

ENVIRONMENTAL PRODUCT DECLARATION



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The Norwegian EPD Foundation

In accordance with ISO 14025 ISO 21930 EN 15804

Owner of the declaration	Blix Datagulv AS
Publisher	The Norwegian EPD Foundation
Declaration number	NEPD00293E
Issue date	15.12.2014
Valid to	15.12.2019

Gammabox/Gammapac panel for use as raised floor

Product

Blix Datagulv AS
Owner of the declaration



General information

Product

Gammabox/Gammapac panel for use as raised floor

Program holder

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:

NEPD00293E

This declaration is based on Product Category Rules:

CEN Standard EN 15804 serve as core PCR
PCR: NPCR 010 rev1 Building boards 2013
This PCR mainly concerns products with the same function, albeit not necessarily with the same materials, as Alucast

Declared unit:

-

Declared unit with option:

-

Functional unit:

1 m² of installed Gammabox/Gammapac panel used as raised floor, including proper maintenance and repair during the reference service life

The EPD has been worked out by:

Fredrik Moltu Johnsen and Kari-Anne Lyng
Østfoldforskning AS




Verification:

Independent verification of data, other environmental information and EPD has been carried out in accordance with ISO14025, 8.1.3 and 8.1.4

externally

internally



Senior Research Scientist, Mie Vold
(Independent verifier approved by EPD Norway)

Owner of the declaration

Blix Datagulv AS
Contact person: Neil Johnsen
Phone: 22272760
e-mail: post@datagulv.no

Manufacturer

Gamma Industries

Place of production:

Formerie, France

Management system:

ISO 9001 (Gamma Industries)

Org. No:

NO 997 045 335 MVA (Blix Datagulv AS)

Issue date

15.12.2014

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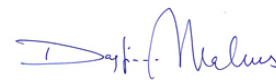
Comparability:

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

Year of study:

2014

Approved



Dagfinn Malnes
Managing Director of EPD-Norway

Key environmental indicators	Unit	Cradle to gate A1 - A3	Transport **** (A4)	Installation ***** (A5)
Global warming	kg CO ₂ -eqv	17 †	13	5
Energy use	MJ	712	198	95
Dangerous substances		0	0	0

† An extra negative emission of 39 kg of CO₂ formally belongs to A1 due to CO₂ uptake during tree growth. This uptake is re-emitted to air in the C3 stage (incineration). This uptake is not included in the table, because the resultant negative emission score for A1 - A3 only makes sense in the context of the full life cycle.

No substances appearing on the Candidate list 16.06.14 and the Norwegian priority list have been added to the product.

***** Transport from production site to central warehouse in Norway

***** A4 and A5, but not A1-A3, include the raw materials of the pedestals and stringers used for raising the floor

Product

Product description:

Gammabox and Gammapac are wood-resin based panels for use in raised floors. Delivered with perimeter trim of PVC or ABS, and finish of choice (such as PVC or laminates).
Bottom plate: 0.5 mm thick, galv. steel.

Product specification

Cf. the data sheets of the products (see Bibliography)
Sustainably sourced wood (PEFC certified)

Materials	kg / m2	%
Wood-resin board (30mm)	21.18	80.4%
Bottom steel tray	3.45	13.1%
Perimeter trim (PVC, G.box)	0.460	1.7%
Finish/laminate (PVC assumed)	1,26	4.8%
Total	26.35	100.0%
Pedestals and stringers (installation phase; 700mm)	7.43	

Technical data:

Weight: 26.3 kg/m² (34 kg/m² as raised floor)

Available with finishes; EPD assumes PVC. Floor height: 110mm - 150mm; EPD assumes 700mm - see sensitivity analysis below.

Wooden core height: 30-38 mm; EPD assumes 30 mm

Compliance with European Standard NF EN 12825

Reference service life:

20 years

Production process:

Wood-resin board, tray, perimeter trim and laminate are cut and tightly fit together.

