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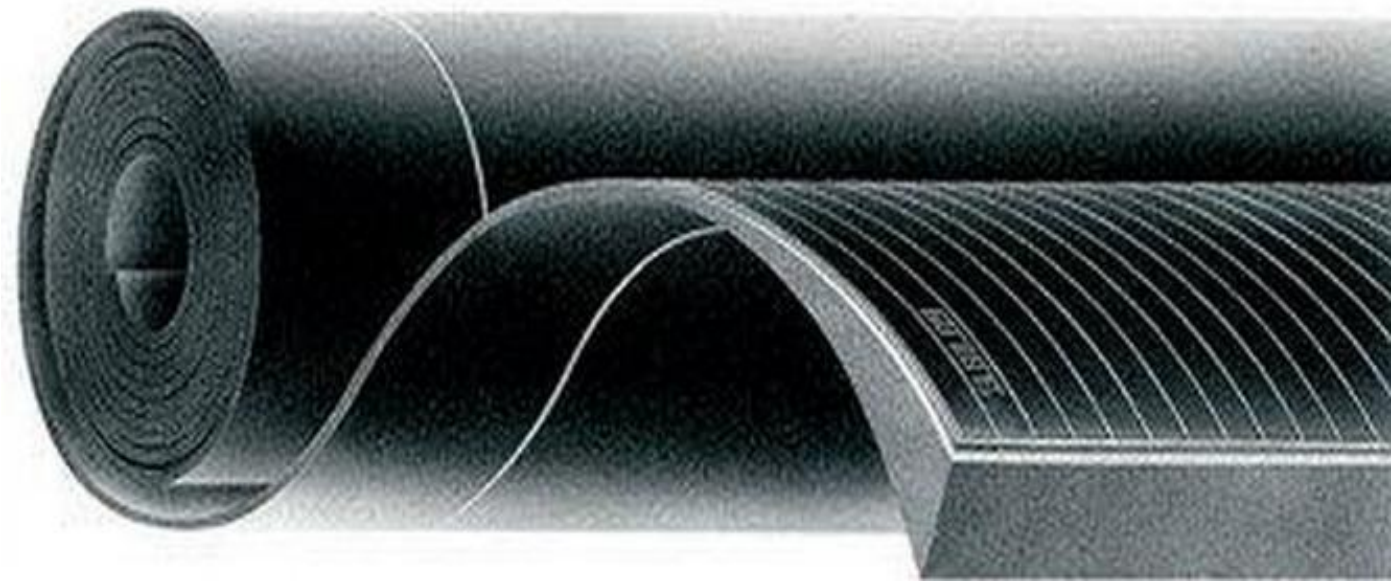
ECO PLATFORM EPD EN 15804 VERIFIED

Owner: Imperbel NV/SA
No.: MD-21033-EN
Issued: 17-08-2021
Valid to: 17-08-2026

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



Owner of declaration
Imperbel NV/SA
Chaussée de Wavre 67, 1360
Perwez
BE 0400.484.591

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Derbigum NT

Number of declared datasets/product variations: 1

Production site
Perwez, Belgium

Product(s) use
Bituminous roofing material

Declared/ functional unit

Functional unit: 1 m2 installed roof waterproofing from cradle-to-grave with activities needed for a study period of 60 years for a building.

In addition, results are also displayed per a declared unit of 1 m2 produced waterproofing layer for cradle-to-gate as required by the reference PCR.

Year of data
2020

EPD version
First version

Issued:
17-08-2021

Valid to:
17-08-2026

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2 and NPCR 022 version 2.0 (PCR – Part B for roof waterproofing).

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804+A2. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804+A2 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings. The EPD is developed for B2B communication.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804+A2 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Linda Høibye

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MNR = module not relevant)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and 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

Product information

Product description

Derbigum NT is a bituminous waterproofing membrane modified by plastomeric polymers. Derbigum NT partly consists of bitumen extracted from recycled cutting waste from installing bituminous waterproofing membranes and used bituminous roofing membranes. The top of the membrane is equipped with two different reinforcements; a glass cloth and a non-woven polyester. These materials give the roofing membrane dimensional stability and tear and puncture resistance.

