

**Declaration Owner**

BerryAlloc

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The EPD owner has the sole ownership, liability, and responsibility for the EPD

Product

Vinyl Flooring

Functional Unit

The functional unit is one square meter of flooring over a 75-year period

EPD Number and Period of Validity

SCS-EPD-10321

EPD Valid January 24, 2025 through January 23, 2030

Product Category Rule

Product Category Rule.PCR2019:14. Construction Products. International EPD® System. Version 1.3.2. December 2023

Complementary Product Category Rules (c-PCR) To PCR 2019:14. Resilient, Textile And Laminate Floor Coverings (EN 16810:2017). International EPD® System. Version 2019-12-20. December 2019

CEN standard EN 15804 serves as the core Product Category Rules (PCR)

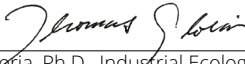
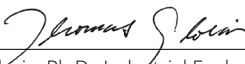
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Declaration Owner:	BerryAlloc
Address:	Industrielaan 100 8930 Menen, Belgium
Declaration Number:	SCS-EPD-10321
Declaration Validity Period:	January 24, 2025 through January 23, 2030
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Gerard Mansell, Ph.D., SCS Global Services
LCA Software and LCI database:	OpenLCA v1.11 software and the Ecoinvent v3.9.1 database
Product RSL:	15 years
Markets of Applicability:	Europe
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Grave
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
LCA Reviewer:	 Thomas Glória, Ph.D., Industrial Ecology Consultants
Product Category Rule:	Product Category Rule.PCR2019:14. Construction Products. International EPD® System. Version 1.3.2. December 2023.
Part A PCR Review conducted by:	The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile.
Complementary Product Category Rule:	Complementary Product Category Rules (c-PCR) To PCR 2019:14. Resilient, Textile And Laminate Floor Coverings (EN 16810:2017). International EPD® System. Version 2019-12-20. December 2019
Part B PCR Review conducted by:	The Technical Committee of the International EPD® System.
Independent verification of the declaration and data, according to ISO 14025 and the PCR	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
EPD Verifier:	 Thomas Glória, Ph.D., Industrial Ecology Consultants
Declaration Contents:	<ul style="list-style-type: none"> 1. BerryAlloc 2 2. Product 2 3. LCA: Calculation Rules 7 4. LCA: Scenarios and Additional Technical Information 7 5. LCA: Results 10 6. LCA: Interpretation 17 7. References 18

Disclaimers: This EPD conforms to ISO 14025, 14040, 14044, and EN 15804.

Scope of Results Reported: The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.

Accuracy of Results: Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.

Comparability: EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

The owner of the declaration shall be liable for the underlying information and evidence; SCS shall not be liable with respect to manufacturer information, life cycle assessment data, and evidence supplied or made available to SCS.

1. BerryAlloc

Based in Belgium, BerryAlloc offers a wide array of interior solutions for residential and commercial projects, ranging from laminate, vinyl and parquet floors to wall panels. The extensive BerryAlloc product range has a lifetime warranty, is durable and meets current aesthetic and technical requirements: quality, variety of finishes, durability, longevity and ease of installation.

Guided by trends and the latest technological improvements, BerryAlloc strives to inspire and delight their customers with vinyl or laminate floors with a natural stone or wood look for your living room, bedroom, hallway, bathroom, kitchen or home office. BerryAlloc also strives to reduce their impact on the environment and grow in a sustainable way as a profitable company.

2. Product

2.1 PRODUCT DESCRIPTION

The products refer to the ASTM F1700/F3261/ISO 10582/EN16776/ISO19322 standards, which cover solid vinyl floor tiles that are monolithic, surface decorated or printed, and protected by a clear wear layer.

This type of floor covering is intended for use in commercial, light commercial, and residential buildings.

The flooring product layers from top to bottom are: PU coating, wear-resistant layer, color film layer, substrate layer 1 and substrate layer 2. Advantages of the products include:

- It has personalized design;
- Waterproof, no bulging in water;
- Fire prevention, belongs to the Bfl-s1 grade;
- Formaldehyde emission belongs to E1 level;
- No phthalates, no heavy metals;
- Low VOC Emission.

The following vinyl flooring products included in the EPD scope are summarized in Table 1.

Table 1. *BerryAlloc flooring products included in the LCA scope.*

Product Name	Product Thickness (mm)	Product weight (kg/m ²)	Manufacturing Facility Location	Consumer Markets	Overall Thickness (mm)	Length (mm)	Width (mm)
LVT Vinyl Flooring (2.5mm)	2.5	4.5	China	Global	1.2-10.0	200-2000	100-2000
SPC Vinyl Flooring (5.5mm)	5.5	9.0	China	Europe	3.0-12.0	200-2000	100-2000

2.2 PRODUCT FLOW DIAGRAM

A flow diagram illustrating the production processes and life cycle phases included in the scope of the EPD is provided below.



