

Please find below the UL Environment third-party certified EPD for **Mipolam range**.

This EPD covers 15 references: Mipolam Planet, Mipolam Elegance SD, Mipolam EL5, Mipolam Troplan, Mipolam Esprit, Mipolam Biocontrol Clean, Mipolam Accord, Mipolam Biocontrol EL5, Mipolam Biocontrol Performance, Mipolam Elegance, Mipolam Bioplanet, Mipolam EL7, Mipolam Cosmo, Mipolam Symbioz, Mipolam Affinity, Streamo Sailer, Streamo Seacrosser.

It's calculated on a 75-year building service life scenario, as requested by UL certification body.

Here is a summary, for your convenience, of the **GWP results for Europe, USA, and Norway**, with 3 different service life scenari (**1 year, 25 years and 75 years**). We also outline some key assumptions used in this EPD.

1. Carbon footprint of the product - in a nutshell

▪ **GWP 1 year**

GWP (kg CO2 eq./m2)	TOTAL LIFE CYCLE	A1	A2	A3	TOTAL PRODUCTION	A4	A5	TOTAL CONSTRUCTION	B2	B4	TOTAL USE	C2	C4	TOTAL End of Life
		Raw materials Supply	Transport	Manufacturing		Transport	Installation		Maintenance	Replacement		Transport	Elimination	
EUROPE	10,27	4,81	0,08	1,73	6,61	0,02	1,36	1,38	0,17	-	0,17	0,07	2,05	2,12
USA	9,22	4,81	0,08	1,73	6,61	0,58	1,54	2,12	0,20	-	0,20	0,07	0,21	0,28
NORWAY	14,60	4,81	0,08	1,73	6,61	0,21	1,38	1,59	0,06	-	0,06	0,07	6,27	6,34

▪ **GWP 25 years (product reference service life)**

Same calculation as GWP 1 year but with B2 maintenance over 25 years.

GWP (kg CO2 eq./m2)	TOTAL LIFE CYCLE	A1	A2	A3	TOTAL PRODUCTION	A4	A5	TOTAL CONSTRUCTION	B2	B4	TOTAL USE	C2	C4	TOTAL End of Life
		Raw materials Supply	Transport	Manufacturing		Transport	Installation		Maintenance	Replacement		Transport	Elimination	
EUROPE	14,24	4,81	0,08	1,73	6,61	0,02	1,36	1,38	4,13	-	4,13	0,07	2,05	2,12
USA	14,08	4,81	0,08	1,73	6,61	0,58	1,54	2,12	5,07	-	5,07	0,07	0,21	0,28
NORWAY	16,12	4,81	0,08	1,73	6,61	0,21	1,38	1,59	1,58	-	1,58	0,07	6,27	6,34

▪ **GWP 75 years (building estimated service life)**

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.

The GWP assessment in the EPD document is based on this 75-year scenario, as requested by UL certification (see in EPD : table 24 for Europe, table 22 for USA, table 23 for Norway on pages 21-22).

GWP (kg CO2 eq./m2)	TOTAL LIFE CYCLE	A1	A2	A3	TOTAL PRODUCTION	A4	A5	TOTAL Construction	B2	B4	TOTAL USE	C2	C4	TOTAL End of Life
		Raw materials Supply	Transport	Manufacturing		Transport	Installation		Maintenance	Replacement		Transport	Elimination	
EUROPE	43,16	4,81	0,08	1,73	6,61	0,17	1,36	1,38	12,40	20,50	32,90	0,07	2,05	2,12
USA	42,32	4,81	0,08	1,73	6,61	0,58	1,54	2,12	15,20	18,10	33,30	0,07	0,21	0,28
NORWAY	48,38	4,81	0,08	1,73	6,61	0,21	1,38	1,59	4,74	29,10	33,84	0,07	6,27	6,34

2. Life cycle assessment assumptions

Life cycle assessment assumptions in EPD		Comments
Building Estimated Service Life (ESL)	75 years	UL certification requires that we consider a building reference service life of 75 years.
Product Reference Service Life (RSL)	25 years	-
Production site	France (Saint-Paul Trois Châteaux factory) or Germany (Troisdorf factory)	-
Transport distance from factory to user	<ul style="list-style-type: none"> From France to user in Europe : 1 685 km From Germany to user in Europe : 959 km From France to user in USA : 11 091 km From Germany to user in USA : 10 115 km From France to user in Norway : 2 633 km From Germany to user in Norway : 1 931 km 	<p>3 different scenarios for user location.</p> <p>For Europe : average distance calculated based on weighted sales by country.</p>
End of life scenario	<ul style="list-style-type: none"> Europe : average scenario = 74% landfill and 26% incineration USA : 100% landfill Norway : 92% incineration and 8% landfill <p>Note : recycling programs are available in several countries but not taken into account here</p>	

Nathalie Faure
Sustainability Certification Manager
August 1, 2023



ENVIRONMENTAL PRODUCT DECLARATION

MIPOLAM COLLECTION

HOMOGENEOUS VINYL FLOORING



Homogeneous vinyl flooring – Mipolam collection



Because we think actions speak louder than words, Gerflor has always been willing to act and to develop flooring solutions that meet the most challenging requirements in term of design, durability, easy installation, acoustic comfort, ...

When it comes to sustainability, we also set ourselves to the highest standards. We believe in developing great products that not only perform, but also contribute to achieving high indoor air quality and top contribution to all green building certification schemes.

Mipolam collection homogeneous vinyl flooring:

- According to ISO 22196 and ISO 21702, it has, respectively, anti-bacterial activity against MRSA of 99% after 24h00 and anti-viral activity against human coronavirus 229E of 99.7% after 2h00.
- The product emission rate of volatile organic compounds is $< 10 \mu\text{g}/\text{m}^3$ (TVOC after 28 days – ISO 16000-6).
- They have an exclusive and patented Evercare™ surface treatment which allowed easy maintenance, no wax for life and high stain resistance.
- They have the Floorscore®, M1 and IAC Gold certification.

Mipolam collection is developed with a view to optimize the environmental impact at every stage of the product's life. This includes assessment of the manufacture, installation, ongoing maintenance, eventual uplift, and recycling of the products. As part of this commitment, Gerflor has decided to take a leadership position by publishing a third party independently verified EPD for each of its product ranges.



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According to ISO 14025,
EN 15804, and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road, Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.4 July 2018	
MANUFACTURER NAME AND ADDRESS	GERFLOR 1 place Verrazzano 69258 LYON Cedex 09. France	
DECLARATION NUMBER	4790130460.104.2	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Mipolam collection homogeneous vinyl flooring The functional unit used for this study is 1m ² of homogeneous vinyl flooring, for a 25 years service life, and for a building estimated service life of 75 years.	
REFERENCE PCR AND VERSION NUMBER	PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2, UL Environment. PCR - Part B: Flooring EPD Requirements, Second Edition, Dated September 28, 2018, UL Environment.	
DESCRIPTION OF PRODUCT APPLICATION/USE	The product is classified in accordance with EN ISO 10874 and in reference to the FCSS (Floor Covering Standard Symbols) to be installed in various areas of application including commercial and industrial applications.	
PRODUCT RSL DESCRIPTION (IF APPL.)	The stated RSL is 25 years. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. The ESL is 75 years, so two replacements are required.	
MARKETS OF APPLICABILITY	Norwegian, European and US Commercial market	
DATE OF ISSUE	July 1, 2022	
PERIOD OF VALIDITY	5 years	
EPD TYPE	Industry average	
RANGE OF DATASET VARIABILITY	Fifteen products are considered in this EPD	
EPD SCOPE	Cradle to Grave	
YEAR(S) OF REPORTED PRIMARY DATA	2020	
LCA SOFTWARE & VERSION NUMBER	Simapro 9	
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent 3.7.1 – allocation cut-off by classification	
LCIA METHODOLOGY & VERSION NUMBER	Methode EN 15804_FR_Ev-DEC 1.21 (EVEA)	

The PCR review was conducted by:

UL Environment
PCR Review Panel
epd@ulenvironment.com

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

María José Monteagudo Arrebola 

This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:

Tomas P. Gloria, Industrial Ecology Consultants 

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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According to ISO 14025,
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1. Product Definition and Information

1.1. Description of Company/Organization

The product is commercialized by Gerflor and made either in Saint-Paul Trois Chateaux Manufacturing Plant (France) for Elegance, Elegance SD, EL5 and Biocontrol EL5 products or in Troisdorf Manufacturing Plant for the others . Those plants comply with:

- ISO 9001 Quality Management System
- ISO 14001 Environmental Management System
- ISO 50001 Energy Management System

1.2. Product Description

Product Identification

Product Designation: "Mipolam collection"

This environmental product declaration covers Gerflor Mipolam collection Homogeneous Vinyl Flooring. Mipolam flooring are presented in rolls of 2.0mm thickness. It is protected by Evercare™ surface treatment that provides easy maintenance, stain resistance and reduces the need to refinish the flooring.

