

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

BIO DILE™ joint filler from GIND AS



**GIND**

The Norwegian EPD Foundation

**Owner of the declaration:**

GIND AS

**Product:**

BIO DILE™ joint filler from GIND AS

**Declared unit:**

1 kg

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR 009:2021 Part B for Technical - Chemical products for building and construction industry

**Program operator:**

The Norwegian EPD Foundation

**Declaration number:**

NEPD-7745-7121-EN

**Registration number:**

NEPD-7745-7121-EN

**Issue date:** 08.10.2024

**Valid to:** 08.10.2029

**EPD software:**

LCAno EPD generator ID: 532516

## General information

### Product

BIO DILE™ joint filler from GIND AS

### Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Phone: +47 977 22 020  
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### Declaration number:

NEPD-7745-7121-EN

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 009:2021 Part B for Technical - Chemical products for building  
and construction industry

### 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:

1 kg BIO DILE™ joint filler from GIND AS

### Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

### Functional unit:

Not applicable.

### 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

### 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. NEPD73

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

### Owner of the declaration:

GIND AS  
Contact person: Siri Galland Grønli  
Phone: +47 47 64 07 74  
e-mail: [post@gind.no](mailto:post@gind.no)

### Manufacturer:

GIND AS  
Ørnaberget 18  
4048 Hafrsfjord, Norway

### Place of production:

GIND AS manufacturing site Sandnes  
Tornroseveien 12  
4315 Sandnes, Norway

### Management system:

### Organisation no:

931 088 653

### Issue date:

08.10.2024

### Valid to:

08.10.2029

### Year of study:

2023

### Comparability:

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

### 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.

Developer of EPD: Pedro Ferreira

Reviewer of company-specific input data and EPD: Børge Heggen  
Johansen, Energiråd AS

### Approved:

Håkon Hauan  
Managing Director of EPD-Norway



## Product

### Product description:

The BIO DILE™ line is a draining joint filler for stones and similar. The blend of biogenic binder component and bitumen is formulated to comply with EN 12591 'Bitumen and bituminous binders'. Applications can be specified for the customer's use. This EPD covers the products 'BIO DILE™ Draining', 'BIO DILE™ Solid', and 'BIO DILE™ Compact'.

### Product specification

Materials	kg	%
Aggregate	0,85	85,00
Bio-based bitumen	0,15	15,00
Total	1,00	100,00

Packaging	kg	%
Packaging - Plastic	0,02	100,00
Total incl. packaging	1,02	100,00

### Technical data:

CarbonBind biogenic bitumen component is used in percentage between 4% and 40% of the total weight. The BIO DILE™ joint filler is a long-lasting product, with virtually unlimited lifetime.

### Market:

Norway, Sweden and Germany.

### Reference service life, product

Not applicable.

### Reference service life, building

Not applicable.

## LCA: Calculation rules

### Declared unit:

1 kg BIO DILE™ joint filler from GIND AS

### 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. 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.

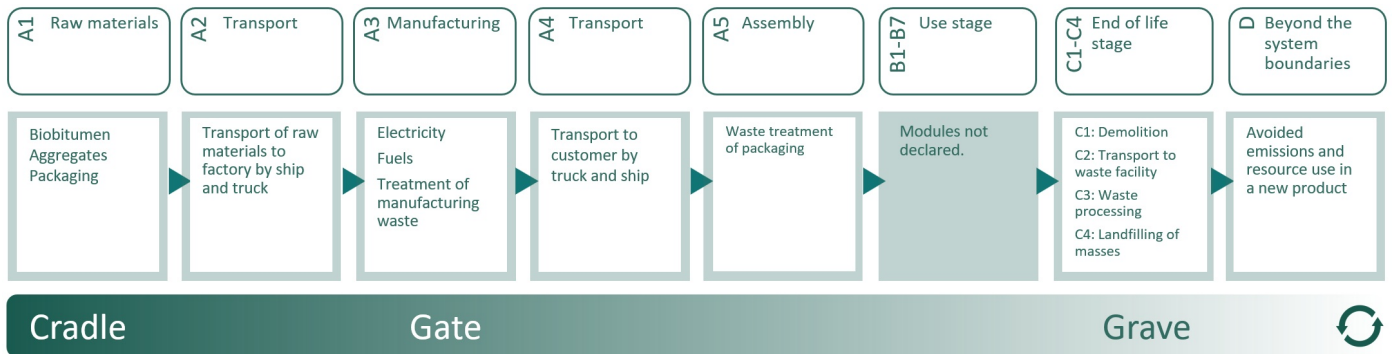
Materials	Source	Data quality	Year
Aggregate	NEPD-4200-3429-NO	EPD	2023
Bio-based bitumen	ecoinvent 3.6	Database	2019
Packaging - Plastic	Modified ecoinvent 3.6	Database	2019

### 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:

This product system includes production of the joint filler out of bio-based bitumen and aggregates (modules A1-A3), transport of the finished goods to Norway Sweden, and Germany (module A4), and end-of-life scenario (modules C1-C4). The benefits for the next life cycle are accounted for in module D.