2.3 APPLICATION

The products provide the primary function of flooring for interior applications. The flooring products are used in various residential and commercial applications including retail, healthcare, education, and hospitality.

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation and use, and product disposal. The LCA is conducted using an attributional approach. The environmental loads and benefits resulting from recyclable materials leaving a product system (Module D) are negligible. Cut-off and allocation procedures are described below and conform to the PCR and ISO standards.

The life cycle phases included in the product system boundary are shown below.



Table 2. Life cycle phases included in the product system boundary.

	Product			Construction Process		Use							End-of-life				Benefits and loads beyond the system boundary
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
Modules Declared	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Geography	GLO	GLO	CN	GLO	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Share of specific data	>90%			>90%		-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	-			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	-			-		-	-	-	-	-	-	-	-	-	-	-	-

X = Included in system boundary

MND = Module not declared

GLO = Global; CN = China; EU = Europe

2.5 TECHNICAL DATA

Technical specifications for the vinyl flooring products are summarized in Table 3 and Table 4.

Table 3. Product characteristics for the BerryAlloc LVT Vinyl Flooring (2.5mm) flooring product.

Characteristic			Description			
Sustainable certifications			-			
VOC emissions test method			Indoor Air Comfort Gold, EN16516			
Characteristic			Average Value	Unit	Min Value	Max Value
Product thickness			2.50 (0.10)	mm (inch)	2.4 (0.10)	2.63 (0.10)
Wear layer thickness (where applicable)			0.55 (0.02)	mm (inch)	0.50 (0.02)	0.62 (0.02)
Product weight			4,500 (14.75)	g/m ² (oz/ft ²)	4,050 (13.27)	5,085 (16.66)
Product Form	Planks	Width	184.2 (7.25)	mm (in)	184.0 (7.24)	184.3 (7.26)
		Length	1.22 (4.00)	m (ft)	1.219(4.00)	1.225(4.02)

Table 4. Product characteristics for the BerryAlloc SPC Vinyl Flooring (5.5mm) flooring product.

Characteristic		Description			
Sustainable certifications		-			
VOC emissions test method		Indoor Air Comfort Gold, EN16516			
Characteristic		Average Value	Unit	Min Value	Max Value
Product thickness		5.50 (0.22)	mm (in)	5.00 (0.20)	6.50 (0.26)
Wear layer thickness (where applicable)		0.55 (0.022)	mm (in)	0.45 (0.018)	0.57 (0.022)
Product weight		5,310 (17.4)	g/m ² (oz/ft ²)	4,779 (15.7)	6,000 (19.7)
Product Form	Planks	Width	229 (9.00)	mm (in)	128 (5.04)
		Length	1,524 (60.00)	mm (in)	640 (25.20)

2.6 MARKET PLACEMENT/APPLICATION RULES

Technical specifications of the flooring products are summarized above. Detailed product performance results can be found on the manufacturer's website <https://www.berryalloc.com>.

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

The luxury vinyl flooring products are delivered for installation in the form of planks of various dimensions.

2.8 MATERIAL COMPOSITION

The primary materials include polyvinyl chloride (PVC), plasticizers, fillers and various stabilizers and coatings.

Table 5. Average material component summary for the BerryAlloc products by mass in kg/m² and as a percentage of total mass. All values in the table have been rounded; masses to three significant figures, percentages to two significant figures.

Component	Renewable	Recycled Content (%)	LVT Vinyl Flooring (2.5mm)	SPC Vinyl Flooring (5.5mm)
PVC	No	0%	1.04	2.00
			23%	22%
Re-grind	No	100%	1.37	2.76
			31%	31%
CaCO ₃	No	0%	1.11	2.29
			25%	25%
Plasticizer	No	0%	0.434	0.744
			9.6%	8.3%
Stabilizer	No	0%	0.236	0.172
			5.2%	1.9%
IXPE; PE	No	0%	0.00	0.114
			0%	1.3%
Other	No	0%	0.314	0.920
			7%	10%
Total Product			4.50	9.00
			100%	100%

Based on a review of the product components provided by the manufacturer, no regulated chemicals, i.e., substances of Very High Concern (SVHC) or substances on the REACH Candidate List, were identified in the product or product components.

2.9 MANUFACTURING

The products are manufactured at the company's production facilities in the People's Republic of China (China). The luxury vinyl flooring is made primarily from polyvinyl chloride (PVC), calcium carbonate (mineral reinforcement), plasticizers and additives (i.e., pigments and stabilizers). These flooring products are structured into a number of layers, with a polyurethane (PU) protective layer, a clear embossed PVC wear layer, a high definition photographic layer, stability and backing layers and a mineral filler. Post-industrial recycled material is included in the products.

The production of luxury vinyl tile flooring involves the following general manufacturing processes. The raw materials are first mixed and heated. The mixture is then calendared into a sheet to create the backing or the transparent wear layers. The sheets are cut and laminated with a print film. The semi-finished product is coated with a lacquer and annealed. Finally, the product is cut into planks and packaged. Quality checks are made at each step of the production process.

