

ENVIRONMENTAL PRODUCT DECLARATION

MASQ WALL

PVC WALL COVERING



dumaplast[®]
EXTRUDED PRODUCTS

The product covered by this EPD is MASQ WALL.

MASQ WALL is a rigid vinyl wall covering which has a thickness of 5mm for an extended durability.

Its non-porous conception, its tongue and groove assembly system combined with a glued installation give MASQ WALL a water resistance allowing an installation in wet areas including showers.

It has a fire reaction classification D-s3,d0 according to EN13501. It has excellent chemical resistance according to EN 423.

It will be CMR 1 & 2 free and 100% Reach compliant.

TVOC 28-day air emissions (NF EN 16000-6) will be classified as A+ under French health labelling.

MASQ WALL contains up to 30% recycled and is 100% recyclable.

MANUFACTURER NAME AND ADDRESS	DUMAPLAST VUEGPLEIN 41, 9991 MALDEGEM, BELGIQUE
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	The functional unit is one square meter of installed product. The reference service life considered is 25 years.
REFERENCE PCR AND VERSION NUMBER	PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0, UL Environment. PCR - Part B: Flooring EPD Requirements, Second Edition, Dated September 28, 2018, UL Environment.
DESCRIPTION OF PRODUCT APPLICATION/USE	The product is to be installed in various areas of application including commercial and industrial applications.
PRODUCT RSL DESCRIPTION (IF APPL.)	The product service life recommended is 25 years. According to UL PCR, the building Estimated Service Life (ESL) is 75 years. For this duration, two replacements are required Environmental impacts are calculated for two different Service Life assumptions: 1 year and 75 years.
MARKETS OF APPLICABILITY	European Commercial market
DATE OF ISSUE	April 2024
PERIOD OF VALIDITY	5 years
EPD TYPE	Product-specific
VARIABILITY OF REPORTED DATA	1 product(s) is considered in this EPD.
EPD SCOPE	Cradle to Grave
YEAR(S) OF REPORTED PRIMARY DATA	2022
LCA SOFTWARE & VERSION NUMBER	Simapro 9
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent 3.8 – allocation cut-off by classification
LCIA METHODOLOGY & VERSION NUMBER	Method EN 15804 A2 EPD Ev-DEC 1.11 (EVEA)

This declaration was independently verified in accordance with ISO 14025: 2006.

INTERNAL EXTERNAL

LIMITATIONS

Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

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1. Product Definition and Information

1.1. Company Description and production site information

The products are commercialized by Dumaplast.

Dumaplast is a leading manufacturer and supplier of sustainable cladding for walls, ceilings and floors. Applications for interior and exterior use, with a special emphasis on waterproof PVC materials.

We provide high-quality decorative products that enhance any house and interior. Our vast range of products includes PVC wall panels, outside wall cladding, waterproof flooring as an alternative to laminate or LVT, water-resistant shower and bathroom panels and much more.

Faced with the climate emergency and the scarcity of raw materials, the Group’s ambition is now more than ever to reconcile sustainable and profitable growth with resolute and innovative approaches to reduce our environmental impact.

1.2. Product Description

This environmental product declaration covers Masq Wall Mat.

MASQ WALL is a rigid vinyl wall covering which has a thickness of 5mm for an extended durability. It is available in 3 dimensions : 65 x 37,5cm for tiles, and 2.6m x 90cm or 2.6m x 120cm for panels.

It is 100% recyclable and made with up to 30% of recycled content. It is 100% compliant with REACH. The product emission rate of volatile organic compounds is < 100µg/m3 (TVOC <28 days – ISO 16000-6).

The following figure shows MASQ WALL product constructions:



- 1. Polyurethane protective varnish**
- 2. Decorative film**
- 3. Coextrusion layer**
- 4. Rigid layer containing recycled material**

1.3. Technical Specifications

The product considered in this EPD meets or exceeds all technical requirements in NF EN 15102 Decorative wallcoverings.

The product meets the following technical specifications :

Name	Value	Unit
Product Thickness	5	mm
Product Weight	6.67	kg/m ²
Density	1334	kg/m ³

1.4. Product Certifications

Fire test: D-s3,d0

VOC emissions classification : A+ (French health labelling)

1.5. Product Classifications

The Masq Wall product is a rigid vinyl wall covering, classified in accordance with :
EN 13245-2 PLASTICS - UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PROFILES FOR BUILDING APPLICATIONS - PART
2: PVC-U PROFILES AND PVC-UE PROFILES FOR INTERNAL AND EXTERNAL WALL AND CEILING FINISHES

2. Life Cycle Assessment General Information

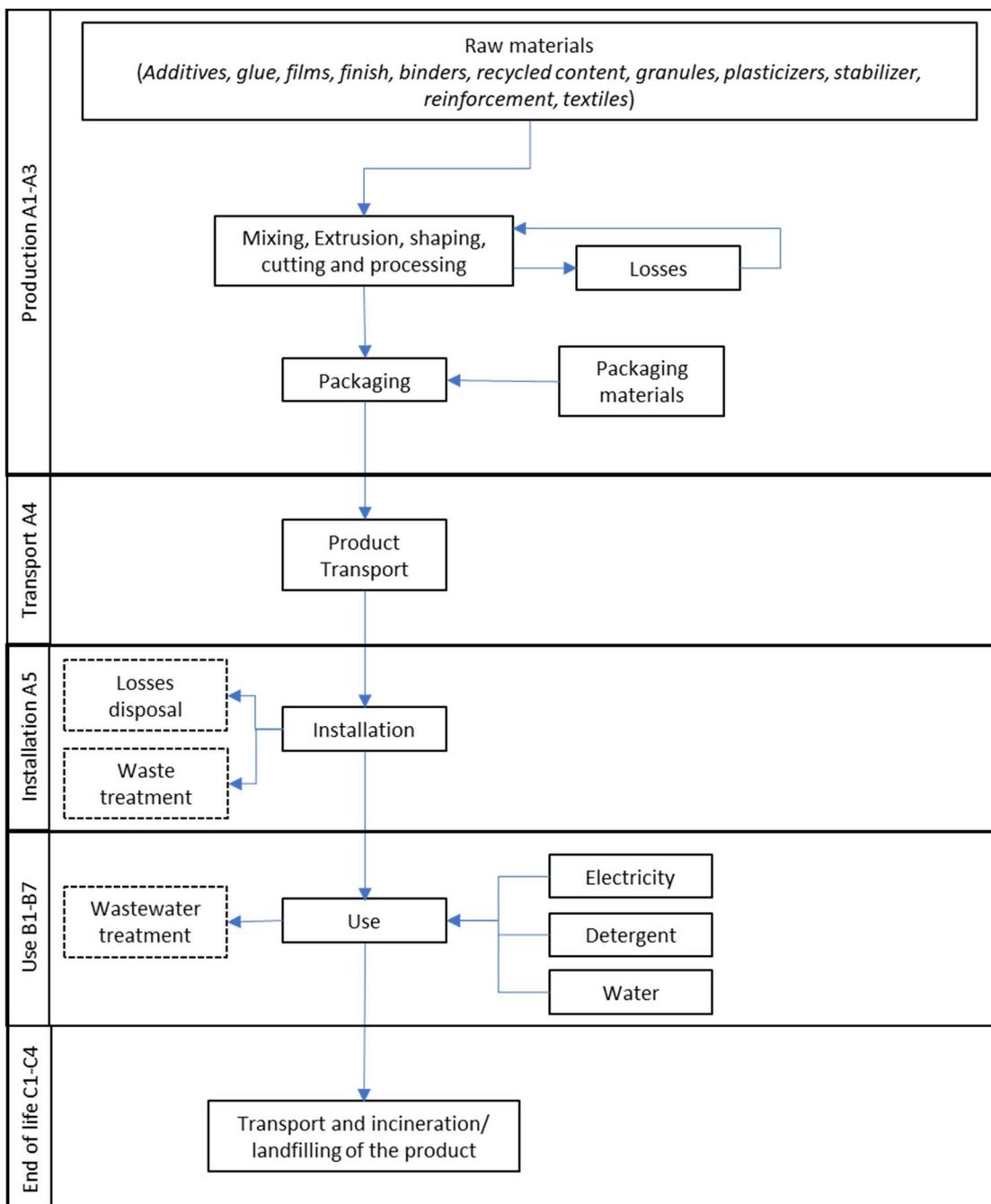
2.1. Methodological Framework

A full Life Cycle Assessment has been performed according to ISO 14040, ISO 14044 and in compliance with EN15804.

