

Environmental Product Declaration

In accordance with 14025 and EN15804 +A2

ECO Standard 13 Type A



NORGIPS

The Norwegian
EPD Foundation

Owner of the declaration:
Norgips Norge AS

Product name:
ECO Standard

Declared unit:
1 m² covering surface of installed ECO
Standard 13 Type A gypsum plasterboard,
including waste treatment at end-of-life.

Product category /PCR:
NPCR Part A:2021 Construction products and
services Version 2.0 and NPCR part B for
building boards Version: 2.0.

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-4001-3041-EN

Registration number:
NEPD-4001-3041-EN

Issue date: 01.12.2022

Valid to: 01.12.2027

General information

Product:

ECO Standard

Program Operator:

The Norwegian EPD Foundation
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Declaration Number:

NEPD-4001-3041-EN

This declaration is based on Product Category Rules:

NPCR Part A:2021 Construction products and services Version 2.0 and NPCR part B for building boards Version: 2.0.

Statements:

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

Declared unit:

1 m² covering surface of installed ECO Standard 13 Type A gypsum plasterboard, including waste treatment at end-of-life.

Declared unit with option:

-

Functional unit:

-

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal External x



Mie Vold, LCA.no AS

Independent verifier approved by EPD Norway

Owner of the declaration:

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Manufacturer:

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e-mail: norgips@norgips.no

Place of production:

Svelvik, Norway

Management system:

NS-EN ISO 14001:2015
NS-EN ISO 45001:2018

Organisation no:

986 034 757

Issue date:

01.12.2022

Valid to:

01.12.2027

Year of study:

2021

Comparability:

EPDs from other programmes than EPD Norge may not be comparable.

The EPD has been worked out by:

Mafalda Silva and Clara Valente

Approved



Manager of EPD Norway

Product

Product description:

ECO Standard 13 Type A is a gypsum plasterboard composed of a plaster core encased in and firmly bonded to paper liners. The front and back paper liners are overlapped and glued together on the backside of the board. The product is particularly suitable for the cladding of internal walls, ceilings and partitions in all types of buildings. The board is classified for use in fire-rated construction and will provide very good sound insulation. It is produced with 100 % renewable energy and liquefied biogas (LBG).

Product specification:

ECO Standard gypsum board is produced in various widths and lengths but with the same thickness, therefore there are no variations of the product per square meter.

Materials	KG	%
Gypsum	7.256	82.46 %
Paper liner	0.3159	3.59 %
Glass fiber	0.010	0.11 %
Additives	0.087	0.99 %
Water	1.140	12.95 %
Total	8.809	100 %
Plastic packaging	0.0048	
Wood packaging	0.0522	
Wood pallet	0.0095	
Total product + packaging	8.876	

Technical data:

The product is in compliance with EN 520

Weight: 8.8 kg/m² ± 2%

Thickness: 12.5 mm ± 0.5 mm

For more information from the product data sheet please see: www.norgips.no

Market:

Norway and Sweden

Reference service life, product:

60 years

Reference service life, building:

60 years

LCA: Calculation rules

Declared unit:

1 m² covering surface of installed ECO Standard 13 Type A gypsum plasterboard, including waste treatment at end-of-life.

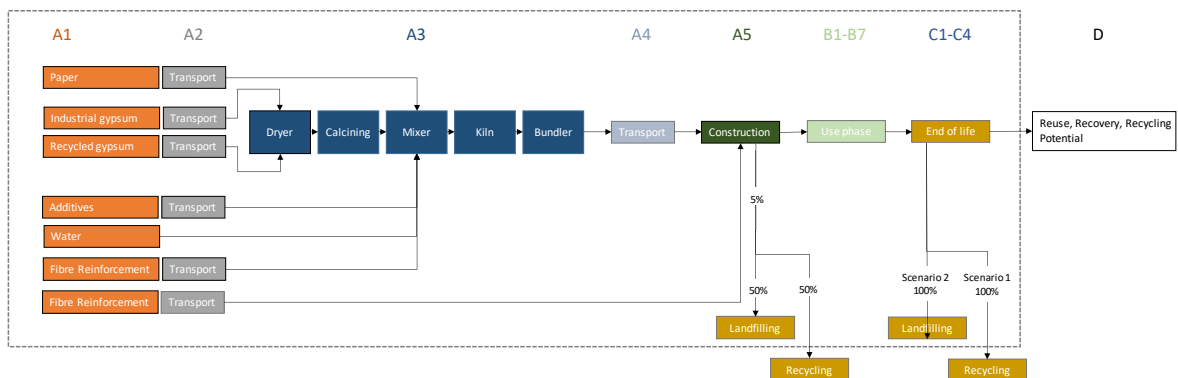
Data quality:

The manufacturing data for Norgips was collected in 2022 and represents an average for 2021. Other data are from Ecoinvent v3.8, released in 2019, but with some changes to improve representativeness.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy use is sub-divided between different process and allocated with physical relationships to the different types of boards. Packaging, water use and waste production is allocated equally among all products through mass allocation. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Flowchart:



Industrial gypsum and recycled gypsum are mixed and dried before the mixture is calcined. The calcined gypsum is transferred to the mixer where water and additives are added. The slurry is distributed to a plasterboard liner where the edges are folded, and a new layer of plasterboard liner is glued on to form a sandwich. The board line is continuously transferred along the production line, cut to suitable lengths, and dried in a kiln. The dried boards are cut to the correct lengths and stacked in pallets.

System boundary:

This EPD represents a cradle-to-gate with options analysis. The analysis comprises modules A1-A3, A4, A5, B1-B7 and C1-C4. Modul D is also declared with material and energy substitution from net recovery.

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.

Transport from production place to assembly (A4)

The product is either first transported to a building merchant or directly to a building site. It is included a scenario considering that the product is directly transported to a building site by using an average distance of 360 km.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	55	EURO6	360	0.0224	l/tkm

Assembly (A5)

It is assumed 0.0012 MJ of electricity use in assembly and 5 % wastage of the product, in addition to waste management of the packaging. Jointing compound and jointing tape are also added to smooth the surface between boards.

	Unit	Value
Auxiliary – jointing tape	kg	0.0042
Auxiliary – jointing compound	kg	0.33
Water consumption	m ³	0
Electricity consumption	MJ	0.00121
Other energy carriers	MJ	0
Material loss	kg	0.44
Output materials from waste treatment	kg	0.069
Dust in the air	kg	0

Use (B1)

There are no LCA-related environmental impacts during use.

	Unit	Value
Relevant emissions during use	kg	0

Maintenance (B2)/Repair (B3)

It is assumed no need for maintenance nor repair under a normal scenario.

	Unit	Value
Maintenance cycle*		
Auxiliary	kg	0
Other resources	kg	0
Water consumption	m ³	0
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Material loss	kg	0

Replacement (B4)/Refurbishment (B5)

It is assumed no need for replacement nor refurbishment under a normal scenario.

	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	0
Replacement of worn parts	0	0

Operational energy (B6) and water consumption (B7)

It is assumed no need for operational energy nor water under a normal scenario

	Unit	Value
Water consumption	m ³	0
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Power output of equipment	kW	0

End of Life (C1, C3, C4)

The product is collected as gypsum. The most common treatment is recycling and landfilling. Both scenarios are declared as separate 100 % scenarios

	Unit	Value
Hazardous waste disposed	kg	
Collected as gypsum waste	kg	8.81
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling scenario	kg	8.81
Energy recovery	kg	0
Landfilling scenario	kg	8.81

Transport to waste processing (C2)

The transport of gypsum waste is assumed to be 50 km for landfilling scenario and 300 km for recycling.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	value (l/t)
Truck – Recycling scenario		Unspecified	300	0.063	l/tkm
Truck – Landfilling scenario		Unspecified	50	0.063	l/tkm

Benefits and loads beyond the system boundaries (D)

The benefits and loads beyond system boundaries are calculated from the net flows shown in the table below. The benefits beyond life cycle are calculated by substituting the energy production.

The thermal energy exported due to the incineration of paper liner and jointing tape waste is assumed to substitute district heating and therefore the 2021 energy mix (SSB, 2022) is used. In addition to substituting district heating, the export of electric energy is assumed to substitute the Norwegian electricity mix, medium voltage, as used for waste generated electricity in Ecoinvent v3.8. The amount of energy and materials substituted are calculated in C3, but the amount of recycled in the raw materials have been subtracted. The recycling output of gypsum is assumed at 90 % of the weight of the product and the raw material substitution is modelled with mined gypsum. The net output flow of gypsum is however negative and will give a net load in module D.