2.10 PACKAGING

The products are packaged for shipment using cardboard cartons and plastic wrap.

Table 6. Material content for the flooring product packaging in kg per square meter. All values in the table have been rounded; masses to three significant figures, percentages to two significant figures.

Component	Renewable	Recycled Content (%)	LVT Vinyl Flooring (2.5mm)	SPC Vinyl Flooring (5.5mm)
Corrugated	Yes	0%	1.40	1.40
			69%	90%
Plastic	No	0%	0.630	0.150
			31%	9.7%
Total Packaging			2.03	1.55
			100%	100%

2.11 PRODUCT INSTALLATION

Installation of the product is accomplished using hand tools with negligible impacts. Approximately 4% installation waste is assumed. The impacts associated with packaging disposal, as well as the production, transport and disposal of installation waste are included with the installation phase as per PCR requirements.

2.12 USE CONDITIONS

No special conditions of use are noted.

2.13 REFERENCE SERVICE LIFE

The Reference Service Life (RSL) of the flooring products is 15 years.

2.14 RE-USE PHASE

The flooring products are not reused at end-of-life.

2.15 DISPOSAL

At end-of-life, the products are disposed of in a landfill.

2.16 FURTHER INFORMATION

Further information on the product can be found on the manufacturer's website <https://www.berryalloc.com>

3. LCA: Calculation Rules

3.1 FUNCTIONAL UNIT

The functional unit used in the study is defined as 1 m² of floor covering installed for use over a 75-year period. The corresponding reference flow for the product system is presented in Table 7. For the present assessment, a reference service lifetime (RSL) corresponding to the manufacturer's warranted lifetime is assumed. The total number of required product lifecycles during the 75-year period over which the product system is modeled is also summarized for the product in Table 7.

Table 7. Reference flows and RSL for the BerryAlloc flooring products.

Product Name	Product Thickness (mm)	Reference flow (kg/m ²)	Reference Service Life – RSL (years)	Replacement Cycle (ESL/RSL-1)
LVT Vinyl Flooring (2.5mm)	2.5	4.50	10	6.5
SPC Vinyl Flooring (5.5mm)	5.5	9.0	15	4.0

4. LCA: Scenarios and Additional Technical Information

Delivery and Installation stage (A4 – A5)

Distribution of the flooring products to the point of sale is included, based on data from the manufacturer. Transportation parameters for modeling product distribution are summarized in Table 8.

Table 8. Product distribution parameters, per 1 m².

Parameter	Unit	Value	
Ground transport			
Fuel type	-	Diesel	
Liters of fuel	L/100km	18.7	
Vehicle type	-	Diesel truck	
Capacity utilization	%	76	
Ocean transport			
Fuel type	-	Fuel oil	
Liters of fuel	L/tkm	2.23	
Vehicle type	-	Ocean freighter	
Capacity utilization	%	70	
Product Name/Consumer Market	Gross mass transported (kg)	Transport Distance (km)	
		Road	Ship
LVT Vinyl Flooring (2.5mm)	6.53	203	18,556
SPC Vinyl Flooring (5.5mm)	10.6	825	9,900

Installation of the product is accomplished using hand tools with no associated emissions and negligible impacts. Approximately 4% installation waste is assumed landfilled. The impacts associated with packaging disposal, as well as the production, transport and disposal of installation waste are included with the installation phase as per PCR requirements. Modeling parameters for product installation are summarized in Table 9.

Table 9. Installation parameters for the flooring products, per 1 m².

Parameter		LVT Vinyl Flooring (2.5mm)	SPC Vinyl Flooring (5.5mm)
Ancillary materials (kg)		neg.	neg.
Net freshwater consumption (m ³)		-	-
Electricity consumption (kWh)		-	-
Product loss per functional unit (kg)		0.180	0.360
Waste materials generated by product installation (kg)		0.261	1.55
Output materials resulting from on-site waste processing (kg)		n/a	n/a
Mass of packaging waste (kg)	Corrugated	1.40	1.40
	Plastic	0.150	0.15
Biogenic carbon contained in packaging (kg CO ₂)		2.57	2.57
Direct emissions (kg)		-	-

Use stage (B1)

No impacts are associated with the use of the product over the Reference Service Lifetime.

Maintenance stage (B2)

According to the manufacturer, typical maintenance involves regular sweeping and damp mopping, as well as periodic machine cleaning of the vinyl flooring. The present assessment is based on a recommended weekly cleaning schedule including sweeping and mopping with a neutral cleaner and monthly machine cleaning. The parameters used to model the product maintenance are summarized in Table 10.

Table 10. Maintenance parameters for the flooring products, per 1 m².