This EPD covers the entire life cycle of the products from cradle to grave (modules A1 to D) excluding modules for which there are no inputs/outputs.

No known flows are deliberately excluded from this EPD. For these products, the stated Reference Service Life (RSL) is 25 years (see section 3.5).

Flow Diagram :



2.2. Declared Unit

The functional unit is one square meter of installed product. The reference service life considered is 25 years.

	Value	Unit
Functional Unit	1	m ²
Mass	6.67	kg

2.3. System Boundary

EPD is declared from cradle to grave, including the following stages:

A1 – A3: includes the provision of all raw materials and their packaging, transport to the production site and energy consumption during the manufacturing of the product, as well as processing of waste generated by the factory.

A4 – A5: includes the transport from the factory to the final customer, packaging of the final product and the installation of the product, as well as all consumables and energy required, and processing of waste generated during the installation.

B1 – B7: includes provision and transport of all materials, products and services related to the use phase of the product, as well as their related energy and water consumption, and the processing of any resulting waste.

C1 – C4: includes provision and transport of all materials, products and services related to the end-of-life phase of the product, including energy and water consumption, as well as the end-of-life processing of the product.

D: includes benefits coming from the wastes’ end of life.

Scope of study: modules with no “X” in the table below have been considered but have no associated inputs/outputs, therefore do not appear in the results:

Modules	Production Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits & loads beyond syst. Bound.	
	Raw material supply	Transport to manufacturer	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use during product use	Operational water use during product use	Deconstruction	Transport	Waste processing	Disposal	Reuse, recovery or recycling potential	
Accounted for:	X	X	X	X	X	X*	X	X*	X	X*	X*	X*	X	X	X*	X		X

*module has been considered but has no associated inputs/outputs, therefore does not appear in the results.

2.4. Estimates and Assumptions

Estimates and assumptions are made for transport, installation, and deconstruction procedure. Details are provided in section 3.

2.5. Cut-off Criteria

The cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows per module shall be a maximum of 5% of energy usage and mass.

For this study, all input and output flows have been considered. Raw materials are included as per the product composition provided by the manufacturer and the packaging of the final product. Energy and water consumptions have also been considered at 100% according to the data provided.

2.6. Data Sources

As a general rule, specific data derived from specific production processes or average data derived from specific production processes have been used as the first choice as a basis for calculating an EPD.

To model the life cycle of the product in question, the software SimaPro 9, developed by PRé, has been used in conjunction with the LCA database ecoinvent v3.8.

2.7. Data Quality

The requirements for data quality and LCA data are in accordance with the specifications of the PCR.

Temporal Coverage – producer specific data is averaged over 1 year of production and from within the last 5 years (2022). Generic data is taken from the ecoinvent 3.8 database, the entirety of which was updated in 2021. Inputs and outputs from the system are accounted for over a period of 100 years from the year for which the data set is deemed relevant.

Technological Coverage – the technological coverage of the data reflects the physical reality of the declared product.

Geographical Coverage – whenever possible, country specific data reflecting the reality of the Dumaplast supply chain has been used. If country specific data is unavailable, European regional data is used in preference to global data sources.

2.8. Period under Review

Data have been reviewed for the production year 2022.

2.9. Allocation

Allocations when using secondary materials as raw materials:

The recycled content comes from external sources (offcuts from installation and removal of old coatings), the end-of-waste status is considered at the level of the sorted material stock and no impact is assigned to the production of these offcuts.

Allocations in the plant (differentiation from other products manufactured in the plant):

The overall values for the factory's material and energy consumptions during a period of one year have been divided by the annual production of each product to supply a value per square meter of wall covering produced. All factory data is measured in square meters, and it is assumed that the process consumptions are governed by area of wall covering processed rather than mass.

Allocation of multi-input processes if performed during modelling:

Production offcuts: the scraps are components reintegrated into other products on other process lines. Since these scraps are not sold externally, a physical allocation is made between the main product and the scraps.

Thus, the overproduction to produce these losses is not considered in this case. The impacts of the production of these scraps are assigned to the system that uses them (other Dumaplast products), so no impact is omitted.

Allocations of reuse, recycling and energy recovery:

Not relevant here.

2.10. Comparability (Optional)

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

3. Life Cycle Assessment Background Information & Scenarios

3.1. Material Composition & packaging (A1)

Product:

Component	Mass %
Organic binders	55-65%
Mineral filler	30-35%
Stabilizer	< 4%
Decor	< 3%
Additive	< 3%
Pigments	< 1%
Finish	< 1%
Recycled content*	29.6%
Packaging	< 6%

*The recycled content is pre-consumer waste.

Packaging:

The products are packed in cardboard boxes ; the boxes are placed on a wooden pallet, which is protected by cardboard corners and stretch film.

As described in ULE Part A Requirements, the packaging waste scenario for European market is:

- 76.4% recycling, 16.4% landfilling and 7.2% incineration for cardboard
- 24.8% recycling, 54.8% landfilling and 20.4% incineration for wood
- 37% recycling, 35% landfilling and 28% incineration for plastic

3.2. Manufacturing (A3)

The product is made in the Dumaplast manufacturing plant in Belgium. The extrusion manufacturing process is divided into the following stages :

- Mixing of raw materials to obtain mixture
- Extrusion of the layers : the different layers are assembled by extrusion, lamination of the decoration film, embossing of the plates
- Surface treatment : application of varnish
- Shaping : the plates are cut to the desired dimensions, machining and packaging

3.3. Delivery (transport from the factory to the building site) (A4)

The product is made in Belgium and sent to the European market. Distances taken in account are described below.

Truck	VALUE	UNIT
Fuel type	Diesel, low sulfur	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 6	
Transport distance	1000	km
Capacity utilization (including empty runs, mass based	36	%

Gross density of products transported	1334	kg/m3
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m3
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	<1	-

3.4. Installation (A5)

The product is installed by hand using MS Polymer, by assembling the product directly to the wall. During the installation, approximately 5% of the product is lost as off-cuts ; this waste is mainly sent to landfill.

Installation into the building (A5) - Scenario	VALUE	UNIT
Ancillary materials	-	kg
MS Polymer	0.25	
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	3.34E-01	kg
Waste materials at the construction site before waste processing, generated by product installation	3.36E-01	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Biogenic carbon contained in packaging	1.22E-01	kg CO2
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	-	kg/m ²

3.5. Use - Reference Service Life and Building Estimated Service Life (B2)

Service Life	VALUE	UNIT
Product Reference Service Life (RSL)	25	years
Building estimated Service Life (ESL)	75	years

It should be noted that the service life may vary depending the amount and nature of traffic and the type and frequency of maintenance. The manufacturer has provided this service life based on his experience of wall covering manufacture and supply.

This RSL is applicable as long as the product use complies with EN 13245-2, in accordance with the product’s classification.

Declared product properties (at the gate) and finishes, etc.	Declared product properties are described in Declaration of Performance (DOP), in accordance with EN 13245-2
Design application parameters (if instructed by the manufacturer), including references to the	Products in accordance with EN 13245-2 and technical prescription of the manufacturer

appropriate practices and application codes)	
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Assumed to be installed according to the manufacturer's instructions
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	Not relevant
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Use conditions in accordance with manufacturer prescriptions: see technical datasheet
Use conditions, e.g. frequency of use, mechanical exposure.	Use conditions in accordance with manufacturer prescriptions : see technical datasheet
Maintenance, e.g. required frequency, type and quality of replacement components	Maintenance scenario is defined above

3.6. Use – Cleaning (B2)

Maintenance (B2) - Scenario	VALUE	UNIT
Maintenance process information (cite source in report)	Wet cleaning with a sponge, water and detergent every 3 months	-
Maintenance cycle	100	Number/ RSL
Maintenance cycle	300	Number/ ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	0.4	L/year
Ancillary materials specified by type (e.g. cleaning agent)	0.000536	kg/year
Other resources	0	kg
Energy input, specified by activity, type and amount	-	kWh/year
Other energy carriers specified by type	0	kWh
Power output of equipment	-	kW
Waste materials from maintenance (specify materials)	-	kg
Direct emissions to ambient air, soil and water	-	kg

3.7. Repair, replacement, refurbishment, reuse (B3-B5)

Repair (B3): no data

Replacement (B4): product's life expectancy being 25 years and building's life expectancy being 75 years, 2 product replacements will be necessary. The impact of these replacements can be found in indicator B4 "Replacement". B2 "Maintenance" is also proportional to the number of years considered.

Replacement (B4) – Scenario	VALUE	UNIT
Reference Service Life	25	Years
Number of replacements over building estimated service life (75 years)	2	(ESL-RSL)-1

3.8. Operational energy use (B6) and Operational water use (B7)

No data.

