

SureWood® Collections Luxury Vinyl Flooring

In accordance with ISO 14025:2006

Twelve Oaks Forest Product Inc.



Twelve Oaks Forest Product Inc. is pleased to present this environmental product declaration (EPD) for **SureWood Collections Luxury Vinyl Flooring**. This EPD was developed in compliance with ISO 14025 and ISO 21930 and has been verified by Thomas Gloria, Ph.D.

The EPD includes life cycle assessment (LCA) results for cradle-to-grave.

For more information about Twelve Oaks Forest Product Inc., please visit <https://twelveoaks.ca/>.



1 GENERAL INFORMATION

EPD GENERAL INFORMATION	
EPD Program and Program Operator	ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA https://www.astm.org/
General Program Instructions and Version Number	ASTM Program Operator for Product Category Rules (PCR) and Environmental Product Declarations (EPDs) General Program Instructions v8.0, April 29, 2020.
Manufacturer Name and Address	Twelve Oaks Forest Product Inc. 80 Tiverton Court, Suite 100, Markham, ON, L3R 0G4 
Declaration Number	EPD 1154
Declared Product & Functional Unit	SureWood Collections Luxury Vinyl Flooring with functional unit of 1 m ² for a period of 75 years.
Reference PCR and Version Number	Product Category Rules for Building Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements, Version 4.0. UL Environment, conforming to ISO 21930: 2017. PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements, Version 2.0. UL Environment, conforming to ISO 21930: 2017.
Description of Product's Intended Application and Use	For interior residential and commercial floor covering applications, including areas with moderate to high foot traffic.
Product RSL Description	30 years, based on manufacturer information and applicable reference use conditions as defined in the EPD.
Market of Applicability	North America
Date of Issue	March 18, 2026
Period of Validity	5 Years
EPD Type	Product and Manufacturer Specific
EPD Scope	Cradle to Grave
Year of Reported Manufacturer Primary Data	2025
LCA Software & Version Number	OpenLCA 2.4.1
LCA Database(s) & Version Number	Ecoinvent 3.11
LCA Methodology & Version Number	TRACI v2.1, CML-baseline v4.7
The sub-category PCR review was conducted by:	Part A: Lindita Bushi, PhD, Chair Athena Sustainable Materials Institute lindita.bushi@athenasmi.org Part B: Jack Geibig, Chair Ecoform jgeibig@ecoform.com
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Dr. Shiva Zargar at Build Neutral Inc. Calgary, AB, Canada https://www.buildneutral.ca/ 
VERIFICATION AND AUTHORIZATION OF THE DECLARATION	
This declaration and the rules on which this EPD is based have been examined by an independent external verifier in accordance with ISO 14025 and ISO 21930.	Timothy S Brooke ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428 tbrooke@astm.org Signature: 
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Ph. D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728 t.gloria@industrial-ecology.com Signature: 

ENVIRONMENTAL PRODUCT DECLARATION

LIMITATIONS

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of Flooring Products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.

Full conformance with the PCR for Products 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 different results for upstream or downstream of the life cycle stages declared.

2 TWELVE OAKS FOREST PRODUCT INC.

2.1 DESCRIPTION OF THE COMPANY

Twelve Oaks Forest Product Inc. ("Twelve Oaks") is a 100% Canadian-owned and family-run designer and distributor of flooring products serving residential and commercial markets across Canada and the United States. The portfolio spans engineered hardwood, luxury vinyl, and laminate collections developed to pair contemporary design with durable performance for residential and commercial use. Twelve Oaks SureWood collection is manufactured in facilities located in China and Vietnam. Twelve Oaks highlights product stewardship and indoor air quality. Products carry FloorScore® indoor-air-quality certification and stringent in-house testing for scratch resistance, water resilience and temperature tolerance, and certified VOC testing to assure indoor air quality. Twelve Oaks supports customers through regional facilities, including Markham, Ontario (Eastern/Central Canada) and Calgary, Alberta (Western Canada).

2.2 PRODUCT DESCRIPTION

The SureWood collections are a family of premium luxury vinyl flooring products marketed by Twelve Oaks. The collections are designed to deliver high performance, durable, and aesthetically refined flooring solutions for residential and commercial applications. SureWood products combine advanced material engineering with innovative locking technology and integrated underlayment. Across all product lines, SureWood flooring is manufactured as luxury vinyl planks or tiles incorporating a wood polymer composite (WPC) core, a scratch and stain resistant wear layer and coating. Products are supplied as floating floor systems using the Välinge 5G® locking technology, enabling fast installation without the use of adhesives. The construction and finish are durable, and come with a lifetime or 30-year residential warranty (based on selected platform) and 12-year commercial warranty. The primary United Nations Standard Products and Services Code (UNSPSC) code for this flooring product is 30161700, and the Construction Specification Institute (CSI) code is 09 65 00.



Figure 1 Structure of SureWood collections luxury vinyl flooring

2.3 APPLICATION FIELD

The SureWood collections is intended for use as an interior floor covering in residential and commercial buildings and is suitable for use in spaces subject to moderate to heavy residential traffic and light commercial foot traffic. SureWood flooring products are supplied as floating floor systems and are installed without the use of adhesives, utilizing a mechanical click-locking

system. The products may be installed over common subfloor types, including concrete slabs and wood-based subfloors, provided that installation requirements specified by the manufacturer are met. Installation over hydronic or electric radiant heating systems is permitted under controlled temperature and moisture conditions.

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

This EPD is product and manufacturer specific and is based on an attributional LCA conducted in accordance with ISO 14025, ISO 14040/14044, ISO 21930, UL PCR Part A (v4.0), and UL PCR Part B – Flooring (v2.0). The scope is cradle-to-grave and includes all required life cycle stages (A1–A3, A4–A5, B1–B7, and C1–C4); Module D is not declared. The functional unit is 1 m² of SureWood collections luxury vinyl flooring, manufactured in China and Vietnam, installed in a representative North American building, and assessed over a 75-year building service life with a 30-year product reference service life.

Cut-off rules follow ISO 21930 and UL PCR Part A; no known flows were deliberately excluded. Infrastructure, capital goods, and incoming raw material packaging are excluded per PCR allowances. Allocation follows ISO 14044 and UL PCR Part A; no co-products are generated, and the product is produced on dedicated lines, so allocation within manufacturing is not required. Mass-based allocation is applied only where prescribed by the PCR for waste and packaging disposal.

2.5 MARKET PLACEMENT/APPLICATION RULES

SureWood collections luxury vinyl flooring is placed on the North American market as an interior luxury vinyl floor covering for residential and commercial applications. The product is evaluated and documented against applicable product performance, health, and safety frameworks relevant to luxury vinyl flooring. SureWood collections luxury vinyl flooring products meet or exceed the following technical specifications:

- ASTM F1700 Standard Specification for Solid Vinyl Floor Tile
- ASTM E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- ASTM F925 Standard Test Method for Resistance to Chemicals of Resilient Flooring

2.6 MATERIAL COMPOSITION

Table 1 Material composition

Product components	Amount per FU (mass %)
Calcium carbonate	49.53%
PVC	23.11%
Wearlayer	9.84%
Foaming regulators	3.15%
Cork	2.58%
Color film	2.07%
Plasticizer	1.78%
Modifiers	1.76%

Adhesive	1.29%
EVA	1.29%
IXPE	1.29%
Stabilizer	1.22%
Internal lubrication	0.30%
PE wax	0.25%
Oxidized wax	0.13%
UV coating topcoat	0.11%
Yellow foaming agent	0.11%
UV coating primer	0.10%
White foaming agent	0.08%
Carbon black	0.02%
Total	100%

2.7 MANUFACTURING

SureWood collections luxury vinyl flooring products are manufactured in flooring production facilities located in China and Vietnam. The manufacturing processes and quality controls applied at both locations are technically equivalent and follow consistent production workflows, equipment configurations, and performance requirements. The manufacturing location in China is No. 380 Haifeng Road, Haichang Street, Haining City, Zhejiang Province, China 314400 and in Vietnam is Road F1, Area F, Pho Noi A Industrial Park, Minh Hai Commune, Van Lam District, Hung Yen Province, Vietnam. Both facilities operate under established quality and environmental management systems. The SureWood manufacturing process consists of the following main steps. Raw materials are proportioned and mixed according to product specific formulations. Inputs include polyvinyl chloride (PVC) resin, calcium carbonate, plasticizer, stabilizers, modifiers, oxidized polyethylene wax, foaming regulators, yellow and white foaming agents, carbon black, organic pigments, and other minor additives. Mixing is carried out using internal mixers prior to extrusion. The mixed formulation is processed through internal mixers and extrusion equipment to form the rigid wood polymer composite (WPC) core layer. Decorative colour films and the wear layer are laminated to the extruded core under controlled hot-press conditions to form the primary flooring structure. Following lamination, semi-finished boards are cooled and conditioned under ambient conditions to allow dimensional stabilization prior to further processing. A UV primer and a UV topcoat are applied to the surface. The coatings are cured using ultraviolet radiation. The laminated boards are slit, slotted, and profiled to final dimensions. A cork underlayment and IXPE underlayment are laminated to the underside of the flooring product, where applicable, to provide acoustic performance and underfoot comfort. Finished products undergo final quality inspection before being packaged in corrugated paper cartons. Individual cartons are palletized on wooden pallets and secured using stretch film.

Mixing → Extruding → Hot Pressing → Laminating → Cold Pasting → Laminating → Slotting → Packaging

Figure 2 SureWood collections luxury vinyl flooring manufacturing process

2.8 PACKAGING

SureWood collections luxury vinyl flooring products are packaged for shipment using a combination of paper-based and polymer-based materials. Packaging quantities were calculated per 1 m² of flooring based on manufacturer provided carton weights, pallet weights, pallet load capacity, and stretch film usage per pallet. Corrugated carton and wooden pallet masses were allocated to the functional unit using the calculated product coverage per carton and the maximum pallet load capacity of 1500 kg. Stretch film mass was allocated on a pallet basis. Biogenic carbon content of corrugated cardboard and wooden pallets was calculated assuming 35%, reflecting a conservative value, and 50% carbon content by dry mass, respectively (IPCC, 2006). Packaging materials and their composition are presented in Table 2.

