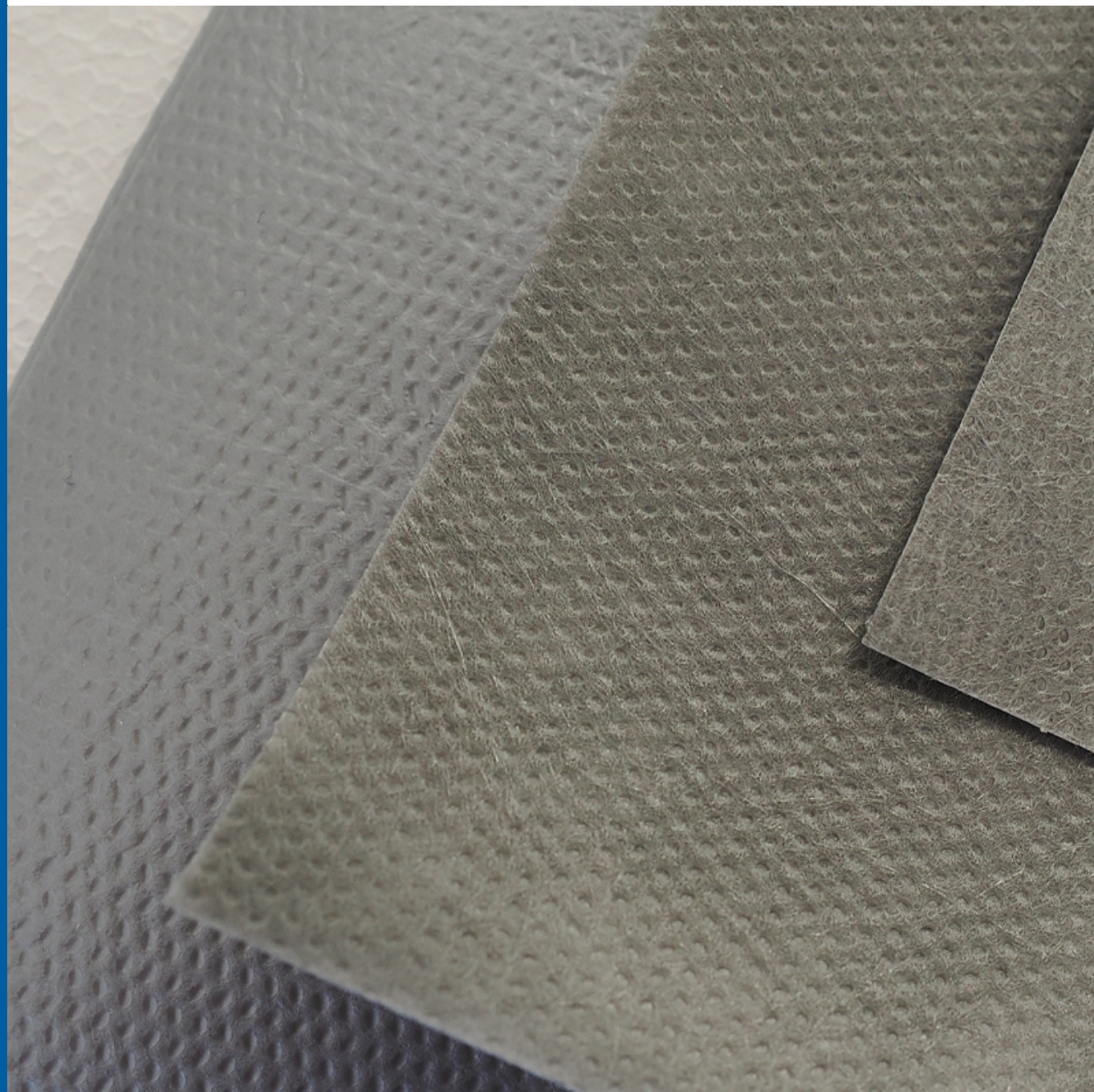
Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Bilaminat



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Issue date:	01-09-2025
Valid until:	01-09-2030
Declaration owner:	Masterplast Nyrt
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Bilaminat

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-203460-EN

1.3 VALIDITY

Issue date: 01-09-2025

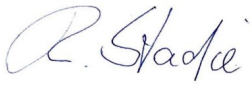
Valid until: 01-09-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Masterplast Nyrt

Address: Arpad u. 1/A, H-8143 Sarszentmihaly, Hungary

E-mail: szokrenyesmiklos@masterplast.hu

Website: www.masterplastgroup.com

Production location: Masterplast Nyrt

Address production location: Árpad u. 1/A, H-8143 Sárszentmihály, Hungary

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

Lucas Pedro Berman, Senda

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

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1203_R. 3.0 (27.02.2025)

Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R. 3.0 (27.02.2025)

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.

