

MOSO[®] by Grad Bamboo X-treme[®] installed in one click



Frédéric Godard



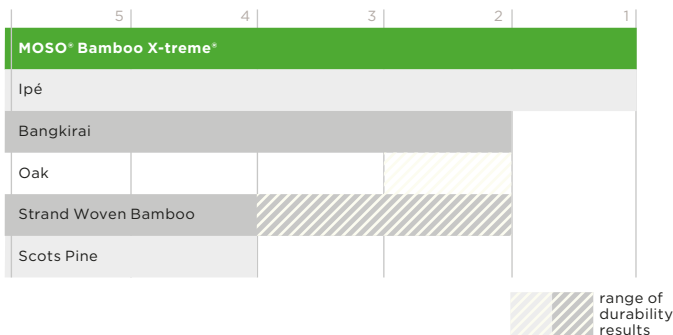
MOSO®

Bamboo X-treme®

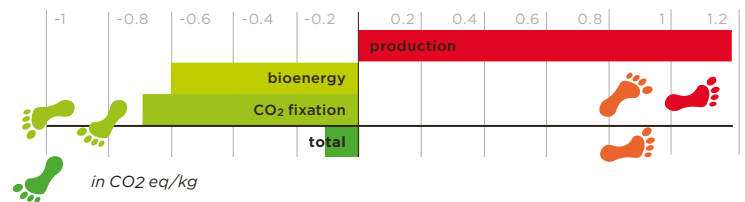


With Bamboo X-treme®, MOSO® has developed a truly **ecological** and **durable** decking product. MOSO® uses a unique process to enhance **hardness**, **dimensional stability**, **fire resistance**, and **durability** to a level **superior** to that of the strongest tropical hardwood species.

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



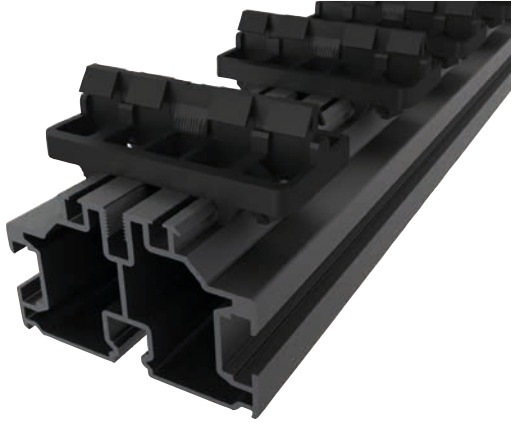
CO₂ footprint according to LCA by TU Delft (ISO 14040/44)



► www.moso-bamboo.com/lca

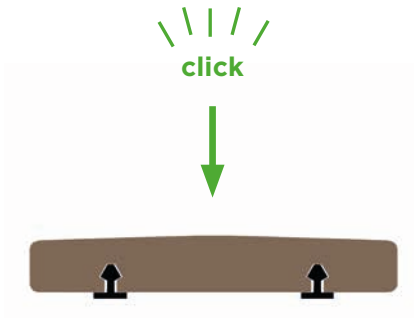
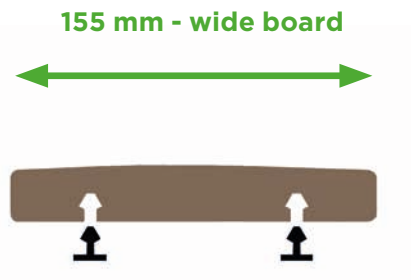


Grad installation system



How it works: **Bamboo X-treme® boards** are snapped onto the **Grad clips** that fit into the **grooves at the backside** of the boards. Grad aluminium rails (available in 4 different heights) with pre-fixed clips, and multiple accessories to finish the deck, allow for a **fast, easy and reliable installation**, and ensure the perfect alignment of the Bamboo X-treme® board to create a decking that lasts.

invisible fasteners on Grad rails with the Grad clips



Grad keys for an easy to remove decking



MOSO® by Grad

Bamboo X-treme®



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.



high stability

- The thermo treatment combined with High Density® compression renders the boards far more stable compared with traditional tropical hardwoods and limits its tendency to torsion.
- Aluminium is not subject to corrosion; its properties are not altered over time.
- 155 mm - wide boards with curved surface to allow for water drainage.
- Gaps of 4-5 mm are respected between all boards to ensure continuous ventilation.