The main product components are shown in the table below.

Material	Weight-% of declared product
Bitumen	53-61%
Polymers	17-21%
Reinforcements	4-6%
Others	18-24%

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of one square meter Derbigum NT bitumen roof waterproofing system in the production site located in Perwez, Belgium. The product specific data, covering the production process and packaging of the products, as well as supplier location and information on inbound transport, has been collected for the year 2020. Allocation of manufacturing data is based on the factory data from 2020 and allocated per square meter by dividing by the total production in 2020. Background data are based on GaBi ts 10.0.1.92 incl. databases 2021 Edition, Ecoinvent 3.6 and an LCI profile from Eurobitume and are less than 10 years old.

Hazardous substances

The product does not contain substances listed in the ”Candidate List of Substances of Very High Concern for authorization”.

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

The modified bituminous roofing membrane is covered by harmonized technical specification DS/EN13707:2004+A2:2009. Declaration of performance according to EU regulation 305/2011 is available for the declared product.

Fire resistance: In accordance with EN 13501-5, class BROOF (t2) according to method CEN/TS 1187.

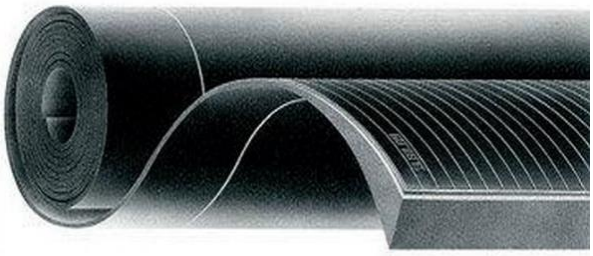
Further technical information can be obtained by contacting the manufacturer or on the manufacturer’s website: www.derbigum.dk/

Reference Service Life (RSL)

The reference service life of the building is set to 60 years in accordance with the reference PCR.

The Derbigum NT is expected to fulfill its function for 40 years in accordance with measurements carried out by British Board of Agrément (an independent certifier) of Derbigum's bitumen at 4 different locations (7 roofs; 3985 m2) during the use phase (S260461 Report Issue 2 FINAL (lifetime), which concluded that a RSL of 40 years can be fulfilled. One replacement has been accounted for in order to maintain the function during the 60-year study period of the building.

Picture of product(s)



LCA background

Functional Unit

The LCI and LCIA results in this EPD relates to a functional unit of 1 m2 installed Derbigum NT bitumen roof waterproofing system, consisting of a 4 mm layer, which is complimented by an additional 3 mm layer after 40 years to maintain its waterproofing function during the study period of 60 years. The functional unit is defined as: "1 m2 installed roof waterproofing, from cradle-to-grave, with activities needed for a study period of 60 years for the building."

Name	Value	Unit
Functional unit	1	m^2 installed roof waterproofing during 60 years
Weight per unit	8.81	kg/m^2
Conversion factor to 1 kg.	0.114	m^2/kg

Declared unit

In addition to the functional unit, the PCR requires that results are also displayed per a declared unit of 1 m^2 of produced waterproofing for cradle-to-gate.