Table 2 Amount of packaging materials (kg/FU) and the associated biogenic carbon content (CO₂/FU) per 1 m² of SureWood flooring

Packaging materials	Material composition	Amount	SureWood	SureWood Chevron	SureWood Plus (California)	SureWood Plus (King)	SureWood Pro (Plank)	SureWood Pro (Tile)	SureWood Elevate	SureWood Origin
Packaging box	Corrugated cardboard	Amount	0.308	0.432	0.674	0.443	0.383	0.616	0.663	0.154
		Biogenic carbon	0.395	0.554	0.865	0.569	0.492	0.791	0.851	0.198
Pallet	Wood	Amount	0.139	0.144	0.150	0.137	0.218	0.141	0.084	0.028
		Biogenic carbon	0.255	0.263	0.274	0.251	0.400	0.258	0.154	0.050
Wrapping film	Polyethylene	Amount	1.336E-03	1.380E-03	1.438E-03	1.318E-03	2.097E-03	1.352E-03	8.089E-04	2.646E-04

2.9 PRODUCT INSTALLATION

SureWood collections luxury vinyl flooring is installed as a floating floor using a click-lock system, requiring only basic hand tools and no adhesives except in localized wet areas. Subfloor preparation and tool production are excluded from the system boundary per PCR guidance. A 10% installation waste rate is assumed based on industry practice and manufacturer recommendations. Installation instructions can be found on Twelve Oaks website and by request.

2.10 USE CONDITIONS

Recommended maintenance practices follow manufacturer guidance and are representative of typical residential and commercial use. Maintenance includes routine sweeping or vacuuming and periodic damp mopping; no additional finishes or coatings are required.



Maintenance intensity varies by building type and user practices, and associated water and cleaner consumption is modeled in accordance with PCR requirements.

2.11 PRODUCT REFERENCE SERVICE LIFE AND BUILDING ESTIMATED SERVICE LIFE

The product reference service life (RSL) for SureWood collections luxury vinyl flooring is 30 years, as specified by Twelve Oaks based on warranty conditions, product testing, and expected performance under normal residential and commercial use. For this study, the flooring is installed in a representative North American building with an estimated service life (ESL) of 75 years, consistent with the UL PCR. The RSL and ESL combination implies 1.5 replacement cycles of the flooring over the building's lifetime.

2.12 DISPOSAL

At the end of life, SureWood luxury vinyl flooring is typically removed manually and does not entail powered equipment under normal practice. The end-of-life is modelled based on the UL PCR disposal assumptions (regional mix with limited recycling). It reflects the regional end-of-life mix defined in the UL PCR, applied to the product's installed distribution.

2.13 FURTHER INFORMATION

Further information about SureWood collections luxury vinyl flooring is available at <https://twelveoaks.ca/>

3 LIFE CYCLE ASSESSMENT CALCULATION RULES

3.1 FUNCTIONAL UNIT

The functional unit of SureWood luxury vinyl flooring is 1 (m²) according to UL PCR. Table 3 presents the technical data details of the SureWood collections luxury vinyl flooring covered by this EPD, including product mass and dimensional parameters. The values reported represent declared product specifications provided by the manufacturer to Twelve Oaks for standard production configurations. For each product variant, a single declared value is reported; therefore, the minimum, maximum, and average values are identical and do not represent statistical variation. The mass associated with the functional unit is representative of typical production and corresponds to the declared product configuration used for life cycle inventory modelling.

Table 3 Technical details

Name		Average Value (Declared Value)		Unit	Min Value	Max Value
SureWood						
Product thickness		8		mm	8	8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		8015		g/m ²	8015	8015
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	180*1220		mm	180*1220	180*1220
SureWood Chevron						
Product thickness		8		mm	8	8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		8279		g/m ²	8279	8279
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	305*718.4		mm	305*718.4	305*718.4
SureWood Plus (California)						
Product thickness		8.8		mm	8.8	8.8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		8627		g/m ²	8627	8627
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	225*1830		mm	225*1830	225*1830
SureWood Plus (King)						
Product thickness		8		mm	8	8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		7909		g/m ²	7909	7909
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	225*1524		mm	225*1524	225*1524

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SureWood Pro (Plank)						
Product thickness		8		mm	8	8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		12583		g/m ²	12583	12583
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	180*1522		mm	180*1522	180*1522
SureWood Pro (Tile)						
Product thickness		8		mm	8	8
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		8110		g/m ²	8110	8110
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	457*930		mm	457*930	457*930
	Planks	N/A		mm	N/A	N/A
SureWood Elevate						
Product thickness		12		mm	12	12
Wear layer thickness (where applicable)		0.75		mm	0.75	0.75
Product weight		4853		g/m ²	4853	4853
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	225*1830		mm	225*1830	225*1830
SureWood Origin						
Product thickness		7		mm	7	7
Wear layer thickness (where applicable)		0.5		mm	0.5	0.5
Product weight		1588		g/m ²	1588	1588
Product Form	Rolls	Width	N/A	mm	N/A	N/A
		Length	N/A	m	N/A	N/A
	Tiles	N/A		mm	N/A	N/A
	Planks	180*1220		mm	180*1220	180*1220

Table 4 presents the functional unit and the associated weighted average mass for SureWood collections luxury vinyl flooring products.

Table 4 Functional unit for the SureWood collections luxury vinyl flooring products

Name		Collections	Value	Unit
Functional unit			1	m ²
Mass	SureWood		8.015	kg
	SureWood Chevron		8.279	
	SureWood Plus (California)		8.627	
	SureWood Plus (King)		7.909	
	SureWood Pro (Plank)		12.582	
	SureWood Pro (Tile)		8.110	
	SureWood Elevate		4.853	
	SureWood Origin		1.588	

3.2 SYSTEM BOUNDARY

According to (UL Environment, 2022, 2018), the EPD shall be specified as cradle-to-grave. Table 5 presents the life cycle stages and their modules included in the system boundaries analyzed in accordance with (ISO 21930, 2017).

Table 5 Life cycle stages and their information modules included in the system boundary

Product stage		Construction process stage			Use stage							End of life stage				Benefits beyond system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Bldg. Operational energy use during	Bldg. Operational water use during product use	Deconstruction	Transport	Waste processing	Disposal	Reuse, recovery, recycling potential
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

(X = Included in the LCA, MND - Module not declared)

The product stage (A1-A3) for the product includes extraction and processing of raw materials, transportation to the factory and manufacturing processes with packaging. The construction process stage (A4-A5) includes the transportation of SureWood collections luxury vinyl flooring products to the building site from the factory and the installation phase. The use stage (B1-B7) includes the maintenance of the SureWood collections luxury vinyl flooring products, as well as

the replacement according to the RSL of the product and ESL of the building. The end-of-life stage (C1-C4) includes deconstruction, transportation of waste products to the final disposition site, and disposal. Throughout the life cycle stages of products, all energy and material inputs have been traced back to the extraction of resources, emissions from the whole system have been quantified, and waste management scenarios have also been included. For the recovery, reuse, and recycling process at the end of the life stage, to be conservative, the benefits of recycling and recovery are beyond the boundaries of the product system, according to PCR Part A; hence, module D is not reported. Capital goods and infrastructure flows for flooring do not significantly affect the results and conclusions of the LCA or additional environmental information, hence are excluded from unit processes used to model the LCIA per PCR Part B recommendation.

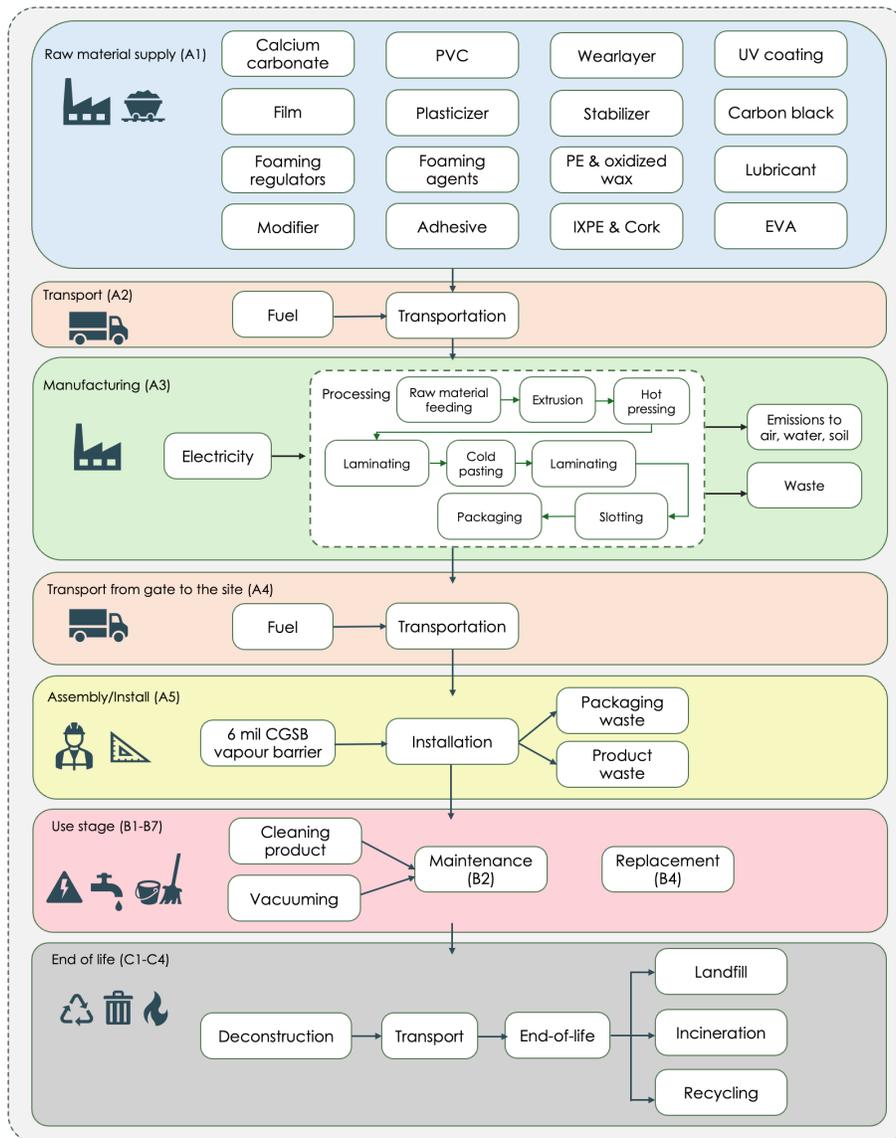


Figure 3 Cradle-to-grave system boundary for SureWood collections luxury vinyl flooring

3.3 PRODUCT USE PHASE (MODULES B1-B7)

During the use stage, SureWood collections luxury vinyl flooring products do not require operational energy or water use beyond routine cleaning and maintenance. Repair (B3) and refurbishment (B5) are not considered for this product. Routine cleaning consists of weekly vacuuming or sweeping and periodic damp mopping using a neutral, diluted cleaning detergent, in accordance with Twelve Oaks recommendations.