The Mipolam Flooring are classified according to the United Nations Standard Products and Service Code (UNSPSC) as "Flooring" : UNSPSC Code 30161700.

And according to Construction Specification Institute (CSI) as "Resilient flooring" : CSI Code 09 65 00.

The following figure shows a homogeneous vinyl flooring :



Figure 1: Homogeneous vinyl flooring's illustration



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Product Specification

The products considered in this EPD meet or exceed one of the following Technical Specifications:
Meets or exceeds all technical requirements in EN ISO 10581– Homogeneous poly(vinyl chloride) floor covering — Specifications

Mipolam homogeneous vinyl flooring meets requirements of the standard EN 14041 – Resilient, textile and stratified floor coverings: Essential characteristics.

Product Specific EPD

Fifteen products are grouped and reported in this EPD as weight average product, based on production volume. The following products are covered :

- | | | |
|-----------------------------|-----------------------------------|------------------------|
| 1. Mipolam Planet | 7. Mipolam Accord | 13. Mipolam Cosmo |
| 2. Mipolam Elegance SD | 8. Mipolam Biocontrol EL5 | 14. Mipolam Symbioz |
| 3. Mipolam EL5 | 9. Mipolam Biocontrol Performance | 15. Mipolam Affinity |
| 4. Mipolam Troplan | 10. Mipolam Elegance | 16. Streamo Sailer |
| 5. Mipolam Esprit | 11. Mipolam Bioplanet | 17. Streamo Seacrosser |
| 6. Mipolam Biocontrol Clean | 12. Mipolam EL7 | |

These products have, mainly, a similar composition and the same thickness: 2.00 mm, (excepted for the Elegance SD wich has a thickness of 2.40mm). They have a different weight (between 2.68 and 3.30 kg/m²). They are produced in rolls form. The following products are also produced in blade form : Accord, Affinity, Esprit, Cosmo, Troplan, Elegance Streamo Sailer and Streamo Seacrosser. Environnemental impacts of each have been compared and products have been considered as homogeneous, with a weighted coefficient of variation less or equal to 20% for each impact category.

The Mipolam are intended for the building industry while the Streamo are intended for the marine industry.



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Flow Diagram

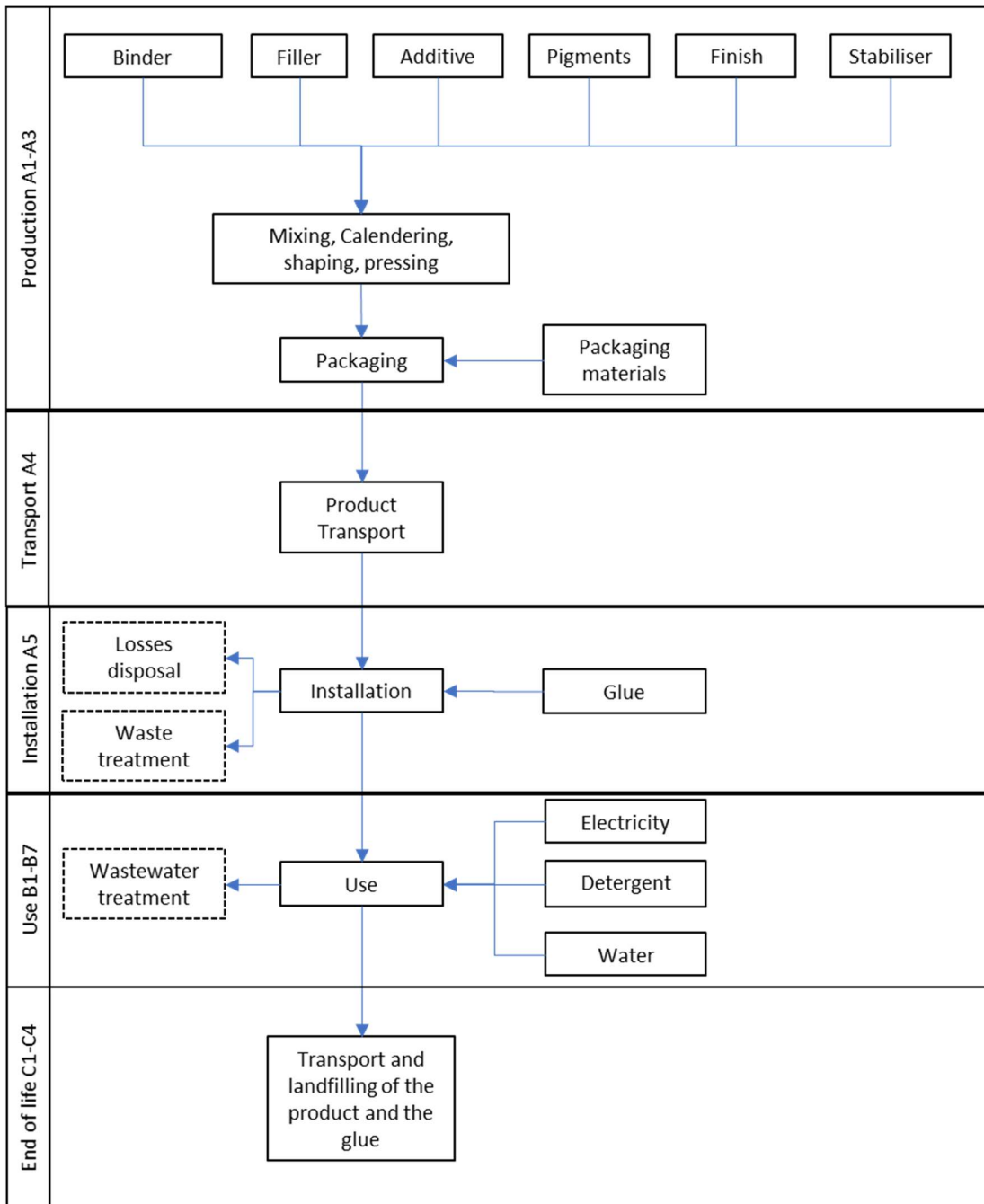


Figure 2 : Flow product diagram



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According to ISO 14025,
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1.3. Application

The Mipolam homogeneous collection is classified in accordance with EN ISO 10874 and in reference to the FCSS (Floor Covering Standard Symbols) to be installed in various areas of application including commercial, education and healthcare environments.

1.4. Declaration of Methodological Framework

This EPD covers the entire life cycle of the product from cradle to grave (modules A1 to C4) excluding modules for which there are no inputs/outputs. No known flows are deliberately excluded from this EPD.

For this product, the stated RSL is 25 years. It should be noted, however, that the service life of a homogeneous vinyl flooring may vary depending on the amount and nature of floor traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. This RSL is applicable as long as the product use complies with that defined by ISO 14041 and ISO 10874 in accordance with the product's classification.