3.9. Deconstruction (C1)

Product deconstruction is carried out manually.

3.10. Transport (C2) and end-of-life (C3-C4)

3 end-of-life scenarios are therefore proposed in this EPD to address the different cases: recycling, landfill, or incineration.

According to the PCR UL Part A, 50% of the product should be recycled for Europe. There is no specific data for this distance for European market, so the North America’s one, in PCR UL Part B, is assumed by default.

COLLECTION PROCESS		VALUE	UNIT
Collection process (specified by type)	Collected with mixed construction waste - Product	6.67	kg
	Collected with mixed construction waste - Glue	6.92	kg
RECYCLING SCENARIO		VALUE	UNIT
Distance to recycling center		161	km
Truck		16-32 metric ton Euro6	-
LANDFILL SCENARIO		VALUE	UNIT
Distance to landfill		161	km
Truck		16-32 metric ton Euro6	-
INCINERATION SCENARIO		VALUE	UNIT
Distance to incineration center		161	km
Truck		16-32 metric ton Euro6	-
BIOGENIC CARBON		VALUE	UNIT
Removals of biogenic carbon (excluding packaging)		-	kg CO ₂

3.11. Benefits and loads beyond system boundary (D)

Reuse, recovery and/or recycling potentials (D) - scenarios	VALUE	UNIT
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	-	MJ
Net energy benefit from thermal and electrical energy due to treatment of waste declared as exported energy in C4 (R<0.6)	1.27E+1	MJ
Net energy benefit from material flow declared in C3 for energy recovery	-	MJ
Process and conversion efficiencies		
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);		

4. Life Cycle Assessment Results for Europe

The following results are given for a service life of 1 year and 75 years.
75 years results include 2 replacements based on a product reference service life of 25 years.

LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All results should be used with caution because the uncertainties in the results are high.

In the paragraphs below, the LCA results will be presented for three scenarios: recycling (1), landfill (2) and incineration (3). **Results only vary in C phase.**

4.1. Summary of key GWP results

For convenience, here is a summary of the key GWP results:

GLOBAL WARMING POTENTIAL (GWP) kg CO2 eq./m ²	Total GWP, with recycling scenario	Total GWP, with landfill scenario	Total GWP, with incineration scenario
Use 1 year	1.25E+1	1.29E+1	2.34E+1
Use 75 years	3.76E+1	3.89E+1	7.03E+1

4.2. Life Cycle Assessment – Environmental impacts

4.2.1. Environmental impacts for 1 year

4.2.1.1. Potential environmental impact in case of RECYCLING at end of use

POTENTIAL ENVIRONMENTAL IMPACT - RECYCLING - 1 YEAR - per m ²												
Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Maintenance (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO2 eq	1.18E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.47E-3	1.80E-1	9.36E-2	0.00E+0	-6.04E+0
Climate change - GWP fossil	kg CO2 eq	1.14E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	1.27E-3	1.80E-1	5.55E-2	0.00E+0	-6.19E+0
Climate change - GWP biogenic	kg CO2 eq	3.20E-2	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.34E-5	5.69E-5	3.80E-2	0.00E+0	1.57E-1
Climate change -GWP land use and change	kg CO2 eq	3.38E-1	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.82E-4	7.34E-5	1.29E-4	0.00E+0	-2.55E-3
Ozone depletion	kg CFC11 eq	4.15E-6	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.55E-10	4.20E-8	2.82E-9	0.00E+0	-2.18E-6
Acidification	mol H+ eq	5.53E-2	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.38E-5	5.15E-4	3.00E-4	0.00E+0	-3.47E-2
Eutrophication, freshwater (P)	kg P eq	4.11E-4	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	4.74E-7	1.29E-6	5.82E-6	0.00E+0	-8.46E-5
Eutrophication, freshwater (PO4)	kg PO4 eq	1.26E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.45E-6	3.97E-6	1.79E-5	0.00E+0	-2.60E-4
Eutrophication, marine	kg N eq	1.14E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.47E-5	1.02E-4	4.07E-5	0.00E+0	-4.64E-3
Eutrophication, terrestrial	mol N eq	9.78E-2	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	3.82E-5	1.14E-3	4.65E-4	0.00E+0	-5.21E-2
Photochemical ozone formation	kg NMVOC eq	3.38E-2	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	6.45E-6	4.38E-4	1.31E-4	0.00E+0	-3.08E-2
Resource use, minerals and metals	kg Sb eq	2.02E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	2.30E-8	6.59E-7	1.57E-7	0.00E+0	-1.29E-4
Resource use, fossils	MJ	2.94E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.59E-2	2.75E+0	1.17E+0	0.00E+0	-2.19E+2
Water use	m3 depriv.	1.29E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	4.78E-3	8.23E-3	1.34E-2	0.00E+0	-5.57E+0
Particulate matter	disease inc.	5.29E-7	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.45E-10	1.46E-8	9.78E-10	0.00E+0	-2.73E-7
Ionising radiation	kBq U-235 eq	7.65E-1	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	5.64E-5	1.19E-2	1.04E-2	0.00E+0	3.78E-2
Ecotoxicity, freshwater	CTUe	8.58E+1	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	5.39E-2	8.04E-1	6.52E-2	0.00E+0	-6.73E+1
Human toxicity, cancer	CTUh	3.36E-9	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	3.52E-12	3.23E-11	1.14E-11	0.00E+0	3.34E-10
Human toxicity, non-cancer	CTUh	8.74E-9	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	1.20E-12	8.18E-11	1.02E-11	0.00E+0	-5.68E-9
Land use	Pt	1.04E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	7.06E-2	1.92E+0	1.81E-1	0.00E+0	9.42E+0

4.2.1.2. Potential environmental impact in case of LANDFILL at end of use

POTENTIAL ENVIRONMENTAL IMPACT - LANDFILL - 1 YEAR - per m²												
Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Maintenance (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO2 eq	1.22E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.47E-3	1.80E-1	0.00E+0	5.27E-1	0.00E+0
Climate change - GWP fossil	kg CO2 eq	1.19E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	1.27E-3	1.80E-1	0.00E+0	4.89E-1	0.00E+0
Climate change - GWP biogenic	kg CO2 eq	3.18E-2	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.34E-5	5.69E-5	0.00E+0	3.77E-2	0.00E+0
Climate change -GWP land use and change	kg CO2 eq	3.38E-1	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.82E-4	7.34E-5	0.00E+0	1.51E-5	0.00E+0
Ozone depletion	kg CFC11 eq	4.17E-6	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.55E-10	4.20E-8	0.00E+0	2.14E-8	0.00E+0
Acidification	mol H+ eq	5.55E-2	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.38E-5	5.15E-4	0.00E+0	5.14E-4	0.00E+0
Eutrophication, freshwater (P)	kg P eq	4.06E-4	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	4.74E-7	1.29E-6	0.00E+0	4.98E-7	0.00E+0
Eutrophication, freshwater (PO4)	kg PO4 eq	1.24E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.45E-6	3.97E-6	0.00E+0	1.53E-6	0.00E+0
Eutrophication, marine	kg N eq	1.17E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.47E-5	1.02E-4	0.00E+0	3.55E-4	0.00E+0
Eutrophication, terrestrial	mol N eq	9.94E-2	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	3.82E-5	1.14E-3	0.00E+0	2.07E-3	0.00E+0
Photochemical ozone formation	kg NMVOC eq	3.44E-2	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	6.45E-6	4.38E-4	0.00E+0	7.13E-4	0.00E+0
Resource use, minerals and metals	kg Sb eq	2.02E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	2.30E-8	6.59E-7	0.00E+0	2.03E-7	0.00E+0
Resource use, fossils	MJ	2.94E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.59E-2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Water use	m3 depriv.	1.29E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	4.78E-3	8.23E-3	0.00E+0	7.31E-3	0.00E+0
Particulate matter	disease inc.	5.39E-7	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.45E-10	1.46E-8	0.00E+0	1.12E-8	0.00E+0
Ionising radiation	kBq U-235 eq	7.62E-1	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	5.64E-5	1.19E-2	0.00E+0	7.12E-3	0.00E+0
Ecotoxicity, freshwater	CTUe	1.11E+2	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	5.39E-2	8.04E-1	0.00E+0	2.48E+1	0.00E+0
Human toxicity, cancer	CTUh	3.36E-9	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	3.52E-12	3.23E-11	0.00E+0	1.51E-11	0.00E+0
Human toxicity, non-cancer	CTUh	9.32E-9	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	1.20E-12	8.18E-11	0.00E+0	5.86E-10	0.00E+0
Land use	Pt	1.08E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	7.06E-2	1.92E+0	0.00E+0	4.03E+0	0.00E+0

