

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:

Program operator:

Publisher:

Declaration number: Registration number:

ECO Platform reference number:

Issue date: Valid to: Norgips Norge AS

The Norwegian EPD Foundation The Norwegian EPD Foundation

NEPD-2516-1255-EN NEPD-2516-1255-EN

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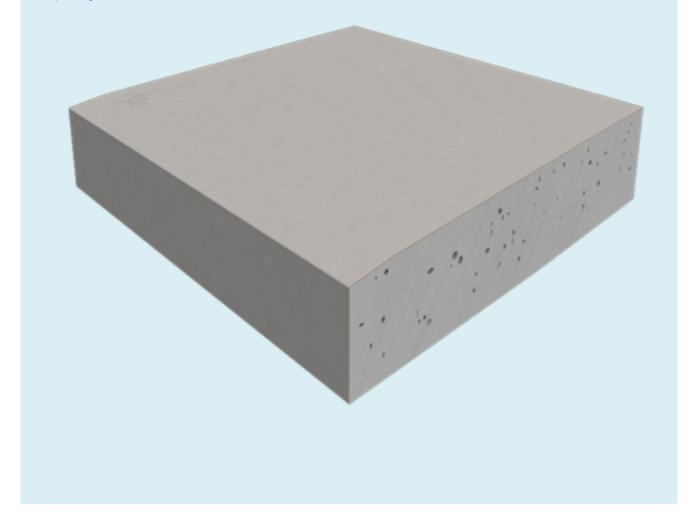
05.11.2020 05.11.2025

Norgips Ultra board 15 mm type DFIR

Norgips Norge AS

www.epd-norge.no







General information

Product:		Owner of the decla	ration:
Norgips Ultra board 15 mm	type DFIR	Norgips Norge AS Contact person: Phone:	Trond Even Fagerli +47 46 95 32 15
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Program operator:		Manufacturer:	
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Declaration number:		Place of productio	n:
NEPD-2516-1255-EN		Svelvik, Norway	
ECO Platform reference n	umber:	Management syste	em:
		NS-EN ISO 14001:2	
	on Product Category Rules:	Organisation no:	
CEN Standard EN 15804 se NPCR010 v3.0 Building box	_	NO 986034757 MV/	Ą
NPCRUTU V3.0 Building box	arus (04/2019).		
Statement of liability:		Issue date:	
The owner of the declaration	n shall be liable for the	05.11.2020	
underlying information and	evidence. EPD Norway shall		
	manufacturerinformation, life		
cycle assessment data and	evidences.	Valid to	
		Valid to: 05.11.2025	
		00.11.2025	
Declared unit:		Year of study:	
		2019	
Declared unit with option	:	Comparability:	
	oard, including waste treatment at		products may not be comparable if they
end of life.		not comply with EN	15804 and seen in a building context.
Functional unit:		The EPD has been	
		Clara Valente & Lar	s G. F. Tellnes
		Close Valent	■ NQRSUS
		1 1/4/	γ
Verification:		LANSH Elle	les established
The CEN Norm EN 15804 s		-	
Independent verification of according to ISO14025:201			
☐ internal	☑ external		
Third	party verifier:	Approved	, 11 _
	party verifier:		skon Daugu
		1)6	
	M. K. Iversen	Manag	Håkon Hauan ing Director of EPD-Norway
(maepenaent verifie	r approved by EPD Norway)	3	· · · · · · · · · · · · · · · · · ·



Product

Product description:

Building board consisting of a fiberglass reinforced plaster core with high density. Protected in front and back with cardboard firmly attached to the core of the plate, overlapped and glued to each other on the back of the plasterboard. The long sides are submerged for sparkling with strip, the short sides are cut. The product is particularly suitable for the cladding of internal walls, ceilings and partitions in all types of buildings. With Ultra Board makes it possible to mount fixtures directly in the plate without the need for plugs; screw straight into the plate with a suitable screw.

Product specification:

Gypsum board is produced in various width and length, but at the same thickness and it is therefore no variations of the product per square meter.