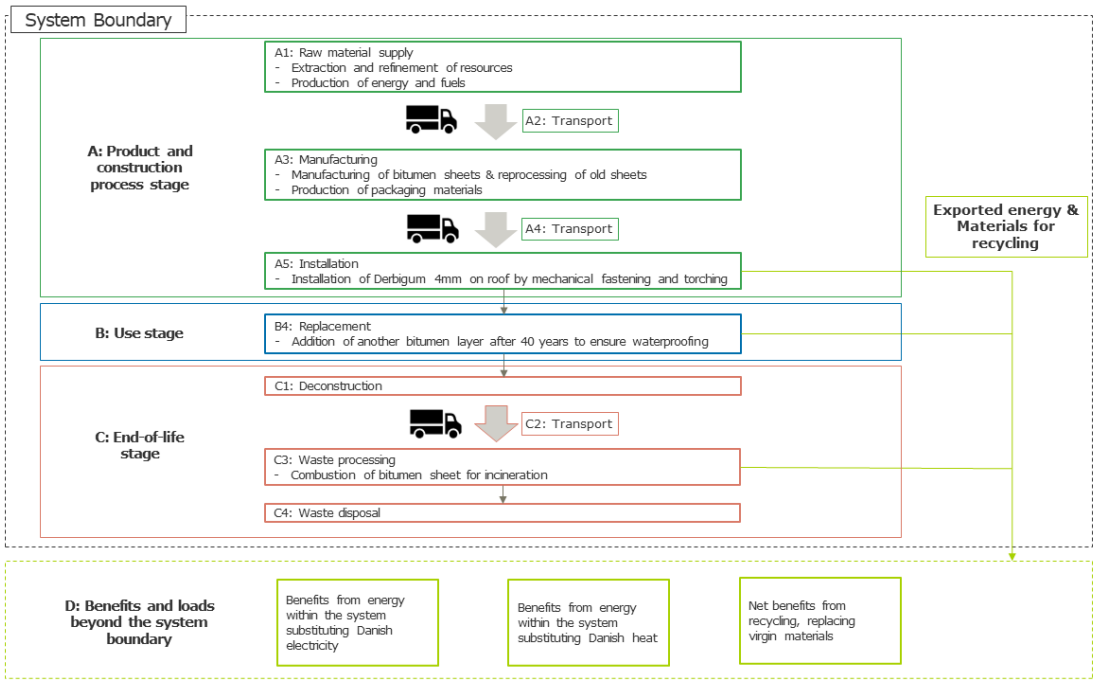
In this EPD, the results per declared unit (1 m2 Derbigum NT 4 mm sheet) corresponds to the first column (A1-A3) of the results per functional unit.

Name	Value	Unit
Declared unit	1	m^2
Weight per unit	4.61	kg/m^2
Conversion factor to 1 kg.	0.217	m^2/kg

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804, and NPCR 022 version 2.0 (PCR – Part B for roof waterproofing).

Flowdiagram



System boundary

This is a specific product EPD, based on a cradle-to-grave and module D LCA, in which 100 product weight-% has been accounted for.

The cut-off criteria, meaning the general rules for the exclusion of inputs and outputs, follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes. The application of cut-off criteria is described below.

Excluded processes:

In addition to the processes explicitly excluded from the system boundary by DS/EN 15804 and the reference PCR, the following exclusions have been made based on the cut-off criteria:

- Production and waste management of packaging materials used for incoming raw materials.
- Production of infrastructure, capital goods, travelling by personnel and research and development.
- Production and waste management of packaging materials accompanying the product which are small (0.12 % of weight) in comparison to the product, these are:
    - Corrugated board
    - Plastic packaging
    - Tape

Product stage (A1-A3) includes:

A1 – Raw material supply

Module A1 comprises impacts from extraction and processing of raw materials including bitumen, polymers, reinforcements (glass- and polyester fiber), fillers, etc. The module also includes the production of purchased electricity used at the Derbigum production site. The recycling process of secondary raw materials used in the product is also included in module A1.

A2 – Transport (to the production site)

Module A2 comprises impacts from transportation of raw materials to the Derbigum production site, which includes extraction and production of the fuels as well as the combustion of the fuel during the transport.

A3 – Manufacturing

Module A3 includes the manufacturing of the final product, production of larger packaging materials (e.g. pallet), combustion of fuels on site (natural gas, diesel, and propane), as well as end-of-life treatment of waste generated during manufacturing. Inflows and outflows of water that is used in the manufacturing is also included as well as the wastewater treatment.

The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Construction process stage (A4-A5) includes:

A4 – Transport

Module A4 includes impacts from transportation of the finished product to an assumed installation site in Denmark. The module includes extraction of the fuels and the combustion of the fuel during the transport.

A5 – Construction installation process

Module A5 represents installation of the product to the building at the installation site. The module includes the production of additional bitumen sheets needed for overlap of the layers for complete waterproofing and wasted product during installation. It also includes production of fastening materials, and production and combustion of propane for torching. Waste from the installation is classified as materials for recycling (99%) and waste for incineration (1%). Impacts from these waste management processes are included in module A5 whereas potential benefits are reported in module D.