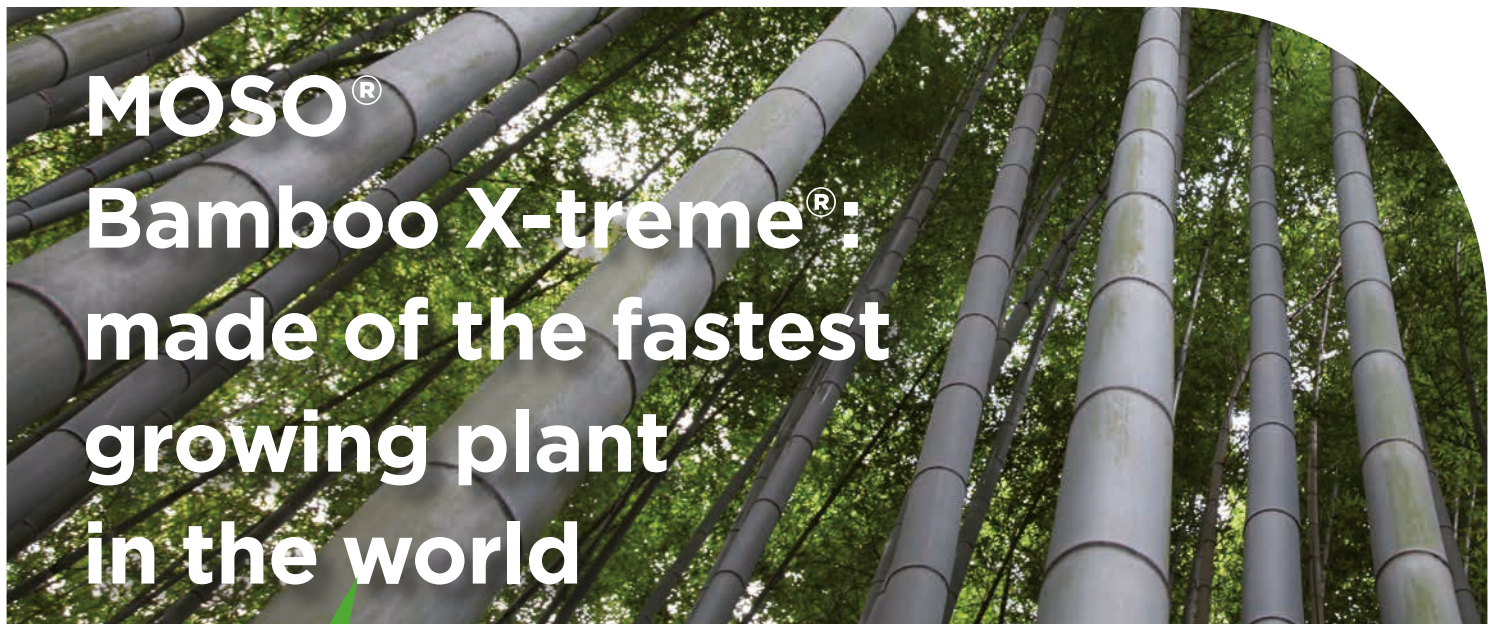
fire resistant

- Meets fire resistance Class Bfl-s1 as per EN 13501-1 without the addition of fire retardant. As a result, MOSO® Bamboo X-treme® can be easily applied in public projects without additional protective measures.
- Meets Class A flame spread index as per ASTM E84.



hard & durable

- The bamboo decking with the durability Class 1 (EN 350) tested following CEN/TS 15083-2 class (simulated graveyard test).
- Use Class 4 in accordance with EN 335.
- Class 0 fungi resistance in accordance with EN 152.
- Exceptionally hard: Brinell >9.5 kg/mm² (harder than any tropical hardwood available).



certified

durable



fire resistant



sustainable



proven

Since 2008 over
3.5 million m²
Bamboo X-treme®
decking **installed**,
in more than
60 countries.



discover the **benefits**



economical

- 20% faster compare to installation with standard clip.
- Lengths of boards and aluminium rails optimised to minimise transportation costs.
- Tried and tested system offering a 30-year warranty on the subdeck.



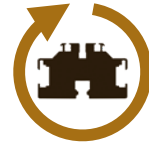
easy to install/remove

- Easy set-up thanks to the combination of aluminium rails, clips, and pedestals from the Grad system.
- The aluminium rails are delivered already equipped with the Grad clips spaced at the right distances for first time perfect board alignment and fixed gaps between boards all around.
- The Grad 3D designing software guides all your project creations.
- Boards can be removed and put back effortlessly into place, and the subdeck can be accessed at anytime.



Grad clip

- Fasteners made of 100% recycled polymer (POM).
- Extreme heat and cold resistant (-40°C to 70°C).
- Pull-out resistance of 240 kg per board (fixed by 2 fasteners).