1.5. Technical Requirements

Table 1: Technical data

Name	Value	Unit
Product Thickness	2.00	Mm
Product Weight	2.93	kg/m ²
Product Form	Sheet width	200
	Sheet length	20

1.6. Properties of Declared Product as Delivered

The product declared in this document complies with the following codes or regulations:

- Floorscore SCS-FS-02145 et SCS-FS-02146
- M1
- IAC Glod pour les produits Mipolam Planet, Accord, Cosmo, Symbioz, Affinity, Troplan, Esprit, Bioplanet



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According to ISO 14025,
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1.7. Material Composition

Table 2: Material content

Component	Mass %
Binder	50-60%
Additive	< 5%
Stabilizer	< 1%
Filler	30-40%
Finish	< 1%
Pigments	< 5%
Packaging	< 6%

1.8. Manufacturing

The Mipolam Homogeneous collection is made in the Gerflor manufacturing plant, either in France or in Germany.

For both cases, the production of the sheets is divided into the following stages:

- Mixing: Binder, filler, additive, stabilizer, and pigments are mixed to obtain mixture
- Calendering: The rolls are then calendered to get the desired shape.
- Pressing.
- Reinforcement and finish.
- Shaping: rolls are cut at the desired dimensions.



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Figure 3: Calendering process' diagram

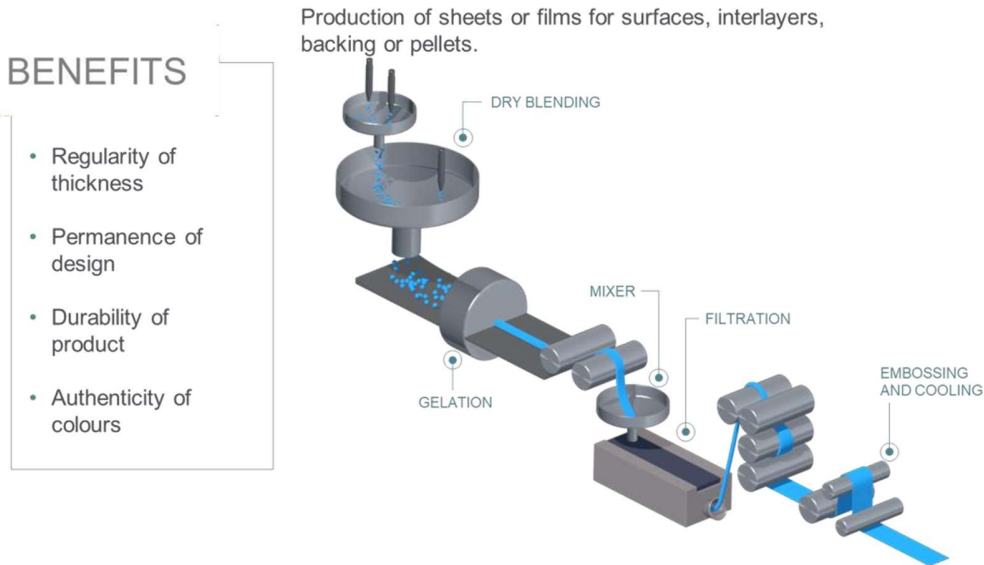
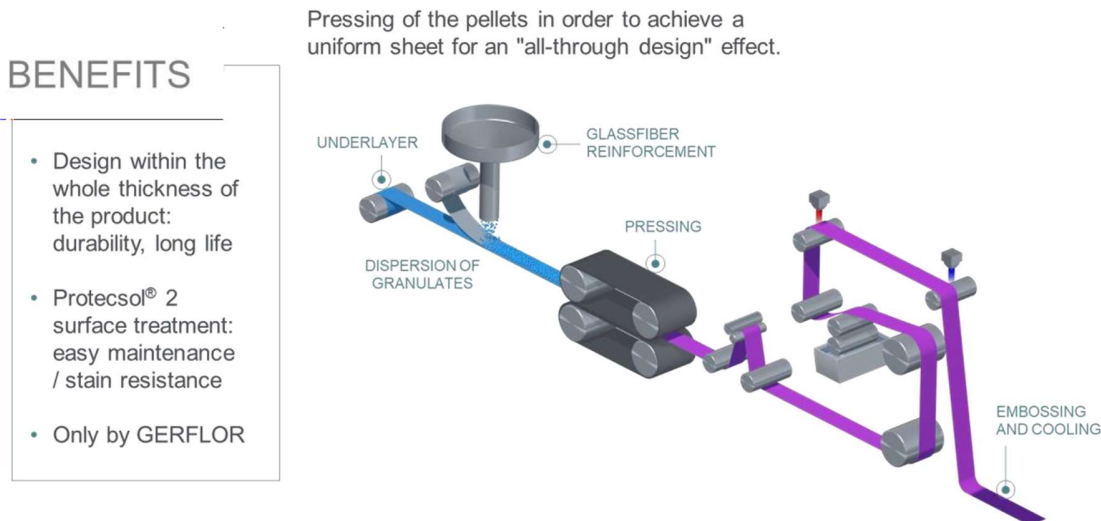


Figure 4: Pressing process' diagram



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1.9. Packaging

The products are packaged differently if they are distributed in sheets or tiles and according to the different factories.

For rolls: The rolls are wrapped around a 100% recycled cardboard core and then packed in paper.

For the tiles: They are stored in cardboard boxes, with a protective plastic film inside and 100% recycled cardboard corners, several boxes are then placed on pallets which are finally wrapped in plastic film.

- The packaging waste scenario for US market for paper and cardboard is 75% recycling, 20% landfilling and 5% incineration as describe in ULE Part A Requirements.

- According to the Ecoinvent datas, the packaging waste scenario for Norway represents 92% against 8% of landfill.

- The packaging waste scenario for European market for cardboard and paper is 76.4% recycling, 16.4% landfilling and 7.2% incineration. For plastic packaging waste, it is 37% recycling, 35% landfilling and 28% incineration and for wooden pallet, it is 25% recycling, 55% landfilling and 20% incineration as describe in ULE Part A Requirements 2022.

1.10. Transportation

The Mipolam homogeneous collection is made in France and in Germany and is then sent to the Norwegian, European or US market. Distances taken in account are described below.



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Table 3: Transport's distance

MEANS OF TRANSPORT	FACTORY	NORWEGIAN MARKET		US MARKET		EUROPEAN MARKET	
		Journey	Distance (km)	Journey	Distance (km)	Journey	Distance (km)
Road – 16-32T Truck	France	From Saint-Paul Trois Chateaux factory to Belgium port: Zeebrugge	947	From Saint-Paul Trois Châteaux to the port of Fos-Sur-Mer	133	From Saint-Paul Trois Chateaux factory to customers	1613
	Germany	From Troisdorf factory to German's station: Duisburg	90	From Troisdorf factory to Belgium's port: Antwerp	226	From Troisdorf factory to customers	885
Rail	France	-	-	Montreal to Chicago	1357	-	-
	Germany	Duisburg to Swedish's station: Falkoping	1126	Montreal to Chicago	1357	-	-
Boat	France	Zeebrugge to Swedish's port: Goteborg	1007	Fos-Sur-Mer to Montreal	7167	From Saint-Paul Trois Chateaux factory to customers	72
	Germany	-	-	Antwerp port to Montreal port	6102	From Troisdorf factory to customers	74
Road – 16-32T Truck	France	Goteborg port to Norwegian's warehouse: Vestby, and then to customer	679	Chicago to Bensenville warehouse and then to customer in Denver	2434	-	-
	Germany	Falkoping to Norwegian's warehouse: Vestby, and then to customer	715	Chicago to Bensenville warehouse and then to customer in Denver	2430	-	-



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1.11. Product Installation

The product is installed by using acrylic glue. Approximately 250 g/m² of this water-based low emission adhesive is used to fix the flooring in place.

During the installation approximately 8.5% of the material is lost as off-cuts – this waste is mainly sent to incineration. Waste classification is according to RCRA for North American region (Resource Conservation and Recovery Act (RCRA), Subtitle 3).