Market:

Norway/Nordic countries

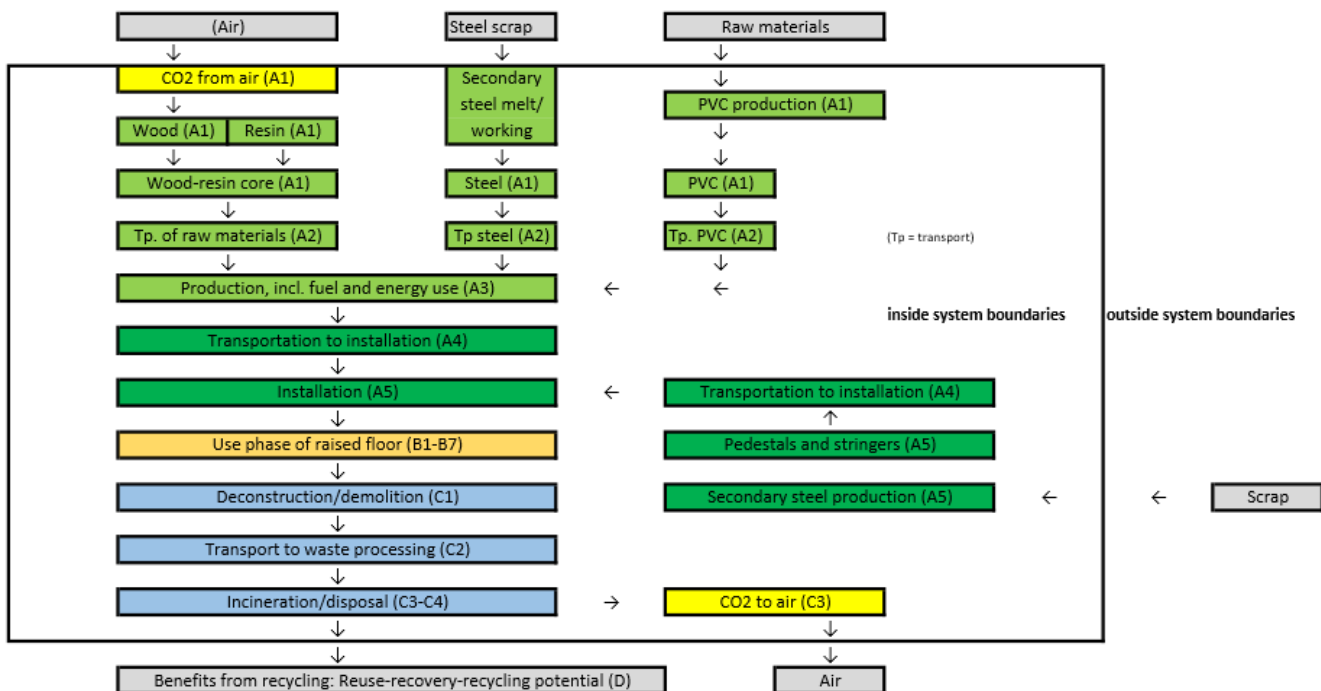
LCA: Calculation rules

Functional unit:

1 m² of installed Gammabox/Gammapac panel used as as raised floor, including proper maintenance and repair during the reference service

System boundary:

Flowsheet - see below.



Specific data for products and mass flows were supplied by the producer in 2014. Estimates related to the product-specific data are generally based on data from the 2010s. Generic data sources: Ecoinvent 2.2/SimaPro software (generic). Ecoinvent 2.2 processes are created 2003-2007. Upstream data for raw materials are significant for the LCA results in this study; these are modelled using Ecoinvent processes. 50 km transportation from Blix to installation is assumed. For longer transportation, please consult the sensitivity analysis below. A sensitivity analysis is moreover provided for different heights of the raised floor, which can also significantly influence results.

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 in-house 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.