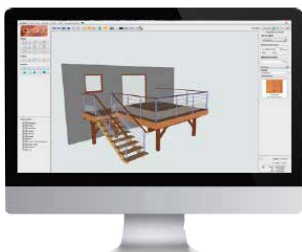
Grad rails

- Extreme stability and durability.
- Up to 90% of the aluminium used in the Grad rails comes from recyclable sources.

Grad installation system: reliable, fast and accurate



quote on request



Lépine gold medal -
Paris + world of the
inventors Geneva -
2008

proven

Since 2006, over
1.4 million m² of
Grad system has
been **installed**,
100% satisfaction
everytime.

30

years of
warranty on the
structure



📷 Frédéric GODARD - Grad



📷 Grad (120 mm)



📷 Grad (120 mm)

MOSO® Bamboo X-treme® Outdoor Decking

for Grad installation system

MOSO® Bamboo X-treme® is a solid, Thermo-Density® decking board, made from compressed bamboo strips. A special, unique heat-treatment process at 200°C provides Bamboo X-treme® with the highest durability class possible in the appropriate EU norms and increases the hardness and stability. The boards are precisely profiled to be installed on the Grad system. Like any untreated tropical hardwood species, when exposed to outdoor conditions, Bamboo X-treme® will turn grey over time creating a very natural look.

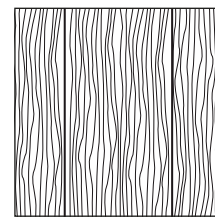
BO-DTHT190-C-BG



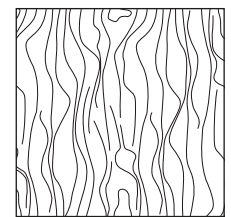
BO-DTHT191-C-BG



Smooth



High Density®



O: Oil Woca, ends of the boards are protected with Sikkens Kodrin WV 456 sealer, B: Bevel (also on ends).

Product Code	Surface	Finish	Grooved	End-matched	Edges	Dimensions (mm)
BO-DTHT190-C-BG	Smooth	-	Grad system	No	B	1850x155x21
BO-DTHT191-C-BG	Smooth	O	Grad system	No	B	1850x155x21

installation summary

(full version available on www.moso-bamboo.com/x-treme)

- Install a suitable, fixed, stable and durable sub frame and follow Grad's installation instructions:
 - gradconcept.com/media/
- 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.
- Thanks to the curved surface installing with a slope is not required.
- For further info: please see the general Bamboo X-treme® installation/maintenance instructions:
 - moso-bamboo.com/x-treme/decking
- 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.
- Store in a cool and dry place away from direct sunlight, and protected from weather influences, dirt and dust.

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 Bfl-s1 (EN 13501-1)
- Flame spread index: Class A (ASTM E84)
- Slip resistance: USRV 55 (Dry), USRV 29 (Wet) (CEN/TS 15676) / R 10 (CEN/TS 16165 Annex B - DIN 51130) (Dry)
- 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)
- Breaking 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.eu/lca)
- Environmental Product Declaration - EPD (EN 15804) (www.moso.eu/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



breeam

MOSO[®] by Grad

Bamboo X-treme[®]

installation system

12 mm Flat Rail to complete
the deck installation

- GRAD1800-FR-155
- GRAD1489-TOP-LINK

Plot adjustable from
35 to 380 mm

- GRAD1181-TOP-LFT
- GRAD1641-TOP-LFT-EX
- GRAD1499-TOP

- GRAD1815-RD
- GRAD1503-BOW

Unique tool
to ensure
fixed
spacings

- GRAD1504-ADJUST+

Various skirtings
available for perfect
decking finishing

Up to 800 kg
per pedestal
(spread load)

- GRAD1181-TOP-LFT
- GRAD 1802-PR39-155
- GRAD1816-BANNER
- GRAD1498-TOPCUBE

- GRAD1505-ADJUST

MOSO® by Grad

installation system

MOSO® by Grad rails including fasteners

With these rails and fasteners, MOSO® Bamboo X-treme® Decking can be easily installed.
When installed correctly, there will be 4 mm gaps between length boards for ventilation.