1 General information

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: v3.19 (20250306)

** 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 'Bilaminat' with the calculation identifier ReTHiNK-103460.

2 Product

2.1 PRODUCT DESCRIPTION

MASTERPLAST's bilaminate (two-layer) products are composed of two distinct layers joined through a controlled thermal bonding process. The base layers are typically made from polymers such as polypropylene (PP) or polyethylene (PE) nonwoven materials, combined with additional functional membranes.

These materials are designed for use in sectors including construction, healthcare, hygiene, automotive applications, and industrial filtration. Their functional characteristics include increased mechanical strength, resistance to water penetration, vapor permeability, and resistance to various chemicals. The layered configuration can be adapted for specific technical requirements, such as acting as a vapor barrier or incorporating antibacterial or flame-retardant properties.

This Environmental Product Declaration is a representative EPD for the product group, based on a variant with a basis weight of 50 g/m².

The composition of the product

Materials	Weight %
Polypropylene	99 - 100
Additives	1 - 2

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Bilaminate membranes are versatile solutions suitable for roofing, façade, and wall assemblies. By selecting the appropriate type, they can be easily adapted to a wide range of thermal and moisture management needs. Typical applications include use as underlay membranes, wind barriers, or additional moisture protection layers.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

As the service life of product is not taken into account, there is no need to specify a reference service life.

USED RSL (YR) IN THIS LCA CALCULATION:

1

2.4 TECHNICAL DATA

	Charasteristics	Method	Value	Unit
Linopore	Unit Weight	EN 18459-2	50-90	g/m2
	Nominal tensile strength - MD	EN 12311-1	80-140	N/5cm
	Nominal tensile strength - CD	EN 12311-1	60-130	N/5cm
	Elongation at maximum load - MD	EN 12311-1	35-50	%
	Elongation at maximum load - CD	EN 12311-1	30-40	%
	Resistance to tearing - MD	EN 12310-1	30-100	N
	Resistance to tearing - CD	EN 12310-1	30-100	N
	Resistance to water penetration	EN 1928 Method A	W1	Class
	Water vapour transmission (Sd)	EN ISO 12572	<0.1	m

	Parameter	Method	Value	Unit
Linobarrier	Unit Weight	EN 18459-2	50-100	g/m2
	Nominal tensile strength- MD	EN 12311-1	80-130	N/5cm
	Nominal tensile strength- CD	EN 12311-1	80-130	N/5cm
	Elongation at maximum load- MD	EN 12311-1	35-40	%
	Elongation at maximum load- CD	EN 12311-1	25-30	%
	Resistance to tearing- MD	EN 12310-1	25-70	N
	Resistance to tearing- CD	EN 12310-1	25-70	N
	Resistance to water penetration	EN 1928 Method A	W1	Class
	Water vapour transmission (Sd)	EN ISO 12572	>10	m

2 Product

2.5 SUBSTANCES OF VERY HIGH CONCERN

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH Regulations that exceed 0.1% of the total weight are present in the examined systems.

2.6 DESCRIPTION PRODUCTION PROCESS

The production of bilaminate begins with the manufacturing of fleece, using polypropylene (PP) granules. The granules are melted using extruders and then transformed into fine filaments through a spinning process, which are deposited onto a moving belt, forming a nonwoven, porous fleece structure. During fleece production, various additives – such as UV stabilizers or colorants – can be incorporated to achieve specific material properties. The resulting fleece layer is stabilized using a thermobonding process. Next, the fleece is fed into a film extruder, where a functional layer – typically a polymer film produced by melt-blown technology – is applied. The hot film adheres directly to the surface of the fleece, creating a tight, layered bond. The bilaminate thus produced performs excellently both mechanically and functionally, and can also be subjected to biaxial stretching if required.

3 Calculation rules

3.1 DECLARED UNIT

m2

The declared unit is 1 m² of bilaminat (two-layer) membrane manufactured by MASTERPLAST.