3.4 UNITS

All data and results are presented using SI units.

3.5 ESTIMATES AND ASSUMPTIONS

The LCA for SureWood collections luxury vinyl flooring products is based on a structured set of data, assumptions, and modelling choices. The following key assumptions were made due to data limitations. For missing background data, the substitution of missing data using a similar background data approach as a proxy was considered. Information on formulation, production, packaging, and vapour barrier use was supplied by Twelve Oaks' contracted manufacturing facilities. However, equivalent background datasets for certain inputs (e.g., plasticizers) were not available in ecoinvent v3.11. In these cases, the input (e.g. plasticizer) was modelled using representative ecoinvent datasets based on its main constituent ingredients. These datasets were applied as proxies and represent typical production technologies rather than the specific suppliers used in the SureWood collections luxury vinyl flooring supply chain. Transport assumptions according to c-PRC were made where it was not possible to obtain the specific data, for instance, product transport from the building site to the waste processing, and it is clearly stated in this EPD when it occurred. These choices are technically justified, but they also introduce limitations that users of this EPD should keep in mind.

3.6 CUT-OFF CRITERIA

Cut-off rules follow ISO 21930 and UL PCR Part A. Flows contributing less than 1% of total mass or energy may be excluded if environmentally insignificant, and all emissions contributing more than 1% to any impact category are included. No known flows were deliberately excluded.

Infrastructure and capital equipment, incoming raw-material packaging, storage and sales activities, abnormal product losses, and warehouse handling are excluded in accordance with PCR allowances, as their contributions are negligible at the declared-unit scale.

3.7 DATA SOURCES

Primary data is provided by the contracted manufacturing facilities of Twelve Oaks. Production volumes, raw and auxiliary material inputs, and manufacturing waste were provided for 12 months representative of normal operation. All background unit processes were modelled using the ecoinvent v3.11 database (Cut-off system model), which served as the primary source of secondary data.

3.8 DATA QUALITY

Data quality was assessed in accordance with ISO 21930, ISO 14044, and UL PCR Part A, considering temporal, geographical, and technological representativeness, as well as

completeness and consistency. Primary data were collected directly from the manufacturing facilities for the 2025 reference year and are fully representative of current operations. Background data were sourced from ecoinvent v3.11 and selected to reflect regional conditions for upstream and downstream processes. Overall data quality is judged to be high, with excellent temporal, geographic, and technological representativeness.

3.9 PERIOD UNDER REVIEW

The period under review is November 2024 to October 2025.

3.10 ALLOCATION

Allocation procedures follow ISO 14044, ISO 21930, and UL PCR Part A. Allocation is avoided wherever possible through the use of product-specific primary data and process subdivision. System expansion is not applied, consistent with PCR guidance for EPDs.

No allocation within manufacturing is required because the declared products are produced on dedicated lines and no co-products, by-products, or multi-input processes occur in the foreground system. Secondary materials are not used as raw material inputs.

Allocation is applied only where required by the PCR for waste and packaging flows at installation and end-of-life. These flows are distributed across regional waste treatment routes (e.g., landfill, recycling) using mass-based allocation. Background datasets follow the allocation rules inherent to the ecoinvent database.

3.11 COMPARABILITY AND BENCHMARKING

This report is not intended to support standalone comparative assertions between products. Consistent with ISO 21930 and ISO 14025, meaningful comparison of construction products requires that EPDs are developed under the same core and sub-category PCR and use the same functional unit and reference service life, while covering the same modules and applying the equivalent technical assumptions and scenarios for installation, use, maintenance, and end of life in the context of the specific building application as well as consistent use of background datasets (database, version, reference year), LCIA methods, and LCA software, and apply cut-off and data quality rules in the same way. Hence, the user of the EPD should take care when comparing EPDs from different companies.

4 LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The following information is reported for declared modules.

4.1 TRANSPORT TO SITE (A4)

Products manufactured in China and Vietnam are transported by truck or rail to their respective export ports, shipped by ocean container to the Port of Vancouver, and then moved by rail to regional distribution before final truck delivery to Twelve Oaks warehouses. All products are distributed through warehouse facilities prior to customer delivery. Transport from the point of purchase to the building site is modeled as an 800 km trip by diesel-powered truck/trailer, consistent with c-PCR assumptions.

4.2 ASSEMBLY/INSTALLATION (A5)

Installation of SureWood collections luxury vinyl flooring is performed as a floating floor using a mechanical click-lock system. Installation requires only basic hand tools, and no adhesives are needed except for localized sealant use in wet areas. Subfloor preparation and tool production are excluded from the system boundary in accordance with PCR guidance.

A 10% installation waste rate is assumed based on manufacturer recommendations and typical industry practice. Installation waste is transported 161 km by diesel-powered truck to regional waste facilities, consistent with c-PCR requirements. Installed product distribution is assumed to be 50% in Eastern Canada, 30% in Western Canada, and 20% in the United States.

4.3 USE STAGE (B1-B7)

The product requires no operational energy or water during use, and no repair or refurbishment is expected; therefore, modules B1, B3, B5, B6, and B7 are reported as zero. Routine maintenance consists of sweeping or vacuuming and occasional damp mopping per manufacturer guidance. The reference service life applies under these normal in-use conditions.

4.4 MAINTENANCE (B2)

A common and periodic maintenance schedule should be followed during the use stage. A detailed maintenance guide can be found on <https://twelveoaks.ca/>.

Table 6 Inputs in the maintenance stage

	Amount	Units	Scenario
Electricity	0.052	kWh/m ² /yr.	Based on weekly vacuuming and 0.001kWh/m ² square assumption
Detergent	0.052	kg/m ² /yr.	Based on weekly mopping and 0.001kg/m ² detergent usage assumption

4.5 REPLACEMENT (B4)

Replacement impacts are modelled as the re-installation of SureWood collections luxury vinyl flooring with the same bill of materials, transport and packaging as modules A1-A5, scaled by the number of replacements (n = 1.5).

4.6 END-OF-LIFE STAGE (C1-C4)

At the end of life, SureWood collections luxury vinyl flooring is typically removed manually and does not entail powered equipment under normal practice. As a result, no operational energy or water use is quantified in C1 (de-construction), consistent with typical practice for vinyl flooring. The mass of flooring entering the end-of-life stage is based on the installed product and associated ancillary materials, excluding installation waste already accounted for in A5.

5 LCA: RESULTS

Life cycle assessment results must be presented per FU (Heijungs et al., 1992). This section presents impact assessment results for the declared modules, which are calculated using the U.S. EPA's Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts, TRACI v2.1 and CML-baseline (US EPA, 2012). It is noted that the LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. The impact categories reported in this EPD should be understood as potential impacts. They are estimates of environmental effects that could arise if the modelled emissions (a) follow the assumed impact pathways and (b) encounter specific conditions in the receiving environment while doing so. Moreover, the life cycle inventory reflects only the share of total environmental burdens associated with the defined functional unit, i.e., it is a relative rather than an absolute description. As a result, the LCIA outcomes are comparative indicators only; they do not quantify real-world damage, indicate whether regulatory thresholds are exceeded, or describe safety margins or risk levels.

5.1 LIFE CYCLE IMPACT ASSESSMENT RESULTS

Table 7 LCIA results for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.471E+01	1.149E+00	3.360E+00	3.086E+00	5.347E-01	0.000E+00	2.857E+00	0.000E+00	3.546E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.088E-01	1.640E-01	6.289E-01
ODP	5.446E-06	1.663E-08	1.865E-08	4.266E-08	1.433E-08	0.000E+00	5.507E-08	0.000E+00	8.314E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.967E-09	1.776E-09	2.250E-09
AP	5.737E-02	2.456E-03	1.679E-02	3.427E-02	1.787E-03	0.000E+00	1.243E-02	0.000E+00	1.709E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.827E-04	3.951E-04	5.950E-04
EP	1.259E-01	1.630E-03	4.693E-02	4.916E-03	8.214E-03	0.000E+00	1.852E-02	0.000E+00	7.959E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.268E-04	1.412E-03	3.432E-01
SFP	7.934E-01	4.607E-02	2.595E-01	8.042E-01	3.354E-02	0.000E+00	1.486E-01	0.000E+00	2.957E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.386E-02	4.743E-03	1.536E-02
ADP _{fossil}	2.634E+02	1.594E+01	3.359E+01	4.010E+01	1.238E+01	0.000E+00	4.004E+01	0.000E+00	5.545E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.935E+00	9.536E-01	1.855E+00

