epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Norgips Light Board 13



NORGIPS

The Norwegian EPD Foundation

Owner of the declaration:
Norgips Norge AS

Product:
Norgips Light Board 13

Declared unit:
1 m2

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 010:2022 Part B for building boards

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-8322-7979-EN

Registration number:
NEPD-8322-7979-EN

Issue date:
03.12.2024

Valid to:
03.12.2029

EPD software:
LCAno EPD generator ID: 656825

General information

Product

Norgips Light Board 13

Owner of the declaration:

Norgips Norge AS
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Program operator:

The Norwegian EPD Foundation
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Phone: +47 977 22 020
web: www.epd-norge.no

Manufacturer:

Norgips Norge AS

Declaration number:

NEPD-8322-7979-EN

Place of production:

Norgips Norge AS
Svelvikveien 625
3060 SVELVIK, Norway

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 010:2022 Part B for building boards

Management system:

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.

Organisation no:

986 034 757

Declared unit:

1 m2 Norgips Light Board 13

Issue date:

03.12.2024

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Valid to:

03.12.2029

Year of study:

2022

Functional unit:

1 m2 covering surface of installed building board with a specific function, from cradle-to-grave, with activities
needed for a study period of 60 years for the building.

Comparability:

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

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. NEPDT96 Knauf

Developer of EPD: Trond Even Fagerli

Reviewer of company-specific input data and EPD: Øystein Edland

Verification of EPD tool:

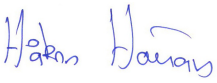
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Norgips Light Board 13 is a gypsum board 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 long sides of the board have tapered edges, the short sides are cut. Norgips Light Board 13 has a weight of only 7 kg/m².
It is produced with 100% renewable electric energy and liquefied natural gas (LNG)

Product specification

Norgips Light Board 13 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	%
Additives	0,13	1,83
Adhesive	0,00	0,04
Chemical	0,04	0,50
Gypsum	4,39	62,73
Recycled cardboard	0,39	5,57
Recycled gypsum	1,10	15,72
Water	0,95	13,60
Total	7,00	100,00

Packaging	kg	%
Packaging - Cardboard	0,05	94,08
Packaging - Plastic	0,00	5,92
Total incl. packaging	7,05	100,00

Technical data:

More product information is available on www.norgips.no/www.norgips.se

Produced according to:	Weight:	Thickness:	Reaction to fire:
EN 520 - Gypsum plasterboards	7 kg/m2	12,5 mm	A2-s1,d0

Market:

Norway and Sweden

Reference service life, product

60 years

Reference service life, building or construction works

60 years

LCA: Calculation rules

Declared unit:

1 m2 Norgips Light Board 13

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included when specific information are missing. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

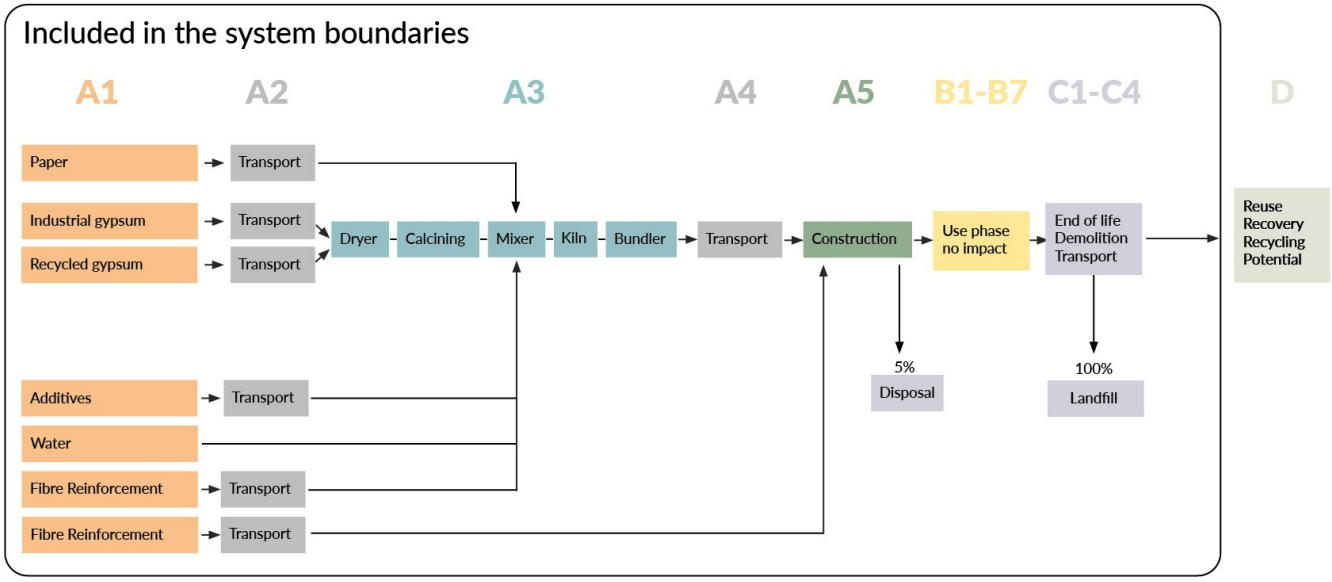
Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Client Specific	2019
Additives	ecoinvent 3.6	Database	2019
Adhesive	ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Gypsum	Supplier	Supplier specific	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Recycled cardboard	S-P-08304	EPD	2021
Recycled gypsum	Supplier/ecoinvent 3.6	Supplier specific/database	2019
Water	Treteknisk	Specific	2021

