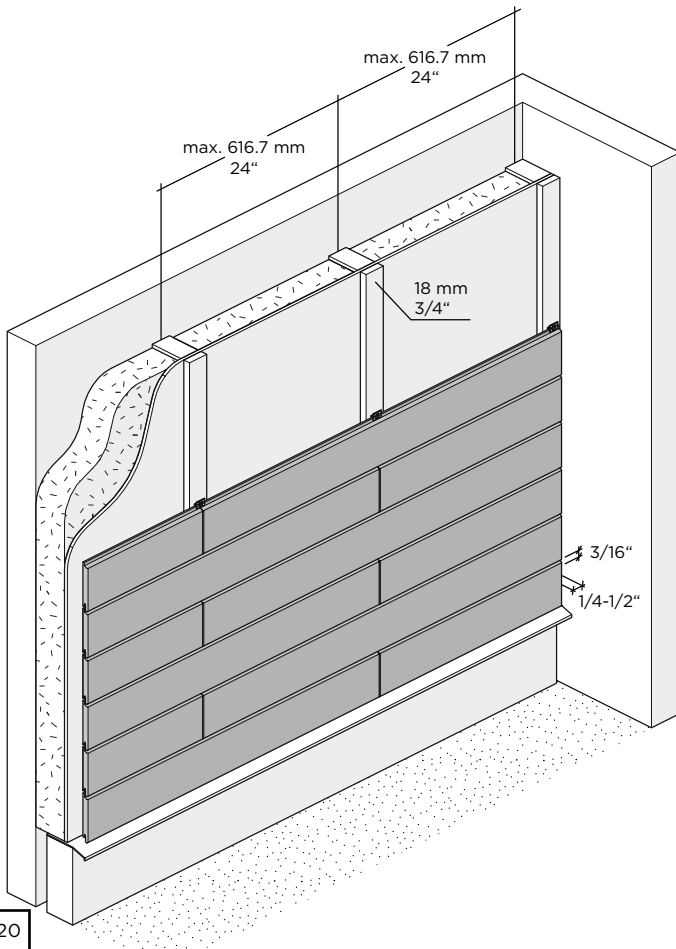
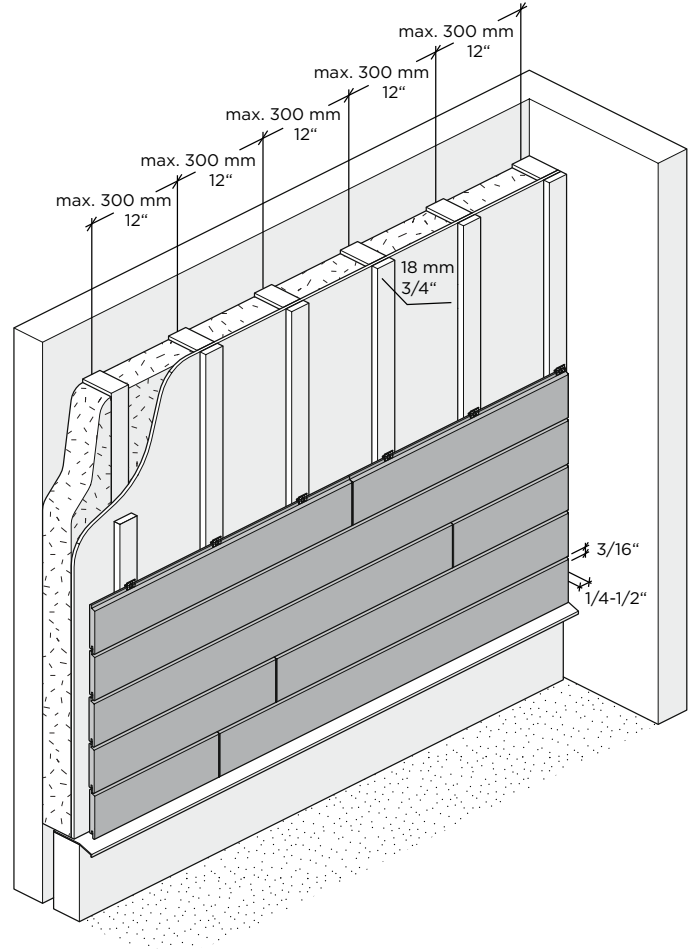