Parameter	Unit	LVT Vinyl Flooring (2.5mm)	SPC Vinyl Flooring (5.5mm)
Maintenance cycle	Cycles / RSL	520	780
Maintenance cycle	Cycles / ESL	3,900	3,900
Maintenance process	-	Damp mopping	Damp mopping
Net freshwater consumption	m ³ /m ² /yr	0.0058	0.0058
Cleaning agent	kg/m ² /yr	0.0119	0.0119
Maintenance process	-	Machine cleaning	Machine cleaning
Electricity	kWh/m ² /yr	0.022	0.022
Further assumptions	-	Moderate traffic; weekly maintenance	Moderate traffic; weekly maintenance

Repair/Refurbishment stage (B3; B5)

Product repair and refurbishment are not relevant during the lifetime of the product.

Replacement stage (B4)

The materials and energy required for replacement of the product over the 75-year estimated service Lifetime of the assessment are included in this stage. Modeling parameters for the product replacement stage are summarized in Table 11.

Table 11. Product replacement parameters for the flooring products, per 1 m².

Parameter	Units	LVT Vinyl Flooring (2.5mm)	SPC Vinyl Flooring (5.5mm)
Reference service life	Years	10	15
Replacement cycle	-	6.5	4.0
Energy input	kWh	0	0
Freshwater consumption	m ³	0	0
Ancillary materials	kg	Negligible	Negligible
Replacement parts	kg	42.45	42.20
Direct emissions	kg	0	0

Building operation stage (B6 – B7)

There is no operational energy or water use associated with the use of the product.

Disposal stage (C1 – C4)

The disposal stage includes demolition of the products (C1); transport of the flooring products to waste treatment facilities (C2); waste processing (C3); and associated emissions as the product degrades in a landfill (C4). For the flooring products, no emissions are generated during demolition (C1) while no waste processing (C3) is required for landfill disposal.

Transportation of waste materials at end-of-life (C2) assumes a 161 km average distance to disposal, as specified by the PCR. A 10% recycling rate is assumed for the product packaging materials, consistent with the PCR. No recycling of the product materials is assumed at end-of-life. The end-of-life disposal scenario modeling parameters are summarized in Table 12.

Table 12. End-of-life disposal scenario parameters for the flooring products.

Product	Assumptions for scenario development	Collected with mixed construction waste (kg)	Recovery	Disposal – Landfill (kg)	Removals of biogenic carbon (kg CO ₂ eq)
LVT Vinyl Flooring (2.5mm)	100% landfill	6.53	n/a	6.53	n/a
SPC Vinyl Flooring (5.5mm)	100% landfill	9.00	n/a	9.00	n/a



5. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All LCA results are stated to three significant figures in agreement with the PCR for this flooring product and therefore the sum of the total values may not exactly equal 100%.

The impact indicators specified by the PCR include:

- Potential for Global Warming,
- Acidification Potential,
- Eutrophication Potential,
- Ozone Depletion Potential,
- Photochemical Ozone (smog) Creation Potential.
- Ecotoxicity,
- Human Toxicity, and
- Land Use/Land Occupation

Impact category indicators for acidification, eutrophication, ozone depletion potential and photochemical ozone creation are estimated using the characterization factors¹, as prescribed by the PCR, including from CML-IA and ReCiPe methodologies as well as those defined by EN 15804 reference package based on EF 3.0. Impact indicators for Ecotoxicity and Human Toxicity are estimated using the USEtox 2.02 characterization method, while Land Occupation impacts are estimated using the ReCiPe 2016 version 1.1 methodology. The impact category indicators included in the assessment are summarized below.

Note that the use of the results of modules A1-A3 without considering the results of module C is discouraged.

¹ <https://www.environdec.com/resources/indicators>

Table 13. Key Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. (LVT Vinyl Flooring (2.5mm))