4.2.1.3. Potential environmental impact in case of INCINERATION at end of use

POTENTIAL ENVIRONMENTAL IMPACT – INCINERATION - 1 YEAR - per m²

Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Maintenance (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO ₂ eq	2.27E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.47E-3	1.80E-1	0.00E+0	1.10E+1	-8.85E+0
Climate change - GWP fossil	kg CO ₂ eq	2.23E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	1.27E-3	1.80E-1	0.00E+0	1.09E+1	-8.81E+0
Climate change - GWP biogenic	kg CO ₂ eq	3.48E-2	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.34E-5	5.69E-5	0.00E+0	4.08E-2	-3.19E-2
Climate change -GWP land use and change	kg CO ₂ eq	3.40E-1	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.82E-4	7.34E-5	0.00E+0	2.06E-3	-1.48E-2
Ozone depletion	kg CFC11 eq	4.80E-6	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.55E-10	4.20E-8	0.00E+0	6.51E-7	-8.06E-7
Acidification	mol H+ eq	6.38E-2	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.38E-5	5.15E-4	0.00E+0	8.84E-3	-4.66E-2
Eutrophication, freshwater (P)	kg P eq	4.62E-4	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	4.74E-7	1.29E-6	0.00E+0	5.67E-5	-6.68E-4
Eutrophication, freshwater (PO4)	kg PO ₄ eq	1.42E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.45E-6	3.97E-6	0.00E+0	1.74E-4	-2.05E-3
Eutrophication, marine	kg N eq	1.38E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.47E-5	1.02E-4	0.00E+0	2.41E-3	-5.61E-3
Eutrophication, terrestrial	mol N eq	1.24E-1	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	3.82E-5	1.14E-3	0.00E+0	2.66E-2	-6.38E-2
Photochemical ozone formation	kg NMVOC eq	4.07E-2	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	6.45E-6	4.38E-4	0.00E+0	7.05E-3	-1.84E-2
Resource use, minerals and metals	kg Sb eq	2.28E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	2.30E-8	6.59E-7	0.00E+0	2.58E-5	-1.55E-5
Resource use, fossils	MJ	3.07E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.59E-2	2.75E+0	0.00E+0	1.50E+1	-1.72E+2
Water use	m ³ depriv.	1.40E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	4.78E-3	8.23E-3	0.00E+0	1.07E+0	-1.46E+0
Particulate matter	disease inc.	5.99E-7	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.45E-10	1.46E-8	0.00E+0	7.09E-8	-1.89E-7
Ionising radiation	kBq U-235 eq	8.18E-1	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	5.64E-5	1.19E-2	0.00E+0	6.38E-2	-1.29E+0
Ecotoxicity, freshwater	CTUe	3.33E+2	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	5.39E-2	8.04E-1	0.00E+0	2.48E+2	-1.17E+1
Human toxicity, cancer	CTUh	5.46E-9	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	3.52E-12	3.23E-11	0.00E+0	2.11E-9	-8.45E-10
Human toxicity, non-cancer	CTUh	9.42E-9	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	1.20E-12	8.18E-11	0.00E+0	6.89E-10	-1.30E-9
Land use	Pt	1.09E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	7.06E-2	1.92E+0	0.00E+0	5.01E+0	-2.20E+1

4.2.2. Environmental impacts for 75 years

4.2.2.1. Potential environmental impact in case of RECYCLING at end of use

POTENTIAL ENVIRONMENTAL IMPACT - RECYCLING - 75 YEARS - per m ²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO ₂ eq	3.55E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.10E-1	2.36E+1	1.80E-1	9.36E-2	0.00E+0	-6.04E+0
Climate change - GWP fossil	kg CO ₂ eq	3.44E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	9.56E-2	2.29E+1	1.80E-1	5.55E-2	0.00E+0	-6.19E+0
Climate change - GWP biogenic	kg CO ₂ eq	9.69E-2	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.00E-3	6.39E-2	5.69E-5	3.80E-2	0.00E+0	1.57E-1
Climate change -GWP land use and change	kg CO ₂ eq	1.03E+0	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.36E-2	6.76E-1	7.34E-5	1.29E-4	0.00E+0	-2.55E-3
Ozone depletion	kg CFC11 eq	1.25E-5	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.16E-8	8.30E-6	4.20E-8	2.82E-9	0.00E+0	-2.18E-6
Acidification	mol H+ eq	1.67E-1	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.03E-3	1.11E-1	5.15E-4	3.00E-4	0.00E+0	-3.47E-2
Eutrophication, freshwater (P)	kg P eq	1.27E-3	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	3.55E-5	8.21E-4	1.29E-6	5.82E-6	0.00E+0	-8.46E-5
Eutrophication, freshwater (PO4)	kg PO4 eq	3.89E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.09E-4	2.52E-3	3.97E-6	1.79E-5	0.00E+0	-2.60E-4
Eutrophication, marine	kg N eq	3.52E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.10E-3	2.27E-2	1.02E-4	4.07E-5	0.00E+0	-4.64E-3
Eutrophication, terrestrial	mol N eq	2.96E-1	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	2.87E-3	1.96E-1	1.14E-3	4.65E-4	0.00E+0	-5.21E-2
Photochemical ozone formation	kg NMVOC eq	1.02E-1	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	4.83E-4	6.76E-2	4.38E-4	1.31E-4	0.00E+0	-3.08E-2
Resource use, minerals and metals	kg Sb eq	6.08E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	1.72E-6	4.04E-4	6.59E-7	1.57E-7	0.00E+0	-1.29E-4
Resource use, fossils	MJ	8.83E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.94E+0	5.87E+2	2.75E+0	1.17E+0	0.00E+0	-2.19E+2
Water use	m ³ depriv.	3.91E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	3.59E-1	2.58E+1	8.23E-3	1.34E-2	0.00E+0	-5.57E+0
Particulate matter	disease inc.	1.60E-6	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.08E-8	1.06E-6	1.46E-8	9.78E-10	0.00E+0	-2.73E-7
Ionising radiation	kBq U-235 eq	2.30E+0	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	4.23E-3	1.53E+0	1.19E-2	1.04E-2	0.00E+0	3.78E-2
Ecotoxicity, freshwater	CTUe	2.61E+2	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	4.04E+0	1.71E+2	8.04E-1	6.52E-2	0.00E+0	-6.73E+1
Human toxicity, cancer	CTUh	1.03E-8	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	2.64E-10	6.71E-9	3.23E-11	1.14E-11	0.00E+0	3.34E-10
Human toxicity, non-cancer	CTUh	2.63E-8	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	9.01E-11	1.75E-8	8.18E-11	1.02E-11	0.00E+0	-5.68E-9
Land use	Pt	3.16E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	5.29E+0	2.07E+2	1.92E+0	1.81E-1	0.00E+0	9.42E+0