Use stage (B1-B7) includes:

B1 – Use

No impacts from use have been included in accordance with the default values provided in the reference PCR.

B2 – Maintenance

No impacts from maintenance have been included in accordance with the default values provided in the reference PCR.

B3 – Repair

No impacts from repair have been included in accordance with the default values provided in the reference PCR. Planned replacement is accounted for in module B4 as required by the reference PCR.

B4 – Replacement

Module B4 includes replacement after 40 years to maintain the function of the roof waterproofing (for the study period of 60 year). Replacement is performed by adding an additional layer on top of the existing. The module includes production of an additional sheet and its installation via torching on top of the existing sheet, as well as propane for torching. Production of material wasted during installation is also included as is the overlap required. Waste from the replacement is classified as materials for recycling (99%) and waste for incineration (1%). Impacts from these waste management processes are included in module B4 whereas potential benefits are reported in module D.

B5 – Refurbishment

No impacts from the refurbishment have been included in accordance with the default values provided in the reference PCR. Planned replacement is accounted for in B4 as required by the reference PCR.

B6 – Operational energy use

The roofing system does not require energy to operate. Therefore no operational energy use for either of the product systems is included.

B7 – Operational water use

The roofing system does not require water to operate, there is therefore no operational water use for either of the product systems.

End of Life (C1-C4) includes:

C1 – De-construction, demolition

De-construction of the waterproofing sheet was assumed to be done manually, and thus not require any processes with an environmental impact.

C2 – Transport (to waste processing)

Comprises impacts from transportation of the deconstructed products after 60 years to the waste processing (incineration or recycling site).

C3 – Waste processing

Module C3 consists of the waste processing steps, that is incineration of the bitumen sheets (1%) and plastic fastening materials at end-of-life. Emissions from the materials incinerated in Denmark are reported in module C3 and the benefits from heat and electricity generation are carried forward to module D.

Most of the de-constructed bitumen roofing (99%) from C1 is collected by Derbigum for recycling. This is reported as materials for recycling in C3 and the burden from the recycling process and the benefits from replacing bitumen is recorded in module D.

C4 – Disposal

Ashes and other remains after incineration are reported in stage C4.

Re-use, recovery and recycling potential (D) includes:

Module D includes recovery and/or recycling potential, expressed as net impact and benefits.

At end of life most of the product is recycled. When bitumen sheets are recycled throughout the modules, the burden from the recycling process and net benefit of this recycling is reported in module D. The net benefit consists of the virgin material in the bitumen sheet replacing alternative material production.

A part of the product is also incinerated, and heat and electricity are produced. The energy is recovered and assumed to replace heat that would have been produced from other sources.

