

Environmental Product Declaration (EPD)

According to ISO 14025 and EN
15804+A2:2019

PREFA Flood protection solutions

Registration number:	EPD-Kiwa-EE-264449-EN
Issue date:	22-06-2026
Valid until:	22-06-2031
Declaration owner:	PREFA Aluminiumprodukte GmbH
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

kiwa



1 General information

1.1 PRODUCT

PREFA Flood protection solutions

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-264449-EN

1.3 VALIDITY

Issue date: 22-06-2026

Valid until: 22-06-2031

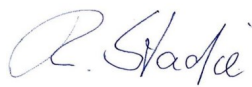
1.4 PROGRAMME OPERATOR

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(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: PREFA Aluminiumprodukte GmbH

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E-mail: office.at@prefa.com

Website: <https://www.prefa.com/>

Production location: PREFA Aluminiumprodukte GmbH

Address production location: Herzogenburger Str. 75, 3100 St. Pölten, AT

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

Internal External



Boris Agarski , University of Novi Sad

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

General Product Category Rules

Kiwa-EE GPI R.4.0 (2025)

Kiwa-EE GPI R.4.0 Annex B1 (2025)

Specific Product Category Rules

IBU: Part B: Requirements on the EPD for Aluminium roofing and cladding systems v12 (2026)

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20f (20260507)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'PREFA Flood protection solutions' with the calculation identifier ReTHiNK-164449.

2 Product

2.1 PRODUCT DESCRIPTION

This is an average EPD, taking into account different size variants of the same product. The following sizes are included:

- Barrier panel 25/200 cm
- Barrier panel 50/150 cm
- Barrier panel 50/200 cm
- Barrier panel 80/200 cm

The flood protection system consists of aluminium panels, a ground seal and barrier panel seals made from EPDM foam.

The product consists of the following components:

Component	Share (wt.%)
Extruded aluminium profile	96
Sealant	4

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Flood protection solutions are used in residential, commercial/industrial and public buildings. They are used for both perimeter and property protection.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The service life of many aluminium applications in the construction sector is often linked to the service life of the building. Due to aluminium's self-passivating surface, maintenance requirements are minimal. Based on empirical data, a service life of over 70 years can be expected when used as intended. Description of factors influencing aging when used in accordance with the rules of the art.

A reference service life for aluminium cladding (Metallbekleidungen) of 50 years is provided by "Nutzungsdauer von Bauteilen - Stand: 13.03.2026" (BBSR 2026).

USED RSL (YR) IN THIS LCA CALCULATION:

70

2.4 TECHNICAL DATA

There is no technical product standard for this product.

Characteristic	Unit	Wall thickness [mm]		Standard
		≤ 10	10-25	
Yield strength	MPa	200	180	EN 755-2
Tensile strength	MPa	245	225	EN 755-2
Elongation at break	%	6-8	6-8	EN 755-2
Bending property	-	B3	B3	EN 1999-1

The following products are considered in this EPD with different specific weights:

- Barrier panel 25/200: 14.95 kg/m²
- Barrier panel 50/150: 37.33 kg/m²
- Barrier panel 50/200: 20.60 kg/m²
- Barrier panel 80/200: 38.90 kg/m²

2.5 SUBSTANCES OF VERY HIGH CONCERN

None of the substances contained in the product with a content of more than 0.1% of the total weight is on the "List of Substances of Very High Concern" (SVHC) that are eligible for authorization under the REACH Regulation.