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

Product stage			Construction installation 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	X

System boundary:

Flow chart for the life cycle (A1-A5 and C1-C4) with system boundaries are shown in the figure below. Modul D is also declared outside the life cycle with material and energy substitution from net recovery and is further explained in the scenarios.



Additional technical information:

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 continuous 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.

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Train, Electrical (kgkm) - Norway	42,0 %	90	0,051	kWh/tkm	4,59
Truck, Biogas, 80.2% Capacity Utilisation, Class50, EURO 6 (km)	80,2 %	150	0,026	l/tkm	3,90
Truck, Diesel, 69.2% Capacity Utilisation, Class50, EURO 6 (km)	69,2 %	60	0,012	l/tkm	0,72

Assembly (A5)	Unit	Value			
Material loss from installation (percent)	Units/DU	0,05			
Electricity, Norway (kWh)	kWh/DU	0,00			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0,00			
Waste, packaging, folding chipboard, to average treatment (kg)	kg	0,05			

De-construction demolition (C1)	Unit	Value			
Default scenario from PCR - demolition and landfill	kg/DU	7,00			
Electricity, Norway (kWh)	kWh	0,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (kgkm) - Europe	53,3 %	50	0,023	l/tkm	1,15

Disposal (C4)	Unit	Value			
Landfilling of gypsum	kg	7,00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,00			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	0,05			

LCA: Results

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

Environmental impact										
	Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	1,14E+00	6,54E-02	1,87E-01	5,72E-05	3,07E-02	4,42E-01	5,75E-02	-2,72E-04
	GWP-fossil	kg CO_2 -eq	1,74E+00	5,90E-02	1,03E-01	5,55E-05	3,07E-02	0,00E+00	5,74E-02	-2,63E-04
	GWP-biogenic	kg CO_2 -eq	-5,99E-01	6,43E-03	8,38E-02	1,53E-06	1,32E-05	4,42E-01	6,70E-05	-5,43E-07
	GWP-luluc	kg CO_2 -eq	2,82E-03	5,69E-05	1,49E-04	2,29E-07	9,35E-06	0,00E+00	1,41E-05	-9,06E-06
	ODP	kg CFC11 -eq	2,20E-07	1,25E-08	1,54E-08	4,00E-12	7,40E-09	0,00E+00	2,17E-08	-1,92E-05
	AP	mol H+ -eq	6,13E-03	3,52E-04	3,64E-04	4,33E-07	9,89E-05	0,00E+00	5,11E-04	-2,17E-06
	EP-FreshWater	kg P -eq	6,42E-05	1,53E-06	3,06E-06	3,99E-09	2,44E-07	0,00E+00	6,51E-07	-2,34E-08
	EP-Marine	kg N -eq	1,86E-03	8,89E-05	1,07E-04	4,76E-08	2,16E-05	0,00E+00	1,90E-04	-7,08E-07
	EP-Terrestial	mol N -eq	1,81E-02	9,92E-04	1,07E-03	6,20E-07	2,41E-04	0,00E+00	2,09E-03	-7,66E-06
	POCP	kg NMVOC -eq	3,70E-03	3,81E-04	2,65E-04	1,67E-07	9,48E-05	0,00E+00	6,00E-04	-2,11E-06
	ADP-minerals&metals[1]	kg Sb-eq	1,43E-05	2,58E-06	1,06E-06	4,14E-09	5,47E-07	0,00E+00	5,17E-07	-2,62E-09
	ADP-fossil[1]	MJ	2,77E+01	1,02E+00	1,68E+00	7,57E-04	4,99E-01	0,00E+00	1,58E+00	-3,76E-03
	WDP[1]	m^3	4,81E+01	3,80E+00	3,06E+00	1,32E-01	3,82E-01	0,00E+00	9,75E+00	-4,68E-02