	Unit	Value
Recycling scenario		
Substitution of electric energy	MJ	0.34
Substitution of thermal energy	MJ	3.90
Substitution of raw materials	kg	-0.54
Substitution of fuels	kg	0
Substitution of products	kg	0
Landfilling scenario		
Substitution of electric energy	MJ	0
Substitution of thermal energy	MJ	0
Substitution of raw materials	kg	-8.67
Substitution of fuels	kg	0
Substitution of products	kg	0

Additional technical information

The manufacturing of ECO Standard 13 Type A is done by using LBG and electricity with 100% renewable energy. The use of 100 % renewable electricity is evidenced by a purchased Guarantee of Origin (GOO) certificate.

LCA: Results

As specified in the PCR and EN 15804:2012+A2:2019, the LCA results are presented in the following tables for the environmental impact categories, resource indicators, and waste and outflow indicators. The impacts have been analyzed excluding long-term emissions.

LCA results refer to a declared unit of 1 m² covering surface of installed ECO Standard 13 Type A gypsum plasterboard, including waste treatment at end-of-life.

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

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
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	X	X	X	X	X	X	X	X	X	X	X	X

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
GWP-total	kg CO ₂ eq.	5.01E-01	2.82E-01	1.83E-01	0.00E+00	9.02E-06
GWP-fossil	kg CO ₂ eq.	6.10E-01	2.57E-01	6.43E-02	0.00E+00	8.60E-06
GWP-biogenic	kg CO ₂ eq.	-1.11E-01	1.69E-02	1.18E-01	0.00E+00	3.69E-07
GWP-LULUC	kg CO ₂ eq.	2.64E-03	7.49E-03	5.30E-04	0.00E+00	4.65E-08
ODP	kg CFC11 eq.	8.15E-08	6.50E-08	1.89E-08	0.00E+00	3.39E-13
AP	mol H ⁺ eq.	6.07E-03	1.04E-03	8.02E-03	0.00E+00	6.33E-08
EP-freshwater	kg P eq.	4.53E-05	3.43E-06	3.01E-06	0.00E+00	4.62E-10
EP-marine	kg N eq.	1.63E-03	3.14E-04	1.56E-04	0.00E+00	7.16E-09
EP-terrestrial	mol N eq.	1.77E-02	2.72E-03	1.52E-03	0.00E+00	9.06E-08
POCP	kg NMVOC eq.	4.91E-03	9.32E-04	9.08E-04	0.00E+00	2.49E-08
ADP-M&M	kg Sb eq.	1.00E-05	1.50E-06	1.19E-06	0.00E+00	1.00E-09
ADP-fossil	MJ	9.33E+00	4.43E+00	3.12E+00	0.00E+00	1.42E-04
WDP	m ³	4.10E+00	2.72E-02	2.71E-01	0.00E+00	8.77E-06

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
GWP-total	kg CO ₂ eq.	3.49E-01	5.46E-01	7.41E-03	-4.08E-02
GWP-fossil	kg CO ₂ eq.	3.49E-01	4.27E-02	7.32E-03	-3.48E-02
GWP-biogenic	kg CO ₂ eq.	3.39E-04	5.03E-01	8.03E-05	-5.83E-03
GWP-LULUC	kg CO ₂ eq.	1.40E-04	1.48E-05	7.56E-06	-1.38E-04
ODP	kg CFC11 eq.	8.13E-08	9.60E-09	1.90E-09	-3.85E-09
AP	mol H ⁺ eq.	1.43E-03	4.97E-04	1.82E-02	-2.16E-04
EP-freshwater	kg P eq.	2.53E-06	3.92E-07	1.76E-07	-1.58E-06
EP-marine	kg N eq.	4.24E-04	2.16E-04	1.87E-05	-5.93E-05
EP-terrestrial	mol N eq.	4.68E-03	2.38E-03	2.07E-04	-6.56E-04
POCP	kg NMVOC eq.	1.47E-03	6.43E-04	1.18E-03	-2.47E-04
ADP-M&M	kg Sb eq.	1.13E-06	1.79E-07	2.32E-08	-7.50E-07
ADP-fossil	MJ	5.33E+00	5.60E-01	1.61E-01	-5.54E-01
WDP	m ³	1.76E-02	5.74E-03	6.23E-03	-6.87E-03