Materials	kg	%
Gypsum	12.1	80.52 %
Cardboard	0.408	2.71 %
Glass fibre reinforcement	0.080	0.53 %
Additives	0.3518	2.34 %
Water	2.09	13.89 %
Total for product	15.028	100 %
Plastic packaging	0.003	
Wood packaging	0.0959	
Wooden pallet	0.0175	
Total product + packaging	15.144	

Technical data:

The product is in compliance with EN 520

Weight: $15 \text{ kg/m}^2 \pm 2 \%$, Thickness: $15.5 \text{ mm} \pm 0.5 \text{ mm}$

For more information from the product data sheet, see

www.norgips.no / www.norgips.se

Market:

Norway and Sweden

Reference service life, product:

60

Reference service life, building:

60

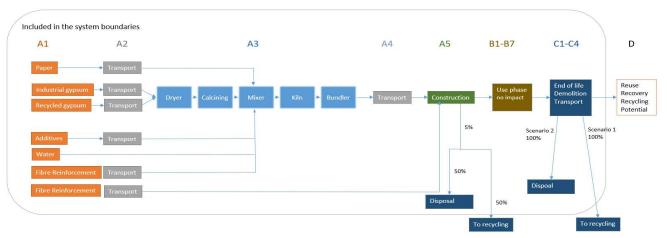
LCA: Calculation rules

Declared unit:

1 m2 of installed gypsum board, including waste treatment at end of life.

System boundary:

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



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 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.



Data quality:

The manufacturing data for Norgips was collected in 2019 and represents an average for 2018. Other data are from ecoinvent v3.6, released in 2020, but with some changes to improve representativeness.

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.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production inhouse is first sub-division and then 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.

Calculation of biogenic carbon:

Uptake and emissions of biogenic carbon are calculated according to EN 16485:2014. This is based on the modularity principle in EN 15804:2012, where the emissions shall be accounted in the module where it ocurs. Net contributrion of biogenic carbon is calculated for each module on page 8.

LCA: Scenarios and additional technical information

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

All products are either first transported to a building mechant or directly to a building site. It is included a scenario for direct transport to building site with a distance of 360 km.

Transport from production place to user (A4)

Туре	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit
Truck	55	EURO6	360	0.0227	l/tkm
Truck					

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 tape are also added to smooth the surface between boards.

There are no LCA-related environmental impacts during use.

Assembly (A5)

	Unit	Value
Auxiliary - jointing tape	kg	0.0042
Auxiliary - jointing compound	kg	0.33
Water consumption	m ³	0
Electricity consumption	MJ	0.0012
Other energy carriers	MJ	0
Material loss	kg	0.75
Output materials from waste treatment	kg	0.1164
Dust in the air	kg	0

Use (B1)

	Unit	Value
Relevant emissions during use	kg	0



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

Maintenance (B2)/Repair (B3)

	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

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

Operational energy (B6) and water consumption (B7)

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

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

Replacement (B4)/Refurbishment (B5)

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

* Number or RSL (Reference Service Life)

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

End of Life (C1, C3, C4)

	Unit	Value
Collected as gypsum waste	kg	15.0
Collected as mixed construction waste	kg	0.0
Reuse	kg	0.0
Recycling - scenario 1	kg	15.0
Energy recovery	kg	0.0
To landfill - scenario 2	kg	15.0

The transport of gypsum waste is assumed to be 50 km for landfilling scenario and 250 km for recycling.

Transport to waste processing (C2)

Туре	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit
Scenario 1 - recycling					
Truck		Unspecified	300	0.027	l/tkm
Scenario 2 - landfill					
Truck		Unspecified	50	0.027	l/tkm

The benefits and loads beyond system boundaries are calculated from the net flows shown in the tables below. The exported energy from municipal incineration was calculated from amounts in 2015 and that substitututes Norwegian electricity mix and district heating mix. 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 gypsym is however negative and will give a net load in module D.

Scenario 1 - Recycling - Benefits and loads beyond the system boundaries (D)

	Unit	Value
Substitution of electric energy	MJ	0.6
Substitution of thermal energy	MJ	4.2
Substitution of raw materials	kg	-0.9
Substitution of fuels	kg	0.0
Substituion of products	kg	0.0

Scenario 2 - Landfilling - Benefits and loads beyond the system boundaries (D)

	Unit	Value
Substitution of electric energy	MJ	0.0
Substitution of thermal energy	MJ	0.0
Substitution of raw materials	kg	-14.8
Substitution of fuels	kg	0.0
Substitution of products	kg	0.0



LCA: Results

The results for global warming of the different modules have a large contribution from uptake and emission of biogenic carbon. The net contribution of biogenic carbon to each modules is shown on page 8.