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)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	Fleet average (CH/EUR)	lorry 20-28 t	1850	N/A l/tkm	N/A
Railway				kWh/tkm	
Boat				l/tkm	

Specific data for the A2 and A4 stages: Distance and type of vehicle (lorry). Generic/assumed: 20-28t (Ecoinvent 2,2)

Installation in the building (A5)

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

Includes the material for the steel pedestals and stringers.

Use (B1)

	Unit	Value

Emissions from the use of the raised floor.

Maintenance (B2)/Repair (B3)

	Unit	Value
Maintenance cycle*	RSL/yr	20
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

No maintenance assumed. Need for repair assumed to emerge during installation phase (A5).

Replacement (B4)/Refurbishment (B5)

	Unit	Value
Replacement cycle*	RSL/yr	20
Electricity consumption	kWh	0
Replacement of worn parts		

* Number or RSL (Reference Service Life)

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

No emissions have been identified during the use phase (B1-B7)

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	7.43
Energy recovery	kg	26.35
To landfill	kg	0

C3 does not include emissions from energy recovery, but includes biogenic CO₂ released back to atmosphere

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	Fleet average	lorry 20-28 t	50	N/A l/tkm	N/A
Railway				kWh/tkm	
Boat				l/tkm	

Assumptions: Transport by lorry 20-28 t (CH, Ecoinvent 2,2); distance: 50 km

LCA: Results

The performed LCA is a cradle to grave analysis, i.e. all stages A1-C4 are included.

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	Construction installation stage	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	MND

Environmental impact

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	kg CO ₂ -eqv	-25	1,8	0,92	13	5,3	0	0	0	0	0	0	0	0	0,33	39	0
ODP	kg CFC11-eqv	1,20E-06	2,92E-07	9,51E-08	2,10E-06	4,62E-07	0	0	0	0	0	0	0	0	5,30E-08	0	0
POCP	kg C ₂ H ₄ -eqv	3,82E-03	3,46E-04	1,20E-04	2,49E-03	1,73E-03	0	0	0	0	0	0	0	0	6,28E-05	0	0
AP	kg SO ₂ -eqv	5,32E-02	9,88E-03	2,71E-03	7,10E-02	2,08E-02	0	0	0	0	0	0	0	0	1,79E-03	0	0
EP	kg PO ₄ ³⁻ -eqv	7,31E-03	2,58E-03	4,20E-04	1,55E-02	3,24E-03	0	0	0	0	0	0	0	0	3,90E-04	0	0
ADPM	kg Sb-eqv	3,77E-05	4,26E-06	1,94E-07	3,54E-05	8,90E-06	0	0	0	0	0	0	0	0	8,93E-07	0	0
ADPE	MJ	272	26	12	190	79	0	0	0	0	0	0	0	0	4,8	0	0

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

The product's raw materials take up 39 kg CO₂ from air in A1 (hence negative GWP in A1). The 39 kgs are re-emitted in C3.

Resource use

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPEE	MJ	438	0,35	0,65	2,6	4,1	0	0	0	0	0	0	0	0	6,60E-02	0	0
RPEM	MJ	308	3,39E-02	5,19E-02	0,23	0,71	0	0	0	0	0	0	0	0	5,85E-03	0	0
TPE	MJ	745	0,38	0,70	2,8	4,8	0	0	0	0	0	0	0	0	7,18E-02	0	0
NRPE	MJ	234	27	12	195	91	0	0	0	0	0	0	0	0	4,9	0	0
NRPM	MJ	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRPE	MJ	289	27	12	195	91	0	0	0	0	0	0	0	0	4,9	0	0
SM	kg	25	1,006E-07	0	0	7,4	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	m ³	34	5,5	22	0	0	0	0	0	0	0	0	0	0	0	0	0

