

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Skonto Prefab SIA
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2319-1065-EN
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Issue date:	20.08.2020
Valid to:	20.08.2025

Hollow Core Slabs

Product

Skonto Prefab SIA

Owner of the declaration

www.epd-norge.no



General information

Product:

Hollow Core Slabs

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-2319-1065-EN

ECO Platform reference number:
This declaration is based on Product Category Rules:

CEN Standard EN 15804 serves as core PCR
 NPCR Part A:2017 Construction products and services
 NPCR 020:2018 Part B for Concrete and concrete elements
 EN 16757:2017 serves as a complimentary PCR

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:

-

Declared unit with option (A1-A5, C1-C4):

Production of 1 ton of prefabricated concrete elements

Functional unit:

-

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:

sign *Simon A. Saxegård*

Simon A. Saxegård

(Independent verifier approved by EPD Norway)

Owner of the declaration:

Skonto Prefab SIA

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Manufacturer:

Skonto Prefab SIA
 33/4 Granita street, Acone, Salaspils area
 LV-2119 Latvia

Place of production:

Acone, Salaspils area, Latvia

Management system:

ISO 9001:2015
 ISO 14001:2015

Organisation no:

LV40003610650

Issue date:

20.08.2020

Valid to:

20.08.2025

Year of study:

Revision of NEPD00286E (2014)
 Year of revision: 2020

Comparability:

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

The EPD has been worked out by:

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M.M.J. asplan viak

Approved

Håkon Hauan

Håkon Hauan
 Managing Director of EPD-Norway

Product

Product description:

Prestressed hollow core slabs (HCS) are used to construct floors in multi-story buildings, and are manufactured with extrusion method on 90 m long lines. The lines are heated in order to speed up hardening process. Reinforced with steel wires with diameter 9.3 and 12.5 mm. Four different thicknesses, ranging from 200mm up to 400mm. Standard extruded width is 1200mm. HCS span length up to 16 meters.

Technical data:

The product is certified in accordance with the EN1168 standard. Properties (min/max): Compressive strength: C35/45 - C50/60. Length: 1000 - 12000 mm. Width: 400 - 1200 mm. Height: 200-400 mm.

Product specification:

The composition of the product is described in the table below:

Materials	kg	%
Aggregate	484	44
Sand	305	28
Cement	251	23
Water	34	3
Steel	20	2
Additives	0.00005	<1

Market:

Norway, Sweden

Reference service life, product:

Not relevant for declared unit

Reference service life, building:

Not relevant for declared unit

LCA: Calculation rules

Declared unit with options (A1-A5, C1-C4):

Production of 1 ton of prefabricated concrete elements

System boundary:

Cradle to grave. Included modules production and construction are A1-A5, included modules for end of life are C1, C2 and C4. The use stage is not declared. Building demolition takes places in C1 while waste processing is considered in C3. Module D is not declared. Production process at Skonto includes mould preparation, casting of concrete product, curing and finalising. The product is then loaded on trucks for transportation to building site.