4.2.2.2. Potential environmental impact in case of LANDFILL at end of use

POTENTIAL ENVIRONMENTAL IMPACT - LANDFILL - 75 YEARS - per m ²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO2 eq	3.68E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.10E-1	2.45E+1	1.80E-1	0.00E+0	5.27E-1	0.00E+0
Climate change - GWP fossil	kg CO2 eq	3.57E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	9.56E-2	2.38E+1	1.80E-1	0.00E+0	4.89E-1	0.00E+0
Climate change - GWP biogenic	kg CO2 eq	9.63E-2	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.00E-3	6.35E-2	5.69E-5	0.00E+0	3.77E-2	0.00E+0
Climate change -GWP land use and change	kg CO2 eq	1.03E+0	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.36E-2	6.76E-1	7.34E-5	0.00E+0	1.51E-5	0.00E+0
Ozone depletion	kg CFC11 eq	1.25E-5	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.16E-8	8.34E-6	4.20E-8	0.00E+0	2.14E-8	0.00E+0
Acidification	mol H+ eq	1.67E-1	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.03E-3	1.11E-1	5.15E-4	0.00E+0	5.14E-4	0.00E+0
Eutrophication, freshwater (P)	kg P eq	1.25E-3	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	3.55E-5	8.10E-4	1.29E-6	0.00E+0	4.98E-7	0.00E+0
Eutrophication, freshwater (PO4)	kg PO4 eq	3.84E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.09E-4	2.49E-3	3.97E-6	0.00E+0	1.53E-6	0.00E+0
Eutrophication, marine	kg N eq	3.62E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.10E-3	2.34E-2	1.02E-4	0.00E+0	3.55E-4	0.00E+0
Eutrophication, terrestrial	mol N eq	3.01E-1	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	2.87E-3	1.99E-1	1.14E-3	0.00E+0	2.07E-3	0.00E+0
Photochemical ozone formation	kg NMVOC eq	1.04E-1	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	4.83E-4	6.87E-2	4.38E-4	0.00E+0	7.13E-4	0.00E+0
Resource use, minerals and metals	kg Sb eq	6.08E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	1.72E-6	4.04E-4	6.59E-7	0.00E+0	2.03E-7	0.00E+0
Resource use, fossils	MJ	8.84E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.94E+0	5.88E+2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Water use	m3 depriv.	3.90E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	3.59E-1	2.58E+1	8.23E-3	0.00E+0	7.31E-3	0.00E+0
Particulate matter	disease inc.	1.63E-6	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.08E-8	1.08E-6	1.46E-8	0.00E+0	1.12E-8	0.00E+0
Ionising radiation	kBq U-235 eq	2.29E+0	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	4.23E-3	1.52E+0	1.19E-2	0.00E+0	7.12E-3	0.00E+0
Ecotoxicity, freshwater	CTUe	3.36E+2	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	4.04E+0	2.21E+2	8.04E-1	0.00E+0	2.48E+1	0.00E+0
Human toxicity, cancer	CTUh	1.03E-8	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	2.64E-10	6.72E-9	3.23E-11	0.00E+0	1.51E-11	0.00E+0
Human toxicity, non-cancer	CTUh	2.80E-8	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	9.01E-11	1.86E-8	8.18E-11	0.00E+0	5.86E-10	0.00E+0
Land use	Pt	3.28E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	5.29E+0	2.15E+2	1.92E+0	0.00E+0	4.03E+0	0.00E+0

4.2.2.3. Potential environmental impact in case of INCINERATION at end of use

POTENTIAL ENVIRONMENTAL IMPACT – INCINERATION - 75 YEARS - per m ²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Climate change - GWP total	kg CO2 eq	6.82E+1	7.93E+0	2.98E-1	5.11E-1	1.14E+0	1.66E+0	1.10E-1	4.54E+1	1.80E-1	0.00E+0	1.10E+1	-8.85E+0
Climate change - GWP fossil	kg CO2 eq	6.71E+1	7.65E+0	2.97E-1	9.39E-1	1.14E+0	1.18E+0	9.56E-2	4.47E+1	1.80E-1	0.00E+0	1.09E+1	-8.81E+0
Climate change - GWP biogenic	kg CO2 eq	1.05E-1	-3.40E-2	9.27E-5	-4.29E-1	3.59E-4	4.57E-1	1.00E-3	6.96E-2	5.69E-5	0.00E+0	4.08E-2	-3.19E-2
Climate change -GWP land use and change	kg CO2 eq	1.03E+0	3.19E-1	1.25E-4	1.31E-3	4.64E-4	1.66E-2	1.36E-2	6.80E-1	7.34E-5	0.00E+0	2.06E-3	-1.48E-2
Ozone depletion	kg CFC11 eq	1.44E-5	3.39E-6	6.91E-8	1.17E-7	2.65E-7	2.64E-7	1.16E-8	9.60E-6	4.20E-8	0.00E+0	6.51E-7	-8.06E-7
Acidification	mol H+ eq	1.92E-1	3.65E-2	1.19E-3	2.63E-3	3.25E-3	1.09E-2	1.03E-3	1.28E-1	5.15E-4	0.00E+0	8.84E-3	-4.66E-2
Eutrophication, freshwater (P)	kg P eq	1.42E-3	3.29E-4	2.10E-6	1.93E-5	8.17E-6	4.44E-5	3.55E-5	9.23E-4	1.29E-6	0.00E+0	5.67E-5	-6.68E-4
Eutrophication, freshwater (PO4)	kg PO4 eq	4.36E-3	1.01E-3	6.44E-6	5.91E-5	2.51E-5	1.36E-4	1.09E-4	2.83E-3	3.97E-6	0.00E+0	1.74E-4	-2.05E-3
Eutrophication, marine	kg N eq	4.23E-2	8.40E-3	2.54E-4	7.75E-4	6.46E-4	1.15E-3	1.10E-3	2.75E-2	1.02E-4	0.00E+0	2.41E-3	-5.61E-3
Eutrophication, terrestrial	mol N eq	3.75E-1	6.83E-2	2.83E-3	7.35E-3	7.20E-3	1.05E-2	2.87E-3	2.48E-1	1.14E-3	0.00E+0	2.66E-2	-6.38E-2
Photochemical ozone formation	kg NMVOC eq	1.23E-1	2.34E-2	9.60E-4	2.18E-3	2.77E-3	3.86E-3	4.83E-4	8.14E-2	4.38E-4	0.00E+0	7.05E-3	-1.84E-2
Resource use, minerals and metals	kg Sb eq	6.85E-4	1.74E-4	1.06E-6	3.25E-6	4.16E-6	1.85E-5	1.72E-6	4.55E-4	6.59E-7	0.00E+0	2.58E-5	-1.55E-5
Resource use, fossils	MJ	9.24E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.94E+0	6.15E+2	2.75E+0	0.00E+0	1.50E+1	-1.72E+2
Water use	m3 depriv.	4.22E+1	1.12E+1	1.33E-2	4.07E-1	5.20E-2	1.23E+0	3.59E-1	2.79E+1	8.23E-3	0.00E+0	1.07E+0	-1.46E+0
Particulate matter	disease inc.	1.81E-6	3.13E-7	2.35E-8	1.94E-8	9.22E-8	6.56E-8	1.08E-8	1.20E-6	1.46E-8	0.00E+0	7.09E-8	-1.89E-7
Ionising radiation	kBq U-235 eq	2.46E+0	3.87E-1	1.96E-2	1.90E-1	7.54E-2	7.00E-2	4.23E-3	1.64E+0	1.19E-2	0.00E+0	6.38E-2	-1.29E+0
Ecotoxicity, freshwater	CTUe	1.00E+3	6.82E+1	1.31E+0	2.00E+0	5.08E+0	8.29E+0	4.04E+0	6.66E+2	8.04E-1	0.00E+0	2.48E+2	-1.17E+1
Human toxicity, cancer	CTUh	1.66E-8	2.39E-9	5.31E-11	4.08E-10	2.04E-10	2.62E-10	2.64E-10	1.09E-8	3.23E-11	0.00E+0	2.11E-9	-8.45E-10
Human toxicity, non-cancer	CTUh	2.84E-8	6.61E-9	1.31E-10	3.47E-10	5.17E-10	1.05E-9	9.01E-11	1.88E-8	8.18E-11	0.00E+0	6.89E-10	-1.30E-9
Land use	Pt	3.31E+2	4.65E+1	3.07E+0	3.07E+1	1.21E+1	9.23E+0	5.29E+0	2.17E+2	1.92E+0	0.00E+0	5.01E+0	-2.20E+1

4.3. Life Cycle Assessment – Resources, wastes categories and outgoing flows

4.3.1. Resources, wastes categories and outgoing flows for 1 year

4.3.1.1. Resources, waste categories and outgoing flows in case of RECYCLING at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS - RECYCLING - 1 YEAR - per m ²												
Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO ₂ eq	1.87E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	1.30E-2	3.93E-2	2.05E-1	0.00E+0	-1.07E+0
Renewable primary energy used as RM	kg CO ₂ eq	5.84E+0	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	7.01E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO ₂ eq	2.46E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	2.00E-2	3.93E-2	2.05E-1	0.00E+0	-1.07E+0
Non renewable primary energy excl. RM	kg CO ₂ eq	1.82E+2	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.87E-2	2.75E+0	1.17E+0	0.00E+0	-1.47E+2
Non renewable primary energy used as RM	kg CFC11 eq	1.12E+2	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	7.93E-3	0.00E+0	0.00E+0	0.00E+0	-7.20E+1
Total non renewable primary energy	mol H+ eq	2.94E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.66E-2	2.75E+0	1.17E+0	0.00E+0	-2.19E+2
Use of secondary material	kg P eq	9.37E-2	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO ₄ eq	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	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0
Recovered energy	mol N eq	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	0.00E+0
Net use of fresh water	kg NMVOC eq	1.93E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.87E-4	3.11E-4	1.00E-3	0.00E+0	-1.08E-1
Hazardous waste disposed	kg Sb eq	4.85E-1	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.36E-4	2.02E-3	1.85E-3	0.00E+0	-1.39E-1
Non hazardous waste disposed	MJ	7.66E+0	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	1.01E-3	1.60E-1	1.93E-2	0.00E+0	-1.88E+0
Radioactive waste disposed (High)	m3 depriv.	1.04E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	7.25E-9	2.05E-7	1.78E-6	0.00E+0	-5.49E-6
Radioactive waste disposed (Inter-Low)	disease inc.	6.60E-4	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	4.97E-8	1.84E-5	6.73E-6	0.00E+0	2.74E-5
Components for re-use	kBq U-235 eq	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	0.00E+0
Materials for recycling	CTUe	7.11E+0	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	0.00E+0	6.92E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0
Exported energy	CTUh	6.06E-1	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