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
GWP-total	kg CO ₂ eq.	5.82E-02	3.54E-02	8.74E-01	2.17E-02
GWP-fossil	kg CO ₂ eq.	5.81E-02	3.54E-02	1.21E-01	2.17E-02
GWP-biogenic	kg CO ₂ eq.	5.66E-05	5.00E-05	7.53E-01	4.65E-05
GWP-LULUC	kg CO ₂ eq.	2.33E-05	8.22E-06	1.28E-04	2.30E-05
ODP	kg CFC11 eq.	1.36E-08	7.38E-09	3.07E-08	3.48E-09
AP	mol H ⁺ eq.	2.38E-04	3.63E-04	2.84E-01	4.70E-04
EP-freshwater	kg P eq.	4.22E-07	1.78E-07	2.96E-06	4.35E-07
EP-marine	kg N eq.	7.06E-05	1.58E-04	8.28E-04	1.62E-04
EP-terrestrial	mol N eq.	7.80E-04	1.73E-03	3.40E-03	2.28E-03
POCP	kg NMVOC eq.	2.45E-04	4.77E-04	1.87E-02	4.81E-04
ADP-M&M	kg Sb eq.	1.88E-07	1.25E-07	3.87E-07	9.22E-08
ADP-fossil	MJ	8.89E-01	4.87E-01	2.62E+00	2.92E-01
WDP	m ³	2.93E-03	1.68E-03	1.01E-01	2.43E-03

GWP-total: Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See “additional Norwegian requirements” for indicator given as PO₄ eq. **EP-marine:**

*Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial**: Eutrophication potential, Accumulated Exceedance; **POCP**: Formation potential of tropospheric ozone; **ADP-M&M**: Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil**: Abiotic depletion potential for fossil resources; **WDP**: Water deprivation potential, deprivation weighted water consumption*

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
PM	Disease incidence	6.06E-08	3.30E-08	1.79E-08	0.00E+00	5.23E-13
IRP	kBq U235 eq.	4.14E-02	1.83E-02	4.38E-03	0.00E+00	3.00E-06
ETP-fw	CTUe	2.26E+01	4.56E+00	3.17E+00	0.00E+00	4.41E-04
HTP-c	CTUh	9.10E-10	1.63E-10	7.58E-11	0.00E+00	2.75E-14
HTP-nc	CTUh	3.39E-08	4.36E-09	2.67E-09	0.00E+00	6.15E-13
SQP	Dimensionless	7.16E+01	5.82E+00	5.03E+00	0.00E+00	6.19E-05

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
PM	Disease incidence	3.40E-08	7.61E-08	1.48E-08	-1.65E-08
IRP	kBq U235 eq.	2.32E-02	2.54E-03	6.72E-04	-4.71E-03
ETP-fw	CTUe	4.22E+00	1.13E+00	3.71E+00	-1.83E+00
HTP-c	CTUh	1.32E-10	1.29E-10	1.87E-11	-4.61E-11
HTP-nc	CTUh	4.48E-09	9.99E-10	8.82E-10	-3.65E-09
SQP	Dimensionless	4.68E+00	2.19E-01	3.43E-01	-3.06E+00

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
PM	Disease incidence	5.67E-09	7.51E-08	2.31E-07	1.09E-08
IRP	kBq U235 eq.	3.86E-03	2.29E-03	1.09E-02	1.42E-03
ETP-fw	CTUe	7.03E-01	3.32E-01	5.95E+01	1.93E+01
HTP-c	CTUh	2.21E-11	1.83E-11	2.98E-10	1.01E-11
HTP-nc	CTUh	7.47E-10	2.72E-10	1.49E-08	2.46E-10
SQP	Dimensionless	7.80E-01	1.99E-01	5.53E+00	-2.06E-01

***PM**: Particulate matter emissions; **IRP**: Ionising radiation, human health; **ETP-fw**: Ecotoxicity (freshwater); **ETP-c**: Human toxicity, cancer effects; **HTP-nc**: Human toxicity, non-cancer effects; **SQP**: Land use related impacts / soil quality*

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
	Acidification potential, Accumulated Exceedance (AP)	None
ILCD type / level 2	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
ILCD type / level 3	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2	
<p>Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.</p> <p>Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator</p>		

Resource use

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
RPEE	MJ	1.10E+01	3.77E-01	2.41E+00	0.00E+00	1.37E-03
RPEM	MJ	5.13E+00	0.00E+00	-6.13E-01	0.00E+00	0.00E+00
TPE	MJ	1.61E+01	3.77E-01	1.80E+00	0.00E+00	1.37E-03
NRPE	MJ	9.39E+00	4.43E+00	3.44E+00	0.00E+00	1.43E-04
NRPM	MJ	1.53E-03	0.00E+00	7.16E-01	0.00E+00	0.00E+00
TRPE	MJ	9.40E+00	4.43E+00	4.16E+00	0.00E+00	1.43E-04
SM	kg	7.27E+00	0.00E+00	3.64E-01	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.18E-01	9.37E-04	7.56E-03	0.00E+00	1.01E-05