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Key Indicators									
Climate change (kg CO ₂ eq)	6.36	0.341	3.57	1.51	2.16	2.55	119	1.03	3.41
	4.5%	0.24%	2.5%	1.1%	1.5%	1.8%	85%	0.73%	2.4%
Climate change - Biogenic (kg CO ₂ eq)	2.26x10 ⁻²	1.47x10 ⁻⁴	-0.780	-7.82x10 ⁻⁵	0.614	1.51x10 ⁻²	19.3	2.14x10 ⁻⁴	3.11
	0.1%	0.00066%	-3.5%	-0.00035%	2.8%	0.068%	87%	0.00096%	14%
Climate change - Fossil (kg CO ₂ eq)	6.33	0.341	4.33	1.51	1.54	2.54	100	1.03	0.302
	5.4%	0.29%	3.7%	1.3%	1.3%	2.2%	85%	0.87%	0.26%
Climate change - Land use and LU change (kg CO ₂ eq)	5.96x10 ⁻³	1.74x10 ⁻⁴	1.77x10 ⁻²	1.08x10 ⁻³	1.07x10 ⁻³	1.60x10 ⁻³	0.170	1.27x10 ⁻⁴	8.48x10 ⁻⁵
	3%	0.088%	8.9%	0.54%	0.54%	0.81%	86%	0.064%	0.043%
GWP-GHG (IPCC AR6)	6.10	0.332	4.40	1.48	1.82	2.44	113	0.998	2.25
	4.6%	0.25%	3.3%	1.1%	1.4%	1.8%	85%	0.75%	1.7%
Acidification (mol H ⁺ eq)	2.88x10 ⁻²	1.46x10 ⁻³	2.07x10 ⁻²	3.78x10 ⁻²	6.30x10 ⁻³	1.21x10 ⁻²	0.658	5.49x10 ⁻³	6.85x10 ⁻⁴
	3.7%	0.19%	2.7%	4.9%	0.82%	1.6%	85%	0.71%	0.089%
Eutrophication, freshwater (kg P eq)	1.95x10 ⁻³	2.71x10 ⁻⁵	1.24x10 ⁻³	6.15x10 ⁻⁵	1.45x10 ⁻⁴	5.82x10 ⁻⁴	2.27x10 ⁻²	1.87x10 ⁻⁵	5.68x10 ⁻⁵
	7.3%	0.1%	4.6%	0.23%	0.54%	2.2%	85%	0.07%	0.21%
Eutrophication, marine (kg N eq)	5.36x10 ⁻³	5.37x10 ⁻⁴	6.36x10 ⁻³	9.57x10 ⁻³	2.71x10 ⁻³	2.10x10 ⁻³	0.218	2.38x10 ⁻³	6.60x10 ⁻³
	2.1%	0.21%	2.5%	3.8%	1.1%	0.83%	86%	0.94%	2.6%
Eutrophication, terrestrial (mol N eq)	5.64x10 ⁻²	5.75x10 ⁻³	4.93x10 ⁻²	0.106	2.15x10 ⁻²	2.25x10 ⁻²	1.73	2.58x10 ⁻²	2.03x10 ⁻³
	2.8%	0.28%	2.4%	5.2%	1.1%	1.1%	86%	1.3%	0.1%
Ozone depletion (kg CFC11 eq)	5.36x10 ⁻⁶	5.27x10 ⁻⁹	5.58x10 ⁻⁸	2.26x10 ⁻⁸	2.26x10 ⁻⁷	1.39x10 ⁻⁸	3.70x10 ⁻⁵	1.57x10 ⁻⁸	1.51x10 ⁻⁹
	13%	0.012%	0.13%	0.053%	0.53%	0.033%	87%	0.037%	0.0035%
Photochemical ozone formation (kg NMVOC eq)	2.27x10 ⁻²	1.97x10 ⁻³	1.78x10 ⁻²	2.89x10 ⁻²	7.90x10 ⁻³	1.27x10 ⁻²	0.590	1.01x10 ⁻²	1.41x10 ⁻³
	3.3%	0.28%	2.6%	4.2%	1.1%	1.8%	85%	1.5%	0.2%
Particulate matter (disease inc.)	2.43x10 ⁻⁷	2.23x10 ⁻⁸	2.96x10 ⁻⁷	5.20x10 ⁻⁸	8.53x10 ⁻⁸	1.14x10 ⁻⁷	5.42x10 ⁻⁶	1.26x10 ⁻⁷	9.32x10 ⁻⁹
	3.8%	0.35%	4.6%	0.82%	1.3%	1.8%	85%	2%	0.15%

Table 14. Key Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. (SPC Vinyl Flooring (5.5mm))

