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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Masonite Beams AB (Byggma ASA)
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-3202-1842-EN
Registration number:	NEPD-3202-1842-EN
ECO Platform reference number:	-
Issue date:	28.10.2021
Valid to:	28.10.2026

I-beam H300s

Masonite Beams AB (Byggma ASA)

www.epd-norge.no

General information

Product:

The declared Masonite beam H300s is an example of beams type Hs, HIs, HMs, HLs and HBs. Masonite Column type Rs and Masonite Sill type Ss.

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-3202-1842-EN

ECO Platform reference number:

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This declaration is based on Product Category Rules:

CEN Standard EN 15804 A1 serves as core PCR and PCR Part B for wood and wood-based products for use in construction (NPCR 015 version 3.0, 10.04.2019).

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 m I-beam H300s

Declared unit with option:

1 m I-beam H300s including information modules A1-3, A4, A5, C1-4 and D

Functional unit:

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Verification:

The CEN Norm EN 15804 serves as the core PCR. Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☑ external

Third party verifier:

Guangli Du, Aalborg University
(Independent verifier approved by EPD Norway)

Owner of the declaration:

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Manufacturer:

Masonite Beams AB
P. O. Box 5, S-914 29 Rundvik Sweden
Phone: +46 (0) 930 399 00
e-mail: info@byggmagroup.se

Place of production:

Rundvik, Sweden

Management system:

SS-EN ISO 9001, SS-EN ISO 14001, PEFC ST 2002, FSC-STD-40-004

Organisation no:

556228-8060

Issue date:

28.10.2021, revised 21.02.2022

Valid to:

28.10.2026

Year of study:

2018

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

EPD tool used:

This EPD is based on IVL EPD Generator Masoniteand follow the approved background database verification approach.

The EPD has been worked out by:

Martin Erlandsson

Swedish Environmental Research Institute

Approved

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

I-beams are light wood-based beams and columns for structural purposes. The beams have an I-shaped cross section and are made of flanges of structural timber and a web of a wood based panel. I-beams are used for structural purposes and is a strong structural material compared to its weight.

Product specification:

The beam H300s covers the H-type I-beam including particle board, which has a flange dimension of 47x47 mm and C24 strength, a web made of 10 mm particle board with a beam height of 300 mm.

Materials, product	kg/m	%
Particle boards	1.85	50%
Timber	1.84	49%
Resin	0.03	0.8%
Sum	3.72	100%
Packaging materials	kg/m	%
Wood	0.028	73%
Nylon strap	0.0057	15%
Polyethene folio	0.001	1%
Steel strip	0.004	11%
Cardboard	5.23E-05	0.1%
Sum	0.039	100%

Technical data:

The I-beam is produced and approved in accordance with European Technical Approval (ETA-12/0018).

Market:

Main markets are Sweden, Norway, England and France plus Northen Europe.

Reference service life:

Reference service life is the same as the building, which is typically set to 50 or 60 years.

LCA: Calculation rules

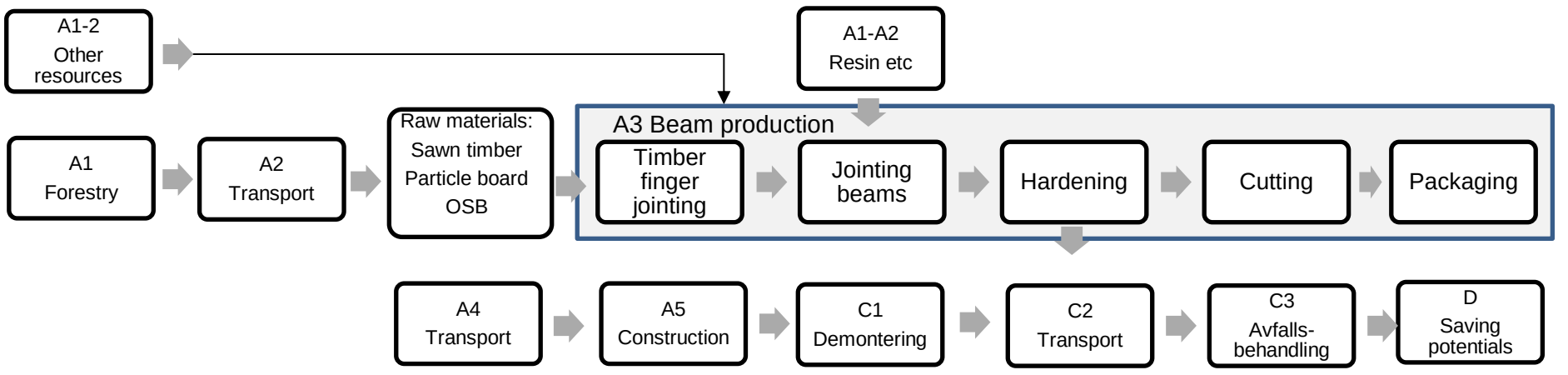
Declared unit:

1 m running beam

System boundary:

Flow chart for the production (A3) of I-beams are shown below, while the rest of the modules are shown on page 5. Module A4 to D is further explained in the scenario section.