Syste	System boundaries (X=included, MND= module not declared, MNR=module not relevant)															
Pro	duct sta	age	Assem	nby 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	А3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	СЗ	C4	D
Х	х	Х	Х	Х	Х	Х	х	Х	Х	Х	Х	Х	Х	Х	Х	×

Environme	nvironmental impact										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1					
GWP	kg CO ₂ -eqv	2.31E+00	4.47E-01	5.01E-01	0.00E+00	7.81E-06					
ODP	kg CFC11-eqv	3.37E-07	8.77E-08	3.42E-08	0.00E+00	6.90E-13					
POCP	kg C ₂ H ₄ -eqv	9.60E-04	6.89E-05	5.83E-04	0.00E+00	2.34E-09					
AP	kg SO ₂ -eqv	1.18E-02	1.46E-03	1.34E-02	0.00E+00	5.22E-08					
EP	kg PO ₄ 3eqv	2.04E-03	3.09E-04	3.39E-04	0.00E+00	5.22E-09					
ADPM	kg Sb-eqv	4.82E-05	1.46E-05	4.24E-06	0.00E+00	5.91E-10			·		
ADPE	MJ	5.42E+01	7.41E+00	5.69E+00	0.00E+00	5.33E-05					

Environme	ntal impact	S	Scenario 1	- Recycling)	Scenario 2 - Landfill				
Parameter	Unit	C2	C3	C4	D	C2	C3	C4	D	
GWP	kg CO ₂ -eqv	5.80E-01	7.24E-01	1.39E-02	-3.45E-02	9.66E-02	5.91E-02	1.35E+00	3.72E-02	
ODP	kg CFC11-eqv	1.07E-07	1.30E-08	3.09E-09	-3.30E-09	1.79E-08	1.01E-08	4.34E-08	5.08E-09	
POCP	kg C ₂ H ₄ -eqv	7.82E-05	1.50E-05	1.29E-03	-3.21E-05	1.30E-05	1.04E-05	1.77E-02	8.88E-06	
AP	kg SO ₂ -eqv	1.88E-03	5.65E-04	3.22E-02	-1.96E-04	3.13E-04	4.43E-04	4.40E-01	5.36E-04	
EP	kg PO₄³eqv	3.04E-04	1.25E-04	1.47E-05	-4.27E-05	5.07E-05	9.56E-05	5.24E-04	1.22E-04	
ADPM	kg Sb-eqv	1.46E-05	3.14E-07	1.32E-07	-1.15E-06	2.44E-06	1.96E-07	1.86E-06	2.97E-07	
ADPE	MJ	8.76E+00	8.90E-01	2.93E-01	-3.33E-01	1.46E+00	8.07E-01	4.14E+00	4.57E-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	Resource use										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1					
RPEE	MJ	1.60E+01	4.72E-01	3.66E+00	0.00E+00	1.40E-03					
RPEM	MJ	8.44E+00	0.00E+00	-1.36E+00	0.00E+00	0.00E+00					
TPE	MJ	2.45E+01	4.72E-01	2.30E+00	0.00E+00	1.40E-03					
NRPE	MJ	5.80E+01	7.55E+00	6.23E+00	0.00E+00	1.08E-04					
NRPM	MJ	3.71E-01	0.00E+00	7.35E-01	0.00E+00	0.00E+00					
TRPE	MJ	5.83E+01	7.55E+00	6.97E+00	0.00E+00	1.08E-04					
SM	kg	1.21E+01	0.00E+00	6.06E-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	6.97E-02	1.55E-03	5.43E-03	0.00E+00	1.05E-05					

Resource	use		Recycling	scenario		Landfill scenario			
Parameter	Unit	C2	C3	C4	D	C2	C3	C4	D
RPEE	MJ	1.27E-01	6.81E+00	1.08E-02	-4.33E+00	2.12E-02	2.36E-01	1.55E-01	2.45E-02
RPEM	MJ	0.00E+00	-6.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.27E-01	2.44E-01	1.08E-02	-4.33E+00	2.12E-02	2.36E-01	1.55E-01	2.45E-02
NRPE	MJ	8.94E+00	9.15E-01	3.11E-01	-4.84E-01	1.49E+00	8.22E-01	4.40E+00	4.97E-01
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	8.94E+00	9.15E-01	3.11E-01	-4.84E-01	1.49E+00	8.22E-01	4.40E+00	4.97E-01
SM	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
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	-1.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	-1.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.01E-03	2.08E-03	3.16E-04	-2.44E-02	1.69E-04	1.77E-03	4.45E-03	1.68E-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	End of life - Waste										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1					
HW	kg	6.86E-05	1.92E-05	6.28E-05	0.00E+00	1.36E-10					
NHW	kg	1.32E+00	7.43E-01	6.01E-01	0.00E+00	1.37E-05					
RW	kg	1.60E-04	4.88E-05	1.35E-05	0.00E+00	9.69E-10					