1.12. Use

Current cleaning of the installed floor has been included in this study as following:

- Dry vacuum cleaning : twice a week
- Wet cleaning by hand with water and detergent: once a week.

1.13. Reference Service Life and Building Estimated Service Life

For this product, the stated RSL is 25 years and the building estimated service life (ESL) is 75 years. It should be noted however that the service life of a Mipolam homogeneous flooring may vary depending on the amount and nature of floor traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. This RSL is applicable as long as the product use complies with EN ISO 14041 and EN ISO 10874 in accordance with the product's classification. The number of replacements necessary to fulfil the required performance and functionality over the construction works Estimated Service Life of 75 years is two.

1.14. Reuse, Recycling, and Energy Recovery

There is a collection for recycling available on request for this product.

1.15. Disposal

For the purpose of this LCA, it has been assumed that 92% of the product is sent to incineration and 8% to landfill at the end of its useful life, according to the Ecoinvent datas and the producer's feedback for Norwegian market. The product is sent to landfill site for US market. Product is considered as non-hazardous waste according to north america regulation. For the European market, according to the ULE PCR part A version 2022, the end of life scenario is 50% recycling, 37% landfill and 13% incineration. As it stands, PVC flooring is not recycled. Thus, the end of life scenario considered is 74% landfill and 26% incineration.

The transport between construction site and incineration/landfill facility is by truck, with a distance of 161 km. There is no specific data for this distance for Norwegian and European market, so the North America's one is assumed by default.

2. Life Cycle Assessment Background Information

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



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According to ISO 14025,
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2.1. Functional or Declared Unit

The functional unit is one square meter of installed product. The reference service life considered is 75 years.

Table 4: Functional Unit

	Value	Unit
Functional Unit	1	m ²
Mass	2.93	kg

2.2. 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 (only for Norway).

Table 5 : Scope of the study

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	X

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



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is no input for D module for US market, because the product is landfilled.

2.3. Estimates and Assumptions

Estimates and assumptions are made for transport, installation and deconstruction procedure. Details are provided in section "LCA: scenarios and additional technical information".

Transport distances have been calculated from the production site (France/Germany) to the warehouse of the destination country (Norway and US). For Europe, an average distance for each country has been multiplied by the sales percentage.

Additional transport between the distribution center and the construction site is considered with a distance of 800 km, according to PCR, part B for US market. A distance of 424 km is considered for the Norwegian market, according to Gerflor's statements.

Transport distance from building site to the end of life treatment center is considered with a distance of 161 km, according to PCR part B.

2.4. 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.

2.5. 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 v3.7.1.

2.6. 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 (2020). Generic data is taken from the ecoinvent 3.7.1 database, the entirety of which was updated in 2020. 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 Gerflor supply chain has been used. If country specific data is unavailable, European regional data is used in preference to global data sources.

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2.7. Period under Review

Data have been reviewed for the production year 2020.

2.8. Allocation

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 flooring produced. All factory data is measured in square meters, and it is assumed that the process consumptions are governed by area of flooring processed rather than mass.

2.9. 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.



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3. Life Cycle Assessment Scenarios

Table 6. Transport to the building site for US Market (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel, low sulfur	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 5	
Transport distance	2633	km
Capacity utilization (including empty runs, mass based)	36	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Boat		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.047	l/100km
Vehicle type	Transoceanic Ship	
Transport distance	6368	km
Capacity utilization (including empty runs, mass based)	100	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Rail		
Energy type	Diesel and electricity	
Percentage diesel / electricity	56.3 / 43.7	%
Vehicle type	Freight train US	
Transport distance	1357	km
Capacity utilization (including empty runs, mass based)	100	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-



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Table 7: Transport to the building site for Norwegian Market (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel, low sulfur	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 5	
Transport distance	1010	km
Capacity utilization (including empty runs, mass based)	36	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Boat		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.047	l/100km
Vehicle type	Transoceanic Ship	
Transport distance	252	km
Capacity utilization (including empty runs, mass based)	100	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Rail		
Energy type	Diesel and electricity	
Percentage diesel / electricity	56.3 / 43.7	%
Vehicle type	Freight train Europe without Switzerland	
Transport distance	845	km
Capacity utilization (including empty runs, mass based)	100	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-



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Table 8: Transport to building site for European market

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel, low sulfur	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 6	
Transport distance	1067	km
Capacity utilization (including empty runs, mass based)	36	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Boat		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.047	l/100km
Vehicle type	Transoceanic Ship	
Transport distance	74	km
Capacity utilization (including empty runs, mass based)	100	%
Gross density of products transported	1463	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-

Table 9. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	0.25	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m ³
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	2.49E-01	kg
Waste materials at the construction site before waste processing, generated by product installation	1.56E-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	1.35E-01	kg CO ₂
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	1.00E-05	kg/m ²



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Table 10. Reference Service Life

NAME	VALUE	UNIT
RSL	25	years
Declared product properties (at the gate) and finishes, etc.	Declared product properties are described in Declaration of Performance (DOP), in accordance with EN 14041	-
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Products in accordance with EN 14041 and technical prescription of the manufacturer	-
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	Assumed to be installed according to the manufacturer's instructions	-
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.	Maintenance scenario is defined in the table above	-
Maintenance, e.g. required frequency, type and quality of replacement components	Declared product properties are described in Declaration of Performance (DOP), in accordance with EN 14041	-



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Table 11. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	Dry vacuum cleaning: 2/week Wet cleaning: 1/week	-
Maintenance cycle	3.90E+03	Number/ RSL
Maintenance cycle	1.17E+04	Number/ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	2.60E+00	m ³ /year
Ancillary materials specified by type (e.g. cleaning agent)	2.60E-02	kg/year
Other resources	-	kg
Energy input, specified by activity, type and amount	2.60E-01	kWh/year
Other energy carriers specified by type	-	kWh
Power output of equipment	-	kW
Waste materials from maintenance (specify materials)	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	-	

Table 12. Repair (B3)

No data for given table

Table 13. Replacement (B4)

NAME	VALUE	UNIT
Reference Service Life	25	Years
Replacement cycle	2	(ESL-RSL)-1
Energy input, specified by activity, type and amount	-	kWh
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)	-	m ³
Ancillary materials specified by type and amount (e.g. cleaning agent)	-	kg
Replacement of worn parts, specify parts/materials	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development, e.g. frequency and time period of use_	-	As appropriate

Table 14. Refurbishment (B5)

No data for given table

Table 15. Operational energy use (B6) and Operational water use (B7)



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No data for given table

Table 16. End of life for US Market (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Product are carried out by hand and sent to landfill. Waste transport is made by truck (16-32 metric ton Euro5). A 161km distance to the landfill treatment center has been considered	
Collection process (specified by type)	Collected separately	2.89E+00	kg
	Collected with mixed construction waste	-	kg
Recovery (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	2.89E+00	kg
	Incineration	-	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Disposal (specified by type)	Product or material for final deposition	-	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO ₂

Table 17: End of life for Norwegian Market (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Product are carried out by hand and sent to landfill or incineration. Waste transport is made by truck (16-32 metric ton Euro5). A 161km distance to the treatment center has been considered	
Collection process (specified by type)	Collected separately	2.89E+00	kg
	Collected with mixed construction waste	-	kg
Recovery (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	2.31E-01	kg
	Incineration	2.66E+00	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Disposal (specified by type)	Product or material for final deposition	-	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO ₂



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Table 18: End of life for European market (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Product are carried out by hand and sent to landfill or incineration. Waste transport is made by truck (16-32 metric ton Euro6). A 161km distance to the treatment center has been considered	
Collection process (specified by type)	Collected separately	2.89E+00	kg
	Collected with mixed construction waste	-	kg
Recovery (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	2.35E+00	kg
	Incineration	8.26E-01	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Disposal (specified by type)	Product or material for final deposition	-	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO ₂

Table 19. Reuse, recovery and/or recycling potentials (D), relevant scenario information – Norwegian market

NAME	VALUE	UNIT
Electricity	7.86E+00	MJ/m ²
Natural gas	1.55E+01	MJ/m ²
Heavy fuel oil		

Table 20: Reuse, recovery and/or recycling potentials (D), relevant scenario information - Europe

NAME	VALUE	UNIT
Electricity	1.96E+00	MJ/m ²
Natural gas	4.00E+00	MJ/m ²
Heavy fuel oil		



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4. Life Cycle Assessment Results

The following results are given for the ESL of 75 years. For the RSL of 25 years, it is necessary to divide the results of B2 and D by three and to delete the results of B4, as two replacements are being considered.