Figure 1 *Beam manufacturing and transport to a customer and the remaing lifecycle.*



Data quality:

Production data for Masonite is based on the average in 2018. Data for the production of resin is calulated based on generic raw materals and specific process information from the manufacturer. Data for production of particle board is based on a EPD from the manufacturer (Forestia 2020) and timber the Swedish sector EPD. Transport and other manufacturing resoures are mainly from Gabi (2020).

Cut-off criteria:

All major raw materials and all the essential energy is included. All production process for raw materials and energy flows that are included, why only limited cut off exists (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. The beam manufacturing is allocated equally among all products through mass allocation. In the production chain of timber is an economic allocation has been used because of the low value of by-products. A conservative approach is used in forestry economical allocation valid for the joint co-product allocation bwteen round timber and wood by products, which means that no impact is allocated to the tops and branches (GROT).

Calculation of biogenic carbon content:

Sequestration (module A1) and emissions of biogenic carbon is calculated according to EN16485:2014, where the net biogenic carbon cycle A to C is zero (i.e. carbon dioxide neutral). The product content of biogenic carbon stored in the product (module A3) is in this EPD additionally reported (according to EN 15804 A2) as biogenic carbon stored in the product (see table 'Resource use'). For biogenic carbon in all other modules after A3 is the carbon stored in the products assigned to the module where they occur in order to support the modularity principle in EN15804, so the net result is zero.

LCA: Scenarios and additional technical information

The following information below describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) % (90+0%)	Type of vehicle	Distance km	Fuel consumption (l/t·km)	Value (l/t)
Semi-trailer	0.45	TT/AT 28-34 + 34-40t	100	0.027 l/tkm	2.7

A4: The transportation is reported as 100 km and shall be used as faktor to estimate the actual distance to the specific object.

Assembly (A5)

	Unit	Value
Material loss	%	5
Crane, electricity consumption	kWh	1.7E-05
Front loader, diesel	kWh	1.6E-04

A5: At the construction site, 4 minutes of work with front loader is assumed (Erlandsson 2013) and an average lift with a crane (Lundström 2016). 5% material loss is assumed att construction site.

Use (B1)

	Unit	Value
MND		

Maintenance (B2)/Repair (B3)

	Unit	Value
MND		

Replacement (B4)/Refurbishment (B5)

	Unit	Value
MND		

Operational energy (B6) and water consumption (B7)

	Unit	Value
MND		

End of Life (C1, C3, C4)*

	Unit	Value
C1: Demolision machine (diesel)	kWh	2.96E-04
C3: To material reuse	kg	0
C3: To material recycling	kg	0
C3: To energy recovery	kg	3.7
C3: Wood chipping (diesel)	kWh	1.61E-03
C4: To landfill	kg	0

C2: Assumed tranport from demolition site to local waste treatment site, from where it is then sold.

Energy need for demolition (C1) and chipping (C3) of the wooden discard products is found in according to Erlandsson et el (2015). The scenario accounts for 100%* energy recovery. No statistics exist in Sweden on recycling of demolition wood but will likely be at least 90%.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) % (90+0%)	Type of vehicle	Distance km	Fuel consumption (l/t·km)	Value (l/t)
Large lorry/truck	45%	TT/AT 14-20+20-28t	35	0.037	1.3

The transport assume empty return.

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Chipped discard product that substitute fuel in a district heating plant	MJ	-70
Transport to district heating (diesel)	kWh	0.05

D: The chipped product is assumed to be used as fuel in a district heating and then replaces the average energy mix. Transportscenario as C2.

***** If less recycling rate than 100% is asked for the result from module C and D can then be multiplied by such factor. 100% is used here to support the modular aproach of using these figures on the builings level.

Additional technical information

No additional information given.