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	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HW	kg	4,65E-03	2,57E-05	1,06E-05	5,49E-04	2,24E-04	0	0	0	0	0	0	0	0	1,38E-05	0	0
NHW	kg	3,8	0,26	6,92E-02	2,4	2,8	0	0	0	0	0	0	0	0	5,93E-02	32	0
RW	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

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

End of life - Output flow

Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,43	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,4	0
EEE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0

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

Sensitivity analysis according to pedestal/stringer height

Pedestal height	Weight of pedestal+stringer	GWP over life cycle (A1-C4)
110 mm (min)	1.085 kg/m ²	28 kg CO ₂ -eq
700 mm (avg; EPD)	7.43 kg/m ²	35 kg CO ₂ -eq
1500 mm (max)	13.22 kg/m ²	42 kg CO ₂ -eq

The raised floors can be installed with pedestals of different heights. Differences in life cycle results are shown in the table. The differences are due to the significant increase in material use (steel) when pedestals are higher.

Sensitivity analysis of transport of full floor (panel, pedestal and stringer) from Blix warehouse to customer

Assumption	Approximate installation location	GWP over life cycle (A1-C4)
50 km	Oslo area (EPD's default assumption)	35 kg CO ₂ -eq
500 km	Bergen/Stavanger/Trondheim/Stockholm area	38 kg CO ₂ -eq
1750 km	Tromsø area	46 kg CO ₂ -eq

The EPD assumes 50 km transport from Blix Datagulv AS's central warehouse to the installation site. The table shows how results change with longer transportation distances, primarily due to additional fuel use.

Additional Norwegian requirements

Dangerous substances

No substances appearing on the Candidate list 16.06.14 and the Norwegian priority list of 11.11.2013 have been added to the product.

Electricity

The electricity at the production site is modelled as a French electricity mix, according to the Ecoinvent 2,2 process "Electricity, high voltage, production FR, at grid/FR U."

Greenhouse gas emissions: 0.0903 kg CO₂ - eqv/MJ

Transport

Transport from production site to central warehouse in Norway is: 1800 km

Carbon footprint




Carbon footprint has not been worked out for the product.

Indoor environment

The product meets the requirements for low emissions (M1) according to EN15251: 2007 Appendix E.

Bibliography

ISO 14025:2006	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
LCI/LCA report	Johnsen, FM & Lyng, K-A (2014) Gammabox/Gammapac panel for use as raised floor. Østfoldforskning report no. OR.26.14. Confidential.
PCR	NPCR 010 rev1 Building boards 2013, EPD Norge
Gammabox product sheet	Available from http://gamma-industries.com/
Gammapac product sheet	Available from http://gamma-industries.com/
ISO 9001 documentation	<i>Quality Organisation Letter</i> . Submitted from Gamma to EPD practitioner 26.09.2014
REACH Candidate List	Date: 16.06.2014
Gammabox emission profile	<i>FICHE DE DONNEES ENVIRONNEMENTALES DES MATERIAUX ET PRODUITS. DALLES GAMMABOX 30-38 mm</i> . Gamma Emissions profile.
Gammapac emission profile	<i>FICHE DE DONNEES ENVIRONNEMENTALES DES MATERIAUX ET PRODUITS. DALLES GAMMAPAC 30/38 mm + stratifié</i> . Emissions profile
Gamma brochure	<i>Gamma Industries Raised access floors</i> , 10/03/2009, 20pp Available from http://gamma-industries.com/

 epd-norge.no The Norwegian EPD Foundation	Program holder and publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
 BLIX DATAGULV	Owner of the declaration Blix Datagulv AS Hamangskogen 88 NO-1338 Sandvika, Norway	Phone: +47 22272760 e-mail: post@datagulv.no web: www.datagulv.no
 Østfoldforskning	Author of the Life Cycle Assessment Østfoldforskning AS Stadion 4 NO-1671 Kråkerøy, Norway	Phone: +47 69351100 e-mail: post@ostfoldforskning.no web: www.ostfoldforskning.no