diagram 2 - random pattern



MOSO® Bamboo X-treme® Outdoor Siding

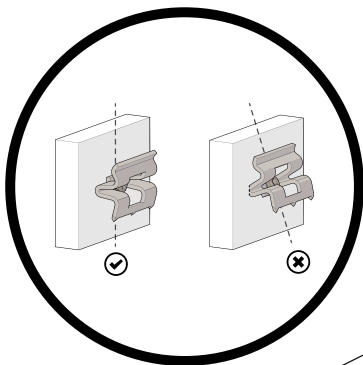
installation instructions

the installation

- Apply a waterproof membrane against the wall and screw vertical battens (at least 3/8" thick x 1-7/8" wide / 1x2" (19 mm thick x 60 mm wide) onto that, creating a rigid / flat surface onto which the boards can be fixed.
- The siding boards should be fixed using the MOSO® Asymmetric Fasteners (CLIPSCREW-BX08). Use a screw that is suitable for the material of the chosen batten.
- Make sure the MOSO® Asymmetric Fasteners are screwed in the middle of the batten so that it is fully supported.

STEP 1 - leveling fasteners

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



STEP 2 - install first row of boards

- Place the board onto the row of fasteners. The waved side of the fastener enables an easy grip into the groove of the board.
- Make sure that the fasteners engage deeply enough in the groove so that the boards lay level. Tapping the boards should be done carefully, preferably with a rubber mallet.
- We recommend fixing the end of the boards (end joints) on a batten, using 2 fasteners; one fastener for the ends, top and bottom, will suffice for fastening the end-matched ends of the boards.
- Make sure you keep a ventilation gap (1/4" - 1/2") on the edge of the cladding.
- Install the first row of boards.

STEP 3 - install second row

- Install the second row of fasteners (MOSO® Asymmetric Fastener with waved side up), pushing them down on the tongue of the first row of boards.
- Install the second row of boards in the same way, and continue for the rest of the surface.
- Check regularly if the boards are level.

STEP 4 Continue with the rest

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

cleaning and maintenance

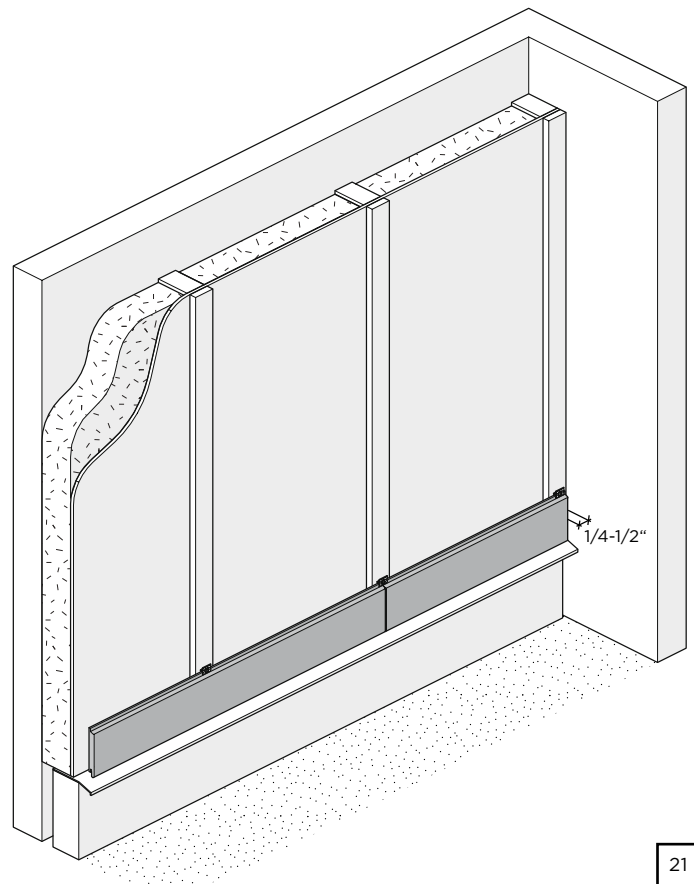
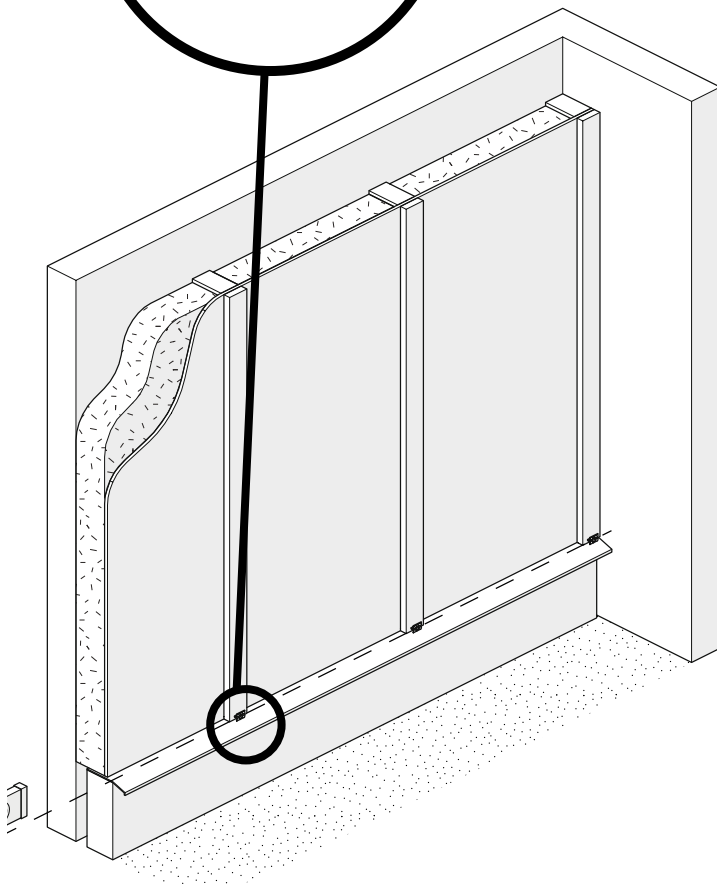
The surface sides of the boards will get rougher and silver over time. If you want to keep a darker color, regular maintenance is needed:

- Clean the material with water.
- Let the material dry.
- Apply a coat of exterior penetrating oil for hardwoods.
- We recommend to repeat this (cleaning + reapplying oil) at least once per year.
- See additional maintenance instructions at www.moso-bamboo.com/x-treme

additional note

While all due care is taken to ensure the accuracy of the installation instructions, individual circumstances (location, wall structure/sheathing and installation procedures) may vary and are beyond the manufacturer's control. In case of doubt, please consult your local dealer/distributor. Always follow the local building code. MOSO warrants the bamboo material and the mounting materials (fastener/screw) it supplies but does not warrant the connection with other materials (such as sub frame joist/battens). It is the responsibility of the installer to make sure the used screw matches such materials during the full lifetime of the product.

These instructions are subject to change. For the latest version visit www.moso-bamboo.com/x-treme/siding
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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 heat treated strand woven bamboo: resistance against degradation by Basidiomycetes according to EN 350 and CEN/TS 15083-1

Report code: 17.0083-B

Date: 29 March 2017

Page: 8/14

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

durability

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

class 1



Resistance of *Heat Treated Strand Woven Bamboo* against blue staining fungi

Report code: 9.061-E

8 September, 2009

Page: 10/10

4 Conclusion

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

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

resistance against surface fungi

EN 152

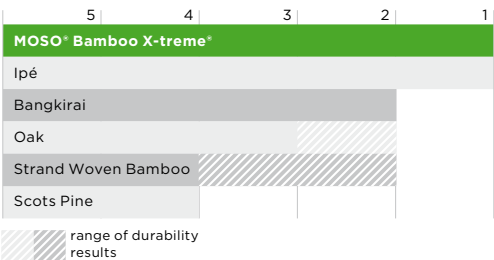
class 0

harder and more durable than almost any other hardwood

durability class

class 1

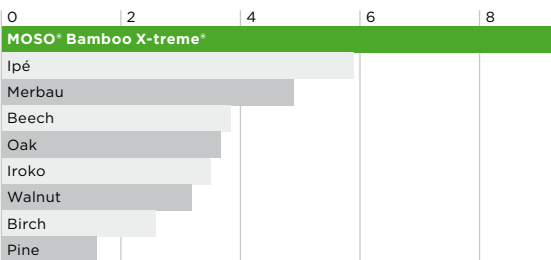
(EN 350 (CEN/TS 15083-2 / CEN/TS 15083-1))



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.

4. Classification and field of application	4.2 CLASSIFICATION
4.1 Reference of classification	The product, MOSO® Bamboo X-treme, in relation to its reaction to fire behaviour is classified:
This classification has been carried out in accordance with clause 12 of EN 13501-1 2007+A1:2009.	B
4.2 Classification	The additional classification in relation to smoke production is:
The product, BAMBOO X-TREME™ DECKING, in relation to its reaction to fire behaviour is classified:	s1
The additional classification in relation to flaming droplets / particles is:	d0
	Reaction to fire classification: B - s1, d0
	Reaction to fire classification: B _{s1} - s1

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

durability

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

class 1

use/risk class

EN 335

class 4

fire resistance

EN 13501-1

decking

class Bfl-s1

cladding, fencing, beams
class B-s1-d0

reaction to fire

(FSI 25 / SDI 45)