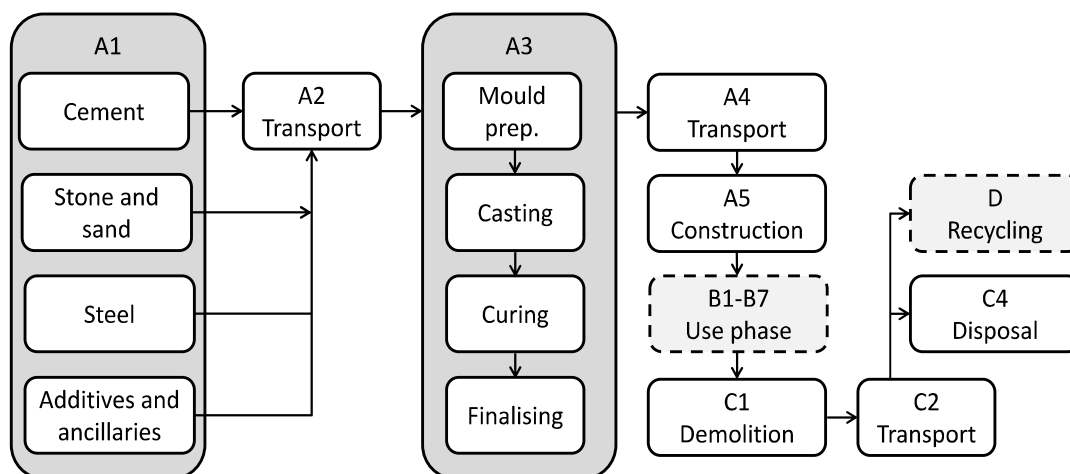


Figure 1: Flow chart of production system

Data quality:

The data is representative according to temporal, geographical and technological requirements as provided in EN15804. Data for Skonto Prefab production facility is for 2019 and represents technology in use. Material and energy use per declared unit has been calculated using expert judgment and validated against annual consumption. Where possible, specific supplier data has been used. Otherwise, generic data is from the ecoinvent 3.5 database. Data quality requirements are in line with core PCR; generic data are <10 years old.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy is allocated on expert judgment to each product group produced by Skonto Prefab to reflect differences between products. Otherwise, mass allocation is used.

Cut-off criteria:

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances.

LCA: Scenarios and additional technical information

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

The scenarios for transportation from production place to user is defined as transport from Salaspils (Latvia) to markets in Norway and Sweden. Scenarios represent typical transportation distances for Skonto Prefab products.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck (to Norway)	44	Lorry, >32t	740	0.022 l/tkm	16.3
Boat (to Norway)	80	10 000 dwt vessel	276	N/A	-
Truck (to Sweden)	44	Lorry, >32t	265	0.022 l/tkm	5.83
Boat (to Sweden)	80	10 000 dwt vessel	276	N/A	-

Description, A5:

Scenario is modelled as installation of a typical concrete product in a building, including waste. Fossil fuel for building machinery and auxiliary materials are included.

Description, C1, C3 and C4:

End of Life scenario is based on demolition of the building and extraction of reinforced concrete in C1. After waste processing and sorting (C3), 99% of steel and 90% of concrete is recycled. The remaining fractions are sent to landfill (module C4).

Description, C2:

Transport from building (demolished building) to waste handling facility.

Assembly (A5)

	Unit	Value
Auxiliary	kg	41
Water consumption	m ³	0
Electricity consumption	kWh	0
Other energy carriers	MJ	72
Material loss	kg	1
Output materials from waste treatment	kg	0
Dust in the air	kg	0.012

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	986
Energy recovery	kg	0
To landfill	kg	108

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	26	Lorry, 16-32t	278	0.044 l/tkm	12.2
Waste collection	50	Lorry, 21t	19	0.39 l/tkm	7.4

LCA: Results

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

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	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	MND

Environmental impact

Parameter	Unit	A1-A3	A4 - NOR	A4 - SWE	A5	C1	C2	C3	C4
GWP	kg CO ₂ -eqv	2.95E+02	7.35E+01	3.08E+01	1.24E+01	5.60E+00	6.89E+01	1.94E+00	5.64E-01
ODP	kg CFC11-eqv	1.48E-05	1.28E-05	4.58E-06	1.51E-06	1.02E-06	1.24E-05	2.24E-07	2.05E-07
POCP	kg C ₂ H ₄ -eqv	3.90E-02	1.58E-02	8.79E-03	2.83E-03	1.12E-03	1.15E-02	4.12E-04	2.11E-04
AP	kg SO ₂ -eqv	8.14E-01	3.59E-01	2.17E-01	6.99E-02	4.26E-02	2.50E-01	1.21E-02	4.28E-03
EP	kg PO ₄ ³⁻ -eqv	1.18E-01	5.39E-02	3.04E-02	1.47E-02	9.22E-03	4.69E-02	1.94E-03	7.38E-04
ADPM	kg Sb-eqv	3.61E-04	1.25E-04	4.48E-05	2.88E-05	1.90E-06	1.53E-04	2.82E-06	6.40E-07
ADPE	MJ	2.27E+03	1.15E+03	4.65E+02	1.51E+02	8.09E+01	1.00E+03	2.96E+01	1.73E+01