Table 8 LCIA results for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.519E+01	1.187E+00	3.525E+00	3.188E+00	5.677E-01	0.000E+00	2.857E+00	0.000E+00	3.674E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.155E-01	1.694E-01	6.493E-01
ODP	5.624E-06	1.717E-08	2.298E-08	4.406E-08	1.453E-08	0.000E+00	5.507E-08	0.000E+00	8.592E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.063E-09	1.834E-09	2.323E-09
AP	5.926E-02	2.537E-03	1.749E-02	3.540E-02	1.887E-03	0.000E+00	1.243E-02	0.000E+00	1.771E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.113E-04	4.080E-04	6.143E-04
EP	1.301E-01	1.684E-03	4.916E-02	5.078E-03	9.239E-03	0.000E+00	1.852E-02	0.000E+00	8.081E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.374E-04	1.458E-03	3.543E-01
SFP	8.195E-01	4.759E-02	2.719E-01	8.307E-01	3.582E-02	0.000E+00	1.486E-01	0.000E+00	3.067E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.463E-02	4.898E-03	1.585E-02
ADP _{fossil}	2.721E+02	1.646E+01	3.546E+01	4.142E+01	1.261E+01	0.000E+00	4.004E+01	0.000E+00	5.742E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.030E+00	9.849E-01	1.915E+00

Table 9 LCIA results for 1 m² of SureWood Plus California Size flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.583E+01	1.237E+00	3.843E+00	3.322E+00	6.315E-01	0.000E+00	2.857E+00	0.000E+00	3.859E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.244E-01	1.762E-01	6.760E-01
ODP	5.861E-06	1.790E-08	3.143E-08	4.591E-08	1.490E-08	0.000E+00	5.507E-08	0.000E+00	8.965E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.189E-09	1.908E-09	2.418E-09
AP	6.176E-02	2.644E-03	1.885E-02	3.688E-02	2.080E-03	0.000E+00	1.243E-02	0.000E+00	1.856E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.489E-04	4.245E-04	6.396E-04
EP	1.356E-01	1.754E-03	5.282E-02	5.292E-03	1.119E-02	0.000E+00	1.852E-02	0.000E+00	8.418E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.513E-04	1.517E-03	3.689E-01
SFP	8.540E-01	4.958E-02	2.961E-01	8.656E-01	4.021E-02	0.000E+00	1.486E-01	0.000E+00	3.219E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.565E-02	5.096E-03	1.651E-02
ADP _{fossil}	2.835E+02	1.715E+01	3.911E+01	4.316E+01	1.304E+01	0.000E+00	4.004E+01	0.000E+00	6.014E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.155E+00	1.025E+00	1.994E+00

Table 10 LCIA results for 1 m² of SureWood Plus King Size flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.451E+01	1.134E+00	3.534E+00	3.045E+00	5.693E-01	0.000E+00	2.857E+00	0.000E+00	3.543E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.061E-01	1.618E-01	6.208E-01
ODP	5.374E-06	1.641E-08	2.332E-08	4.210E-08	1.453E-08	0.000E+00	5.507E-08	0.000E+00	8.213E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.928E-09	1.752E-09	2.221E-09
AP	5.661E-02	2.424E-03	1.754E-02	3.382E-02	1.891E-03	0.000E+00	1.243E-02	0.000E+00	1.706E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.713E-04	3.899E-04	5.873E-04
EP	1.242E-01	1.608E-03	4.771E-02	4.852E-03	9.205E-03	0.000E+00	1.852E-02	0.000E+00	7.900E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.226E-04	1.393E-03	3.387E-01
SFP	7.829E-01	4.546E-02	2.727E-01	7.936E-01	3.589E-02	0.000E+00	1.486E-01	0.000E+00	2.954E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.355E-02	4.681E-03	1.516E-02
ADP _{fossil}	2.599E+02	1.573E+01	3.559E+01	3.957E+01	1.261E+01	0.000E+00	4.004E+01	0.000E+00	5.522E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.897E+00	9.410E-01	1.831E+00

SureWood® Collections Luxury Vinyl Flooring

Twelve Oaks Forest Product Inc.

Environmental Product Declaration: EPD 1154



Table 11 LCIA results for 1 m² of SureWood Pro (Plank) flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	2.309E+01	1.804E+00	3.519E+00	4.845E+00	5.713E-01	0.000E+00	2.857E+00	0.000E+00	5.270E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.256E-01	2.558E-01	9.809E-01
ODP	8.549E-06	2.610E-08	2.178E-08	6.697E-08	1.465E-08	0.000E+00	5.507E-08	0.000E+00	1.303E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.627E-09	2.771E-09	3.509E-09
AP	9.007E-02	3.856E-03	1.740E-02	5.380E-02	1.908E-03	0.000E+00	1.243E-02	0.000E+00	2.540E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.377E-03	6.164E-04	9.280E-04
EP	1.977E-01	2.559E-03	6.664E-02	7.718E-03	1.028E-02	0.000E+00	1.852E-02	0.000E+00	1.231E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.097E-04	2.203E-03	5.352E-01
SFP	1.246E+00	7.232E-02	2.710E-01	1.262E+00	3.655E-02	0.000E+00	1.486E-01	0.000E+00	4.424E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.721E-02	7.400E-03	2.395E-02
ADP _{fossil}	4.135E+02	2.502E+01	3.521E+01	6.295E+01	1.272E+01	0.000E+00	4.004E+01	0.000E+00	8.353E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.578E+00	1.488E+00	2.893E+00

Table 12 LCIA results for 1 m² of SureWood Pro (Tile) flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.488E+01	1.163E+00	3.761E+00	3.123E+00	6.147E-01	0.000E+00	2.857E+00	0.000E+00	3.659E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.112E-01	1.658E-01	6.363E-01
ODP	5.511E-06	1.682E-08	2.936E-08	4.317E-08	1.479E-08	0.000E+00	5.507E-08	0.000E+00	8.431E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.002E-09	1.795E-09	2.276E-09
AP	5.806E-02	2.486E-03	1.851E-02	3.468E-02	2.028E-03	0.000E+00	1.243E-02	0.000E+00	1.759E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.931E-04	3.994E-04	6.020E-04
EP	1.274E-01	1.649E-03	5.016E-02	4.975E-03	1.058E-02	0.000E+00	1.852E-02	0.000E+00	8.135E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.306E-04	1.427E-03	3.472E-01
SFP	8.029E-01	4.662E-02	2.899E-01	8.138E-01	3.901E-02	0.000E+00	1.486E-01	0.000E+00	3.048E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.414E-02	4.795E-03	1.554E-02
ADP _{fossil}	2.666E+02	1.613E+01	3.818E+01	4.058E+01	1.291E+01	0.000E+00	4.004E+01	0.000E+00	5.688E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.970E+00	9.640E-01	1.877E+00

Table 13 LCIA results for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	8.905E+00	6.957E-01	3.778E+00	1.869E+00	6.145E-01	0.000E+00	2.857E+00	0.000E+00	2.456E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.279E-01	1.005E-01	3.854E-01
ODP	3.297E-06	1.007E-08	3.062E-08	2.583E-08	1.471E-08	0.000E+00	5.507E-08	0.000E+00	5.072E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.818E-09	1.088E-09	1.379E-09
AP	3.474E-02	1.487E-03	1.863E-02	2.075E-02	2.020E-03	0.000E+00	1.243E-02	0.000E+00	1.178E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.408E-04	2.421E-04	3.646E-04
EP	7.625E-02	9.870E-04	3.701E-02	2.977E-03	9.869E-03	0.000E+00	1.852E-02	0.000E+00	5.063E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.002E-04	8.650E-04	2.103E-01
SFP	4.804E-01	2.790E-02	2.916E-01	4.870E-01	3.863E-02	0.000E+00	1.486E-01	0.000E+00	2.024E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.462E-02	2.906E-03	9.411E-03
ADP _{fossil}	1.595E+02	9.650E+00	3.852E+01	2.428E+01	1.285E+01	0.000E+00	4.004E+01	0.000E+00	3.716E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.798E+00	5.842E-01	1.137E+00

Table 14 LCIA results for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in China.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	2.913E+00	2.276E-01	3.074E+00	6.113E-01	4.708E-01	0.000E+00	2.857E+00	0.000E+00	1.121E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.438E-02	1.005E-01	1.337E-01
ODP	1.079E-06	3.293E-09	1.256E-08	8.450E-09	1.380E-08	0.000E+00	5.507E-08	0.000E+00	1.677E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.306E-10	1.088E-09	4.783E-10
AP	1.136E-02	4.865E-04	1.567E-02	6.788E-03	1.580E-03	0.000E+00	1.243E-02	0.000E+00	5.430E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.876E-04	2.421E-04	1.265E-04
EP	2.494E-02	3.229E-04	1.878E-02	9.739E-04	4.943E-03	0.000E+00	1.852E-02	0.000E+00	1.845E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.946E-05	8.650E-04	7.295E-02
SFP	1.572E-01	9.125E-03	2.385E-01	1.593E-01	2.846E-02	0.000E+00	1.486E-01	0.000E+00	9.013E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.071E-03	2.906E-03	3.265E-03
ADP _{fossil}	5.218E+01	3.157E+00	3.058E+01	7.943E+00	1.183E+01	0.000E+00	4.004E+01	0.000E+00	1.601E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.239E-01	5.842E-01	3.944E-01



ADVANCING STANDARDS
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SureWood® Collections Luxury Vinyl Flooring

Twelve Oaks Forest Product Inc.