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Key Indicators									
Climate change (kg CO ₂ eq)	10.5	0.708	2.06	2.78	1.96	2.55	107	2.05	6.74
	7.7%	0.52%	1.5%	2%	1.4%	1.9%	79%	1.5%	4.9%
Climate change - Biogenic (kg CO ₂ eq)	3.97x10 ⁻²	2.75x10 ⁻⁴	-0.727	5.69x10 ⁻⁴	0.778	1.51x10 ⁻²	24.9	4.29x10 ⁻⁴	6.14
	0.13%	0.00088%	-2.3%	0.0018%	2.5%	0.048%	80%	0.0014%	20%
Climate change - Fossil (kg CO ₂ eq)	10.4	0.708	2.77	2.78	1.19	2.54	82.0	2.05	0.607
	9.9%	0.67%	2.6%	2.6%	1.1%	2.4%	78%	2%	0.58%
Climate change - Land use and LU change (kg CO ₂ eq)	1.33x10 ⁻²	3.73x10 ⁻⁴	1.62x10 ⁻²	1.68x10 ⁻³	1.32x10 ⁻³	1.60x10 ⁻³	0.133	2.54x10 ⁻⁴	1.68x10 ⁻⁴
	7.9%	0.22%	9.6%	1%	0.79%	0.95%	79%	0.15%	0.1%
GWP-GHG (IPCC AR6)	10.0	0.689	2.92	2.71	1.56	2.44	97.3	2.00	4.45
	8.1%	0.55%	2.4%	2.2%	1.3%	2%	78%	1.6%	3.6%
Acidification (mol H ⁺ eq)	4.82x10 ⁻²	4.34x10 ⁻³	1.41x10 ⁻²	3.89x10 ⁻²	6.33x10 ⁻³	1.21x10 ⁻²	0.497	1.10x10 ⁻²	1.36x10 ⁻³
	7.6%	0.69%	2.2%	6.1%	1%	1.9%	78%	1.7%	0.22%
Eutrophication, freshwater (kg (PO ₄) ³⁻ eq)	3.01x10 ⁻³	5.38x10 ⁻⁵	8.46x10 ⁻⁴	1.70x10 ⁻⁴	1.77x10 ⁻⁴	5.82x10 ⁻⁴	1.76x10 ⁻²	3.75x10 ⁻⁵	1.12x10 ⁻⁴
	13%	0.24%	3.7%	0.75%	0.78%	2.6%	78%	0.17%	0.5%
Eutrophication, marine (kg N eq)	9.23x10 ⁻³	1.41x10 ⁻³	5.06x10 ⁻³	1.06x10 ⁻²	2.84x10 ⁻³	2.10x10 ⁻³	0.188	4.77x10 ⁻³	1.31x10 ⁻²
	3.9%	0.6%	2.1%	4.5%	1.2%	0.89%	79%	2%	5.5%
Eutrophication, terrestrial (mol N eq)	9.52x10 ⁻²	1.53x10 ⁻²	3.55x10 ⁻²	0.116	2.02x10 ⁻²	2.25x10 ⁻²	1.35	5.16x10 ⁻²	4.06x10 ⁻³
	5.6%	0.89%	2.1%	6.8%	1.2%	1.3%	79%	3%	0.24%
Ozone depletion (kg CFC11 eq)	6.55x10 ⁻⁶	1.09x10 ⁻⁸	4.71x10 ⁻⁸	4.23x10 ⁻⁸	2.72x10 ⁻⁷	1.39x10 ⁻⁸	2.78x10 ⁻⁵	3.14x10 ⁻⁸	3.02x10 ⁻⁹
	19%	0.031%	0.14%	0.12%	0.78%	0.04%	80%	0.09%	0.0087%
Photochemical ozone formation (kg NMVOC eq)	3.62x10 ⁻²	4.93x10 ⁻³	1.13x10 ⁻²	3.34x10 ⁻²	7.34x10 ⁻³	1.27x10 ⁻²	0.465	2.02x10 ⁻²	2.81x10 ⁻³
	6.1%	0.83%	1.9%	5.6%	1.2%	2.1%	78%	3.4%	0.47%
Particulate matter (disease inc.)	4.16x10 ⁻⁷	4.44x10 ⁻⁸	2.35x10 ⁻⁷	1.41x10 ⁻⁷	8.01x10 ⁻⁸	1.14x10 ⁻⁷	4.75x10 ⁻⁶	2.52x10 ⁻⁷	1.86x10 ⁻⁸
	6.9%	0.73%	3.9%	2.3%	1.3%	1.9%	78%	4.2%	0.31%

Table 15. Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. (LVT Vinyl Flooring (2.5mm))

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Other Indicators									
Freshwater ecotoxicity (PAF.m ³ .day)	102,000	1,470	51,500	2,970	19,000	34,100	2.60x10 ⁶	936	223,000
	3.4%	0.048%	1.7%	0.098%	0.62%	1.1%	86%	0.031%	7.3%
Human toxicity, cancer (cases)	4.31x10 ⁻⁷	2.29x10 ⁻⁸	2.49x10 ⁻⁷	8.63x10 ⁻⁸	5.25x10 ⁻⁸	1.60x10 ⁻⁷	6.34x10 ⁻⁶	1.92x10 ⁻⁸	1.14x10 ⁻⁷
	5.8%	0.31%	3.3%	1.2%	0.7%	2.1%	85%	0.26%	1.5%
Human toxicity, non-cancer (cases)	2.70x10 ⁻⁶	4.57x10 ⁻⁸	1.02x10 ⁻⁶	8.81x10 ⁻⁸	4.08x10 ⁻⁷	3.66x10 ⁻⁷	3.87x10 ⁻⁵	4.13x10 ⁻⁸	1.65x10 ⁻⁶
	6%	0.1%	2.3%	0.2%	0.91%	0.81%	86%	0.092%	3.7%
Land use (species.yr)	8.07x10 ⁻¹⁰	1.12x10 ⁻¹⁰	8.70x10 ⁻⁹	1.27x10 ⁻¹⁰	4.27x10 ⁻¹⁰	3.29x10 ⁻¹⁰	6.72x10 ⁻⁸	4.71x10 ⁻¹¹	1.20x10 ⁻¹⁰
	1%	0.14%	11%	0.16%	0.55%	0.42%	86%	0.06%	0.15%
Resource use, fossils (MJ) ¹	133	4.72	80.5	18.6	15.8	62.7	1,730	13.0	1.45
	6.4%	0.23%	3.9%	0.9%	0.77%	3%	84%	0.63%	0.07%
Resource use, minerals and metals (kg Sb eq) ¹	6.71x10 ⁻⁵	1.07x10 ⁻⁶	1.24x10 ⁻⁵	2.00x10 ⁻⁶	3.65x10 ⁻⁶	1.88x10 ⁻⁵	5.66x10 ⁻⁴	6.45x10 ⁻⁷	2.43x10 ⁻⁷
	10%	0.16%	1.8%	0.3%	0.54%	2.8%	84%	0.096%	0.036%
Water use (m ³ depriv.) ¹	0.705	2.43x10 ⁻²	1.39	5.65x10 ⁻²	0.113	19.7	15.4	2.62x10 ⁻²	5.58x10 ⁻²
	1.9%	0.065%	3.7%	0.15%	0.3%	52%	41%	0.07%	0.15%