LCA results

ENVIRONMENTAL IMPACTS PER [m2 installed roof waterproofing during 60 years]																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.21E+00	4.32E-01	7.70E-01	0	0	0	3.31E+00	0	0	0	0.00E+00	8.13E-01	3.12E-01	1.03E-04	-4.34E-01
GWP-fossil	[kg CO_2 eq.]	3.22E+00	4.29E-01	7.44E-01	0	0	0	3.29E+00	0	0	0	0.00E+00	8.08E-01	3.12E-01	1.03E-04	-4.28E-01
GWP-biogenic	[kg CO_2 eq.]	-5.64E-03	-5.09E-04	2.52E-02	0	0	0	1.42E-02	0	0	0	0.00E+00	-9.59E-04	1.51E-05	2.76E-07	-6.15E-03
GWP-luluc	[kg CO_2 eq.]	2.09E-03	3.49E-03	8.90E-04	0	0	0	4.64E-03	0	0	0	0.00E+00	6.58E-03	3.28E-06	9.58E-09	7.57E-04
ODP	[kg CFC 11 eq.]	6.29E-08	8.44E-17	8.87E-09	0	0	0	4.90E-08	0	0	0	0.00E+00	1.59E-16	1.11E-09	2.07E-11	-7.08E-08
AP	[mol H^+ eq.]	8.72E-03	1.38E-03	1.79E-03	0	0	0	8.69E-03	0	0	0	0.00E+00	2.60E-03	9.36E-05	1.03E-06	-1.01E-02
EP-freshwater	[kg PO_4 eq.]	1.36E-04	1.27E-06	1.96E-05	0	0	0	1.08E-04	0	0	0	0.00E+00	2.39E-06	1.19E-06	5.84E-09	-4.43E-05
EP-marine	[kg N eq.]	2.30E-03	6.31E-04	5.50E-04	0	0	0	2.52E-03	0	0	0	0.00E+00	1.19E-03	2.64E-05	4.43E-07	-1.61E-03
EP-terrestrial	[mol N eq.]	2.50E-02	7.04E-03	6.03E-03	0	0	0	2.79E-02	0	0	0	0.00E+00	1.33E-02	2.61E-04	4.85E-06	-1.81E-02
POCP	[kg NMVOC eq.]	7.89E-03	1.24E-03	1.75E-03	0	0	0	8.03E-03	0	0	0	0.00E+00	2.34E-03	6.28E-05	1.36E-06	-6.71E-03
ADPm[1]	[kg Sb eq.]	2.77E-06	3.79E-08	4.12E-07	0	0	0	2.26E-06	0	0	0	0.00E+00	7.14E-08	1.21E-07	1.51E-10	2.91E-07
ADPf[1]	[MJ]	1.55E+02	5.69E+00	2.68E+01	0	0	0	1.33E+02	0	0	0	0.00E+00	1.07E+01	6.73E-02	1.38E-03	-2.89E+02
WDP[1]	[m^3]	2.34E-01	3.97E-03	3.95E-02	0	0	0	2.10E-01	0	0	0	0.00E+00	7.47E-03	1.18E-02	3.21E-06	-9.92E-02
Caption	GWP-total = Globale 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use															
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.															

ADDITIONAL ENVIRONMENTAL IMPACTS PER [m2 installed roof waterproofing during 60 years]																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	7.54E-08	7.96E-09	1.67E-08	0	0	0	7.40E-08	0	0	0	0.00E+00	1.50E-08	5.60E-10	2.69E-11	-3.43E-09
IRP[2]	[kBq U235 eq.]	9.19E-02	1.52E-03	1.82E-02	0	0	0	8.26E-02	0	0	0	0.00E+00	2.86E-03	3.40E-04	6.05E-06	-3.79E-03
ETP-fw[1]	[CTUe]	5.13E+01	4.23E+00	1.05E+01	0	0	0	4.68E+01	0	0	0	0.00E+00	7.96E+00	1.08E-01	1.07E-03	-1.54E+01
HTP-c[1]	[CTUh]	3.48E-09	8.54E-11	5.63E-10	0	0	0	3.02E-09	0	0	0	0.00E+00	1.61E-10	7.44E-12	3.06E-14	3.88E-10
HTP-nc[1]	[CTUh]	1.25E-07	5.00E-09	2.18E-08	0	0	0	1.21E-07	0	0	0	0.00E+00	9.43E-09	2.65E-10	1.23E-12	1.41E-09
SQP[1]	-	7.86E+00	1.96E+00	1.51E+00	0	0	0	8.67E+00	0	0	0	0.00E+00	3.69E+00	2.81E-02	6.27E-03	-1.10E-01
Caption	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 = Soil Quality (dimensionless)															
Disclaimers	[1] The results of this environmental 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 PER [m2 installed roof waterproofing during 60 years]																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	8.62E+00	3.28E-01	1.39E+00	0	0	0	8.01E+00	0	0	0	0.00E+00	6.17E-01	4.01E-03	1.06E-05	1.61E+01
PERM	[MJ]	1.95E-01	0.00E+00	2.69E-02	0	0	0	1.80E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	8.81E+00	3.28E-01	1.42E+00	0	0	0	8.19E+00	0	0	0	0.00E+00	6.17E-01	4.01E-03	1.06E-05	1.61E+01
PENRE	[MJ]	2.78E+01	5.71E+00	8.42E+00	0	0	0	3.75E+01	0	0	0	0.00E+00	1.08E+01	6.73E-02	1.38E-03	-5.06E+01
PENRM	[MJ]	1.33E+02	0.00E+00	1.91E+01	0	0	0	9.95E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.56E+02
PENRT	[MJ]	1.61E+02	5.71E+00	2.75E+01	0	0	0	1.37E+02	0	0	0	0.00E+00	1.08E+01	6.73E-02	1.38E-03	-3.07E+02
SM	[kg]	1.02E+00	0.00E+00	1.43E-01	0	0	0	8.08E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	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
FW	[m^3]	9.80E-03	3.75E-04	1.72E-03	0	0	0	8.69E-03	0	0	0	0.00E+00	7.07E-04	2.75E-04	7.47E-08	-2.48E-03
Caption	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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water															