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Construction process stage		Use stage							End of life stage				Beyond the system boundary
Raw materials	Transport	Manufacturing	Transport	Construction, installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	X	x
SE,NO	SE,NO	SE	—	SE	—	—	—	—	—	—	—	SE	SE	SE	SE	SE

Environmental impact

Parameter	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
GWP-TOT	kg CO_2 e	-4.82E+00	2.39E-02	6.15E-02	7.03E-05	1.13E-02	6.03E+00	0.00E+00	-9.84E-01
GWP-FOSSIL*	kg CO_2 e	1.21E+00	2.39E-02	6.15E-02	7.03E-05	1.13E-02	3.85E-04	0.00E+00	-9.84E-01
ODP	kg CFC11 e	1.68E-07	3.43E-10	8.42E-09	1.01E-12	1.62E-10	5.54E-12	0.00E+00	-8.88E-09
AP	kg C_2H_4 e	6.65E-03	1.59E-04	3.41E-04	4.67E-07	7.49E-05	2.56E-06	0.00E+00	-2.92E-03
EP	kg SO_2 e	1.30E-03	5.65E-05	6.80E-05	1.66E-07	2.67E-05	9.12E-07	0.00E+00	-1.58E-05
POCP**	kg PO_4^{3-} e	6.68E-04	-4.65E-05	3.11E-05	-1.37E-07	-2.19E-05	-7.50E-07	0.00E+00	-2.12E-03
ADPM	kg Sb e	1.17E-05	9.78E-09	5.85E-07	2.88E-11	4.62E-09	1.58E-10	0.00E+00	-2.14E-07
ADPE	MJ	2.10E+01	3.57E-01	1.07E+00	1.05E-03	1.69E-01	5.76E-03	0.00E+00	-1.09E+01

**LCI origin from GaBi database separates NOx into NO and NO_2, in combination with the applied characterization model with a marginal approach for POCP based on highly polluted ambient air, can result in a negative characterization factor for nitric oxide.

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources.
***** Also refered as GWP-GHG in context to Swedish legislation and public procurement and GWP-IOBC in EPD Norway.

Resource use

Parameter	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	4.02E+01	9.22E-02	2.01E+00	2.71E-04	4.35E-02	4.35E-02	0.00E+00	-1.00E+02
RPEM	MJ	6.31E+01	0.00E+00	3.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.03E+02	9.22E-02	5.17E+00	2.71E-04	4.35E-02	4.35E-02	0.00E+00	-1.00E+02
NRPE	MJ	1.69E+01	3.90E-01	8.67E-01	1.15E-03	1.84E-01	1.84E-01	0.00E+00	-8.92E+00
NRPM	MJ	7.33E+00	0.00E+00	3.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	2.43E+01	3.90E-01	1.23E+00	1.15E-03	1.84E-01	1.84E-01	0.00E+00	-8.92E+00
SM	kg	1.03E-10	0.00E+00	5.15E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	1.03E-10	0.00E+00	5.15E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.03E-10	0.00E+00	5.15E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.70E+01
W	m^3	8.92E-03	7.08E-03	8.00E-04	2.08E-05	3.34E-03	3.34E-03	0.00E+00	-7.50E-01

Biogenic carbon stored in the product, [kg C]	1.64E+00

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
HW	kg	2.28E-03	1.75E-08	1.14E-04	5.15E-11	8.26E-09	2.82E-10	0.00E+00	-1.06E-08
NHW	kg	5.58E-01	1.07E-04	2.79E-02	3.15E-07	5.05E-05	1.73E-06	0.00E+00	-3.18E-02
RW	kg	6.48E-04	4.54E-07	3.24E-05	1.34E-09	2.15E-07	7.33E-09	0.00E+00	-2.16E-03

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow

Parameter	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
CR	kg	1.03E-10	0.00E+00	5.15E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	1.11E+00	0.00E+00	5.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	8.77E-03	0.00E+00	4.38E-04	0.00E+00	0.00E+00	3.72E+00	0.00E+00	0.00E+00
EEE	MJ	6.80E-04	0.00E+00	3.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	1.20E-01	0.00E+00	6.01E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Additional Norwegian requirements

Greenhous gas emission from the use of electricity in the manufacturing phase
National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Data source	Amount	Unit
Energywares Gabi and end energymix ENSTO-E 2016	42	g CO_2-eqv/kWh

Dangerous substances

☑ The product contains no substances given by the REACH Candidate list or the Norwegian priority list

☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.

☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.

☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Name	CAS no.	Amount
—	—	—

Indoor environment
Not relevant

Carbon footprint
Carbon footprint according to ISO 14067 has not been worked out for the product.

Bibliography

ISO 14025:2006	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006+A1:2017+A2:2020	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A1:2013	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
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