Environmental Product Declaration: EPD 1154



Table 15 LCIA results for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.407E+01	1.257E+00	2.495E+00	3.163E+00	5.347E-01	0.000E+00	2.857E+00	0.000E+00	3.353E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.088E-01	1.640E-01	6.289E-01
ODP	5.448E-06	1.832E-08	2.039E-08	4.387E-08	1.433E-08	0.000E+00	5.507E-08	0.000E+00	8.326E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.967E-09	1.776E-09	2.250E-09
AP	5.534E-02	7.908E-03	1.739E-02	3.772E-02	1.787E-03	0.000E+00	1.243E-02	0.000E+00	1.824E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.827E-04	3.951E-04	5.950E-04
EP	9.813E-02	1.752E-03	4.766E-02	4.994E-03	8.214E-03	0.000E+00	1.852E-02	0.000E+00	7.564E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.268E-04	1.412E-03	3.432E-01
SFP	7.631E-01	1.495E-01	1.883E-01	8.672E-01	3.354E-02	0.000E+00	1.486E-01	0.000E+00	3.061E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.386E-02	4.743E-03	1.536E-02
ADP _{fossil}	2.585E+02	1.708E+01	2.616E+01	4.091E+01	1.238E+01	0.000E+00	4.004E+01	0.000E+00	5.397E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.935E+00	9.536E-01	1.855E+00

Table 16 LCIA results for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.453E+01	1.298E+00	2.659E+00	3.267E+00	5.677E-01	0.000E+00	2.857E+00	0.000E+00	3.478E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.155E-01	1.694E-01	6.493E-01
ODP	5.627E-06	1.892E-08	2.473E-08	4.532E-08	1.453E-08	0.000E+00	5.507E-08	0.000E+00	8.604E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.063E-09	1.834E-09	2.323E-09
AP	5.715E-02	8.169E-03	1.809E-02	3.897E-02	1.887E-03	0.000E+00	1.243E-02	0.000E+00	1.887E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.113E-04	4.080E-04	6.143E-04
EP	1.014E-01	1.810E-03	4.988E-02	5.159E-03	9.239E-03	0.000E+00	1.852E-02	0.000E+00	7.831E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.374E-04	1.458E-03	3.543E-01
SFP	7.882E-01	1.544E-01	2.008E-01	8.958E-01	3.582E-02	0.000E+00	1.486E-01	0.000E+00	3.173E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.463E-02	4.898E-03	1.585E-02
ADP _{fossil}	2.670E+02	1.764E+01	2.804E+01	4.226E+01	1.261E+01	0.000E+00	4.004E+01	0.000E+00	5.587E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.030E+00	9.849E-01	1.915E+00

Table 17 LCIA results for 1 m² of SureWood Plus California Size flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.514E+01	1.353E+00	2.978E+00	3.404E+00	6.315E-01	0.000E+00	2.857E+00	0.000E+00	3.661E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.244E-01	1.762E-01	6.760E-01
ODP	5.864E-06	1.972E-08	3.318E-08	4.722E-08	1.490E-08	0.000E+00	5.507E-08	0.000E+00	8.977E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.189E-09	1.908E-09	2.418E-09
AP	5.956E-02	8.512E-03	1.944E-02	4.060E-02	2.080E-03	0.000E+00	1.243E-02	0.000E+00	1.977E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.489E-04	4.245E-04	6.396E-04
EP	1.056E-01	1.886E-03	5.355E-02	5.375E-03	1.119E-02	0.000E+00	1.852E-02	0.000E+00	8.203E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.513E-04	1.517E-03	3.689E-01
SFP	8.214E-01	1.609E-01	2.250E-01	9.334E-01	4.021E-02	0.000E+00	1.486E-01	0.000E+00	3.335E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.565E-02	5.096E-03	1.651E-02
ADP _{fossil}	2.782E+02	1.838E+01	3.168E+01	4.404E+01	1.304E+01	0.000E+00	4.004E+01	0.000E+00	5.858E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.155E+00	1.025E+00	1.994E+00

Table 18 LCIA results for 1 m² of SureWood Plus King Size flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.388E+01	1.240E+00	2.668E+00	3.121E+00	5.693E-01	0.000E+00	2.857E+00	0.000E+00	3.346E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.061E-01	1.618E-01	6.208E-01
ODP	5.376E-06	1.808E-08	2.507E-08	4.329E-08	1.453E-08	0.000E+00	5.507E-08	0.000E+00	8.224E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.928E-09	1.752E-09	2.221E-09
AP	5.460E-02	7.804E-03	1.813E-02	3.722E-02	1.891E-03	0.000E+00	1.243E-02	0.000E+00	1.817E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.713E-04	3.899E-04	5.873E-04
EP	9.683E-02	1.729E-03	4.844E-02	4.928E-03	9.205E-03	0.000E+00	1.852E-02	0.000E+00	7.503E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.226E-04	1.393E-03	3.387E-01
SFP	7.530E-01	1.475E-01	2.015E-01	8.558E-01	3.589E-02	0.000E+00	1.486E-01	0.000E+00	3.049E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.355E-02	4.681E-03	1.516E-02
ADP _{fossil}	2.551E+02	1.685E+01	2.816E+01	4.037E+01	1.261E+01	0.000E+00	4.004E+01	0.000E+00	5.367E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.897E+00	9.410E-01	1.831E+00



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Twelve Oaks Forest Product Inc.

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Table 19 LCIA results for 1 m² of SureWood Pro (Plank) flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	2.209E+01	1.973E+00	2.654E+00	4.965E+00	5.713E-01	0.000E+00	2.857E+00	0.000E+00	5.033E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.256E-01	2.558E-01	9.809E-01
ODP	8.553E-06	2.876E-08	2.352E-08	6.887E-08	1.465E-08	0.000E+00	5.507E-08	0.000E+00	1.305E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.627E-09	2.771E-09	3.509E-09
AP	8.687E-02	1.242E-02	1.800E-02	5.922E-02	1.908E-03	0.000E+00	1.243E-02	0.000E+00	2.711E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.377E-03	6.164E-04	9.280E-04
EP	1.541E-01	2.751E-03	6.737E-02	7.840E-03	1.028E-02	0.000E+00	1.852E-02	0.000E+00	1.167E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.097E-04	2.203E-03	5.352E-01
SFP	1.198E+00	2.347E-01	1.998E-01	1.361E+00	3.655E-02	0.000E+00	1.486E-01	0.000E+00	4.637E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.721E-02	7.400E-03	2.395E-02
ADP _{fossil}	4.058E+02	2.681E+01	2.779E+01	6.423E+01	1.272E+01	0.000E+00	4.004E+01	0.000E+00	8.172E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.578E+00	1.488E+00	2.893E+00

Table 20 LCIA results for 1 m² of SureWood Pro (Tile) flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	1.424E+01	1.272E+00	2.895E+00	3.200E+00	6.147E-01	0.000E+00	2.857E+00	0.000E+00	3.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.112E-01	1.658E-01	6.363E-01
ODP	5.513E-06	1.854E-08	3.110E-08	4.439E-08	1.479E-08	0.000E+00	5.507E-08	0.000E+00	8.441E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.002E-09	1.795E-09	2.276E-09
AP	5.600E-02	8.003E-03	1.910E-02	3.817E-02	2.028E-03	0.000E+00	1.243E-02	0.000E+00	1.872E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.931E-04	3.994E-04	6.020E-04
EP	9.931E-02	1.773E-03	5.088E-02	5.054E-03	1.058E-02	0.000E+00	1.852E-02	0.000E+00	7.727E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.306E-04	1.427E-03	3.472E-01
SFP	7.722E-01	1.513E-01	2.188E-01	8.776E-01	3.901E-02	0.000E+00	1.486E-01	0.000E+00	3.148E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.414E-02	4.795E-03	1.554E-02
ADP _{fossil}	2.616E+02	1.728E+01	3.076E+01	4.140E+01	1.291E+01	0.000E+00	4.004E+01	0.000E+00	5.532E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.970E+00	9.640E-01	1.877E+00

Table 21 LCIA results for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	8.519E+00	7.612E-01	2.912E+00	1.915E+00	6.145E-01	0.000E+00	2.857E+00	0.000E+00	2.285E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.279E-01	1.005E-01	3.854E-01
ODP	3.299E-06	1.109E-08	3.236E-08	2.657E-08	1.471E-08	0.000E+00	5.507E-08	0.000E+00	5.080E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.818E-09	1.088E-09	1.379E-09
AP	3.350E-02	4.789E-03	1.922E-02	2.284E-02	2.020E-03	0.000E+00	1.243E-02	0.000E+00	1.249E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.408E-04	2.421E-04	3.646E-04
EP	5.942E-02	1.061E-03	3.774E-02	3.024E-03	9.869E-03	0.000E+00	1.852E-02	0.000E+00	4.824E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.002E-04	8.650E-04	2.103E-01
SFP	4.620E-01	9.054E-02	2.205E-01	5.252E-01	3.863E-02	0.000E+00	1.486E-01	0.000E+00	2.041E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.462E-02	2.906E-03	9.411E-03
ADP _{fossil}	1.565E+02	1.034E+01	3.109E+01	2.478E+01	1.285E+01	0.000E+00	4.004E+01	0.000E+00	3.578E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.798E+00	5.842E-01	1.137E+00

Table 22 LCIA results for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in Vietnam.