¹⁾ The results of this environmental impact indicator shall be used with care as uncertainties on these results are high or as there is limited experience with the indicator

Table 16. Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. (SPC Vinyl Flooring (5.5mm))

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Other Indicators									
Freshwater ecotoxicity (PAF.m ³ .day)	168,000 4.8%	2,900 0.083%	40,100 1.1%	8,910 0.25%	32,400 0.92%	34,100 0.97%	2.78x10 ⁶ 79%	1,870 0.053%	440,000 13%
Human toxicity, cancer (cases)	7.03x10 ⁻⁷ 9.7%	4.68x10 ⁻⁸ 0.65%	1.66x10 ⁻⁷ 2.3%	1.73x10 ⁻⁷ 2.4%	6.49x10 ⁻⁸ 0.89%	1.60x10 ⁻⁷ 2.2%	5.68x10 ⁻⁶ 78%	3.84x10 ⁻⁸ 0.53%	2.27x10 ⁻⁷ 3.1%
Human toxicity, non-cancer (cases)	2.04x10 ⁻⁶ 5.8%	9.01x10 ⁻⁸ 0.26%	8.53x10 ⁻⁷ 2.4%	2.74x10 ⁻⁷ 0.78%	3.48x10 ⁻⁷ 0.99%	3.66x10 ⁻⁷ 1%	2.79x10 ⁻⁵ 79%	8.27x10 ⁻⁸ 0.23%	3.28x10 ⁻⁶ 9.3%
Land use (species.yr)	1.40x10 ⁻⁹ 2.5%	2.18x10 ⁻¹⁰ 0.38%	8.28x10 ⁻⁹ 15%	5.96x10 ⁻¹⁰ 1.1%	4.52x10 ⁻¹⁰ 0.8%	3.29x10 ⁻¹⁰ 0.58%	4.51x10 ⁻⁸ 80%	9.42x10 ⁻¹¹ 0.17%	2.39x10 ⁻¹⁰ 0.42%
Resource use, fossils (MJ) ¹	218 12%	9.70 0.54%	39.3 2.2%	36.5 2%	17.0 0.94%	62.7 3.5%	1,400 77%	26.0 1.4%	2.90 0.16%
Resource use, minerals and metals (kg Sb eq) ¹	1.17x10 ⁻⁴ 16%	2.11x10 ⁻⁶ 0.29%	7.37x10 ⁻⁶ 1%	6.37x10 ⁻⁶ 0.88%	5.60x10 ⁻⁶ 0.78%	1.88x10 ⁻⁵ 2.6%	5.63x10 ⁻⁴ 78%	1.29x10 ⁻⁶ 0.18%	4.82x10 ⁻⁷ 0.067%
Water use (m ³ depriv.) ¹	0.320 1.2%	4.83x10 ⁻² 0.17%	0.831 3%	0.154 0.56%	7.63x10 ⁻² 0.28%	19.7 71%	6.37 23%	5.23x10 ⁻² 0.19%	0.111 0.4%

¹⁾ The results of this environmental impact indicator shall be used with care as uncertainties on these results are high or as there is limited experience with the indicator

Table 17. Resource use and waste flows for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. **(LVT Vinyl Flooring (2.5mm))**