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
RPEE	MJ	7.61E-02	5.24E+00	5.38E-03	-2.51E+00
RPEM	MJ	0.00E+00	-5.10E+00	0.00E+00	0.00E+00
TPE	MJ	7.61E-02	1.42E-01	5.38E-03	-2.51E+00
NRPE	MJ	5.33E+00	5.60E-01	1.61E-01	-5.54E-01
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	5.33E+00	5.60E-01	1.61E-01	-5.54E-01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	6.36E-04	1.24E-03	1.65E-04	-6.57E-03

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
RPEE	MJ	1.27E-02	1.36E-01	9.01E-02	1.46E-02
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.27E-02	1.36E-01	9.01E-02	1.46E-02
NRPE	MJ	8.89E-01	4.87E-01	2.62E+00	2.92E-01
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	8.89E-01	4.87E-01	2.62E+00	2.92E-01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.06E-04	1.01E-03	2.66E-03	1.01E-04

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

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
HW	kg	4.31E-05	1.13E-05	6.11E-05	0.00E+00	1.35E-10
NHW	kg	5.40E-01	4.77E-01	3.72E-01	0.00E+00	2.38E-05
RW	kg	4.61E-05	2.84E-05	5.71E-06	0.00E+00	1.43E-09

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
HW	kg	1.35E-05	1.49E-06	2.31E-07	-7.65E-07
NHW	kg	4.02E-01	1.11E-02	5.74E-01	-2.38E-02
RW	kg	3.60E-05	3.61E-06	9.49E-07	-2.81E-06

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
HW	kg	2.26E-06	1.32E-06	3.74E-06	7.01E-07
NHW	kg	6.71E-02	5.26E-03	9.24E+00	5.06E-03
RW	kg	6.00E-06	3.38E-06	1.53E-05	1.78E-06

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

End of life – output flow

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	8.90E-03	0.00E+00	2.12E-01	0.00E+00	0.00E+00
MER	kg	1.75E-05	0.00E+00	3.23E-03	0.00E+00	0.00E+00
EEE	MJ	8.92E-03	0.00E+00	1.19E-02	0.00E+00	0.00E+00
ETE	MJ	9.54E-02	0.00E+00	8.36E-02	0.00E+00	0.00E+00

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	8.26E+00	0.00E+00	5.42E-01
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	4.58E-01	0.00E+00	-3.42E-01
ETE	MJ	0.00E+00	3.15E+00	0.00E+00	-3.90E+00

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	0.00E+00	8.67E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	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 = $9,0 \cdot 10^{-3} = 0,009$

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	1.32E+00
Biogenic carbon content in the accompanying packaging	kg C	3.99E-01

Note: 1 kg biogenic carbon is equivalent to 44/12 (approx. 3,67) kg CO₂

The biogenic carbon content in the product is linked to the production of starch maize (as binder), sugar (as grinding agent) and paper liner used in surfacing. Regarding the biogenic carbon in the accompanying packaging, it is linked to the production of wood packaging and wood pallet.

Additional Norwegian requirements

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

As stated in NPCR Part A, if the manufacturer purchases GOO, the results towards GWP with the physical national grid mix shall be calculated and reported in the EPD in parallel for reasons of transparency.

The manufacturing of ECO Standard 13 type A takes place in Norway and if GOO are not purchased, it is assumed that the manufacturing site is supplied with Norwegian electricity mix on low voltage. The GWP emission factor for Norwegian electricity mix including imports is presented in the following table.

National electricity grid	Unit	Value
Electricity, low voltage {NO} market for Cut-off, S	kg CO ₂ eq/kWh	0.0268

Regarding the Norgips GOO certificate, the information used to model it is presented in following table. It has an associated GWP emission factor of 0.00709 kg CO₂ eq/kWh.

Type of information	Description
Location	Representative of average production in Norway
Geographical representativeness	Split of energy sources in Norway:
Description	- Hydropower 92.36 % - Wind power 7.51 % - Biomass 0.13 %
Reference year	2021
Data quality	Cradle-to-gate
Type of data set	The reported energy production is based on Association of issuing bodies (AIB) report (AIB, 2021) and Guarantee of Origin certificate. The associated emissions are calculated in ecoinvent v3.8, which was released in 2021.
Source	Guarantee of Origin (GOO) certificate ecoinvent database, version 3.8

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1
GWP-IOBC	kg CO ₂ eq.	8.99E-01	2.65E-01	9.51E-02	0.00E+00	8.86E-06

Indicator	Unit	Recycling scenario			
		C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	3.49E-01	4.29E-02	7.36E-03	-3.60E-02

Indicator	Unit	Landfilling scenario			
		C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	5.81E-02	3.54E-02	7.57E-01	2.17E-02

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- 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 contains 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 (Avfallsforskiten, Annex III), see table.

