Result summary

Laminated (EN15804)

MOSO

Calculation number:	EPD-NIBE-20210322-18247
Generation on:	14-03-2022
Issue date:	14-03-2022
Valid until:	14-03-2027
Status:	verified

R<THiNK

powered by nibe

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1.1 COMPANY INFORMATION / DECLARATION OWNER

Manufacturer: MOSO

Production Location: Manufacturing plant CN

Address: Adam Smithweg 2, 1689 ZWZwaag

E-mail: info@moso.eu

Website: www.moso-bamboo.com

1.2 EPD INFORMATION

Calculation number: EPD-NIBE-20210322-18247

Date of issue: 14-03-2022

End of validity: 14-03-2027

Version NIBE's EPD Application: v2.0

Version database: v3.07 (2021-11-08)

PCR: EN15804+A2:2019

1.3 VERIFICATION OF THE DECLARATION

CEN standard EN 15804:2012 serves as the core PCR.

Independent verification of the declaration. according to EN ISO 14025:2010.

☐ Internal ☑ External

I hereby confirm that, following detailed examination as independent 3rd party verifier, I have not been able to trace any relevant deviations by the report concerning bamboo products by MOSO, and by its project report from the requirements outlined in the corresponding product category regulations based on the EN 15804:2019 and as PCR, the Dutch Assessment (Determination) Method version 1.0 July 2020, including the amendments Hereby the report meets also the standards given in ISO 14040/44 and ISO 21930.

A.K. Jeeninga is recognized by NMD as verifier.

Third party verifier: Anne Kees Jeeninga, Advieslab

1.4 DECLARED UNIT

1 m3 Bamboo

1 m3 Bamboo produced in China and used for the Dutch market. It is a semi-finished product, therefore this EPD considers Cradle to Gate with options. The following stages have been declarded: A1-A4, C2-C4 and D.

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1.5 SCOPE OF DECLARATION

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	MND	MND	MND	MND	X	X	X	X	X

(X = included, MND = module not declared)

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1.6 PRODUCT DESCRIPTION

MOSO® Solid Panel and Beam is a visually appealing product (semi-finished material) that consists of multiple layers of bamboo, available in multiple variations with respect to size, thickness, configuration, style and colour. The Bamboo Solid Panel can be used in various indoor applications such as work tops, walls, ceilings, stairs, flooring and furniture. The Bamboo Solid Beam is mainly used in semi-structural indoor applications such as window and door frames.

Dimensions

Available in various sizes; typically 2440x1220x7-40 mm (Solid Panel) and 2440 x 120/55 x 55-100 (Solid Beam), but also various other sizes.

Indoor emissions (formaldehyde)

Class E1 (< 0.124 mg/m3) (EN 717-1)

Hardness (Brinell)

> 4 kg / mm² (EN 1534)

Reaction to fire

Class D-s1-d0 (EN 13501-1)

Biogenic CO2

Density of material kg/m3 (u=12%)	ρ	700
glue content	%	2,2%
carbon content	%	50,24%
Bamboo without glue kg/m3	Pw	685
Density without 12% moisture content kg/m3	Pw x Vw*/1,12	611
kg carbon / m3	cf x Pw x Vw*/1,12	307
kg CO2 / m3	44/12	1.127,42

For more information see:

· Production process: https://www.moso-bamboo.com/bamboo/how-bamboo-products-are-made/laminated-bamboo-production/

· Technical datasheet MOSO® Solid Panel https://www.moso-bamboo.com/product/bamboo-solid-panel/

· Technical datasheet MOSO® Solid Beam https://www.moso-bamboo.com/product/bamboo-solid-beam/

Substances of very high concern
The product does not contain any substances listed in the “Candidate List of Substances” of Very High Concern (SVHC) for authorisation” exceeding 0.1% of the weight of the product.

1.7 DESCRIPTION OF THE MANUFACTURING PROCESS

After harvesting the mature bamboo stems are split in longitudinal direction and the outer skin is removed. The resulting strips are either placed horizontally (Plain Pressed) or vertically (Side Pressed) to produce the MOSO® Solid Panel and Beam. Depending on the type of product and required dimensions, the bamboo strips can be glued together in a hot press in different ways. The strips naturally have a light yellow colour (Natural or Ecru), but can be steamed for a light brown colour (Caramel).

The product consists for approx. 98 % of rough strips made from the giant bamboo species “Phyllostachus Pubescens (Edulis)” from China (diameter up to 15 cm, length up to 15 meters), and about 2% of glue (melamine urea formaldehyde), and is also available with FSC certificate on request.