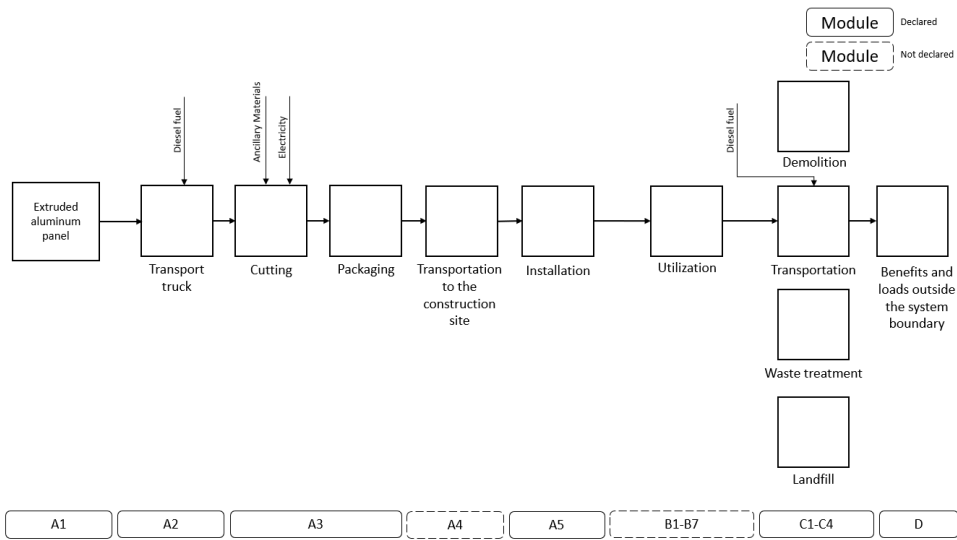
2.6 DESCRIPTION PRODUCTION PROCESS

This Environmental Product Declaration covers manufacturer-specific information on flood protection solutions produced by PREFEA Aluminiumprodukte GmbH. The production takes place at one production site located at Herzogenburger Str. 75, St. Pölten, Austria.

During production, the aluminium beams are cut to length at 90-degree angles using a profile saw and then deburred. The products are packaged.



2 Product



2.7 CONSTRUCTION DESCRIPTION

Not applicable because the construction process is not considered.

3 Calculation rules

3.1 DECLARED UNIT

1 kg of PREFA Flood protection solutions

This is an average EPD for the production of 1 kg of PREFA Flood protection solutions by PREFA Aluminiumprodukte GmbH in St. Pölten, Austria.

Reference unit: kilogram (kg)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	kg
Conversion factor to 1 kg	1.000000	kg

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative of PREFA Flood protection solutions, a product of PREFA Aluminiumprodukte GmbH. The results of this EPD are representative of the European Union.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. Therefore, the total neglected



3 Calculation rules

input flows do not exceed the limit of 5% of energy use and mass. All data from the operational data collection was taken into account, i.e. all input and output materials used, the thermal energy employed, and electricity consumption. However, the scope is limited to production-related data. Building and plant components that are not relevant to product manufacturing were excluded. Excluded processes/inputs are:

- Long-term emissions
- The manufacture of equipment used in production, buildings or any other capital goods;
- The transport of personnel to the plant;
- The transport of personnel within the plant;
- Research and development activities

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. Therefore, the total neglected input flows do not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

Allocation was avoided wherever possible. In this LCA study, the allocation is based on physical properties. The raw material, energy and production data were calculated according to the annual production volume using this allocation key and declared unit of 1 kg. The differences in the composition, diameter and shape were neglected by using annual average production data. No by-products or co-products are produced during the manufacture of the analysed product.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was collected from 01.01.2025 to 31.12.2025. The quantities of raw materials, auxiliary and process materials used and the energy consumption were collected and averaged over the entire operating year 2025. The reference area is Austria.

Representative data for Austria was used for most inputs (raw materials and external inputs). For inputs for which there was no corresponding Austrian data set, a data set for a neighbouring country (e.g. Switzerland or the Netherlands) or a regional data set (e.g. for the EU) was used. In a few cases, a global dataset was used. If data was provided by a manufacturer (e.g. an EPD), this was used as the data source.

All specific transport distances of the source materials were recorded and taken into account.

3.8 ESTIMATES AND ASSUMPTIONS

The various lubricating oils used as ancillary materials in production have been summarised, and a weighted transport distance has been calculated, taking into account the weight and transport distance of each supplied material.

For the packaging materials, no reuse was assumed. This represents a worst-case approach. Module A5 considers only the environmental impact of packaging waste. The impacts of the construction of the product must be assessed separately.

For the dismantling of end-of-life products, a consumption of 0.0437 MJ of diesel per kilogram of product is assumed. The diesel consumption is taken from Allacker et al., 2012.

For the end-of-life treatment of the product, the following assumptions were made: A payload factor of 50 percent was used for all truck transports, which in fact corresponds to a full delivery and empty return trip. A data set for a non-specific truck was used. Regarding the end-of-life treatment of the product, the following assumptions according to NMD waste scenario ID 5 were made: 94% recycling, 3% incineration and 3% landfill.