4.1 Life Cycle Impact Assessment Results

Table 21. North American Impact Assessment Results over the ESL of 75 years

TRACI v2.1	A1	A2	A3	A4	A5	B2	B4	C2	C4
GWP 100 [kg CO ₂ eq]	4.82E+00	8.27E-02	1.93E+00	5.84E-01	1.59E+00	1.52E+01	1.86E+01	7.09E-02	2.10E-01
ODP [kg CFC-11 eq]	1.53E-06	2.00E-08	1.32E-07	1.31E-07	2.24E-07	1.11E-06	4.13E-06	1.64E-08	1.09E-08
AP [kg SO ₂ eq]	2.14E-02	2.91E-04	3.58E-03	4.02E-03	7.12E-03	6.29E-02	7.47E-02	2.56E-04	7.06E-04
EP [kg N eq]	8.88E-03	4.15E-05	1.88E-03	3.66E-04	1.48E-03	3.83E-02	2.56E-02	3.56E-05	1.39E-04
SFP [kg O ₃ eq]	2.17E-01	6.42E-03	5.02E-02	8.75E-02	8.04E-02	6.09E-01	9.07E-01	5.49E-03	6.20E-03
ADP _{fossil} [MJ. LHV]	1.23E+01	1.81E-01	2.46E+00	1.19E+00	2.51E+00	1.94E+01	3.78E+01	1.49E-01	1.09E-01

GWP: Global Warming Potential / ODP: Ozone Depletion Potential / AP: Acidification Potential / EP: Eutrophication Potential / SFP: Smog Formation Potential / ADP: Abiotic Depletion Potential

Table 22. EU Impact Assessment Results over the ESL of 75 years – US

CML v4.2	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
GWP 100 [kg CO ₂ eq]	4.81E+00	8.27E-02	1.73E+00	5.84E-01	1.54E+00	1.52E+01	1.81E+01	7.09E-02	2.09E-01	-
ODP [kg CFC-11 eq]	1.48E-06	1.50E-08	1.07E-07	9.86E-08	2.00E-07	8.63E-07	3.84E-06	1.23E-08	8.19E-09	-
AP [kg SO ₂ eq]	2.17E-02	2.59E-04	3.43E-03	3.58E-03	7.07E-03	6.14E-02	7.29E-02	2.27E-04	2.22E-04	-
EP [kg PO ₄ ⁻³ eq]	4.70E-03	4.29E-05	1.06E-03	5.26E-04	9.78E-04	2.06E-02	1.49E-02	3.69E-05	8.29E-05	-
POCP [kg ethene eq]	3.55E-03	4.23E-05	4.37E-04	4.14E-04	9.89E-04	7.31E-03	1.11E-02	3.58E-05	6.64E-05	-
ADP _{element} [kg Sb-eq]	1.00E-04	3.43E-07	6.13E-06	2.25E-06	2.20E-05	1.69E-04	2.63E-04	2.85E-07	1.35E-07	-
ADP _{fossil} [MJ. LHV]	8.88E+01	1.24E+00	2.31E+01	8.36E+00	2.12E+01	1.98E+02	2.89E+02	1.04E+00	7.74E-01	-

GWP: Global Warming Potential / ODP: Ozone Depletion Potential / AP: Acidification Potential / EP: Eutrophication Potential / POCP: Photochemical Ozone / ADP: Abiotic Depletion Potential



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Table 23. EU Impact Assessment Results over the ESL of 75 years – Norway

CML v4.2	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
GWP 100 [kg CO ₂ eq]	4.81E+00	8.27E-02	1.73E+00	2.06E-01	1.38E+00	4.74E+00	2.91E+01	6.80E-02	6.27E+00	-1.29E+00
ODP [kg CFC-11 eq]	1.48E-06	1.50E-08	1.07E-07	3.44E-08	1.97E-07	4.64E-07	4.05E-06	1.24E-08	1.80E-07	-1.86E-07
AP [kg SO ₂ eq]	2.17E-02	2.59E-04	3.43E-03	8.18E-04	9.59E-03	3.00E-02	7.92E-02	2.13E-04	3.59E-03	-5.51E-03
EP [kg PO ₄ ⁻³ eq]	4.70E-03	4.29E-05	1.06E-03	1.37E-04	8.82E-04	1.59E-02	1.49E-02	3.53E-05	5.89E-04	-2.67E-04
POCP [kg ethene eq]	3.55E-03	4.23E-05	4.37E-04	1.19E-04	9.66E-04	4.78E-03	1.12E-02	3.48E-05	4.44E-04	-3.91E-04
ADP _{element} [kg Sb-eq]	1.00E-04	3.43E-07	6.13E-06	9.14E-07	2.05E-05	1.60E-04	2.69E-04	2.82E-07	6.40E-06	-2.14E-06
ADP _{fossil} [MJ. LHV]	8.88E+01	1.24E+00	2.31E+01	2.97E+00	1.97E+01	8.08E+01	2.92E+02	1.02E+00	9.03E+00	-1.81E+01

Table 24: EU Impact Assessment Results over the ESL of 75 years – Europe

CML v4.2	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
GWP 100 [kg CO ₂ eq]	4.81E+00	8.27E-02	1.72E+00	1.73E-01	1.36E+00	1.24E+01	2.05E+01	6.67E-02	2.05E+00	-5.46E-01
ODP [kg CFC-11 eq]	1.48E-06	1.50E-08	1.07E-07	3.14E-08	1.96E-07	8.08E-07	4.26E-06	1.21E-08	2.89E-07	-5.76E-08
AP [kg SO ₂ eq]	2.17E-02	2.59E-04	3.43E-03	4.13E-04	9.50E-03	6.63E-02	7.58E-02	1.53E-04	2.48E-03	-2.42E-03
EP [kg PO ₄ ⁻³ eq]	4.70E-03	4.29E-05	1.06E-03	5.35E-05	8.69E-04	2.05E-02	1.42E-02	2.00E-05	3.78E-04	-1.98E-04
POCP [kg ethene eq]	3.55E-03	4.23E-05	4.37E-04	7.93E-05	9.58E-04	7.03E-03	1.07E-02	3.03E-05	2.52E-04	-1.62E-04
ADP _{element} [kg Sb-eq]	1.00E-04	3.43E-07	6.13E-06	7.27E-07	2.05E-05	1.76E-04	2.73E-04	2.82E-07	8.25E-06	-7.34E-07
ADP _{fossil} [MJ. LHV]	8.88E+01	1.24E+00	2.31E+01	2.58E+00	1.96E+01	1.70E+02	2.84E+02	9.98E-01	5.83E+00	-7.15E+00



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4.2 Life Cycle Inventory Results