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1.8 RESULTS

Environmental effects	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
AP	mol H+ eqv.	6.73E-1	5.38E-2	7.55E-1	2.23E+0	2.04E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.08E-2	2.06E-1	2.60E-3	-1.29E+0	2.91E+0
GWP-total	kg CO2 eqv.	-1.03E+3	9.29E+0	1.89E+2	1.07E+2	3.00E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.39E+1	1.11E+3	5.97E+1	-4.21E+2	6.67E+1
GWP-b	kg CO2 eqv.	-1.13E+3	4.29E-3	-1.08E+1	-4.75E-2	7.30E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.43E-3	1.07E+3	5.93E+1	-4.30E+0	-1.21E+1
GWP-f	kg CO2 eqv.	9.57E+1	9.28E+0	2.00E+2	1.07E+2	2.92E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.39E+1	4.02E+1	3.73E-1	-4.16E+2	7.91E+1
GWP-luluc	kg CO2 eqv.	2.90E-2	3.40E-3	5.42E-2	1.14E-1	1.09E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.11E-3	1.60E-3	7.52E-5	-4.80E-1	-2.62E-1
ETP-fw	CTUe	1.49E+3	1.25E+2	3.40E+3	1.23E+3	4.06E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.87E+2	1.56E+2	6.51E+0	-2.46E+3	4.54E+3
PM	disease incidence	1.09E-5	8.35E-7	9.49E-6	6.15E-6	1.56E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.25E-6	1.66E-6	5.48E-8	-3.37E-6	2.85E-5
EP-m	kg N eqv.	1.69E-1	1.90E-2	1.66E-1	5.71E-1	5.38E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.85E-2	9.59E-2	1.94E-3	-1.95E-1	9.10E-1
EP-fw	kg P eqv.	3.32E-3	9.36E-5	3.04E-3	9.15E-4	4.04E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.41E-4	1.20E-4	4.55E-6	-2.17E-2	-1.36E-2
EP-T	mol N eqv.	2.22E+0	2.09E-1	1.88E+0	6.34E+0	6.17E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.14E-1	1.10E+0	1.06E-2	-2.35E+0	1.03E+1
HTP-c	CTUh	4.40E-7	4.05E-9	1.26E-7	8.59E-8	4.64E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.08E-9	2.36E-7	1.96E-10	-6.54E-8	8.79E-7
HTP-nc	CTUh	1.89E-6	1.37E-7	1.66E-6	1.27E-6	3.22E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.05E-7	7.42E-7	7.77E-9	-1.96E-6	4.27E-6
IR	kBq U235 eqv.	3.08E+0	5.87E-1	1.53E+0	6.07E+0	6.50E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.81E-1	1.56E-1	3.69E-2	-3.81E+1	-2.52E+1
SQP	Pt	1.97E+5	1.21E+2	2.53E+4	6.74E+2	1.12E+4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.82E+2	2.03E+1	2.04E+1	-1.15E+3	2.33E+5
ODP	kg CFC 11 eqv.	1.31E-5	2.05E-6	1.05E-5	2.16E-5	2.78E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.08E-6	7.63E-7	1.09E-7	-4.75E-5	6.49E-6
POCP	kg NMVOC eqv.	5.13E-1	5.97E-2	5.22E-1	1.70E+0	1.63E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.96E-2	2.87E-1	3.84E-3	-6.39E-1	2.70E+0
ADP-f	MJ	1.42E+3	1.40E+2	2.40E+3	1.45E+3	2.92E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.10E+2	6.20E+1	7.96E+0	-7.66E+3	-1.68E+3
ADP-mm	kg Sb-eqv.	9.78E-4	2.35E-4	5.09E-4	2.11E-3	2.25E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.53E-4	3.74E-5	2.64E-6	-5.07E-4	3.94E-3

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WDP	m3 world eqv.	1.19E+2	5.01E-1	4.69E+1	4.87E+0	9.02E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.52E-1	1.94E+0	4.37E-2	-4.66E+1	1.37E+2

AP=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **ETP-fw**=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

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Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
PERE	MJ	4.52E+1	1.75E+0	1.43E+2	1.80E+1	1.13E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.63E+0	2.71E+0	3.09E-1	-7.35E+2	-5.11E+2
PERM	MJ	9.58E+3	0.00E+0	1.24E+3	0.00E+0	5.41E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.55E+1	1.13E+4
PERT	MJ	9.63E+3	1.75E+0	1.38E+3	1.80E+1	5.52E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.63E+0	2.71E+0	3.09E-1	-7.61E+2	1.08E+4
PENRE	MJ	1.38E+3	1.49E+2	2.49E+3	1.54E+3	3.01E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.23E+2	6.68E+1	8.45E+0	-8.24E+3	-2.08E+3
PENRM	MJ	1.54E+2	0.00E+0	1.08E+2	0.00E+0	1.31E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-3.11E+0	2.72E+2
PENRT	MJ	1.53E+3	1.49E+2	2.60E+3	1.54E+3	3.14E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.23E+2	6.68E+1	8.45E+0	-8.24E+3	-1.81E+3
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	2.87E+0	1.71E-2	1.15E+0	1.60E-1	2.37E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.56E-2	3.19E-1	9.81E-3	-3.56E+0	1.23E+0
HWD	Kg	1.89E-3	3.55E-4	1.44E-3	2.59E-3	3.68E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.33E-4	2.14E-4	9.78E-6	-5.77E-3	1.63E-3
NHWD	Kg	1.61E+1	8.88E+0	1.44E+1	4.39E+1	7.29E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.33E+1	4.83E+0	3.50E+1	-1.47E+1	1.29E+2
RWD	Kg	4.39E-3	9.19E-4	1.69E-3	9.62E-3	9.48E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.38E-3	1.87E-4	5.20E-5	-3.21E-2	-1.29E-2
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.23E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.23E-1
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	-5.91E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.98E+3	-2.99E+3
EEE	MJ	0.00E+0	0.00E+0	-3.43E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.73E+3	-1.74E+3
SP	**s€**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**

PERE=renewable primary energy ex. raw materials | **PERM**=renewable primary energy used as raw materials | **PERT**=renewable primary energy total | **PENRE**=non-renewable primary energy ex. raw materials | **PENRM**=non-renewable primary energy used as raw materials | **PENRT**=non-renewable primary energy total | **SM**=use of secondary material | **RSF**=use of renewable secondary fuels | **NRSF**=use of non-renewable secondary fuels | **FW**=use of net fresh water | **HWD**=hazardous waste disposed | **NHWD**=non hazardous waste disposed | **RWD**=radioactive waste disposed | **CRU**=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy Thermic | **EEE**=Exported Energy Electric

1.9 ADDITIONAL INFORMATION

Allocation

There is no allocation applied for the environmental profiles / datasets used in this LCA.