#### Additional technical information:

Not applicable.

## LCA: Scenarios and additional technical information

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

Module A4 calculates a weighted average of customer distances by truck and ferry. This is based on the market share and specific transportation distances for each market: Norway, with a 50% market share, and 350 km by truck, 20 km by ferry; Sweden, with a 20% market share, and 1000 km by truck, 50 km by ferry; and Germany, with a 30% market share, and 1500 km by truck and 141 km by ferry.

Module A5 includes a 5% material loss during installation, as described by NPCR 009:2021.

Module C and D account for the end-of-life scenario of BIO DILE joint filler, with 100% of the material being recycled into asphalt by Velde AS.

Module C2 presents the average distance from the construction site to the waste handling facility (50km).

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Ferry, Sea (km)	50,0 %	62	0,034	l/tkm	2,12
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	825	0,043	l/tkm	35,48
Assembly (A5)		Unit	Value		
Waste, packaging, Polypropylene (PP), to average treatment (kg)	kg	0,02			
Material loss, dry mortar, including waste treatment (psc)	Units/DU	0,05			
De-construction demolition (C1)		Unit	Value		
Demolition of building per kg (kg)	kg/DU	1,00			
Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	50	0,043	l/tkm	2,15
Waste processing (C3)		Unit	Value		
Waste, joint filler waste, to recycling (kg)	kg	1,00			
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	0,00			
Substitution of primary asphalt with net recycled asphalt (kg)	kg	1,00			

## 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	A2	A3	A4	A5	C1	C2	C3	C4	D	
GWP-total	kg CO <sub>2</sub> -eq	-2,49E-01	4,02E-02	4,37E-02	1,45E-01	1,77E-02	1,32E-03	8,37E-03	3,26E-01	0	-4,29E-02	
GWP-fossil	kg CO <sub>2</sub> -eq	7,31E-02	4,02E-02	4,34E-02	1,45E-01	1,75E-02	1,32E-03	8,36E-03	7,10E-04	0	-4,27E-02	
GWP-biogenic	kg CO <sub>2</sub> -eq	-3,22E-01	1,66E-05	2,68E-04	5,89E-05	2,02E-04	2,47E-07	3,46E-06	3,26E-01	0	-1,44E-04	
GWP-luluc	kg CO <sub>2</sub> -eq	2,66E-04	1,56E-05	3,03E-05	5,35E-05	1,86E-05	1,04E-07	2,98E-06	9,83E-07	0	-3,41E-05	
ODP	kg CFC11-eq	9,26E-09	8,97E-09	8,07E-09	3,27E-08	3,18E-09	2,85E-10	1,89E-09	1,40E-10	0	-7,47E-08	
AP	mol H <sup>+</sup> -eq	3,28E-04	1,96E-04	2,04E-04	6,26E-04	7,23E-05	1,38E-05	2,40E-05	5,75E-06	0	-4,33E-04	
EP-FreshWater	kg P -eq	3,63E-06	3,19E-07	6,58E-07	1,13E-06	2,97E-07	4,80E-09	6,68E-08	4,49E-08	0	-8,92E-07	
EP-Marine	kg N -eq	6,11E-05	4,33E-05	5,50E-05	1,36E-04	1,75E-05	6,09E-06	4,76E-06	1,68E-06	0	-8,21E-05	
EP-Terrestrial	mol N -eq	6,65E-04	4,82E-04	6,14E-04	1,51E-03	1,79E-04	6,68E-05	5,32E-05	1,94E-05	0	-9,32E-04	
POCP	kg NMVOC-eq	3,22E-04	1,54E-04	1,99E-04	5,01E-04	6,37E-05	1,84E-05	2,04E-05	5,20E-06	0	-5,13E-04	
ADP-minerals&metals <sup>1</sup>	kg Sb-eq	1,24E-06	1,12E-06	5,83E-07	3,86E-06	3,63E-07	2,02E-09	2,31E-07	9,01E-09	0	-3,78E-07	
ADP-fossil <sup>1</sup>	MJ	1,95E+00	5,99E-01	5,94E-01	2,18E+00	2,82E-01	1,81E-02	1,26E-01	2,21E-02	0	-4,01E+00	
WDP <sup>1</sup>	m <sup>3</sup>	4,36E+01	5,81E-01	1,50E+01	2,04E+00	3,22E+00	3,86E-03	1,22E-01	2,43E+00	0	-3,25E+01	