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Resources									
Use of renewable primary energy (MJ)	5.13	6.01x10 ⁻²	22.4	0.152	1.14	1.72	188	5.13x10 ⁻²	6.08x10 ⁻²
	2.3%	0.027%	10%	0.069%	0.52%	0.78%	86%	0.023%	0.028%
Use of renewable primary energy resources used as raw materials (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Renewable primary energy (MJ)	5.13	6.01x10 ⁻²	22.4	0.152	1.14	1.72	188	5.13x10 ⁻²	6.08x10 ⁻²
	2.3%	0.027%	10%	0.069%	0.52%	0.78%	86%	0.023%	0.028%
Use of nonrenewable primary energy (MJ)	INA	INA	INA	INA	INA	INA	INA	INA	INA
Use of nonrenewable primary energy resources used as raw materials (MJ)	INA	INA	INA	INA	INA	INA	INA	INA	INA
Total Nonrenewable primary energy (MJ)	133	4.72	80.5	18.6	15.8	62.7	1,730	13.0	1.45
	6.4%	0.23%	3.9%	0.9%	0.77%	3%	84%	0.63%	0.07%
Use of secondary materials (MJ)	1.37	0.00	0.00	0.00	0.00	0.00	8.93	0.00	0.00
	13%	0%	0%	0%	0%	0%	87%	0%	0%
Use of Renewable secondary fuels (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of Nonrenewable secondary fuels (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of net fresh water (m ³)	0.417	3.60x10 ⁻³	0.236	8.88x10 ⁻³	2.97x10 ⁻²	0.589	4.57	4.64x10 ⁻³	2.94x10 ⁻³
	7.1%	0.061%	4%	0.15%	0.51%	10%	78%	0.079%	0.05%

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Wastes									
Hazardous waste (kg)	1.96x10 ⁻⁴	3.05x10 ⁻⁵	1.06x10 ⁻⁴	9.78x10 ⁻⁵	6.02x10 ⁻⁵	4.00x10 ⁻⁵	3.82x10 ⁻³	8.83x10 ⁻⁵	8.69x10 ⁻⁶
	4.4%	0.69%	2.4%	2.2%	1.4%	0.9%	86%	2%	0.2%
Nonhazardous waste (kg)	0.608	0.229	0.604	0.211	0.625	0.171	44.6	6.58x10 ⁻²	4.51
	1.2%	0.44%	1.2%	0.41%	1.2%	0.33%	86%	0.13%	8.7%
Radioactive waste (kg)	1.12x10 ⁻⁴	9.53x10 ⁻⁷	6.23x10 ⁻⁵	2.37x10 ⁻⁶	7.72x10 ⁻⁶	2.27x10 ⁻⁵	1.22x10 ⁻³	9.49x10 ⁻⁷	1.16x10 ⁻⁶
	7.9%	0.067%	4.3%	0.17%	0.54%	1.6%	85%	0.066%	0.081%
Components for re-use (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
Materials for recycling (kg)	0.00	0.00	0.00	0.00	1.41	0.00	9.19	0.00	0.00
	0%	0%	0%	0%	13%	0%	87%	0%	0%
Materials for energy recovery (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported energy (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

INA = Indicator not assessed | Neg. = Negligible

Table 18. Resource use and waste flows for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. **(SPC Vinyl Flooring (5.5mm))**

Impact Category	Raw Materials (A1)	Upstream Transport (A2)	Manufacturing (A3)	Downstream Transport (A4)	Installation (A5)	Maintenance (B2)	Replacement (B4)	Transport to Disposal (C2)	Disposal (C4)
Resources									
Use of renewable primary energy (MJ)	8.41	0.120	20.5	0.391	1.21	1.72	123	0.103	0.121
	5.4%	0.077%	13%	0.25%	0.77%	1.1%	79%	0.066%	0.077%
Use of renewable primary energy resources used as raw materials (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Renewable primary energy (MJ)	8.41	0.120	20.5	0.391	1.21	1.72	123	0.103	0.121
	5.4%	0.077%	13%	0.25%	0.77%	1.1%	79%	0.066%	0.077%
Use of nonrenewable primary energy (MJ)	INA	INA	INA	INA	INA	INA	INA	INA	INA
	INA	INA	INA	INA	INA	INA	INA	INA	INA
Total Nonrenewable primary energy (MJ)	218	9.70	39.3	36.5	17.0	62.7	1,400	26.0	2.90
	12%	0.54%	2.2%	2%	0.94%	3.5%	77%	1.4%	0.16%
Use of secondary materials (MJ)	2.98	0.00	0.00	0.00	0.00	0.00	11.9	0.00	0.00
	20%	0%	0%	0%	0%	0%	80%	0%	0%
Use of Renewable secondary fuels (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of Nonrenewable secondary fuels (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of net fresh water (m ³)	0.711	7.18x10 ⁻³	0.128	2.32x10 ⁻²	3.72x10 ⁻²	0.589	3.69	9.27x10 ⁻³	5.84x10 ⁻³
	14%	0.14%	2.5%	0.45%	0.72%	11%	71%	0.18%	0.11%

INA = Indicator not assessed | Neg. = Negligible

6. LCA: Interpretation

Contributions to total impact indicator results are dominated by the product replacement phase (B4) of the assessment. Of the remaining life cycle phases, with few exceptions, the raw material extraction and processing (A1) phase is the largest contributor to indicator impact results followed by product maintenance (B2), product distribution (A4), product manufacture (A3) and disposal (C4). Other life cycle phase contributions are minimal.

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