4.3.1.2. Resources, waste categories and outgoing flows in case of LANDFILL at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS - LANDFILL - 1 YEAR - per m ²												
Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO ₂ eq	1.86E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	1.30E-2	3.93E-2	0.00E+0	6.78E-2	0.00E+0
Renewable primary energy used as RM	kg CO ₂ eq	5.84E+0	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	7.01E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO ₂ eq	2.44E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	2.00E-2	3.93E-2	0.00E+0	6.78E-2	0.00E+0
Non renewable primary energy excl. RM	kg CO ₂ eq	1.83E+2	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.87E-2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Non renewable primary energy used as RM	kg CFC11 eq	1.12E+2	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	7.93E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total non renewable primary energy	mol H+ eq	2.94E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.66E-2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Use of secondary material	kg P eq	9.37E-2	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO ₄ eq	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	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0
Recovered energy	mol N eq	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	0.00E+0
Net use of fresh water	kg NMVOC eq	1.94E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.87E-4	3.11E-4	0.00E+0	1.96E-3	0.00E+0
Hazardous waste disposed	kg Sb eq	4.85E-1	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.36E-4	2.02E-3	0.00E+0	1.78E-3	0.00E+0
Non hazardous waste disposed	MJ	1.46E+1	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	1.01E-3	1.60E-1	0.00E+0	6.93E+0	0.00E+0
Radioactive waste disposed (High)	m ³ depriv.	1.02E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	7.25E-9	2.05E-7	0.00E+0	1.79E-7	0.00E+0
Radioactive waste disposed (Inter-Low)	disease inc.	6.63E-4	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	4.97E-8	1.84E-5	0.00E+0	9.82E-6	0.00E+0
Components for re-use	kBq U-235 eq	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	0.00E+0
Materials for recycling	CTUe	1.86E-1	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0
Exported energy	CTUh	6.06E-1	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

4.3.1.3. Resources, waste categories and outgoing flows in case of INCINERATION at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS – INCINERATION - 1 YEAR - per m ²												
Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO ₂ eq	2.02E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	1.30E-2	3.93E-2	0.00E+0	1.66E+0	-2.37E+1
Renewable primary energy used as RM	kg CO ₂ eq	5.84E+0	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	7.01E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO ₂ eq	2.60E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	2.00E-2	3.93E-2	0.00E+0	1.66E+0	-2.37E+1
Non renewable primary energy excl. RM	kg CO ₂ eq	3.39E+2	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.87E-2	2.75E+0	0.00E+0	1.58E+2	-1.72E+2
Non renewable primary energy used as RM	kg CFC11 eq	-3.12E+1	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	7.93E-3	0.00E+0	0.00E+0	-1.43E+2	0.00E+0
Total non renewable primary energy	mol H+ eq	3.08E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	2.66E-2	2.75E+0	0.00E+0	1.50E+1	-1.72E+2
Use of secondary material	kg P eq	9.37E-2	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO ₄ eq	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	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0
Recovered energy	mol N eq	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	0.00E+0
Net use of fresh water	kg NMVOC eq	2.23E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.87E-4	3.11E-4	0.00E+0	3.17E-2	-1.14E-1
Hazardous waste disposed	kg Sb eq	2.96E+0	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.36E-4	2.02E-3	0.00E+0	2.48E+0	-1.38E-1
Non hazardous waste disposed	MJ	8.54E+0	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	1.01E-3	1.60E-1	0.00E+0	8.98E-1	-1.79E+0
Radioactive waste disposed (High)	m ³ depriv.	1.11E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	7.25E-9	2.05E-7	0.00E+0	9.01E-6	-2.07E-4
Radioactive waste disposed (Inter-Low)	disease inc.	7.03E-4	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	4.97E-8	1.84E-5	0.00E+0	5.02E-5	-9.23E-4
Components for re-use	kBq U-235 eq	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	0.00E+0
Materials for recycling	CTUe	1.86E-1	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0
Exported energy	CTUh	4.95E+1	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	0.00E+0	0.00E+0	4.89E+1	0.00E+0

4.3.2. Resources, waste categories and outgoing flows for 75 years

4.3.2.1. Resources, waste categories and outgoing flows in case of RECYCLING at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS - RECYCLING - 75 YEARS - per m ²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO2 eq	5.72E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	9.76E-1	3.75E+1	3.93E-2	2.05E-1	0.00E+0	-1.07E+0
Renewable primary energy used as RM	kg CO2 eq	1.80E+1	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	5.26E-1	1.17E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO2 eq	7.52E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	1.50E+0	4.91E+1	3.93E-2	2.05E-1	0.00E+0	-1.07E+0
Non renewable primary energy excl. RM	kg CO2 eq	5.49E+2	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.40E+0	3.65E+2	2.75E+0	1.17E+0	0.00E+0	-1.47E+2
Non renewable primary energy used as RM	kg CFC11 eq	3.35E+2	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	5.95E-1	2.23E+2	0.00E+0	0.00E+0	0.00E+0	-7.20E+1
Total non renewable primary energy	mol H+ eq	8.84E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.99E+0	5.88E+2	2.75E+0	1.17E+0	0.00E+0	-2.19E+2
Use of secondary material	kg P eq	2.81E-1	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	1.87E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO4 eq	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	0.00E+0	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0	0.00E+0
Recovered energy	mol N eq	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	0.00E+0	0.00E+0
Net use of fresh water	kg NMVOC eq	5.91E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.40E-2	3.85E-1	3.11E-4	1.00E-3	0.00E+0	-1.08E-1
Hazardous waste disposed	kg Sb eq	1.47E+0	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.02E-2	9.70E-1	2.02E-3	1.85E-3	0.00E+0	-1.39E-1
Non hazardous waste disposed	MJ	2.30E+1	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	7.54E-2	1.53E+1	1.60E-1	1.93E-2	0.00E+0	-1.88E+0
Radioactive waste disposed (High)	m3 depriv.	3.12E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	5.44E-7	2.08E-4	2.05E-7	1.78E-6	0.00E+0	-5.49E-6
Radioactive waste disposed (Inter-Low)	disease inc.	1.98E-3	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	3.73E-6	1.32E-3	1.84E-5	6.73E-6	0.00E+0	2.74E-5
Components for re-use	kBq U-235 eq	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	0.00E+0	0.00E+0
Materials for recycling	CTUe	2.13E+1	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	1.42E+1	0.00E+0	6.92E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0	0.00E+0
Exported energy	CTUh	1.82E+0	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	1.21E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

4.3.2.2. Resources, waste categories and outgoing flows in case of LANDFILL at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS - LANDFILL - 75 YEARS - per m²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO2 eq	5.68E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	9.76E-1	3.72E+1	3.93E-2	0.00E+0	6.78E-2	0.00E+0
Renewable primary energy used as RM	kg CO2 eq	1.80E+1	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	5.26E-1	1.17E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO2 eq	7.48E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	1.50E+0	4.89E+1	3.93E-2	0.00E+0	6.78E-2	0.00E+0
Non renewable primary energy excl. RM	kg CO2 eq	5.50E+2	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.40E+0	3.66E+2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Non renewable primary energy used as RM	kg CFC11 eq	3.35E+2	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	5.95E-1	2.23E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total non renewable primary energy	mol H+ eq	8.85E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.99E+0	5.89E+2	2.75E+0	0.00E+0	1.55E+0	0.00E+0
Use of secondary material	kg P eq	2.81E-1	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	1.87E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO4 eq	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	0.00E+0	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0	0.00E+0
Recovered energy	mol N eq	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	0.00E+0	0.00E+0
Net use of fresh water	kg NMVOC eq	5.94E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.40E-2	3.87E-1	3.11E-4	0.00E+0	1.96E-3	0.00E+0
Hazardous waste disposed	kg Sb eq	1.47E+0	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.02E-2	9.70E-1	2.02E-3	0.00E+0	1.78E-3	0.00E+0
Non hazardous waste disposed	MJ	4.38E+1	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	7.54E-2	2.91E+1	1.60E-1	0.00E+0	6.93E+0	0.00E+0
Radioactive waste disposed (High)	m3 depriv.	3.07E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	5.44E-7	2.04E-4	2.05E-7	0.00E+0	1.79E-7	0.00E+0
Radioactive waste disposed (Inter-Low)	disease inc.	1.99E-3	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	3.73E-6	1.33E-3	1.84E-5	0.00E+0	9.82E-6	0.00E+0
Components for re-use	kBq U-235 eq	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	0.00E+0	0.00E+0
Materials for recycling	CTUe	5.59E-1	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	3.73E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0	0.00E+0
Exported energy	CTUh	1.82E+0	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	1.21E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