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<sup>-3</sup> = 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	A2	A3	A4	A5	C1	C2	C3	C4	D	
PM	Disease incidence	2,91E-09	2,32E-09	2,97E-09	8,64E-09	9,33E-10	3,65E-10	5,12E-10	9,20E-11	0	-2,72E-09	
IRP <sup>2</sup>	kgBq U235 -eq	1,74E-02	2,62E-03	3,65E-03	9,50E-03	1,75E-03	7,78E-05	5,53E-04	3,70E-04	0	-2,01E-02	
ETP-fw <sup>1</sup>	CTUe	1,76E+00	4,43E-01	6,91E-01	1,60E+00	2,38E-01	9,92E-03	9,37E-02	1,56E-02	0	-2,55E+00	
HTP-c <sup>1</sup>	CTUh	1,30E-10	0,00E+00	3,10E-11	0,00E+00	8,00E-12	0,00E+00	0,00E+00	1,00E-12	0	-2,50E-11	
HTP-nc <sup>1</sup>	CTUh	1,31E-09	4,97E-10	8,04E-10	1,75E-09	2,31E-10	9,00E-12	1,02E-10	1,40E-11	0	-6,26E-10	
SQP <sup>1</sup>	dimensionless	9,37E-01	3,86E-01	1,14E-01	1,47E+00	1,64E-01	2,30E-03	8,84E-02	1,25E-02	0	-9,03E-01	

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<sup>-3</sup> = 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	A2	A3	A4	A5	C1	C2	C3	C4	D	
PERE	MJ	5,01E-01	8,63E-03	1,10E+00	3,04E-02	8,28E-02	9,82E-05	1,81E-03	1,14E-02	0	-2,22E-01	
PERM	MJ	2,75E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,75E+00	0	0,00E+00	
PERT	MJ	3,25E+00	8,63E-03	1,10E+00	3,04E-02	8,28E-02	9,82E-05	1,81E-03	-2,74E+00	0	-2,22E-01	
PENRE	MJ	1,16E+00	5,99E-01	5,94E-01	2,18E+00	2,43E-01	1,81E-02	1,26E-01	2,21E-02	0	-4,01E+00	
PENRM	MJ	7,87E-01	0,00E+00	0,00E+00	0,00E+00	-7,47E-01	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	
PENRT	MJ	1,95E+00	5,99E-01	5,94E-01	2,18E+00	-5,05E-01	1,81E-02	1,26E-01	2,21E-02	0	-4,01E+00	
SM	kg	1,72E-01	0,00E+00	0,00E+00	0,00E+00	8,58E-03	8,91E-06	0,00E+00	0,00E+00	0	0,00E+00	
RSF	MJ	6,83E-03	3,07E-04	1,03E-03	1,08E-03	4,71E-04	2,41E-06	6,48E-05	0,00E+00	0	-2,43E-03	
NRSF	MJ	3,09E-03	1,08E-03	3,25E-03	3,82E-03	5,89E-04	3,55E-05	2,32E-04	0,00E+00	0	-1,01E-03	
FW	m <sup>3</sup>	1,55E-03	6,35E-05	9,16E-03	2,27E-04	5,57E-04	9,34E-07	1,35E-05	3,78E-05	0	-1,97E-03	

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<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed



End of life - Waste												
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
	HWD	kg	9,91E-04	3,10E-05	5,53E-04	1,11E-04	8,48E-05	5,34E-07	6,52E-06	2,20E-06	0	-1,61E-03
	NHWD	kg	1,46E-02	2,64E-02	7,70E-03	1,02E-01	3,18E-02	2,15E-05	6,15E-03	6,96E-05	0	-5,20E-03
	RWD	kg	1,06E-05	4,08E-06	4,12E-06	1,48E-05	1,74E-06	1,26E-07	8,61E-07	2,33E-07	0	-2,95E-05

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

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

\*INA Indicator Not Assessed

End of life - Output flow												
Indicator	Unit	A1	A2	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	0	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	6,90E-04	0,00E+00	6,23E-02	8,75E-06	0,00E+00	1,00E+00	0	0,00E+00
	MER	kg	0,00E+00	0,00E+00	1,31E-03	0,00E+00	6,65E-05	2,71E-08	0,00E+00	0,00E+00	0	0,00E+00
	EEE	MJ	0,00E+00	0,00E+00	7,81E-04	0,00E+00	4,09E-05	9,30E-08	0,00E+00	0,00E+00	0	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	1,18E-02	0,00E+00	6,19E-04	1,41E-06	0,00E+00	0,00E+00	0	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 =  $9,0 \cdot 10^{-3} = 0,009$

\*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	8,88E-02
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## 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
Electricity, Norway (kWh)	ecoinvent 3.6	24,33	g CO <sub>2</sub> -eq/kWh

### Dangerous substances

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

### Indoor environment






## Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO <sub>2</sub> -eq	7,68E-02	4,02E-02	4,36E-02	1,45E-01	1,77E-02	1,32E-03	8,37E-03	7,11E-04	0	-4,29E-02

GWPI-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

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+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.  
 ecoinvent v3, (2019) Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.  
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 Graafland, J. and Ruttenborg, M. (2023) EPD generator for NPCR009:2021, Part B for Technical - Chemical products (non-cement based products), Background information for EPD generator application and LCA data, LCA.no report number: 12.23.  
 NPCR Part A: Construction products and services. Ver. 2.0, 24.03.2021 EPD Norway.  
 NPCR 009 Part B for Technical - Chemical products for building and construction industry, Ver. 3.0, 06.10.2021, EPD Norway.

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