Reference unit: square meter (m2)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m2
Weight per reference unit	0.050	kg
Conversion factor to 1 kg	20.000000	m2

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D 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	ND	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 for Bilaminat, a product of Masterplast. The results of this EPD are representative for 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. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

3 Calculation rules

The following processes are excluded:

- Manufacturing of equipment used in production, buildings or any other capital asset
- Transportation of personnel to the plant
- The transportation of personnel within the plant
- Research and development activities
- Long-term emissions

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. The total neglected input flows do therefore 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

Allocations were avoided as far as possible. There are no coproducts or by-product in the manufacturing of the examined product. Based on energy consumption measurements, the energy requirements of the production were allocated to the individual products. Specific information about allocations within the background data is included in the documentation of the ecoinvent datasets.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data were collected for the operating year 2024 (January to December).

3.8 ESTIMATES AND ASSUMPTIONS

This specific EPD is based on the product variant with a basis weight of 50 g/m². Environmental impacts are calculated per kg of product and converted to per m² using a normalized conversion factor of 1.000 for the declared product. For other commercially available basis weights, the following conversion factors can be applied proportionally.

Basis weight (g/m²)	Normalized conversion factor (relative to specific EPD)
40	0.800
50	1.000
60	1.200
70	1.400
80	1.600
90	1.800
100	2.000
110	2.200
120	2.400

To derive environmental indicators per m² for any other product variant, multiply the results of this specific EPD by the appropriate factor.

The additives account for approximately 1.04% of the total material used. As this falls below the cut-off threshold, they are excluded from the system boundaries in this EPD.

The environmental impact results in this EPD are based on the total production data of bilaminat products in various colors.

The Environmental Product Declaration complies with the principles of “polluter pays” and “modularity,” ensuring that waste management responsibilities and impacts are allocated appropriately and consistently.

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”.

To ensure the comparability of the results, only consistent background data from the ecoinvent database version 3.9.1 (2022) was used in the LCA (e.g. data sets on energy, transports, auxiliary and operating materials). The database is regularly checked and thus complies with the requirements of EN 15804 (background data not older than 10 years). Almost all consistent data sets contained in the ecoinvent database version 3.9.1 are documented and can be viewed in the online documentation. The raw material data were

3 Calculation rules

converted into reference flows (input per declared unit).The general rule was followed that specific data from specific production processes or average data derived from specific processes must have priority in the calculation of an LCA. Data for processes over which the manufacturer has no influence were assigned generic data.

The LCA calculation was carried out using Nibe's LCA & EPD tool R<THINK.

3.10 POWER MIX

The electricity mix considered in this EPD follows the market-based approach and corresponds to the electricity mix procured by Masterplast via energy suppliers for production in the year 2024.

For the Hungarian site, the dataset “Electricity, medium voltage {HU} | electricity, medium voltage, residual mix” was used, with a GWP-100 of 0.388 kg CO_2 equivalent per kWh (ecoinvent 3.9.1).

In Hungary, electricity from an on-site PV plant was modeled using the ecoinvent v3.9.1 dataset with a GWP of 0.131 kg CO_2-eq/kWh.

4 Scenarios and additional technical information

4.1 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.2 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) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0

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

	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

4.3 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) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0

4 Scenarios and additional technical information

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.005	0.043	0.003	0.000
Total	**0.000**	**0.005**	**0.043**	**0.003**	**0.000**

4.4 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.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.003	1.393
Total	**0.003**	**1.393**