GWP-total = Global Warming Potential total; 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: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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

Remarks to environmental impacts

Additional environmental impact indicators										
Indicator		**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	3,11E-08	1,10E-08	3,63E-09	3,00E-12	2,82E-09	0,00E+00	1,09E-08	-1,31E-10
	IRP[2]	kgBq U235 -eq	3,31E-02	4,21E-03	2,98E-03	1,37E-05	2,18E-03	0,00E+00	7,21E-03	-2,40E-05
	ETP-fw[1]	CTUe	1,29E+01	1,26E+00	8,21E-01	3,45E-03	3,65E-01	0,00E+00	8,62E-01	-2,04E-02
	HTP-c[1]	CTUh	4,21E-10	0,00E+00	2,10E-11	0,00E+00	0,00E+00	0,00E+00	3,50E-11	0,00E+00
	HTP-nc[1]	CTUh	1,55E-08	2,12E-09	9,56E-10	4,00E-12	3,53E-10	0,00E+00	6,23E-10	-1,90E-11
	SQP[1]	dimensionless	8,28E+00	2,45E+00	1,01E+00	3,81E-04	5,72E-01	0,00E+00	6,08E+00	-2,51E-02

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. 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
2. 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.

Resource use										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	4,16E+00	2,92E-01	2,03E-01	9,81E-03	6,27E-03	0,00E+00	5,66E-02	-2,32E-02
	PERM	MJ	3,95E-01	0,00E+00	-1,22E-01	0,00E+00	0,00E+00	-1,47E-04	0,00E+00	0,00E+00
	PERT	MJ	4,55E+00	2,92E-01	8,08E-02	9,81E-03	6,27E-03	-1,47E-04	5,66E-02	-2,32E-02
	PENRE	MJ	2,72E+01	9,84E-01	1,65E+00	7,58E-04	4,99E-01	0,00E+00	1,58E+00	-3,76E-03
	PENRM	MJ	1,65E+00	0,00E+00	-1,33E-01	0,00E+00	0,00E+00	-6,09E-01	0,00E+00	0,00E+00
	PENRT	MJ	2,89E+01	9,84E-01	1,52E+00	7,58E-04	4,99E-01	-6,09E-01	1,58E+00	-3,76E-03
	SM	kg	5,93E+00	0,00E+00	2,96E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	3,42E-02	1,07E-03	1,80E-03	7,70E-06	2,19E-04	0,00E+00	1,17E-03	-4,07E-06
	NRSF	MJ	1,44E-02	0,00E+00	1,14E-03	1,92E-05	7,35E-04	0,00E+00	2,53E-03	-1,38E-03
	FW	m^3	5,02E-02	4,80E-03	2,74E-03	7,32E-05	5,67E-05	0,00E+00	1,94E-03	-2,80E-05

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = 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; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	3,95E-03	3,86E-04	2,21E-04	4,86E-07	2,73E-05	0,00E+00	0,00E+00	-1,77E-07
	NHWD	kg	2,04E-01	1,96E-01	4,42E-01	5,83E-05	4,33E-02	0,00E+00	7,00E+00	-8,88E-05
	RWD	kg	4,70E-05	5,82E-06	3,77E-06	6,78E-09	3,41E-06	0,00E+00	0,00E+00	-1,97E-08

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	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
	MFR	kg	3,64E-02	0,00E+00	5,22E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	4,81E-02	0,00E+00	6,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EEE	MJ	3,36E-02	0,00E+00	4,68E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	5,08E-01	0,00E+00	7,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	1,30E-01
Biogenic carbon content in accompanying packaging	kg C	2,47E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions 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).

Electricity mix	Source	Amount	Unit
Renewable electricity Norgips, based on 100% hydro power, with Guarantee of Origin from Glitre Energi Strøm AS 2022 (kWh)	Modified ecoinvent 3.6	9,66	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Emissions to indoor air are tested by RISE in 2020 and evaluated according to EN 16516.
The test are performed according to ISO 16000-9 and the calculation and reporting of TVOC according to EN 16516.
The test results of Norgips Standard 12.5 mm Typ A are in compliance with the emission requirements of Sintef Miljøcertifikat.
The emission results can be compared to different Emission Labelling Systems.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	1,71E+00	6,54E-02	1,04E-01	5,71E-05	3,07E-02	0,00E+00	5,74E-02	-2,69E-04

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

Bibliography

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EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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NPCR 010 Part B for Building Boards. Ver. 4.0, March 2022, EPD-Norge.

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