Indoor environment

The product meets the requirements for low emissions.

Emissions to indoor air are tested by RISE and evaluated according to EN 16516.

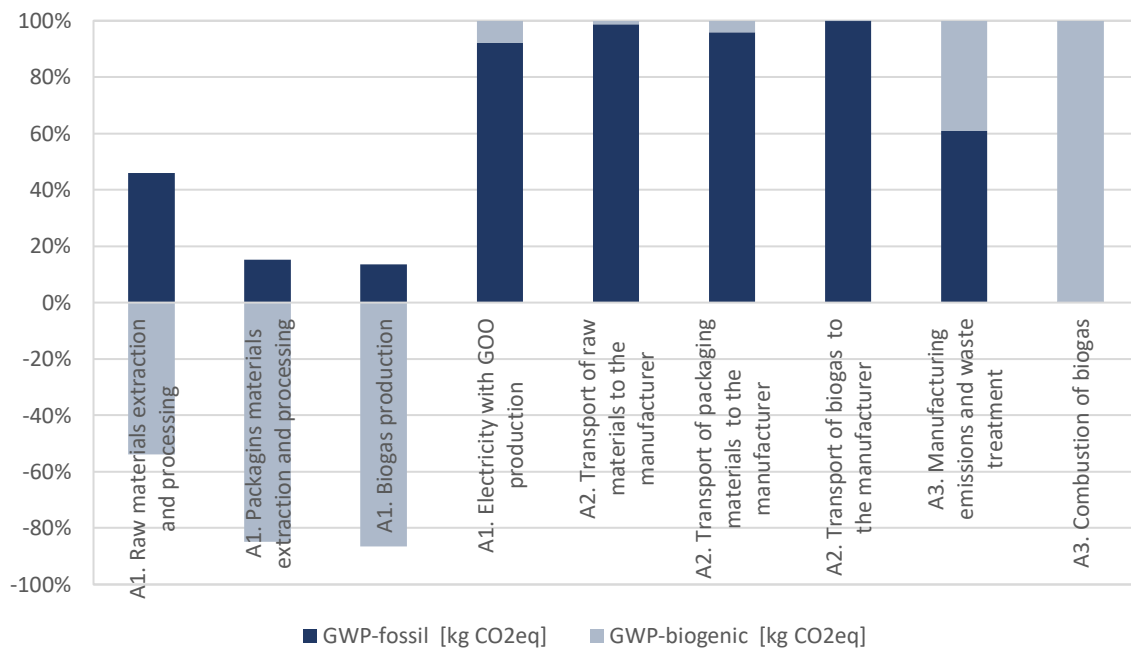
Carbon footprint

For reasons of transparency, the results towards GWP with the physical national grid mix, i.e., with the Norwegian electricity mix, are presented in the following table for A1-A3.

Indicator	Unit	A1-A3
GWP-total	kg CO ₂ eq.	5.10E-01
GWP-fossil	kg CO ₂ eq.	6.18E-01
GWP-biogenic	kg CO ₂ eq.	-1.11E-01
GWP-LULUC	kg CO ₂ eq.	2.70E-03





To further increase the transparency of LCA results of product stage, the following figure shows the impact towards GWP-fossil and biogenic for A1-A3, considering the use of 100 % renewable electricity and LBG. Noteworthy that the LCA results for GWP-LULUC are not presented as they present a much smaller contribution in comparison. The figure shows that the CO₂ emissions linked to raw and packaging materials extraction and processing and production of LBG are mostly biogenic. Figure also shows that for the combustion of LBG, biogenic CO₂ emissions are the main contributor to the total impacts (99.95%) associated with this activity in A3.

Regarding the production and distribution of 100 % renewable electricity (with GOO), figure shows that fossil-CO₂ is the main contributor to the total impacts, which is linked to the production of raw materials such as steel and iron used in the construction of the hydropower plants. However, it should be considered that the emission factor for Norgips GOO certificate is much lower than for Norwegian electricity mix.



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