ASTM E84

class A

WUI approved
CAN/ULC-S102

carbon footprint

ISO 14040/44

CO₂ neutral

Carbon Footprint (CO₂eq) per kg final product

PRODUCTION	END OF LIFE	CO ₂	CO ₂	CO ₂
CO ₂ footprint CO ₂ eq/kg	CO ₂ credit CO ₂ eq/kg	Storage CO ₂ eq/kg	Total CO ₂ eq/kg	Neutral Y / N
1.193	-0.704	-0.607	-0.118	Yes

Eco-costs (€) per kg final product

PRODUCTION	END OF LIFE	ECO-COSTS	ECO-COSTS
Eco-costs Euro/kg	Eco-costs Euro/kg	CO ₂ storage Euro/kg	Total Euro/kg
0.356	-0.132	-0.082	0.142



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

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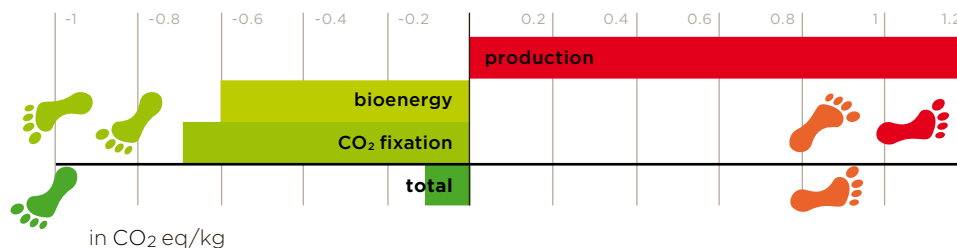
the sustainability of Bamboo X-treme®

MOSO® Bamboo X-treme® offers clear sustainable advantages and is even proven to be CO₂ neutral over its full life cycle! The inclusion of Bamboo X-treme® contributes to a higher LEED, BREEAM and Green Star 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 over full life cycle

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 over the full life cycle ("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).



Venco Campus Eersel, the Netherlands

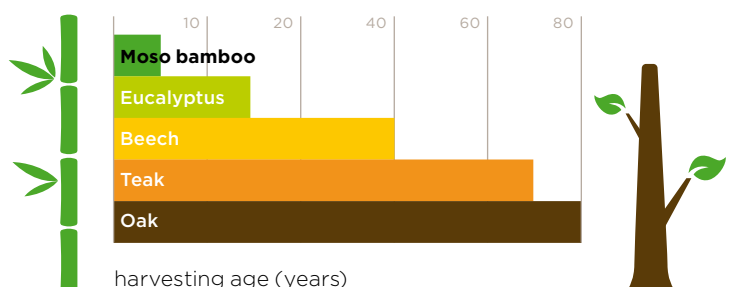


VLCS Architecten
Studio de Brink

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).

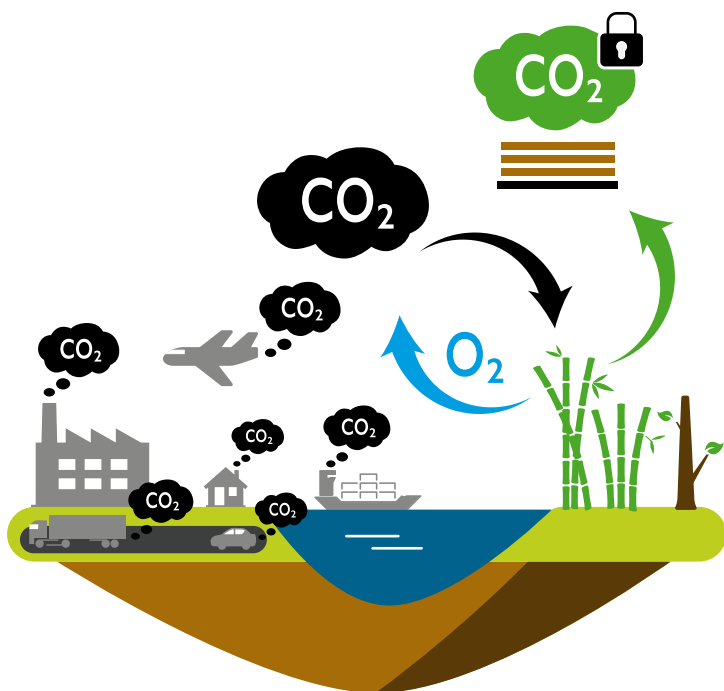




carbon storage in bamboo

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 1.700 kg CO₂ per m³ of bamboo, which is the equivalent of the CO₂ emissions of 14.250 km driven by a mid-range car.



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

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.

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