End of life	- Waste		Recycling	scenario		Landfill scenario			
Parameter	Unit	C2	C3	C4	D	C2	C3	C4	D
HW	kg	2.28E-05	2.45E-06	4.42E-07	-5.92E-07	3.80E-06	2.23E-06	6.22E-06	1.18E-06
NHW	kg	6.22E-01	1.35E-02	1.11E+00	-3.74E-02	1.04E-01	6.70E-03	1.55E+01	6.73E-03
RW	kg	6.08E-05	6.02E-06	1.84E-06	-3.14E-06	1.01E-05	5.71E-06	2.59E-05	3.08E-06

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

End of life	End of life - Output flow										
Parameter	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	1.80E-02	0.00E+00	3.50E-01	0.00E+00	0.00E+00					
MER	kg	3.62E-05	0.00E+00	3.23E-03	0.00E+00	0.00E+00					
EEE	MJ	1.58E-02	0.00E+00	1.55E-02	0.00E+00	0.00E+00					
ETE	MJ	1.67E-01	0.00E+00	1.10E-01	0.00E+00	0.00E+00					

End of life	- Output flow		Recycling	scenario		Landfill scenario			
Parameter	Unit	C2	C3	C4	D	C2	C3	C4	D
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	0.00E+00	1.38E+01	0.00E+00	9.23E-01	0.00E+00	0.00E+00	0.00E+00	1.48E+01
MER	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
EEE	MJ	0.00E+00	5.90E-01	0.00E+00	-6.05E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	4.06E+00	0.00E+00	-4.16E+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: $9.0 \text{ E-}03 = 9.0 \cdot 10^{-3} = 0.009$



Additional Norwegian requirements

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

National consumption mix with import on low voltage (production of transmission lines, in addition to direct emissions and losses in grid) are applied electricity for the manufacturing prosess (A3).

Data source	Amount	Unit
Ecoinvent v3.5 (2018)	31.7	CO ₂ -eqv/kWh

Dangerous substances

\checkmark	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.

Indoor environment

Emissions to indoor air are tested by RISE in 2020 and evaluted according to EN 16516. The summary of the test results are listed below for Norgips Standard 12,5 mm Type A.

TVOC	<10	μg/m²h
Sum carcinogenic VOCs	<1	μg/m²h
Sum VOC with LCI	<2	μg/m²h
Sum VOC without LCI	<2	μg/m²h
Sum VVOC	3	μg/m²h
Formaldehyde	3	μg/m²h
Sum SVOC	<2	μg/m²h
R= Sum Ci/LCli	0.07	

Carbon footprint

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantanious oxidation

GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

Climate impacts								
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1		
GWP-IOBC	kg CO ₂ -eqv	3.13E+00	4.47E-01	3.34E-01	0.00E+00	7.81E-06		
GWP-BC	kg CO ₂ -eqv	-8.22E-01	0.00E+00	1.67E-01	0.00E+00	0.00E+00		
GWP	kg CO ₂ -eqv	2.31E+00	4.47E-01	5.01E-01	0.00E+00	7.81E-06		

Climate impacts		Recycling scenario				Landfill scenario			
Parameter	Unit	C2	C3	C4	D	C2	C3	C4	D
GWP-IOBC	kg CO ₂ -eqv	5.80E-01	6.83E-02	1.39E-02	-3.45E-02	9.66E-02	5.91E-02	6.94E-01	3.72E-02
GWP-BC	kg CO ₂ -eqv	0.00E+00	6.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.55E-01	0.00E+00
GWP	kg CO ₂ -eqv	5.80E-01	7.24E-01	1.39E-02	-3.45E-02	9.66E-02	5.91E-02	1.35E+00	3.72E-02



Bibliography	
ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	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
EN 16485:2014	Round and sawn timber - Environmental Product Declaration - Product category rules for wood and wood-based products for use in construction
EN 16516	Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air
NPCR010 V3.0	Product category rules for building boards
Ecoinvent v3.5	Swiss Centre of Life Cycle Inventories. www.ecoinvent.ch
EN 520	Gypsum plasterboards - Definitions, requirements and test methods
Valente & Tellnes (2020)	EPD Norgips Ultraboard and Weatherboard: LCA-report. Report OR.xx from Norsus, Kråkerøy, Norway.

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