Product Code	Description	Dimensions (mm)	Effective height	Consumption	Distance between pedestals*	Quantity per pallet (units)
GRAD1800-FR-155	Flat Rail 155 - 55/12 (for 12 boards)	1920 x 63 x 30	18 mm	1,2 rail/m ²	continuous support	216
GRAD1808-TR24-155	TR 24 155 - Top Rail (for 12 boards)	1920 x 63 x 70	35 to 90 mm	1,2 rail/m ²	32 cm	120
GRAD1802-PR39-155	PR39 155 - Perfect Rail (for 12 boards)	1920 x 63 x 57	45 mm	1,2 rail/m ²	65 cm	108
GRAD1803-PR56-155	PR56 155 - Perfect Rail (for 12 boards)	1920 x 63 x 74	62 mm	1,2 rail/m ²	100 cm	108
GRAD1815-RD	DIV 463 - Connector Rail	1910 x 63 x 44	32 mm	0,3 piece/m ²		72

*) Distance between plots indicated for residential use. For non-residential use, please contact MOSO®.

Flat Rail
GRAD1800-FR-155



Top Rail
GRAD1808-TR24-155



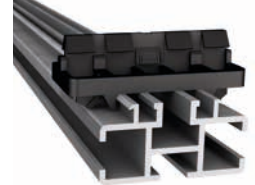
Perfect Rail
GRAD1802-PR39-155



Sub Rail
GRAD1803-PR56-155



Connector Rail
GRAD1815-RD



MOSO® by Grad accessories

Depending on the installation, special Grad accessories are required to install the Bamboo X-treme® decking.

Product code	Description	Material	Quantity per box	Quantity per pallet
GRAD1181-TOP-LFT	TOP LIFT	PP - adjustable from 35 to 55 mm without extension.	1	960
GRAD1641-TOP-LFT-EX	UP+	PP - 45 mm height are added per pair of assembled extensions.	2	7680
GRAD1499-TOP	TOP+	PP - to stabilize the plot beyond 3 pairs of extensions.	80	1920
GRAD1489-TOP-LINK	TOP LINK L	POM - Rail connection piece.	20	4800
GRAD1483-CLIPGRAD	CLIP GRAD	POM + stainless steel - removable clip 6cm with lugs for alu rail, bag of 50.	50	16000
GRAD1487-CLIPGRADSE	CLIP GRAD SE	POM + stainless steel - fasteners without lugs for angled segments and screw M5/12, kit of 50.	50	16000
GRAD1503-BOW	BOW	Stainless steel - bracket kit 47/30 including bolts (for attachment of distributors and creation of trimmers), bag of 4.	4	8192
GRAD1505-ADJUST	ADJUST	Stainless steel - adjustable plate 120/30/1.5 mm to connect rails with variable angles including bolts, kit of 2.	2	7680
GRAD1504-ADJUST+	ADJUST+	POM + stainless steel - adjustable plate 120/30/1.5 mm to connect fascias with variable angles including unit clip, kit of 4.	4	5120
GRAD1784-KEY	KEYS M	High strength steel - pair of keys to remove 155 mm boards.	2	2160

Top Lift
GRAD1181-TOP-LFT



Up+
GRAD1641-TOP-LFT-EX



Top+
GRAD1499-TOP



Top Link L
GRAD1489-TOP-LINK



Clip Grad
GRAD1483-CLIPGRAD



Clip Grad SE
GRAD1487-CLIPGRADSE



Bow
GRAD1503-BOW



Adjust
GRAD1505-ADJUST



Adjust+
GRAD1504-ADJUST+



Keys M
GRAD1784-KEY



MOSO® by Grad

finishes

MOSO® by Grad deck finishing

The Grad system provides unique skirting features for an elegant finish of the decking all around.



Product code	Description	Material	Quantity per box	Quantity per pallet (pieces)
GRAD1498-TOPCUBE	TOP CUBE	POM + stainless steel - to be clipped on the TOP CUBE in order to finalize your decking by adding endprofile board.	4	1920
GRAD1816-BANNER	END1 155	Alu + POM + stainless steel - is fixed on the TOP CUBE, for 1 board with a height of 155 mm.	25	2400
GRAD1817-BANNER	END2 155	Alu + POM + stainless steel - is fixed on the TOP CUBE, for 2 boards with a height of 155 mm.	25	1400
GRAD1486-CALCLIP	CAL CLIP	POM + stainless steel - is used in the case of an edged board with only one groove left.	20	12000