4.3.2.3. Resources, waste categories and outgoing flows in case of INCINERATION at end of use

RESOURCES, WASTES CATEGORIES AND OUTGOING FLOWS - INCINERATION - 75 YEARS - per m²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Renewable primary energy excl. RM	kg CO ₂ eq	6.16E+1	1.31E+1	6.35E-2	2.71E+0	2.48E-1	2.34E+0	9.76E-1	4.04E+1	3.93E-2	0.00E+0	1.66E+0	-2.37E+1
Renewable primary energy used as RM	kg CO ₂ eq	1.80E+1	3.95E+0	0.00E+0	4.36E+0	0.00E+0	-2.48E+0	5.26E-1	1.17E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total renewable primary energy	kg CO ₂ eq	7.96E+1	1.71E+1	6.35E-2	7.07E+0	2.48E-1	-1.47E-1	1.50E+0	5.20E+1	3.93E-2	0.00E+0	1.66E+0	-2.37E+1
Non renewable primary energy excl. RM	kg CO ₂ eq	1.02E+3	1.22E+2	4.52E+0	2.44E+1	1.74E+1	1.06E+1	1.40E+0	6.78E+2	2.75E+0	0.00E+0	1.58E+2	-1.72E+2
Non renewable primary energy used as RM	kg CFC11 eq	-9.30E+1	9.63E+1	0.00E+0	2.70E+0	0.00E+0	1.26E+1	5.95E-1	-6.24E+1	0.00E+0	0.00E+0	-1.43E+2	0.00E+0
Total non renewable primary energy	mol H+ eq	9.26E+2	2.18E+2	4.52E+0	2.71E+1	1.74E+1	2.31E+1	1.99E+0	6.16E+2	2.75E+0	0.00E+0	1.50E+1	-1.72E+2
Use of secondary material	kg P eq	2.81E-1	0.00E+0	0.00E+0	8.92E-2	0.00E+0	4.46E-3	0.00E+0	1.87E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	kg PO ₄ eq	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	0.00E+0	0.00E+0
Use of non renewable secondary fuels	kg N eq	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	0.00E+0	0.00E+0
Recovered energy	mol N eq	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	0.00E+0	0.00E+0
Net use of fresh water	kg NMVOC eq	6.83E-1	1.55E-1	5.03E-4	8.79E-3	1.97E-3	2.50E-2	1.40E-2	4.46E-1	3.11E-4	0.00E+0	3.17E-2	-1.14E-1
Hazardous waste disposed	kg Sb eq	8.89E+0	3.27E-1	3.35E-3	2.99E-2	1.27E-2	1.09E-1	1.02E-2	5.92E+0	2.02E-3	0.00E+0	2.48E+0	-1.38E-1
Non hazardous waste disposed	MJ	2.57E+1	3.42E+0	2.55E-1	1.69E-1	1.01E+0	2.62E+0	7.54E-2	1.71E+1	1.60E-1	0.00E+0	8.98E-1	-1.79E+0
Radioactive waste disposed (High)	m ³ depriv.	3.34E-4	5.91E-5	3.29E-7	3.22E-5	1.29E-6	8.83E-6	5.44E-7	2.22E-4	2.05E-7	0.00E+0	9.01E-6	-2.07E-4
Radioactive waste disposed (Inter-Low)	disease inc.	2.11E-3	2.97E-4	3.02E-5	1.28E-4	1.16E-4	6.39E-5	3.73E-6	1.41E-3	1.84E-5	0.00E+0	5.02E-5	-9.23E-4
Components for re-use	kBq U-235 eq	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	0.00E+0	0.00E+0
Materials for recycling	CTUe	5.59E-1	0.00E+0	0.00E+0	3.07E-2	0.00E+0	1.56E-1	0.00E+0	3.73E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	CTUh	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	0.00E+0	0.00E+0
Exported energy	CTUh	1.49E+2	0.00E+0	0.00E+0	1.43E-1	0.00E+0	4.63E-1	0.00E+0	9.90E+1	0.00E+0	0.00E+0	4.89E+1	0.00E+0

4.4. Life Cycle Assessment – Carbon emissions and removals

4.4.1. Carbon emissions and removals for 1 year

4.4.1.1 Carbon emissions and removals in case of RECYCLING at end of use

CARBON EMISSIONS AND REMOVALS - RECYCLING - 1 YEAR - per m²

Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	1.06E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.57E-3	1.87E-1	1.09E-1	0.00E+0	-6.63E+0
Ozone depletion TRACI	kg CO2 eq	3.97E-6	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.55E-10	4.31E-8	4.75E-9	0.00E+0	-2.17E-6
Acidification TRACI	kg CO2 eq	4.04E-2	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	1.13E-5	4.72E-4	1.97E-4	0.00E+0	-2.84E-2
Eutrophication	kg CO2 eq	8.43E-3	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.84E-5	8.00E-5	4.77E-5	0.00E+0	-3.67E-3
Smog	kg CFC11 eq	4.86E-1	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	1.04E-4	7.01E-3	2.05E-3	0.00E+0	-2.64E-1
Fossil fuel depletion	mol H+ eq	3.03E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.95E-3	3.94E-1	7.43E-2	0.00E+0	-3.05E+1
Carcinogenics	kg P eq	3.18E-7	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	1.12E-10	2.69E-9	1.59E-9	0.00E+0	1.05E-7
Non carcinogenics	kg PO4 eq	1.60E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	2.01E-9	2.81E-8	4.72E-9	0.00E+0	-2.76E-7
Respiratory effects	kg N eq	5.87E-3	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.94E-6	1.03E-4	1.47E-4	0.00E+0	-7.17E-4
Ecotoxicity	mol N eq	2.21E+1	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.93E-2	4.84E-1	3.61E-2	0.00E+0	-3.50E-1

4.4.1.2 Carbon emissions and removals in case of LANDFILL at end of use

CARBON EMISSIONS AND REMOVALS - LANDFILL - 1 YEAR - per m²

Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	1.09E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.57E-3	1.87E-1	0.00E+0	4.87E-1	0.00E+0
Ozone depletion TRACI	kg CO2 eq	3.99E-6	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.55E-10	4.31E-8	0.00E+0	2.34E-8	0.00E+0
Acidification TRACI	kg CO2 eq	4.18E-2	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	1.13E-5	4.72E-4	0.00E+0	1.58E-3	0.00E+0
Eutrophication	kg CO2 eq	8.66E-3	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.84E-5	8.00E-5	0.00E+0	2.71E-4	0.00E+0
Smog	kg CFC11 eq	4.98E-1	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	1.04E-4	7.01E-3	0.00E+0	1.34E-2	0.00E+0
Fossil fuel depletion	mol H+ eq	3.04E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.95E-3	3.94E-1	0.00E+0	2.38E-1	0.00E+0
Carcinogenics	kg P eq	3.19E-7	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	1.12E-10	2.69E-9	0.00E+0	2.27E-9	0.00E+0
Non carcinogenics	kg PO4 eq	1.61E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	2.01E-9	2.81E-8	0.00E+0	7.50E-9	0.00E+0
Respiratory effects	kg N eq	5.81E-3	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.94E-6	1.03E-4	0.00E+0	8.64E-5	0.00E+0
Ecotoxicity	mol N eq	2.23E+1	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.93E-2	4.84E-1	0.00E+0	2.40E-1	0.00E+0