Table 25. Resource Use over the ESL of 75 years – US

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
RPR _E [MJ. LHV]	1.36E+01	1.70E-02	2.38E+00	1.08E-01	2.11E+00	2.98E+01	3.65E+01	1.20E-02	1.40E-02	-
RPR _M [MJ. LHV]	2.74E+00	-	2.51E+00	-	4.45E-01	-	1.14E+01	-	-	-
RPR _T [MJ. LHV]	1.63E+01	1.70E-02	4.88E+00	1.08E-01	2.56E+00	2.98E+01	4.78E+01	1.20E-02	1.40E-02	-
NRPR _E [MJ. LHV]	7.11E+01	1.26E+00	4.24E+01	8.48E+00	1.43E+01	8.63E+01	2.79E+02	1.06E+00	7.93E-01	-
NRPR _M [MJ. LHV]	4.38E+01	-	1.96E-01	-	1.15E+01	1.73E+01	1.11E+02	-	-	-
NRPR _T [MJ. LHV]	1.15E+02	1.26E+00	4.26E+01	8.48E+00	2.58E+01	1.04E+02	3.90E+02	1.06E+00	7.93E-01	-
SM [kg]	-	-	4.15E-02	-	3.53E-03	-	9.01E-02	-	-	-
RSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
NRSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
RE [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
FW [m ³]	1.33E-01	1.70E-04	1.45E-02	1.35E-03	2.77E-02	4.04E-01	3.56E-01	1.61E-04	8.88E-04	-

RPR_E: Use of renewable primary energy excluding renewable primary energy resources used as raw materials / RPR_M: Use of renewable primary energy resources used as raw materials / RPR_T: Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) / NRPR_E: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials / NRPR_M: Use of non-renewable primary energy resources used as raw materials / NRPR_T: Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) / SM: Use of secondary materials / RSF: Use of renewable secondary fuels / NRSF: Use of non-renewable secondary fuels / RE: Recovered energy / FW: Net use of fresh water



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Table 26. Resource Use over the ESL of 75 years – Norway

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
RPR _E [MJ. LHV]	1.36E+01	1.70E-02	2.38E+00	8.16E-02	2.16E+00	5.08E+01	2.45E+03	1.40E-02	8.16E-01	-8.59E+00
RPR _M [MJ. LHV]	2.74E+00	-	2.51E+00	-	4.45E-01	-	9.95E+01	-	-	-
RPR _T [MJ. LHV]	1.63E+01	1.70E-02	4.88E+00	8.16E-02	2.61E+00	5.08E+01	2.46E+03	1.40E-02	8.16E-01	-8.59E+00
NRPR _E [MJ. LHV]	7.11E+01	1.26E+00	4.24E+01	3.14E+00	1.18E+01	3.02E+01	2.81E+02	1.04E+00	9.69E+00	-1.85E+01
NRPR _M [MJ. LHV]	4.38E+01	-	1.96E-01	-	1.32E+01	1.73E+01	1.53E+02	-	-	-
NRPR _T [MJ. LHV]	1.15E+02	1.26E+00	4.26E+01	3.14E+00	2.50E+01	4.75E+01	3.95E+02	1.04E+00	9.69E+00	-1.85E+01
SM [kg]	-	-	4.15E-02	-	3.53E-03	-	7.89E+03	-	-	-
RSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
NRSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
RE [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
FW [m ³]	1.33E-01	1.70E-04	1.45E-02	6.82E-04	2.95E-02	3.81E-01	1.99E+05	1.40E-04	2.53E-01	-6.37E-02

Table 27. Resource Use over the ESL of 75 years – Europe

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
RPRE [MJ. LHV]	1.36E+01	1.70E-02	2.38E+00	3.60E-02	2.16E+00	3.38E+01	3.79E+01	1.39E-02	7.40E-01	-7.38E-01
RPRM [MJ. LHV]	2.74E+00	-	2.51E+00	-	4.45E-01	-	1.14E+01	-	-	-
RPRT [MJ. LHV]	1.63E+01	1.70E-02	4.88E+00	3.60E-02	2.60E+00	3.38E+01	4.92E+01	1.39E-02	7.40E-01	-7.38E-01
NRPRE [MJ. LHV]	7.11E+01	1.26E+00	4.24E+01	2.64E+00	1.17E+01	8.48E+01	2.74E+02	1.02E+00	6.82E+00	-9.34E+00
NRPRM [MJ. LHV]	4.38E+01	-	1.96E-01	-	1.32E+01	1.73E+01	1.14E+02	-	-	-
NRPRT [MJ. LHV]	1.15E+02	1.26E+00	4.26E+01	2.64E+00	2.49E+01	1.02E+02	3.88E+02	1.02E+00	6.82E+00	-9.34E+00
SM [kg]	-	-	4.15E-02	-	3.53E-03	0.00E+00	9.01E-02	-	-	-
RSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
NRSF [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
RE [MJ. LHV]	-	-	-	-	-	-	-	-	-	-
FW [m ³]	1.33E-01	1.70E-04	1.45E-02	3.60E-04	2.93E-02	2.27E-01	3.89E-01	1.39E-04	1.69E-02	-3.88E-03



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According to ISO 14025,
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Table 28. Output Flows and Waste Categories over the ESL of 75 years – US

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
HWD [kg]	2.85E-01	8.57E-04	2.37E-02	9.22E-03	1.50E-01	2.16E-01	9.42E-01	9.96E-04	1.03E-03	-
NHWD [kg]	2.18E+00	7.07E-02	4.67E-01	4.19E-01	1.17E+00	2.91E+00	1.51E+01	6.03E-02	3.19E+00	-
ILLRW [kg] or [m ³]	1.56E-04	8.55E-06	2.29E-04	5.54E-05	6.29E-05	2.54E-04	1.05E-03	6.89E-06	4.66E-06	-
HLRW [kg] or [m ³]	3.08E-05	9.57E-08	6.15E-05	4.94E-07	1.08E-05	6.46E-05	2.08E-04	5.52E-08	7.16E-08	-
CRU [kg]	-	-	-	-	-	-	-	-	-	-
MFR [kg]	-	-	1.18E-02	-	9.75E-02	-	2.19E-01	-	-	-
MER [kg]	-	-	-	-	-	-	0.00E+00	-	-	-
EE [MJ. LHV]	-	-	1.97E-01	-	6.67E-02	-	5.27E-01	-	-	-

HWD: Disposed-of-hazardous waste / NHWD: Disposed-of non-hazardous waste / HLRW: High Level Radioactive Waste / ILLRW: Intermediate and Low-Level Radioactive Waste / CRU: Components for reuse / MFR: Material for recycling / MER: Materials for energy recovery / EE: Exported energy

Table 29. Output Flows and Waste Categories over the ESL of 75 years – Norway

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
HWD [kg]	8.57E-04	2.37E-02	3.34E-03	1.23E-01	8.57E-04	1.38E-01	3.40E+00	7.05E-04	1.55E+00	-4.66E-03
NHWD [kg]	7.07E-02	4.67E-01	1.63E-01	1.02E+00	7.07E-02	1.44E+00	4.54E+00	5.81E-02	4.19E-01	-1.04E-01
ILLRW [kg] or [m ³]	8.55E-06	2.29E-04	2.05E-05	6.96E-05	8.55E-06	5.39E-05	7.77E-04	7.03E-06	4.55E-05	-7.63E-05
HLRW [kg] or [m ³]	9.57E-08	6.15E-05	5.74E-07	1.23E-05	9.57E-08	7.61E-06	1.55E-04	7.87E-08	2.86E-06	-1.33E-06
CRU [kg]	-	-	-	-	-	-	-	-	-	-
MFR [kg]	-	1.18E-02	-	9.99E-04	-	-	2.56E-02	-	-	-
MER [kg]	-	-	-	-	-	-	-	-	-	-
EE [MJ. LHV]	-	1.97E-01	-	7.74E-01	-	-	4.81E+01	-	2.31E+01	-



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According to ISO 14025,
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Table 30. Output Flows and Waste Categories over the ESL of 75 years – Europe