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 SQUARE METER

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	9.42E-2	3.62E-3	9.41E-2	1.92E-1	0.00E+0	1.04E-3	1.14E-1	6.38E-4	-6.35E-2
GWP-f	kg CO_2 eq.	9.40E-2	3.62E-3	9.40E-2	1.92E-1	0.00E+0	1.04E-3	1.14E-1	6.37E-4	-6.35E-2
GWP-b	kg CO_2 eq.	1.37E-4	1.44E-6	9.61E-5	2.34E-4	0.00E+0	3.38E-7	1.55E-5	3.53E-7	-1.05E-5
GWP-luluc	kg CO_2 eq.	2.31E-5	1.28E-6	2.40E-5	4.84E-5	0.00E+0	3.70E-6	1.10E-5	4.53E-8	-5.21E-6
ODP	kg CFC 11 eq.	4.51E-10	8.28E-10	1.54E-9	2.82E-9	0.00E+0	1.85E-11	3.09E-9	1.38E-12	-3.21E-9
AP	mol H+ eq.	3.31E-4	1.84E-5	3.11E-4	6.61E-4	0.00E+0	4.97E-6	4.85E-5	4.29E-7	-5.09E-5
EP-fw	kg P eq.	1.14E-6	2.87E-8	1.61E-6	2.77E-6	0.00E+0	1.03E-8	3.26E-7	9.05E-10	-1.56E-7
EP-m	kg N eq.	5.61E-5	6.27E-6	5.14E-5	1.14E-4	0.00E+0	1.89E-6	1.37E-5	2.82E-7	-1.70E-5
EP-T	mol N eq.	6.15E-4	6.92E-5	5.82E-4	1.27E-3	0.00E+0	2.02E-5	1.53E-4	1.69E-6	-1.87E-4
POCP	kg NMVOC eq.	3.07E-4	1.97E-5	2.20E-4	5.47E-4	0.00E+0	6.88E-6	4.41E-5	7.31E-7	-1.01E-4
ADP-mm	kg Sb-eq.	4.13E-7	9.88E-8	6.62E-7	1.17E-6	0.00E+0	3.25E-9	5.34E-8	1.25E-10	-2.91E-8
ADP-f	MJ	3.58E+0	5.51E-2	1.96E+0	5.59E+0	0.00E+0	1.49E-2	8.59E-2	1.28E-3	-1.05E+0
WDP	m3 world eq.	6.94E-2	1.53E-4	3.66E-2	1.06E-1	0.00E+0	8.13E-5	5.24E-3	5.39E-5	-7.29E-3

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 stratosperic ozon 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) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PM	disease incidence	3.57E-9	2.63E-10	2.31E-9	6.14E-9	0.00E+0	1.03E-10	4.44E-10	9.06E-12	-3.15E-10
IR	kBq U235 eq.	1.62E-3	2.41E-4	8.23E-3	1.01E-2	0.00E+0	5.81E-6	2.81E-4	7.08E-7	-1.54E-4
ETP-fw	CTUe	9.71E-2	4.41E-2	7.01E-1	8.42E-1	0.00E+0	1.10E-2	1.31E+0	9.59E-4	-2.92E-2
HTP-c	CTUh	1.74E-11	1.24E-12	2.81E-11	4.68E-11	0.00E+0	5.50E-13	2.10E-11	3.52E-14	-7.83E-12
HTP-nc	CTUh	4.64E-10	4.80E-11	8.60E-10	1.37E-9	0.00E+0	1.20E-11	2.17E-10	1.38E-12	-7.89E-11
SQP	Pt	7.57E-2	3.80E-2	2.64E-1	3.78E-1	0.00E+0	1.17E-2	2.83E-2	2.90E-3	-1.32E-2

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 idex (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

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.

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.

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	C1	C2	C3	C4	D
PERE	MJ	5.16E-2	7.77E-4	1.48E-1	2.01E-1	0.00E+0	2.10E-4	9.53E-3	2.38E-5	-5.49E-3
PERM	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
PERT	MJ	5.16E-2	7.77E-4	1.48E-1	2.01E-1	0.00E+0	2.10E-4	9.53E-3	2.38E-5	-5.49E-3
PENRE	MJ	1.94E+0	5.85E-2	1.30E+0	3.30E+0	0.00E+0	1.49E-2	8.59E-2	1.28E-3	-9.81E-1
PENRM	MJ	1.64E+0	0.00E+0	6.59E-1	2.30E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-7.11E-2
PENRT	MJ	3.58E+0	5.85E-2	1.96E+0	5.60E+0	0.00E+0	1.49E-2	8.59E-2	1.28E-3	-1.05E+0
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
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
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
FW	m^3	9.12E-4	5.81E-6	6.72E-4	1.59E-3	0.00E+0	3.60E-6	1.56E-4	1.32E-6	-1.07E-4

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	C1	C2	C3	C4	D
HWD	Kg	6.97E-7	1.44E-7	1.07E-6	1.91E-6	0.00E+0	9.49E-8	3.04E-7	6.34E-9	-4.03E-6
NHWD	Kg	3.01E-3	2.63E-3	2.58E-2	3.15E-2	0.00E+0	9.83E-4	4.46E-2	5.01E-3	-1.16E-3
RWD	Kg	1.28E-6	3.75E-7	6.65E-6	8.31E-6	0.00E+0	3.41E-9	1.98E-7	4.32E-10	-1.15E-7