4.4.1.3 Carbon emissions and removals in case of INCINERATION at end of use

CARBON EMISSIONS AND REMOVALS – INCINERATION - 1 YEAR - per m²

Impacts	Units	Total	Production			Construction		Use	End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (1 year)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	1.06E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.57E-3	1.87E-1	1.09E-1	0.00E+0	-6.63E+0
Ozone depletion TRACI	kg CO2 eq	3.97E-6	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.55E-10	4.31E-8	4.75E-9	0.00E+0	-2.17E-6
Acidification TRACI	kg CO2 eq	4.04E-2	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	1.13E-5	4.72E-4	1.97E-4	0.00E+0	-2.84E-2
Eutrophication	kg CO2 eq	8.43E-3	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.84E-5	8.00E-5	4.77E-5	0.00E+0	-3.67E-3
Smog	kg CFC11 eq	4.86E-1	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	1.04E-4	7.01E-3	2.05E-3	0.00E+0	-2.64E-1
Fossil fuel depletion	mol H+ eq	3.03E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.95E-3	3.94E-1	7.43E-2	0.00E+0	-3.05E+1
Carcinogenics	kg P eq	3.18E-7	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	1.12E-10	2.69E-9	1.59E-9	0.00E+0	1.05E-7
Non carcinogenics	kg PO4 eq	1.60E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	2.01E-9	2.81E-8	4.72E-9	0.00E+0	-2.76E-7
Respiratory effects	kg N eq	5.87E-3	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.94E-6	1.03E-4	1.47E-4	0.00E+0	-7.17E-4
Ecotoxicity	mol N eq	2.21E+1	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.93E-2	4.84E-1	3.61E-2	0.00E+0	-3.50E-1

4.4.2. Carbon emissions and removals for 75 years

4.4.2.1 Carbon emissions and removals in case of RECYCLING at end of use

CARBON EMISSIONS AND REMOVALS - RECYCLING - 75 YEARS - per m²

Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	3.18E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.18E-1	2.11E+1	1.87E-1	1.09E-1	0.00E+0	-6.63E+0
Ozone depletion TRACI	kg CO2 eq	1.19E-5	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.16E-8	7.94E-6	4.31E-8	4.75E-9	0.00E+0	-2.17E-6
Acidification TRACI	kg CO2 eq	1.22E-1	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	8.44E-4	8.08E-2	4.72E-4	1.97E-4	0.00E+0	-2.84E-2
Eutrophication	kg CO2 eq	2.66E-2	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.38E-3	1.68E-2	8.00E-5	4.77E-5	0.00E+0	-3.67E-3
Smog	kg CFC11 eq	1.47E+0	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	7.80E-3	9.72E-1	7.01E-3	2.05E-3	0.00E+0	-2.64E-1
Fossil fuel depletion	mol H+ eq	9.10E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.22E-1	6.05E+1	3.94E-1	7.43E-2	0.00E+0	-3.05E+1
Carcinogenics	kg P eq	9.63E-7	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	8.42E-9	6.36E-7	2.69E-9	1.59E-9	0.00E+0	1.05E-7
Non carcinogenics	kg PO4 eq	4.96E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	1.51E-7	3.20E-6	2.81E-8	4.72E-9	0.00E+0	-2.76E-7
Respiratory effects	kg N eq	1.78E-2	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.46E-4	1.17E-2	1.03E-4	1.47E-4	0.00E+0	-7.17E-4
Ecotoxicity	mol N eq	6.78E+1	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.45E+0	4.42E+1	4.84E-1	3.61E-2	0.00E+0	-3.50E-1

4.4.2.2 Carbon emissions and removals in case of LANDFILL at end of use

CARBON EMISSIONS AND REMOVALS - LANDFILL - 75 YEARS - per m²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	3.29E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.18E-1	2.19E+1	1.87E-1	0.00E+0	4.87E-1	0.00E+0
Ozone depletion TRACI	kg CO2 eq	1.20E-5	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.16E-8	7.97E-6	4.31E-8	0.00E+0	2.34E-8	0.00E+0
Acidification TRACI	kg CO2 eq	1.26E-1	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	8.44E-4	8.36E-2	4.72E-4	0.00E+0	1.58E-3	0.00E+0
Eutrophication	kg CO2 eq	2.73E-2	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.38E-3	1.73E-2	8.00E-5	0.00E+0	2.71E-4	0.00E+0
Smog	kg CFC11 eq	1.50E+0	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	7.80E-3	9.95E-1	7.01E-3	0.00E+0	1.34E-2	0.00E+0
Fossil fuel depletion	mol H+ eq	9.15E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.22E-1	6.08E+1	3.94E-1	0.00E+0	2.38E-1	0.00E+0
Carcinogenics	kg P eq	9.65E-7	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	8.42E-9	6.38E-7	2.69E-9	0.00E+0	2.27E-9	0.00E+0
Non carcinogenics	kg PO4 eq	4.97E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	1.51E-7	3.21E-6	2.81E-8	0.00E+0	7.50E-9	0.00E+0
Respiratory effects	kg N eq	1.76E-2	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.46E-4	1.16E-2	1.03E-4	0.00E+0	8.64E-5	0.00E+0
Ecotoxicity	mol N eq	6.84E+1	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.45E+0	4.46E+1	4.84E-1	0.00E+0	2.40E-1	0.00E+0

4.4.2.3 Carbon emissions and removals in case of INCINERATION at end of use

CARBON EMISSIONS AND REMOVALS - INCINERATION - 75 YEARS - per m²													
Impacts	Units	Total	Production			Construction		Use		End-of-life			D Benefits & load beyond system boundaries
			A1 Raw materials	A2 Transport	A3 Manufact.	A4 Transport	A5 Installation	B2 Mainten. (75 years)	B4 Replace (75 years)	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming	kg CO2 eq	6.39E+1	7.77E+0	2.97E-1	4.82E-1	0.00E+0	1.72E+0	1.18E-1	4.25E+1	1.87E-1	0.00E+0	1.08E+1	-1.99E+1
Ozone depletion TRACI	kg CO2 eq	1.23E-5	3.46E-6	7.28E-8	1.22E-7	0.00E+0	2.65E-7	1.16E-8	8.20E-6	4.31E-8	0.00E+0	1.37E-7	-1.35E-6
Acidification TRACI	kg CO2 eq	1.34E-1	3.00E-2	1.00E-3	2.23E-3	0.00E+0	6.55E-3	8.44E-4	8.91E-2	4.72E-4	0.00E+0	4.34E-3	-5.51E-2
Eutrophication	kg CO2 eq	2.88E-2	6.78E-3	1.37E-4	4.51E-4	0.00E+0	9.19E-4	1.38E-3	1.83E-2	8.00E-5	0.00E+0	7.63E-4	-1.28E-2
Smog	kg CFC11 eq	1.73E+0	3.52E-1	1.61E-2	3.75E-2	0.00E+0	7.11E-2	7.80E-3	1.15E+0	7.01E-3	0.00E+0	8.89E-2	-5.47E-1
Fossil fuel depletion	mol H+ eq	9.33E+1	2.42E+1	6.48E-1	2.35E+0	0.00E+0	2.60E+0	2.22E-1	6.20E+1	3.94E-1	0.00E+0	8.38E-1	-2.21E+1
Carcinogenics	kg P eq	1.20E-6	2.04E-7	4.39E-9	1.22E-8	0.00E+0	9.33E-8	8.42E-9	7.97E-7	2.69E-9	0.00E+0	8.18E-8	-1.70E-7
Non carcinogenics	kg PO4 eq	6.21E-6	1.23E-6	4.38E-8	7.56E-8	0.00E+0	2.25E-7	1.51E-7	4.04E-6	2.81E-8	0.00E+0	4.21E-7	-1.17E-6
Respiratory effects	kg N eq	1.88E-2	4.20E-3	1.67E-4	2.19E-4	0.00E+0	1.03E-3	1.46E-4	1.24E-2	1.03E-4	0.00E+0	4.78E-4	-3.96E-2
Ecotoxicity	mol N eq	1.16E+2	1.66E+1	7.70E-1	5.44E-1	0.00E+0	3.72E+0	1.45E+0	7.61E+1	4.84E-1	0.00E+0	1.60E+1	-7.12E+0

5. Additional Environmental Information

5.1. Environment and Health During Installation

The manufacturer's guidelines should be adhered to during the installation of this product.

5.2. Environment and Health During the use stage

The product emission rate of volatile organic compounds is < 100µg/m³ (TVOC <28 days – ISO 16000-6).
VOC emissions classification : A+

The product is not exposed to soil and water during the use stage.

6. References

ISO 14025

ISO 14025:2006 : Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804

EN 15804:2012-04+A2 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

UL Environment

UL Environment General Program Instructions
March 2022 Version 2.7

UL Standard 10010. PCR Part A

PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0. UL Environment.
<https://industries.ul.com/environment>

UL 10010-7. PCR Part B

PCR - Part B: Flooring EPD Requirements. Second Edition. Dated September 28, 2018. UL Environment.
<https://www.ul.com/>

Ecoinvent V3.8

Ecoinvent Life Cycle Inventory database Version 3.8
<http://www.ecoinvent.org>