WASTE CATEGORIES AND OUTPUT FLOWS PER [m2 installed roof waterproofing during 60 years]																
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	8.43E-09	3.01E-10	1.45E-09	0	0	0	7.46E-09	0	0	0	0.00E+00	5.67E-10	1.40E-12	0.00E+00	2.36E-10
NHWD	[kg]	4.75E-02	8.97E-04	7.68E-03	0	0	0	4.59E-02	0	0	0	0.00E+00	1.69E-03	2.55E-04	0.00E+00	2.16E-03
RWD	[kg]	5.16E-04	1.04E-05	1.07E-04	0	0	0	4.78E-04	0	0	0	0.00E+00	1.95E-05	4.46E-07	0.00E+00	-3.36E-05
CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	[kg]	0.00E+00	0.00E+00	9.13E-02	0	0	0	6.58E-02	0	0	0	0.00E+00	0.00E+00	8.71E+00	0.00E+00	0.00E+00
MER	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	[MJ]	0.00E+00	0.00E+00	4.08E-02	0	0	0	3.28E-02	0	0	0	0.00E+00	0.00E+00	5.45E-01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy															

BIOGENIC CARBON CONTENT PER m^2 installed roof waterproofing during 60 years		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	6.16E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	Diesel	-
Vehicle type	Truck, Euro 5, 28-32t gross	-
Transport distance	1230	km
Capacity utilization (including empty runs)	61	%
Capacity utilization volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	0.0172 (plastic fasteners)	kg
Water use	0	m^3
Other resource use	0	kg
Energy type and consumption	0.05 (propane)	kg
Waste materials	0.014 (wooden pallet, for incineration)	kg
	0.001 (bitumen trimmings, for incineration)	
	0.091 (bitumen trimmings, for recycling)	
Output materials	0	kg
Direct emissions to air, soil or water	Combustion of propane	kg
Overlap in cm	13	cm
Additional material due to overlap	11.8	%

Reference service life

RSL information	Unit
Reference service Life	60 years for building; 40 years for product
Declared product properties	Roof waterproofing
Assumed quality of work	Instructions are available via: www.derbigum.dk/
Maintenance	-

Use (B1-B7)

Scenario information	Value	Unit
B4 – Replacement		
Replacement cycle	0.025	MJ? / years
Energy input during replacement	0.05 (propane)	kg
Ancillary materials	0	kg
Exchange of worn parts during products life cycle	0	kg

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	8.81	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	8.71	kg
For energy recovery	0.1	kg
Assumptions for scenario development	50 km to incineration and landfill 1230 km to recycling	-

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Materials replacing bitumen production	6.625	kg
Heat replacing Danish natural gas	1.17	MJ
Electricity replacing Danish electricity grid mix	0.619	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

References

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LCA-practitioner	David Lindén, Niclas Silfverstrand and David Althoff Palm Ramboll Sweden AB Email: david.linden@ramboll.se Niclas.silfverstrand@ramboll.se David.palm@ramboll.se
LCA software /background data	GaBi ts 10.0.1.92 incl. databases 2021 Edition Ecoinvent 3.6 LCI profile from Eurobitume (2019)
3rd party verifier	Linda Høibye Life Cycle Assessment Consulting Email: hoeibye@gmail.com

General programme instructions
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