3.9 DATA QUALITY

The quality level of geographical representativeness can be considered "good". The quality level of technical representativeness can be considered "good". The time representativeness can also be regarded as "good".

The overall data quality for this EPD can, therefore, be described as "good". All relevant process-specific data were collected during data collection.

In all possible cases, primary data from manufacturer was used, which has very good data quality because it comes directly from the source. In addition, secondary data from the ecoinvent database (2019, version 3.9.1) was used when no primary data could be supplied. The database is checked regularly and, therefore, meets the requirements of DIN EN ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804+A2. The quantities of raw materials, consumables and supplies

3 Calculation rules

used and the energy consumption were recorded and averaged over the entire operating year.

The general rule that specific data from certain production processes or average data derived from certain processes must take precedence when calculating an EPD or LCA was adhered to. Data for processes over which the manufacturer has no influence were assigned to generic data/scenarios. When selecting these, care was taken to always choose the data set/scenario that most realistically represents the processes.

3.10 POWER MIX

The electricity mix considered in this EPD follows the market-based approach and therefore corresponds to the electricity mix that PREFEA Aluminiumprodukte GmbH purchased from an electricity supplier in 2025. The electricity used for production is sourced from 100 % hydropower. Guarantees of Origin are provided. Based on a conservative calculation approach including direct, upstream and downstream emissions, this electricity mix results in a global warming potential (GWP-100) of 0.01364 kg CO₂eq/kWh.

4 Scenarios and additional technical information

4.1 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

There are no significant environment impacts as a result of materials or energy used in the construction stage (A5).

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	0	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	0.009	kg

4.2 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
(ei3.9.1) Diesel, burned in machine (incl. emissions)	0.001	l

4.3 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) aluminium (GLO), wrought alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 5)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	50
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	50

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.



4 Scenarios and additional technical information

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.4 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) aluminium (GLO), wrought alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 5)	NL	0	3	3	94	0
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	NL	0	10	85	5	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) aluminium (GLO), wrought alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 5)	0.000	0.029	0.029	0.901	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.004	0.035	0.002	0.000
Total	0.000	0.033	0.064	0.903	0.000

4.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

4 Scenarios and additional technical information

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) aluminium (GLO), wrought alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 5)	0.901	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.002	0.949
Total	0.903	0.949

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER KILOGRAM

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1- A3	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.88E+1	4.81E-2	4.82E-1	1.93E+1	1.62E-2	4.26E-3	8.64E-3	3.85E-1	1.66E-3	-1.69E+1
GWP-f	kg CO ₂ eq.	1.87E+1	4.80E-2	4.93E-1	1.93E+1	6.89E-4	4.26E-3	8.61E-3	3.83E-1	1.65E-3	-1.68E+1
GWP-b	kg CO ₂ eq.	2.31E-2	3.08E-5	-1.23E-2	1.08E-2	1.55E-2	5.93E-7	2.81E-6	1.07E-3	3.38E-6	-1.54E-2
GWP-luluc	kg CO ₂ eq.	5.42E-2	3.19E-5	1.01E-3	5.53E-2	7.66E-7	4.80E-7	3.07E-5	2.48E-4	1.25E-6	-5.02E-2
ODP	kg CFC 11 eq.	1.91E-7	7.98E-10	6.58E-9	1.98E-7	2.14E-11	6.78E-11	1.53E-10	3.37E-9	1.41E-11	-1.66E-7
AP	mol H ⁺ eq.	1.25E-1	2.33E-4	4.18E-3	1.30E-1	3.65E-6	3.95E-5	4.12E-5	1.12E-3	7.56E-6	-1.08E-1
EP-fw	kg P eq.	5.96E-4	6.59E-7	2.06E-5	6.18E-4	5.57E-9	1.54E-8	8.57E-8	5.58E-6	3.74E-8	-5.11E-4
EP-m	kg N eq.	1.91E-2	7.54E-5	4.97E-4	1.97E-2	1.60E-6	1.83E-5	1.57E-5	2.01E-4	2.03E-6	-1.72E-2
EP-T	mol N eq.	2.12E-1	8.25E-4	5.79E-3	2.18E-1	1.77E-5	1.99E-4	1.67E-4	2.29E-3	2.13E-5	-1.89E-1
POCP	kg NMVOC eq.	6.59E-2	3.13E-4	1.85E-3	6.80E-2	5.07E-6	5.90E-5	5.71E-5	7.49E-4	7.19E-6	-5.83E-2
ADP-mm	kg Sb-eq.	1.42E-5	3.67E-7	2.37E-5	3.83E-5	1.13E-9	1.49E-9	2.70E-8	6.03E-6	2.36E-9	8.36E-5
ADP-f	MJ	1.80E+2	6.66E-1	4.90E+0	1.85E+2	4.41E-3	5.58E-2	1.23E-1	2.03E+0	1.71E-2	-1.59E+2
WDP	m ³ world eq.	2.40E+0	3.48E-3	1.65E-1	2.57E+0	6.64E-5	1.20E-4	6.73E-4	2.28E-2	4.61E-4	-1.66E+0