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4	D
HWD [kg]	2.85E-01	8.57E-04	2.37E-02	1.82E-03	1.18E-01	1.90E-01	1.06E+00	7.02E-04	9.87E-02	-5.27E-03
NHWD [kg]	2.18E+00	7.07E-02	4.67E-01	1.50E-01	1.04E+00	2.01E+00	1.34E+01	5.81E-02	2.75E+00	-7.17E-02
ILLRW [kg] or [m ³]	1.56E-04	8.55E-06	2.29E-04	1.79E-05	6.91E-05	3.56E-04	1.02E-03	6.90E-06	2.43E-05	-4.49E-05
HLRW [kg] or [m ³]	3.08E-05	9.57E-08	6.15E-05	2.03E-07	1.23E-05	8.91E-05	2.18E-04	7.85E-08	4.07E-06	-7.12E-06
CRU [kg]	-	-	-	-	-	-	-	-	-	-
MFR [kg]	-	-	1.18E-02	-	1.00E-01	-	2.24E-01	-	-	-
MER [kg]	-	-	-	-	-	-	-	-	-	-
EE [MJ. LHV]	-	-	1.97E-01	-	7.87E-02	-	1.25E+01	-	5.96E+00	-

Table 31. Carbon Emissions and Removals

PARAMETER	A1	A2	A3	A4	A5	B2	B4	C2	C4
BCRP [kg CO ₂]	-	-	-	-	-	-	-	-	-
BCEP [kg CO ₂]	-	-	-	-	-	-	-	-	-
BCRK [kg CO ₂]	-	-	5.27E-01	-	-	-	1.05E+00	-	-
BCEK [kg CO ₂]	-	-	-	-	5.27E-01	-	1.05E+00	-	-
BCEW [kg CO ₂]	-	-	-	-	-	-	-	-	-
CCE [kg CO ₂]	-	-	-	-	-	-	-	-	-
CCR [kg CO ₂]	-	-	-	-	-	-	-	-	-
CWNR [kg CO ₂]	-	-	-	-	-	-	-	-	-

BCRP: Biogenic Carbon Removal from Product / BCEP: Biogenic Carbon Emission from Product / BCRK: Biogenic Carbon Removal from Packaging / BCEK: Biogenic Carbon Emission from Packaging / BCEW: Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes / CCE: Calcination Carbon Emissions / CCR: Carbonation Carbon Removals / CWNR: Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes



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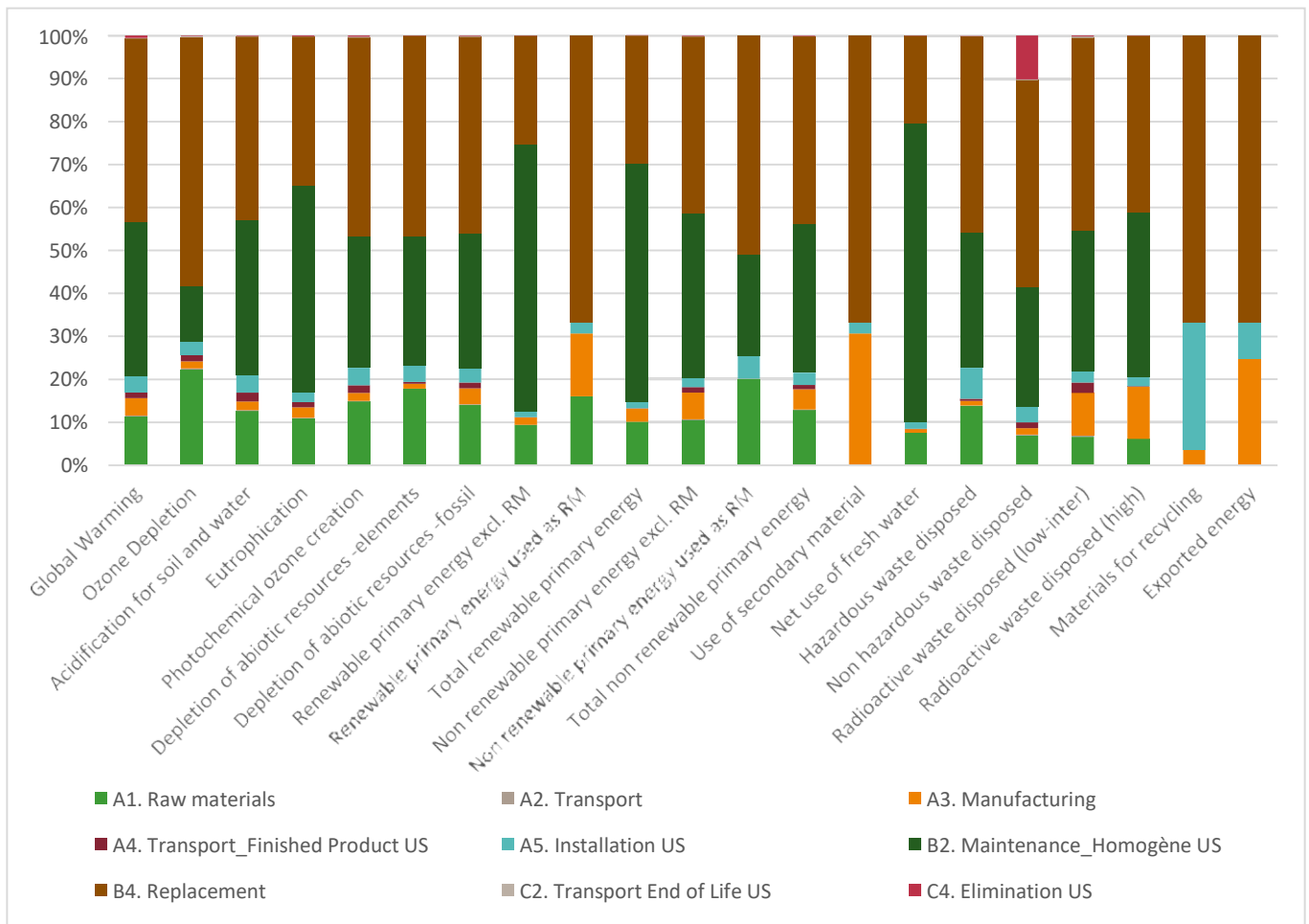


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5. LCA Interpretation

Figure 5: Graph depicting selection of impact indicator results calculated according to EN 15804 – US



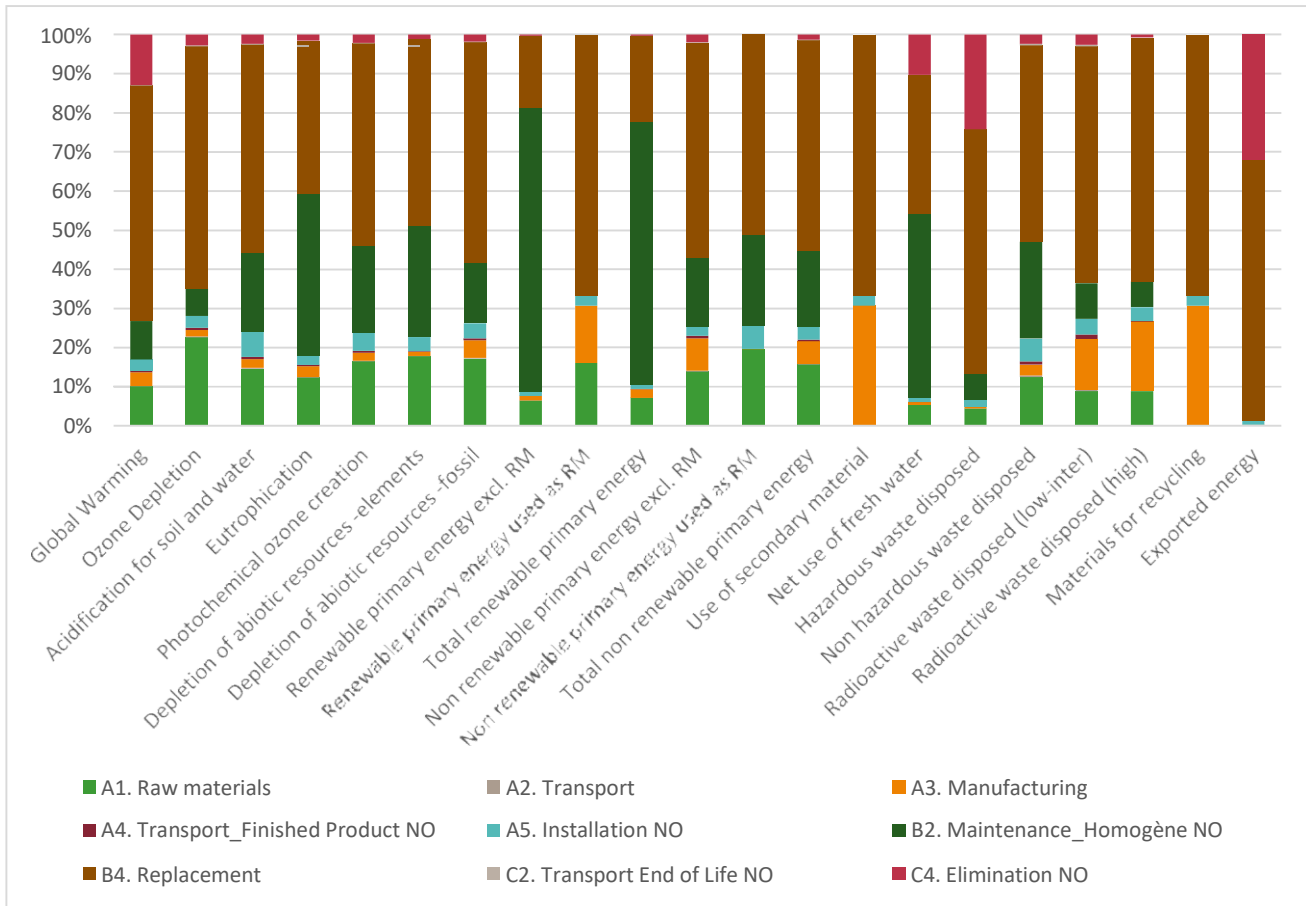
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Figure 6: Graph depicting selection of impact indicator results calculated according to EN 15804 – Norway