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

Resource use									
Parameter	Unit	A1-A3	A4 - NOR	A4 - SWE	A5	C1	C2	C3	C4
RPEE	MJ	1.34E+02	9.76E+00	3.56E+00	1.24E+01	5.60E+00	6.89E+01	1.94E+00	5.64E-01
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	1.51E-06	1.02E-06	1.24E-05	2.24E-07	2.05E-07
TPE	MJ	1.34E+02	9.76E+00	3.56E+00	2.83E-03	1.12E-03	1.15E-02	4.12E-04	2.11E-04
NRPE	MJ	2.46E+03	1.16E+03	4.71E+02	6.99E-02	4.26E-02	2.50E-01	1.21E-02	4.28E-03
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	1.47E-02	9.22E-03	4.69E-02	1.94E-03	7.38E-04
TRPE	MJ	2.46E+03	1.16E+03	4.71E+02	2.88E-05	1.90E-06	1.53E-04	2.82E-06	6.40E-07
SM	kg	2.22E+00	0.00E+00	0.00E+00	1.51E+02	8.09E+01	1.00E+03	2.96E+01	1.73E+01
RSF	MJ	1.52E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	8.59E-01	0.00E+00	0.00E+00	4.82E+00	4.36E-01	7.83E+00	5.47E+00	1.27E-01
W	m ³	1.51E+00	1.93E-01	6.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+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-A3	A4 - NOR	A4 - SWE	A5	C1	C2	C3	C4
HW	kg	0.00393601	0.0006173	0.00022107	0.000177	3.659E-05	0.0005487	5.00093E-05	1.168E-05
NHW	kg	135.73395	90.522519	32.416852	2.5851183	0.0894747	34.678225	0.12960829	107.66032
RW	kg	0.00798527	0.0071976	0.00257751	0.0008765	0.0005699	0.0069797	0.000277176	0.0001155

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

End of life - Output flow									
Parameter	Unit	A1-A3	A4 - NOR	A4 - SWE	A5	C1	C2	C3	C4
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	1.22E-01	0.00E+00	0.00E+00	1.22E-04	0.00E+00	0.00E+00	0.00E+00	9.86E+02
MER	kg	5.64E-02	0.00E+00	0.00E+00	5.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	5.33E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	1.41E-06	0.00E+00	0.00E+00	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

Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3}$ = 0,009

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

National production mix from import, medium 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
Econinvent v3.5	0.604	kg 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 (Avfallsforsiften, Annex III), see table.

Indoor environment

The product has not been tested for emissions to indoor environment. The product contains no dangerous substances on the REACH Candidate list or the Norwegian priority list, and a water-based release agent is used. Based on this it is assumed that the product has a negligible impact on the indoor environment and therefore meets the requirements for low emissions (M1) according to EN15251:2007 Appendix E.

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
EN 16757:2017	<i>Sustainability of construction works Environmental product declarations Product Category Rules for concrete and concrete elements</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
Jenssen, M.M. (2020)	<i>LCA report. EPD revision for prefabricated concrete elements. Presentation of updated life cycle inventories (LCI) and life cycle impact assessment (LCIA) for the revision of EPDs: NEPD00284E, NEPD00285E, NEPD00286E</i>
EPD Norway	<i>NPCR Part A:2017 Construction products and services. Reg 07.04.2017</i>
EPD Norway	<i>NPCR 020:2018 Part B for Concrete and concrete elements. Reg 18.10.2018</i>

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