Top Cube
GRAD1498-TOPCUBE

End1 155
GRAD1816-BANNER

End2 155
GRAD1817-BANNER

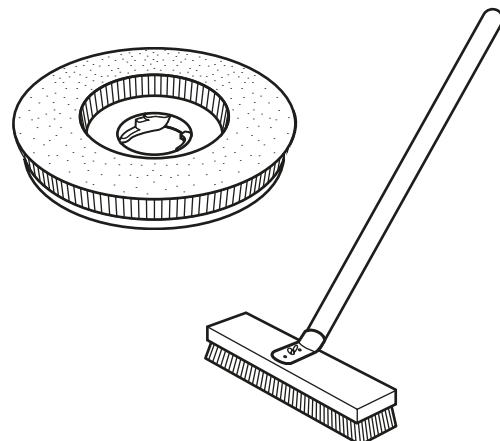
Cal Clip
GRAD1486-CALCLIP



MOSO® maintenance & cleaning accessories for Bamboo X-treme® decking

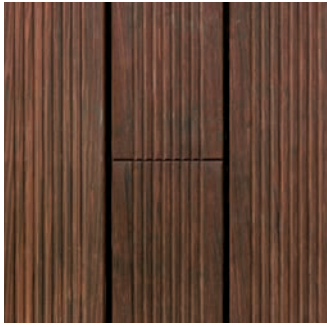
Under the influence of wind, rain, sun and snow the decking will weather. MOSO® recommends to impregnate and maintain the pre-oiled decking with Woca Maintenance materials. Unfinished decking must be treated with Sikkens Saturator or Woca oil right after installation. The silicium carbid broom and machine 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	Material
DISK-01	16" Silicium carbid disk
BROOM-01	Silicium carbid broom
CLEANER-WOCA-01	WOCA Exterior Cleaner
OIL-WOCA-003	WOCA Maintenance Oil Natural
OIL-WOCA-011	WOCA Exterior Oil Exclusive Teak
WAX-BX-01	Wax to seal board ends
WOCA-APPLICATOR	WOCA Applicator set for oil



MOSO® Bamboo X-treme® Outdoor Decking

user information, maintenance & cleaning



Gradual greying of MOSO® Bamboo X-treme® over time: new, non-weathered decking (left), after 3 months of weathering (middle) and after 18 months of weathering (right).

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.

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.

cleaning

- Soak MOSO® Bamboo X-treme® with plenty of water. 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.
- 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. Sikkens Kodrin Sealer WV 456 is available from MOSO®.

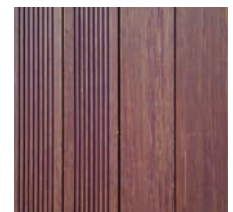
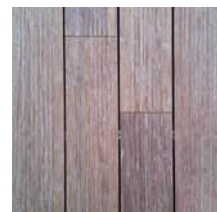
theoretical consumption

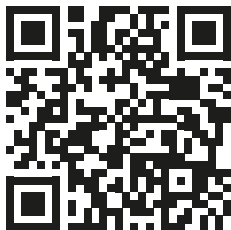
- Mix Woca Exterior Wood Cleaner with water in the ratio 1:2 and apply it. If the decking is extremely dirty, exterior cleaner may be used undiluted.
- Woca Exterior Wood Oil: 12 - 15 m² / litre.

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.

Surface of MOSO® Bamboo X-treme® with different maintenance and cleaning scenarios: weathered, dirty decking (left), cleaned decking (middle), and re-oiled decking (right).





see the ease and fast installation
of MOSO® by Grad on:

www.moso-bamboo.com/grad

MOSO® by Grad **Bamboo X-treme®**: unique and patented decking solution!



Headquarters:

Moso International B.V.
Adam Smithweg 2
1689 ZW Zwaag
The Netherlands
T +31 (0)229 265 732
info@moso.eu

Spain, France, Portugal, North Africa,
Latin America and Middle East:

Moso Europe S.L.U.
C/ Pau Claris, 83 - Principal 2ª
08010 Barcelona
Spain
T +34 (0)93 574 9610
contact@moso.eu

North America:

Moso North America Inc.
8400 B Remington Ave
Pennsauken, NJ 08110
United States of America
T: +1 855 343 8444
info@moso-bamboo.com

Sub-Saharan Africa:

Moso Africa Pty. Ltd.
7 Glosderry Road Kenilworth
7708 Cape Town
South Africa
T +27 2167 11214
contact@moso-bamboo.co.za

Gulf Cooperation Council
(GCC) Countries:

Moso Middle East LLC
202 Al Mansour Bldg.
Damascus Road, Al Qusais
P.O. Box: 384421, Dubai
United Arab Emirates
T: +971 4 258 9337
contact@moso.ae

Italy:

Moso Italia S.R.L.
Via Antonio Locatelli 86
20853 Biassono (MB)
Italy
T +39 (0)39 900 5440
mosoitalia@moso.eu

www.moso-bamboo.com



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products**