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratospheric ozone layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) depreciation potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1- A3	A5	C1	C2	C3	C4	D
PM	disease incidence	1.56E-6	4.76E-9	3.70E-8	1.61E-6	4.40E-11	1.10E-9	8.50E-10	1.80E-8	1.18E-10	-1.42E-6
IR	kBq U235 eq.	1.23E-1	4.85E-4	8.14E-3	1.31E-1	5.09E-6	1.14E-5	4.81E-5	5.47E-3	2.76E-5	-8.93E-2
ETP-fw	CTUe	5.69E+1	3.48E-1	3.57E+0	6.08E+1	7.99E-3	2.67E-2	9.10E-2	1.59E+0	2.39E-1	-4.22E+1
HTP-c	CTUh	2.45E-8	6.77E-11	7.55E-10	2.54E-8	2.41E-12	1.31E-12	4.56E-12	1.71E-10	1.04E-12	-2.15E-8
HTP-nc	CTUh	3.46E-7	5.35E-10	2.97E-8	3.76E-7	7.87E-12	9.08E-12	9.91E-11	7.07E-9	1.41E-11	-2.24E-7
SQP	Pt	3.00E+1	2.93E-1	3.64E+0	3.39E+1	3.09E-3	3.76E-3	9.73E-2	1.82E+0	2.23E-2	-2.12E+1

PM=Potential incidence of disease due to PM emissions (PM) | IR=Potential Human exposure efficiency relative to U235 (IRP) | ETP-fw=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | HTP-c=Potential Comparative Toxic Unit for humans (HTP-c) | HTP-nc=Potential Comparative Toxic Unit for humans (HTP-nc) | SQP=Potential soil quality index (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2
<p>Disclaimer 1 – 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.</p>		
<p>Disclaimer 2 – 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.</p>		

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1- A3	A5	C1	C2	C3	C4	D
PERE	MJ	1.90E+1	1.64E-2	1.26E+0	2.02E+1	1.46E-4	3.18E-4	1.74E-3	2.29E-1	1.10E-3	-1.65E+1
PERM	MJ	0.00E+0	0.00E+0	1.29E-1	1.29E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	1.90E+1	1.64E-2	1.39E+0	2.04E+1	1.46E-4	3.18E-4	1.74E-3	2.29E-1	1.10E-3	-1.65E+1
PENRE	MJ	1.79E+2	6.66E-1	4.88E+0	1.84E+2	4.41E-3	5.58E-2	1.24E-1	2.03E+0	1.71E-2	-1.59E+2
PENRM	MJ	1.12E+0	0.00E+0	1.69E-2	1.13E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-5.87E-2
PENRT	MJ	1.80E+2	6.66E-1	4.90E+0	1.85E+2	4.41E-3	5.58E-2	1.24E-1	2.03E+0	1.71E-2	-1.59E+2
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m ³	1.05E-1	1.22E-4	6.93E-3	1.13E-1	5.21E-6	4.38E-6	2.98E-5	1.25E-3	1.31E-5	-8.27E-2

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

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
HWD	Kg	2.64E-4	1.41E-5	3.23E-3	3.50E-3	2.47E-8	3.76E-7	7.86E-7	5.96E-3	5.85E-8	7.69E-3
NHWD	Kg	3.45E+0	2.26E-2	1.14E-1	3.59E+0	8.72E-3	7.99E-5	8.15E-3	1.43E-1	3.34E-2	-3.11E+0
RWD	Kg	8.22E-5	3.22E-7	5.76E-6	8.83E-5	4.24E-9	6.12E-9	2.82E-8	4.17E-6	1.75E-8	-5.86E-5