Impact Category	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP	2.787E+00	2.490E-01	2.208E+00	6.265E-01	4.708E-01	0.000E+00	2.857E+00	0.000E+00	6.840E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.438E-02	4.438E-02	1.337E-01
ODP	1.079E-06	3.629E-09	1.431E-08	8.690E-09	1.380E-08	0.000E+00	5.507E-08	0.000E+00	1.665E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.306E-10	6.306E-10	4.783E-10
AP	1.096E-02	1.567E-03	1.626E-02	7.472E-03	1.580E-03	0.000E+00	1.243E-02	0.000E+00	3.519E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.876E-04	1.876E-04	1.265E-04
EP	1.944E-02	3.471E-04	1.951E-02	9.892E-04	4.943E-03	0.000E+00	1.852E-02	0.000E+00	1.486E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.946E-05	6.946E-05	7.295E-02
SFP	1.512E-01	2.962E-02	1.673E-01	1.718E-01	2.846E-02	0.000E+00	1.486E-01	0.000E+00	6.284E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.071E-03	5.071E-03	3.265E-03
ADP _{fossil}	5.121E+01	3.383E+00	2.315E+01	8.104E+00	1.183E+01	0.000E+00	4.004E+01	0.000E+00	1.184E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.239E-01	6.239E-01	3.944E-01



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5.2 RESOURCE USE INDICATORS

Table 23 Resource use indicators for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.156E+01	2.271E-01	1.052E+01	7.420E-01	3.256E-01	0.000E+00	1.700E+01	0.000E+00	7.585E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.268E-02	2.728E-01	2.594E-02
RPR _M	0.000E+00															
NRPR _E	2.948E+02	1.717E+01	3.814E+01	4.333E+01	1.370E+01	0.000E+00	6.400E+01	0.000E+00	6.175E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.164E+00	1.503E+00	2.002E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	8.018E-02	1.135E-03	1.823E-02	3.072E-03	1.378E-03	0.000E+00	1.091E-01	0.000E+00	1.566E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.114E-04	7.081E-04	3.008E-04

Table 24 Resource use indicators for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.293E+01	2.346E-01	1.236E+01	7.664E-01	3.343E-01	0.000E+00	1.700E+01	0.000E+00	8.503E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.406E-02	2.818E-01	2.678E-02
RPR _M	0.000E+00															
NRPR _E	3.044E+02	1.774E+01	4.031E+01	4.476E+01	1.394E+01	0.000E+00	6.400E+01	0.000E+00	6.395E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.267E+00	1.553E+00	2.067E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	8.281E-02	1.173E-03	2.087E-02	3.173E-03	1.427E-03	0.000E+00	1.091E-01	0.000E+00	1.649E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.182E-04	7.314E-04	3.105E-04

Table 25 Resource use indicators for 1 m² of SureWood Plus California flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.473E+01	2.445E-01	1.587E+01	7.986E-01	3.510E-01	0.000E+00	1.700E+01	0.000E+00	9.310E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.588E-02	2.931E-01	2.788E-02
RPR _M	0.000E+00															
NRPR _E	3.173E+02	1.848E+01	4.454E+01	4.664E+01	1.441E+01	0.000E+00	6.400E+01	0.000E+00	6.700E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.402E+00	1.615E+00	2.152E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	8.630E-02	1.222E-03	2.600E-02	3.306E-03	1.521E-03	0.000E+00	1.091E-01	0.000E+00	1.783E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.272E-04	7.608E-04	3.234E-04

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Table 26 Resource use indicators for 1 m² of SureWood Plus King flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.101E+01	2.241E-01	1.236E+01	7.322E-01	3.348E-01	0.000E+00	1.700E+01	0.000E+00	8.209E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.212E-02	2.692E-01	2.560E-02
RPR _M	0.000E+00															
NRPR _E	2.908E+02	1.694E+01	4.046E+01	4.276E+01	1.394E+01	0.000E+00	6.400E+01	0.000E+00	6.151E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.124E+00	1.484E+00	1.976E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	7.911E-02	1.120E-03	2.109E-02	3.031E-03	1.430E-03	0.000E+00	1.091E-01	0.000E+00	1.594E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.087E-04	6.988E-04	2.699E-04

Table 27 Resource use indicators for 1 m² of SureWood Pro Plank flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	6.524E+01	3.566E-01	1.345E+01	1.165E+00	3.338E-01	0.000E+00	1.700E+01	0.000E+00	1.210E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.656E-02	4.257E-01	4.045E-02
RPR _M	0.000E+00															
NRPR _E	4.627E+02	2.696E+01	4.000E+01	6.803E+01	1.406E+01	0.000E+00	6.400E+01	0.000E+00	9.297E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.935E+00	2.345E+00	3.122E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	1.259E-01	1.782E-03	1.993E-02	4.822E-03	1.424E-03	0.000E+00	1.091E-01	0.000E+00	2.319E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.297E-04	1.105E-03	4.692E-04

Table 28 Resource use indicators for 1 m² of SureWood Pro Tile flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.206E+01	2.299E-01	1.485E+01	7.508E-01	3.467E-01	0.000E+00	1.700E+01	0.000E+00	8.747E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.318E-02	2.758E-01	2.624E-02
RPR _M	0.000E+00															
NRPR _E	2.983E+02	1.738E+01	4.348E+01	4.385E+01	1.428E+01	0.000E+00	6.400E+01	0.000E+00	6.337E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.202E+00	1.520E+00	2.025E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	8.114E-02	1.149E-03	2.476E-02	3.109E-03	1.497E-03	0.000E+00	1.091E-01	0.000E+00	1.683E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.139E-04	7.159E-04	3.043E-04



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Table 29 Resource use indicators for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	2.517E+01	1.376E-01	1.417E+01	4.493E-01	3.478E-01	0.000E+00	1.700E+01	0.000E+00	6.047E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.615E-02	1.672E-01	1.589E-02
RPR _M	0.000E+00															
NRPR _E	1.785E+02	1.040E+01	4.389E+01	2.624E+01	1.421E+01	0.000E+00	6.400E+01	0.000E+00	4.145E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.939E+00	9.211E-01	1.227E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	4.855E-02	6.876E-04	2.567E-02	1.860E-03	1.503E-03	0.000E+00	1.091E-01	0.000E+00	1.179E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.295E-04	4.339E-04	1.843E-04

Table 30 Resource use indicators for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	8.232E+00	4.499E-02	5.733E+00	1.470E-01	3.110E-01	0.000E+00	1.700E+01	0.000E+00	2.172E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.071E-03	1.672E-01	5.514E-03
RPR _M	0.000E+00															
NRPR _E	5.839E+01	3.401E+00	3.468E+01	8.584E+00	1.310E+01	0.000E+00	6.400E+01	0.000E+00	1.789E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.726E-01	9.211E-01	4.256E-01
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	1.588E-02	2.249E-04	1.483E-02	6.085E-04	1.295E-03	0.000E+00	1.091E-01	0.000E+00	4.942E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.493E-05	4.339E-04	6.395E-05

Table 31 Resource use indicators for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.254E+01	2.251E-01	1.273E+01	7.412E-01	3.256E-01	0.000E+00	1.700E+01	0.000E+00	8.495E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.268E-02	2.728E-01	2.594E-02
RPR _M	0.000E+00															
NRPR _E	2.883E+02	1.838E+01	2.851E+01	4.420E+01	1.370E+01	0.000E+00	6.400E+01	0.000E+00	5.974E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.164E+00	1.503E+00	2.002E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	7.700E-02	1.108E-03	1.286E-02	3.057E-03	1.378E-03	0.000E+00	1.091E-01	0.000E+00	1.439E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.114E-04	7.081E-04	3.008E-04



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Table 32 Resource use indicators for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.394E+01	2.326E-01	1.457E+01	7.656E-01	3.343E-01	0.000E+00	1.700E+01	0.000E+00	8.986E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.406E-02	2.818E-01	2.678E-02
RPR _M	0.000E+00															
NRPR _E	2.978E+02	1.899E+01	3.068E+01	4.565E+01	1.394E+01	0.000E+00	6.400E+01	0.000E+00	6.186E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.267E+00	1.553E+00	2.067E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	7.953E-02	1.145E-03	1.549E-02	3.158E-03	1.427E-03	0.000E+00	1.091E-01	0.000E+00	1.519E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.182E-04	7.314E-04	3.105E-04

Table 33 Resource use indicators for 1 m² of SureWood Plus California flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.578E+01	2.423E-01	1.808E+01	7.978E-01	3.510E-01	0.000E+00	1.700E+01	0.000E+00	9.799E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.588E-02	2.931E-01	2.788E-02
RPR _M	0.000E+00															
NRPR _E	3.103E+02	1.979E+01	3.491E+01	4.757E+01	1.441E+01	0.000E+00	6.400E+01	0.000E+00	6.489E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.402E+00	1.615E+00	2.152E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	8.288E-02	1.193E-03	2.062E-02	3.291E-03	1.521E-03	0.000E+00	1.091E-01	0.000E+00	1.651E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.272E-04	7.608E-04	3.234E-04

Table 34 Resource use indicators for 1 m² of SureWood Plus King flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.198E+01	2.222E-01	1.457E+01	7.314E-01	3.348E-01	0.000E+00	1.700E+01	0.000E+00	8.685E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.212E-02	2.692E-01	2.560E-02
RPR _M	0.000E+00															
NRPR _E	2.845E+02	1.814E+01	3.083E+01	4.362E+01	1.394E+01	0.000E+00	6.400E+01	0.000E+00	5.942E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.124E+00	1.484E+00	1.976E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	7.598E-02	1.094E-03	1.571E-02	3.017E-03	1.430E-03	0.000E+00	1.091E-01	0.000E+00	1.466E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.087E-04	6.988E-04	2.969E-04



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Table 35 Resource use indicators for 1 m² of SureWood Pro Plank flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	6.678E+01	3.534E-01	1.565E+01	1.164E+00	3.338E-01	0.000E+00	1.700E+01	0.000E+00	1.266E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.656E-02	4.257E-01	4.045E-02
RPR _M	0.000E+00															
NRPR _E	4.526E+02	2.886E+01	3.037E+01	6.939E+01	1.406E+01	0.000E+00	6.400E+01	0.000E+00	9.050E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.935E+00	2.345E+00	3.122E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	1.209E-01	1.740E-03	1.455E-02	4.800E-03	1.424E-03	0.000E+00	1.091E-01	0.000E+00	2.163E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.297E-04	1.105E-03	4.692E-04

Table 36 Resource use indicators for 1 m² of SureWood Pro Tile flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	4.305E+01	2.278E-01	1.706E+01	7.501E-01	3.467E-01	0.000E+00	1.700E+01	0.000E+00	9.226E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.318E-02	2.758E-01	2.624E-02
RPR _M	0.000E+00															
NRPR _E	2.918E+02	1.860E+01	3.385E+01	4.473E+01	1.428E+01	0.000E+00	6.400E+01	0.000E+00	6.127E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.202E+00	1.520E+00	2.025E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	7.792E-02	1.121E-03	1.938E-02	3.094E-03	1.497E-03	0.000E+00	1.091E-01	0.000E+00	1.553E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.139E-04	7.159E-04	3.043E-04