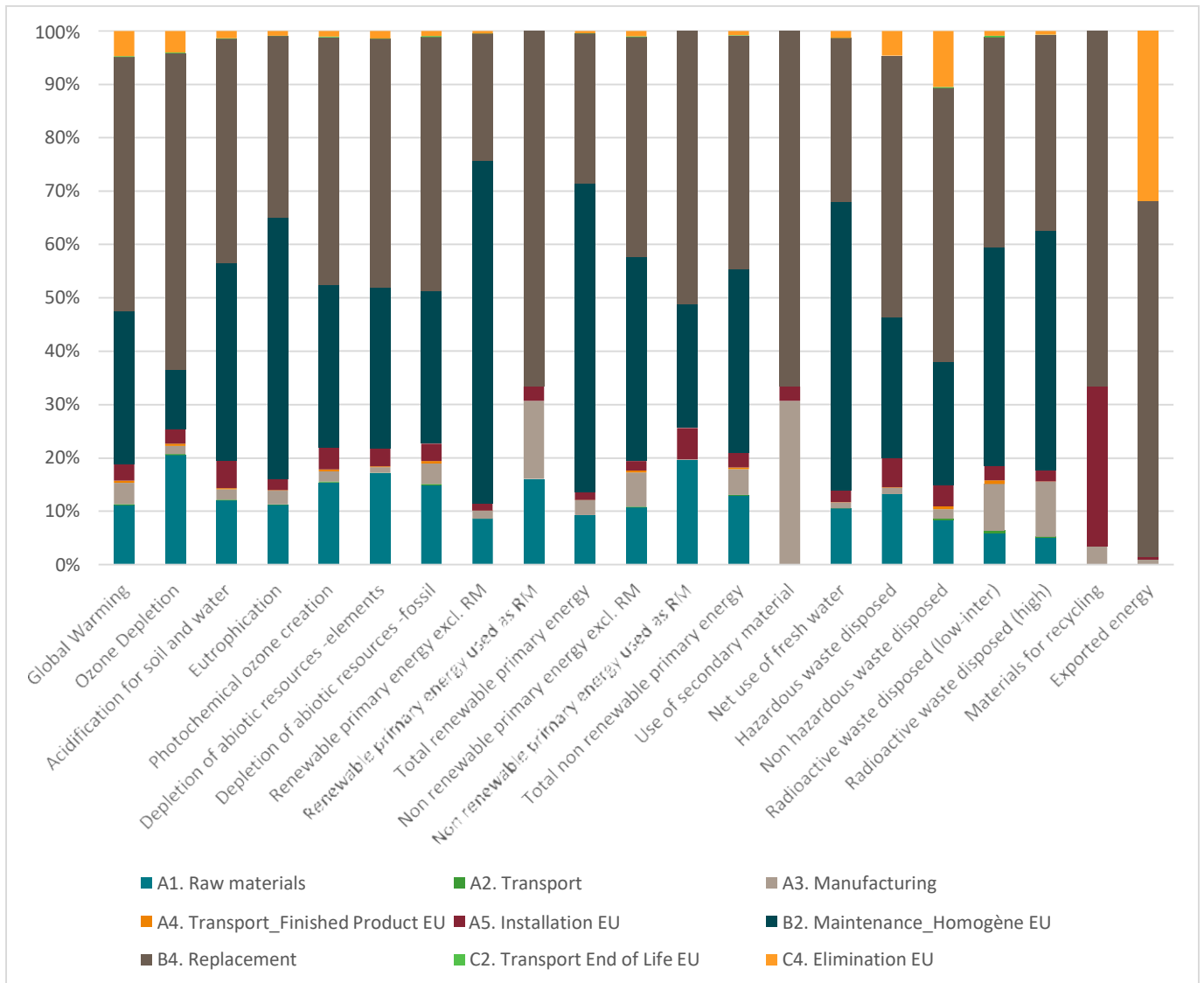
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According to ISO 14025,
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Figure 7: Graph depicting selection of impact indicator results calculated according to EN 15804 – Europe



The primary contributor to the environmental impacts of the product is B4 – Replacement, which requires the production of two additional products and A1 – Extraction and transformation of the raw materials is impactful. Then comes B2 – Maintenance stage because of the scenario of both long reference service life (RSL) of 25 years and the assumption of a weekly cleaning by using a machine and detergent. Stages A3 – Manufacturing and C4 – End of life (for Norway) have the following greatest impacts.



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6. Additional Environmental Information

6.1 Environment and Health During Manufacturing

Gerflor's factory conforms to the ISO 14001 Environmental Management System and the ISO 50001 Energy Management System.

Gerflor uses 100% certified renewable electricity in its plants.

6.2 Environment and Health During Installation

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

6.3 Extraordinary Effects

Fire

Fire behaviour have been tested according to EN 13501-1. Product is classified Bfl-S1.

There's no test available for possible environmental impacts during fire.

Class 1 when tested in accordance with ASTM E 648. Standard Test Method for Critical Radiant Flux

Flaming & Non-Flaming when tested in accordance with ASTM E 662. Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

Water

There's no test available for possible impacts following unforeseeable influence of water.

Mechanical Destruction

Mechanical damage does not chemically alter the product.

6.4 Delayed Emissions

No delayed emissions are taken into account.



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6.5 Environmental Activities and Certifications



FloorScore®

Indoor Air Quality Certified to SCS-EC10.3-2014 v4.0

Registration

SCS-FS-02146

SCS-FS-02145



M1 Standard

Certificate n°3585

6.6 Further Information

Additional information can be found in <https://www.gerflor.com/>

7. Supporting Documentation

All documentation necessary to confirm the data provided in this EPD has been submitted to the critical reviewer.

8. References

ISO 14025

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

ISO 21930

ISO 21930 :2017 : Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services

EN 15804

EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

UL Environment

UL Environment General Program Instructions July 2018. version 2.4



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According to ISO 14025,
EN 15804 and ISO 21930:2017

UL Standard 10010. PCR Part A

PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. 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 V3.6

ecoinvent Life Cycle Inventory database Version 3.6 <http://www.ecoinvent.org>



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9. Contact information

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