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	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
MFR	Kg	0.00E+0	0.00E+0	1.05E-3	1.05E-3	0.00E+0	0.00E+0	2.50E-3	0.00E+0	0.00E+0
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
EET	MJ	0.00E+0	0.00E+0	1.81E-1	1.81E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.32E-1
EEE	MJ	0.00E+0	0.00E+0	1.05E-1	1.05E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.51E-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

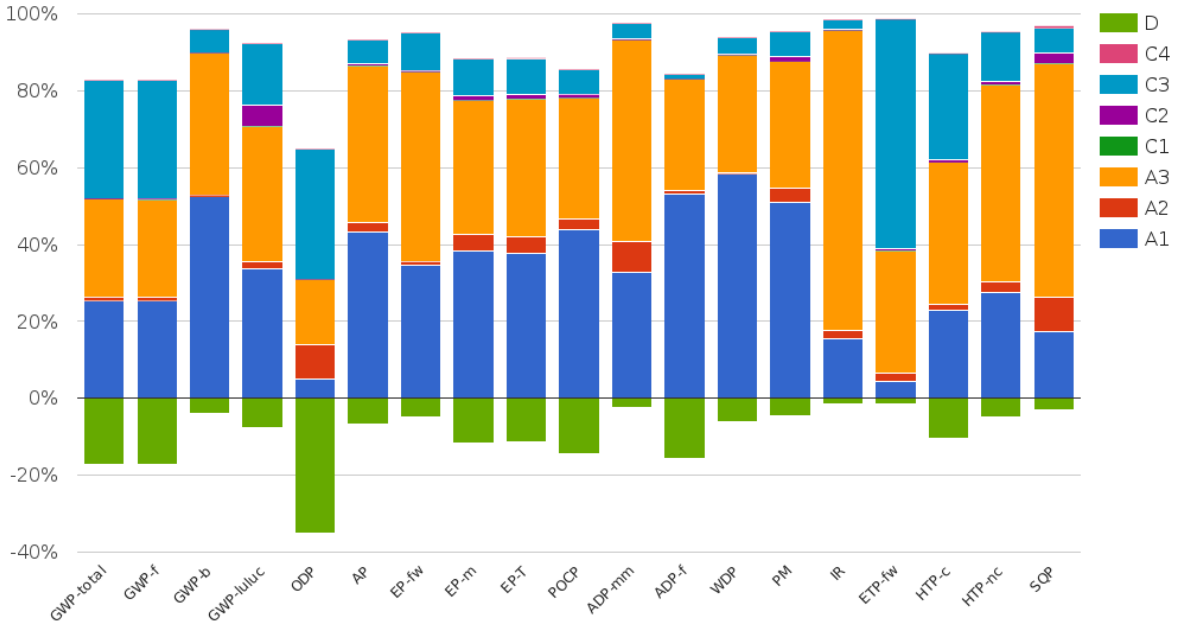
5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER SQUARE METER

BIOGENIC CARBON CONTENT

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

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

6 Interpretation of results



The total GWP (A1–D) is 0.244 kg CO_2-eq per m^2, with production (A1–A3) dominating at 79% (0.192 kg CO_2-eq). The main contributors are polypropylene granulates and electricity consumption. End-of-life (C1–C4 + D) accounts for 21% (0.052 kg CO_2-eq), where disposal impacts are partially offset by recovery benefits

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012+A2:2019/AC:2021, Sustainability of Buildings - Environmental Product Declarations - Framework Development Rules by Product Category

Kiwa-EE GPI R.3.0
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1203_R. 3.0 (27.02.2025)

Kiwa-EE GPI R.3.0 Annex B1
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R. 3.0 (27.02.2025)

ecoinvent
ecoinvent Version 3.9.1 (December 2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A2 indicators (EF 3.1)

NMD EoL scanarios 2022
Forfaitaire waarden voor verwerking-scenario’s einde leven behorende bij: Bepalingsmethode Milieuprestatie Bouwwerken

ISO 9073-1:1989
Textiles — Test methods for nonwovens — Part 1: Determination of mass per unit area

ISO 9073-3:1989
Textiles — Test methods for nonwovens — Part 3: Determination of tear resistance (trapezoid method)

ISO 9073-4:1989
Textiles — Test methods for nonwovens — Part 4: Determination of tensile strength and elongation

8 Contact information

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