Table 37 Resource use indicators for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	2.576E+01	1.363E-01	1.637E+01	4.488E-01	3.478E-01	0.000E+00	1.700E+01	0.000E+00	6.467E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.615E-02	1.672E-01	1.589E-02
RPR _M	0.000E+00															
NRPR _E	1.746E+02	1.113E+01	3.426E+01	2.676E+01	1.421E+01	0.000E+00	6.400E+01	0.000E+00	3.961E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.939E+00	9.211E-01	1.227E+00
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	4.662E-02	6.711E-04	2.030E-02	1.851E-03	1.503E-03	0.000E+00	1.091E-01	0.000E+00	1.069E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.295E-04	4.339E-04	1.843E-04



Table 38 Resource use indicators for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR _E	8.426E+00	4.459E-02	7.940E+00	1.468E-01	3.110E-01	0.000E+00	1.700E+01	0.000E+00	1.348E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.071E-03	1.672E-01	5.514E-03
RPR _M	0.000E+00															
NRPR _E	5.711E+01	3.641E+00	2.505E+01	8.755E+00	1.310E+01	0.000E+00	6.400E+01	0.000E+00	1.310E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.726E-01	9.211E-01	4.256E-01
NRPR _M	0.000E+00															
SM	0.000E+00															
RSF	0.000E+00															
NRSF	0.000E+00															
RE	0.000E+00															
FW	1.525E-02	2.195E-04	9.447E-03	6.056E-04	1.295E-03	0.000E+00	1.091E-01	0.000E+00	2.655E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.493E-05	4.339E-04	6.395E-05

5.3 WASTE FLOW INDICATORS

Table 39 Output flows and waste categories for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	5.989E-03	1.126E-04	1.237E-04	2.668E-04	2.258E-04	0.000E+00	1.033E-03	0.000E+00	1.012E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.052E-05	1.010E-03	1.368E-05
NHWD	1.189E+01	9.947E-01	5.119E+00	1.853E+00	8.490E-01	0.000E+00	2.107E+00	0.000E+00	4.295E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.210E-01	9.394E-02	7.738E+00
HLRW	0.000E+00															
ILLRW	1.485E-04	3.218E-06	3.154E-05	9.988E-06	5.608E-06	0.000E+00	5.259E-04	0.000E+00	2.992E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.164E-07	6.900E-06	3.889E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.331E-01	0.000E+00	0.000E+00	0.000E+00	1.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.571E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 40 Output flows and waste categories for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.186E-03	1.163E-04	1.359E-04	2.756E-04	2.271E-04	0.000E+00	1.033E-03	0.000E+00	1.046E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.118E-05	9.702E-02	1.412E-05
NHWD	1.228E+01	1.027E+00	5.252E+00	1.914E+00	1.049E+00	0.000E+00	2.107E+00	0.000E+00	4.423E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.281E-01	4.802E-06	7.988E+00
HLRW	0.000E+00															
ILLRW	1.533E-04	3.324E-06	3.353E-05	1.032E-05	5.693E-06	0.000E+00	5.259E-04	0.000E+00	3.108E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.364E-07	1.043E-03	4.015E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.712E-01	0.000E+00	0.000E+00	0.000E+00	2.567E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.719E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 41 Output flows and waste categories for 1 m² of SureWood Plus California flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.446E-03	1.212E-04	1.597E-04	2.871E-04	2.294E-04	0.000E+00	1.033E-03	0.000E+00	1.092E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.205E-05	1.085E-03	1.470E-05
NHWD	1.280E+01	1.071E+00	5.496E+00	1.995E+00	1.436E+00	0.000E+00	2.107E+00	0.000E+00	4.652E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.375E-01	1.009E-01	8.317E+00
HLRW	0.000E+00															
ILLRW	1.598E-04	3.464E-06	3.741E-05	1.075E-05	5.856E-06	0.000E+00	5.259E-04	0.000E+00	3.275E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.627E-07	7.413E-06	4.180E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.447E-01	0.000E+00	0.000E+00	0.000E+00	3.670E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.913E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 42 Output flows and waste categories for 1 m² of SureWood Plus King flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	5.910E-03	1.111E-04	1.367E-04	2.633E-04	2.271E-04	0.000E+00	1.033E-03	0.000E+00	1.002E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.025E-05	9.965E-04	1.350E-05
NHWD	1.174E+01	9.816E-01	5.225E+00	1.829E+00	1.061E+00	0.000E+00	2.107E+00	0.000E+00	4.303E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.181E-01	9.271E-02	7.637E+00
HLRW	0.000E+00															
ILLRW	1.465E-04	3.176E-06	3.368E-05	9.856E-06	5.697E-06	0.000E+00	5.259E-04	0.000E+00	2.999E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.085E-07	6.810E-06	3.838E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.726E-01	0.000E+00	0.000E+00	0.000E+00	2.590E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.511E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 43 Output flows and waste categories for 1 m² of SureWood Pro Plank flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	9.402E-03	1.767E-04	1.350E-04	4.188E-04	2.280E-04	0.000E+00	1.033E-03	0.000E+00	1.562E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.200E-05	1.575E-03	2.133E-05
NHWD	1.867E+01	1.562E+00	5.630E+00	2.909E+00	1.037E+00	0.000E+00	2.107E+00	0.000E+00	6.333E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.446E-01	1.466E-01	1.207E+01
HLRW	0.000E+00															
ILLRW	2.331E-04	5.052E-06	3.303E-05	1.568E-05	5.701E-06	0.000E+00	5.259E-04	0.000E+00	4.411E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.614E-07	1.077E-05	6.065E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.794E-01	0.000E+00	0.000E+00	0.000E+00	2.690E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.128E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 44 Output flows and waste categories for 1 m² of SureWood Pro Tile flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.061E-03	1.139E-04	1.536E-04	2.700E-04	2.287E-04	0.000E+00	1.033E-03	0.000E+00	1.029E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E-05	1.021E-03	1.384E-05
NHWD	1.204E+01	1.007E+00	5.396E+00	1.875E+00	1.338E+00	0.000E+00	2.107E+00	0.000E+00	4.455E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.236E-01	9.497E-02	7.828E+00
HLRW	0.000E+00															
ILLRW	1.502E-04	3.256E-06	3.645E-05	1.011E-05	5.814E-06	0.000E+00	5.259E-04	0.000E+00	3.103E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.237E-07	6.976E-06	3.934E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.250E-01	0.000E+00	0.000E+00	0.000E+00	3.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.624E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 45 Output flows and waste categories for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	3.626E-03	6.817E-05	1.553E-04	1.615E-04	2.281E-04	0.000E+00	1.033E-03	0.000E+00	6.391E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E-05	6.187E-04	8.382E-06
NHWD	7.201E+00	6.023E-01	5.118E+00	1.122E+00	1.362E+00	0.000E+00	2.107E+00	0.000E+00	3.042E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.354E-01	5.756E-02	4.741E+00
HLRW	0.000E+00															
ILLRW	8.989E-05	1.949E-06	3.699E-05	6.048E-06	5.814E-06	0.000E+00	5.259E-04	0.000E+00	2.120E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.777E-07	4.228E-06	2.383E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.217E-01	0.000E+00	0.000E+00	0.000E+00	3.325E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.800E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 46 Output flows and waste categories for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in China.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	1.186E-03	2.230E-05	1.031E-04	5.284E-05	2.224E-04	0.000E+00	1.033E-03	0.000E+00	2.391E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.361E-06	6.187E-04	2.908E-06
NHWD	2.356E+00	1.970E-01	4.358E+00	3.671E-01	5.091E-01	0.000E+00	2.107E+00	0.000E+00	1.422E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.697E-02	5.756E-02	1.645E+00
HLRW	0.000E+00															
ILLRW	2.941E-05	6.374E-07	2.868E-05	1.978E-06	5.445E-06	0.000E+00	5.259E-04	0.000E+00	9.954E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.310E-07	4.228E-06	8.267E-08
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.388E-02	0.000E+00	0.000E+00	0.000E+00	8.081E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.715E-02	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 47 Output flows and waste categories for 1 m² of SureWood flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.06E-03	1.16E-04	9.16E-05	2.69E-04	2.258E-04	0.000E+00	1.033E-03	0.000E+00	1.02E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.052E-05	1.010E-03	1.368E-05
NHWD	1.03E+01	9.15E-01	2.67E+00	1.79E+00	8.490E-01	0.000E+00	2.107E+00	0.000E+00	3.67E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.210E-01	9.394E-02	7.738E+00
HLRW	0.000E+00															
ILLRW	1.31E-04	3.18E-06	6.53E-06	9.97E-06	5.608E-06	0.000E+00	5.259E-04	0.000E+00	2.36E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.164E-07	6.900E-06	3.889E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.331E-01	0.000E+00	0.000E+00	0.000E+00	1.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.571E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 48 Output flows and waste categories for 1 m² of SureWood Chevron flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.26E-03	1.20E-04	1.04E-04	2.78E-04	2.271E-04	0.000E+00	1.033E-03	0.000E+00	1.05E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.118E-05	9.702E-02	1.412E-05
NHWD	1.06E+01	9.45E-01	2.80E+00	1.85E+00	1.049E+00	0.000E+00	2.107E+00	0.000E+00	3.82E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.281E-01	4.802E-06	7.988E+00
HLRW	0.000E+00															
ILLRW	1.36E-04	3.29E-06	8.52E-06	1.03E-05	5.693E-06	0.000E+00	5.259E-04	0.000E+00	2.47E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.364E-07	1.043E-03	4.015E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.712E-01	0.000E+00	0.000E+00	0.000E+00	2.567E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.719E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

SureWood® Collections Luxury Vinyl Flooring

Twelve Oaks Forest Product Inc.