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

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A5	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	4.15E-1	4.15E-1	9.88E-4	0.00E+0	0.00E+0	9.03E-1	0.00E+0	9.01E-1
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	3.22E-3	3.22E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.28E-1
EEE	MJ	0.00E+0	0.00E+0	1.87E-3	1.87E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.90E-1

CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EET=Exported Energy, Thermic | EEE=Exported Energy, Electric



5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER KILOGRAM

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per kilogram:

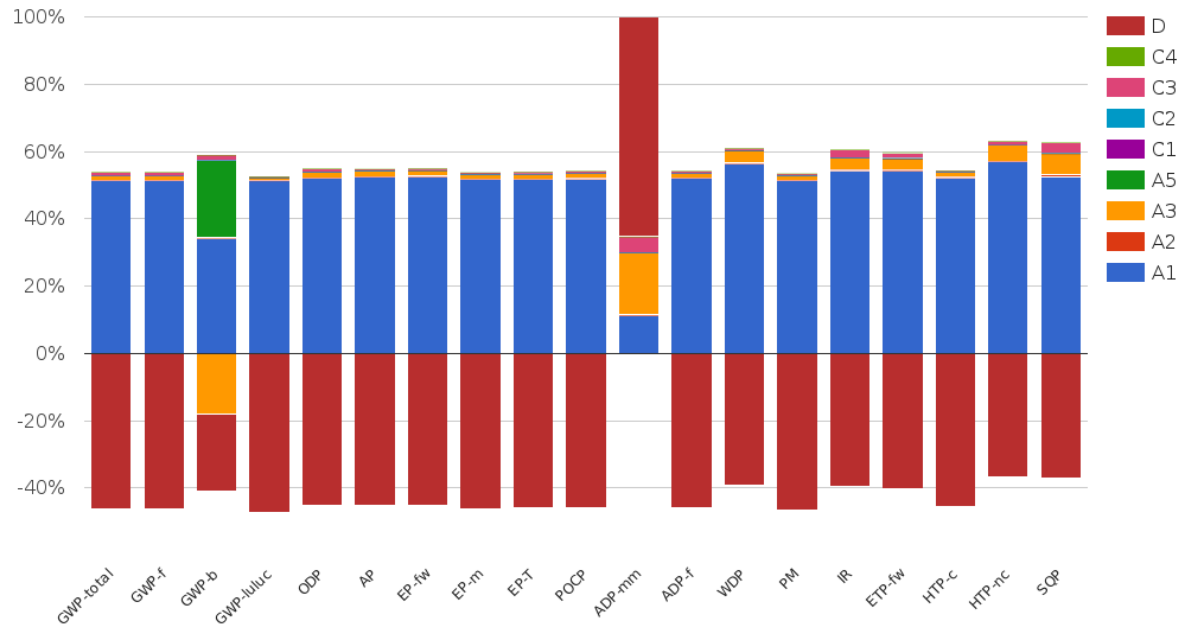
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.004268	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.01565	kg CO2 (biogenic)

6 Interpretation of results



The loads of almost all impact categories are dominated by module A1 (Raw material supply), except for Abiotic depletion potential for non fossil resources (ADP-mm), for which the impacts are mainly driven by module D. In the impact category Global Warming Potential - biogenic (GWP-b), impacts are additionally influenced by modules A3 (Manufacturing) and A5 (Construction). The impacts of module A1 are mainly driven by the supply of aluminium, while the GWP impacts in module A3 are influenced by biogenic packaging materials.

Modules C1-C4 have the lowest contribution and account for less than 10% of the total results in any impact category.

6 Interpretation of results

In total, modules A1–A3 contribute 18.816 kg CO₂-eq., module A5 contributes 0.599 kg CO₂-eq., and modules C1–C4 and D contribute -17.013 kg CO₂-eq. to the overall result for the impact category Global Warming Potential – total.

Benefits beyond the system boundary are reported for almost all impact categories in module D, as indicated by the negative values. The only exception is Abiotic Depletion Potential for non-fossil resources (ADP-mm), for which no benefits are reported.

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Nr. Z-10.3-865 14.07.2020

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