Environmental Product Declaration: EPD 1154



Table 49 Output flows and waste categories for 1 m² of SureWood Plus California flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.52E-03	1.25E-04	1.28E-04	2.90E-04	2.294E-04	0.000E+00	1.033E-03	0.000E+00	1.10E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.205E-05	1.085E-03	1.470E-05
NHWD	1.11E+01	9.84E-01	3.04E+00	1.93E+00	1.436E+00	0.000E+00	2.107E+00	0.000E+00	4.05E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.375E-01	1.009E-01	8.317E+00
HLRW	0.000E+00															
ILLRW	1.41E-04	3.42E-06	1.24E-05	1.07E-05	5.856E-06	0.000E+00	5.259E-04	0.000E+00	2.62E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.627E-07	7.413E-06	4.180E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.447E-01	0.000E+00	0.000E+00	0.000E+00	3.670E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.913E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 50 Output flows and waste categories for 1 m² of SureWood Plus King flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	5.98E-03	1.14E-04	1.05E-04	2.66E-04	2.271E-04	0.000E+00	1.033E-03	0.000E+00	1.01E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.025E-05	9.965E-04	1.350E-05
NHWD	1.02E+01	9.03E-01	2.77E+00	1.77E+00	1.061E+00	0.000E+00	2.107E+00	0.000E+00	3.68E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.181E-01	9.271E-02	7.637E+00
HLRW	0.000E+00															
ILLRW	1.30E-04	3.14E-06	8.67E-06	9.84E-06	5.697E-06	0.000E+00	5.259E-04	0.000E+00	2.37E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.085E-07	6.810E-06	3.838E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.726E-01	0.000E+00	0.000E+00	0.000E+00	2.590E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.511E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 51 Output flows and waste categories for 1 m² of SureWood Pro Plank flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	9.51E-03	1.82E-04	1.03E-04	4.23E-04	2.280E-04	0.000E+00	1.033E-03	0.000E+00	1.58E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.200E-05	1.575E-03	2.133E-05
NHWD	1.62E+01	1.44E+00	3.18E+00	2.81E+00	1.037E+00	0.000E+00	2.107E+00	0.000E+00	5.55E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.446E-01	1.466E-01	1.207E+01
HLRW	0.000E+00															
ILLRW	2.06E-04	5.00E-06	8.01E-06	1.56E-05	5.701E-06	0.000E+00	5.259E-04	0.000E+00	3.63E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.614E-07	1.077E-05	6.065E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.794E-01	0.000E+00	0.000E+00	0.000E+00	2.690E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.128E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 52 Output flows and waste categories for 1 m² of SureWood Pro Tile flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	6.13E-03	1.17E-04	1.22E-04	2.73E-04	2.287E-04	0.000E+00	1.033E-03	0.000E+00	1.04E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.076E-05	1.021E-03	1.384E-05
NHWD	1.04E+01	9.26E-01	2.94E+00	1.81E+00	1.338E+00	0.000E+00	2.107E+00	0.000E+00	3.82E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.236E-01	9.497E-02	7.828E+00
HLRW	0.000E+00															
ILLRW	1.33E-04	3.22E-06	1.14E-05	1.01E-05	5.814E-06	0.000E+00	5.259E-04	0.000E+00	2.47E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.237E-07	6.976E-06	3.934E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.250E-01	0.000E+00	0.000E+00	0.000E+00	3.374E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.624E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															



ADVANCING STANDARDS
TRANSFORMING MARKETS

Table 53 Output flows and waste categories for 1 m² of SureWood Elevate flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	3.67E-03	7.01E-05	1.23E-04	1.63E-04	2.281E-04	0.000E+00	1.033E-03	0.000E+00	6.41E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.257E-05	6.187E-04	8.382E-06
NHWD	6.23E+00	5.54E-01	2.67E+00	1.08E+00	1.362E+00	0.000E+00	2.107E+00	0.000E+00	2.52E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.354E-01	5.756E-02	4.741E+00
HLRW	0.000E+00															
ILLRW	7.95E-05	1.93E-06	1.20E-05	6.04E-06	5.814E-06	0.000E+00	5.259E-04	0.000E+00	1.59E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.777E-07	4.228E-06	2.383E-07
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.217E-01	0.000E+00	0.000E+00	0.000E+00	3.325E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.800E-01	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

Table 54 Output flows and waste categories for 1 m² of SureWood Origin flooring over a 75-year time horizon, manufactured in Vietnam.

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	1.20E-03	2.29E-05	7.10E-05	5.34E-05	2.224E-04	0.000E+00	1.033E-03	0.000E+00	2.29E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.361E-06	6.187E-04	2.908E-06
NHWD	2.04E+00	1.81E-01	1.91E+00	3.55E-01	5.091E-01	0.000E+00	2.107E+00	0.000E+00	7.44E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.697E-02	5.756E-02	1.645E+00
HLRW	0.000E+00															
ILLRW	2.60E-05	6.30E-07	3.66E-06	1.97E-06	5.445E-06	0.000E+00	5.259E-04	0.000E+00	5.24E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.310E-07	4.228E-06	8.267E-08
CRU	0.000E+00															
MR	0.000E+00	0.000E+00	0.000E+00	5.388E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.081E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.715E-02	0.000E+00
MER	0.000E+00															
EE	0.000E+00															

6 LCA: INTERPRETATION

This LCA evaluates the full cradle-to-grave impacts (A1-C4) of 1 m² of SureWood collections luxury vinyl flooring manufactured in China and Vietnam. Although the products vary in dimensions, thickness, and mass, they share similar materials, manufacturing processes, and upstream supply chains. Across all products and both manufacturing locations, impacts are dominated by Modules A1-A3 and B4, reflecting material-intensive production and replacement over the 75-year building service life. SureWood Origin manufactured in Vietnam shows the lowest total GWP due to its lighter construction, while SureWood Pro (Plank) manufactured in China shows the highest GWP due to greater material intensity. Other products fall within an intermediate range. For products manufactured in China, cradle-to-grave GWP values range from 43.893 to 90.949 kg CO₂-eq/m², with SureWood Origin at 21.642 kg CO₂-eq/m² and SureWood Pro (Plank) at the upper end of the range.

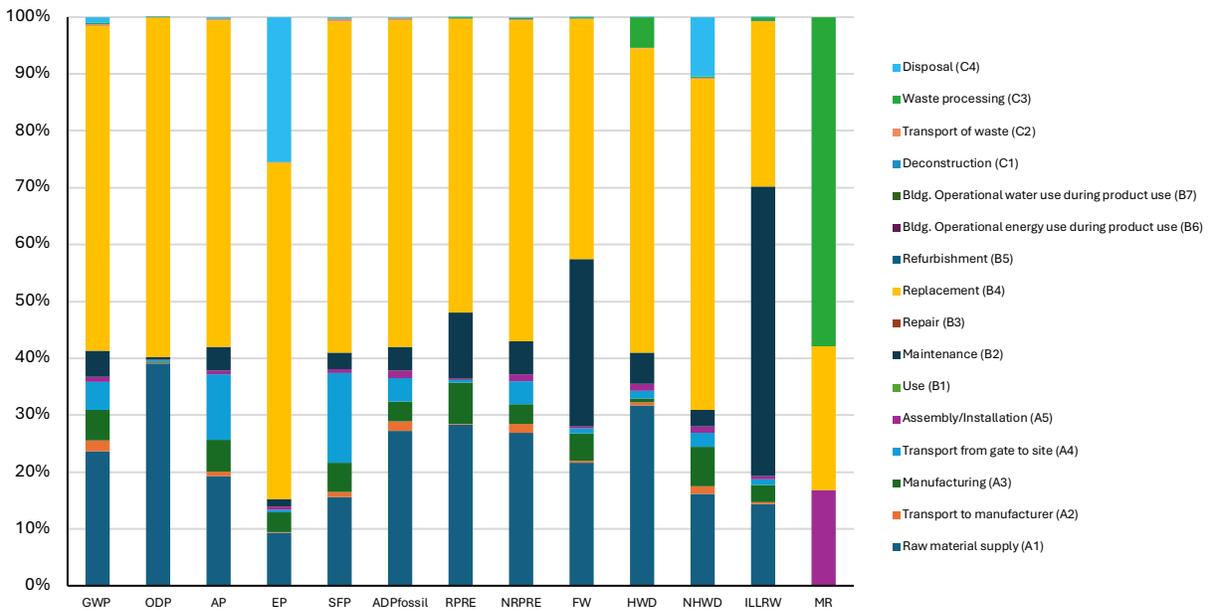


Figure 4 Contribution analysis of life cycle stages for SureWood luxury vinyl flooring manufactured in China

Contribution analysis shows that the replacement stage (B4) is the dominant driver of impacts across all SureWood collections, contributing more than half of total GWP due to the 1.5 replacement cycles over the 75-year building service life. Upstream material production (A1), manufacturing (A3), and transport to site (A4) are the next largest contributors, reflecting the material-intensive nature of luxury vinyl flooring. PVC production, wear-layer components, and foaming agents are key contributors within A1.

Maintenance (B2) and installation (A5) contribute comparatively minor impacts, while transport (A2, C2) and end-of-life processes (C3, C4) represent small fractions of total results. This pattern is consistent across all TRACI 2.1 categories, with B4 and upstream material production remaining the primary drivers of ODP, AP, EP, SFP, and ADP-fossil.

Vietnam-manufactured products show modestly lower impacts than those produced in China, primarily due to lower-carbon electricity mixes and slightly reduced upstream burdens. However, product design and material mass remain the dominant determinants of environmental performance. Lighter-weight products such as SureWood Origin and SureWood Elevate consistently exhibit lower impacts, while more material-intensive designs such as SureWood Pro (Plank) show the highest results across categories.

6.1 FURTHER INFORMATION

No substances required to be reported as hazardous are associated with the production of this product. SureWood flooring contains no dangerous or regulated substances that impact human health or the environment, as supported by its FloorScore® certification. Technical data sheets for the SureWood line of flooring products can be found at the following location:

<https://twelveoaks.ca/resource/technical-data-specs/>

7 REFERENCES

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