TAJ FLOORING
GLOBAL SOURCING, LOCAL SERVICING

VERIFIED by SCS GLOBAL SERVICES
ENVIRONMENTAL PRODUCT DECLARATION
BASED ON LCA

Declaration Owner

TAJ Flooring, Inc.
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Products

- *3mm Select*
- *3mm Phoenix*
- *5mm Modular Acoustic Flooring*

This EPD represents delivery of product to North American customers

UNSPSC Code 30161700
CSI Code 09 65 00

Functional Unit

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

EPD Number and Period of Validity

SCS-EPD-05621
EPD Valid July 23, 2019 through July 22, 2024

Product Category Rule

PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. UL Environment. September 2018

PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. September 2018.

Program Operator

SCS Global Services
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SCSglobal SERVICES

Declaration Owner:	TAJ Flooring, Inc.
Address:	740 Church Road, Elgin, IL 60123
Declaration Number:	SCS-EPD-05621
Declaration Validity Period:	EPD Valid July 23, 2019 through July 22, 2024
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioners:	Jeremie Hakian, SCS Global Services & Dr. Gerard Mansell, SCS Global Services
LCA Software:	openLCA v1.8
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	☒ internal ☐ external
LCA Reviewer:	Aditi Suresh, SCS Global Services
Part A Product Category Rule:	PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. UL Environment. September 2018
Part A PCR Review conducted by:	Lindita Bushi, PhD (Chair); Hugues Imbeault-Tétreault, ing., M.Sc.A.; Jack Geibig
Part B Product Category Rule:	PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. September 2018.
Part B PCR Review conducted by:	Jack Geibig (Chair); Tom Gloria, PhD; and Thaddeus Owen
Independent verification of the declaration and data, according to ISO 14025 and the PCR	☐ internal ☒ external
EPD Verifier:	Tom Gloria, Ph.D., Industrial Ecology Consultants
Declaration Contents:	

Disclaimers: *This EPD conforms to ISO 14025, 14040, 14044, and ISO 21930.*

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: *The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.*

In accordance with ISO 21930:2017, EPDs are comparable only if they comply with the core PCR, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.

1. About TAJ Flooring

TAJ Flooring is a family owned and operated resilient flooring company that offers floors that are as functional as they are beautiful. TAJ Flooring works to incorporate the latest performance technology with current environmental standards in premium design options and unparalleled customer service to meet their customer's project requirements.

2. Products

2.1 Product Descriptions

Product	Description
Select* and *Phoenix	*Select* and *Phoenix* are manufactured with a high molecular weight polymerized vinyl wear layer supported by a high strength vinyl backing. *Select* and *Phoenix* are built with a PROTECH® UV cured polyurethane finish, which is a protective anti-soil coating that is incorporated into the wear surface during the manufacturing process. PROTECH® eliminates the need for floor finishes and provides improved hygiene and chemical resistance.
Modular Acoustic Flooring	*Modular Acoustic Flooring* is a fiberglass reinforced heterogeneous modular floor tile with a factory applied non-slip backing. *Modular Acoustic Flooring* is manufactured with high molecular weight polymerized wear layer which is supported by high strength vinyl backing. The modular tile is sealed with Protech Plus UV cured, ceramic bead infused polyurethane finish which enhances ease of maintenance and provides antimicrobial performance. *Modular Acoustic Flooring* is engineered to contribute to quiet environments and limit sound transmission without the need for acoustical underlayment.

2.2 Application

TAJ Flooring products in this EPD provide the primary function of floor covering for interior applications.

2.3 Technical Data

Table 1. Product specifications for *Select.*

Name		Nominal Value	Unit
Product Thickness		3.0	mm
Wear Layer Thickness		0.5	mm
Product Weight		4,860	g/m^2
Name		**Value Range**	
Product Form	Tile	18″ x 18″; 25-3/8″ x 25-3/8″; 36″ x 36″	457mm x 457mm; 1,153mm x 1,153mm; 914mm x 914mm
	Slab	17-3/4″ x 35-1/2″; 12″ x 24″	451mm x 902mm; 305mm x 610mm
	Plank	4″ x 36″; 6″ x 36″; 7″ x 48″	102mm x 915mm; 152mm x 915mm; 178mm x 1,219mm

Table 2. Product specifications for *Phoenix*.

Name		Nominal Value	Unit
Product Thickness		3.0	mm
Wear Layer Thickness		0.7	mm
Product Weight		4,890	g/m^2
Name		**Value Range**	
Product Form	Tile	18″ x 18″	457mm x 457mm
	Slab	12″ x 24″; 17.72″ x 35.43″	305mm x 610mm; 450mm x 900mm
	Plank	4″ x 36″; 6″ x 36″; 7″ x 48″; 9-1/4″ x 59-1/4″	102mm x 915mm; 152mm x 915mm; 178mm x 1,219mm; 235mm x 1,505mm

Table 3. Product specifications for *Modular Acoustic Flooring*.

Name		Nominal Value	Unit
Product Thickness		5.0	mm
Wear Layer Thickness		0.5	mm
Product Weight		8,510	g/m^2
Name		**Value Range**	
Product Form	Tile	20″ x 20″	508mm x 508mm
	Slab	12″ x 24″; 11.97″ x 23.91″	305mm x 610mm; 304mm x 607mm
	Plank	8″ x 40″; 7″ x 48″; 7.36″ x 48.46″	203mm x 1,016mm; 178mm x 1,219mm; 187mm x 1,231mm

Table 4. Product performance for *Select* and *Phoenix*.

Test Method	Result
Product Classification / ASTM F-1700	Class III, Type A (smooth), Type B (embossed)
Fire Resistance / ASTM E-648	Class 1>0.45
Smoke Density / ASTM E-662	<450 – Flaming/Non-Flaming
Static Load / ASTM F-970	1100 psi
Slip Resistance / ASTM C-1028-89	>0.6 per ADA
Chemical and Stain Resistance	Excellent
VOC Emissions	Negligible
FloorScore® Certified	Yes (SCS-FS-03546)

Table 5. Product performance for *Modular Acoustic Flooring*.

Test Method	Result
Product Classification / ASTM F-1700	Class III, Type B (embossed)
Fire Resistance / ASTM E-648	Class 1>0.45
Smoke Density / ASTM E-662	<450 – Flaming/Non-Flaming
Static Load / ASTM F-970	1000 psi
Slip Resistance / ASTM C-1028-89	>0.6 per ADA
Impact Sound Conduction / ASTM E-492 Airborne Sound Transmission Loss / ASTM E-90	IIC 57 STC 62
Chemical and Stain Resistance	Excellent
VOC Emissions	Negligible
FloorScore® Certified	Yes (SCS-FS-03546)

2.4 Delivery Status

Final product dimensions and configuration vary, which are specified in Section 2.3. Moreover, final products are delivered with various amounts of packaging materials, which are specified in Section 2.5.

2.5 Base Materials

Table 6. Product and packaging composition per m^2 of 3mm *Select*.

Product Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Recycled PVC	Polyvinyl chloride	1.31	27%	59%	0.0%
Filler	Calcite	2.12	44%	13%	0.0%
PVC	Polyvinyl chloride	1.04	21%	29%	0.0%
DOTP	Dioctyl terephthalate	0.212	4.4%	10%	0.0%
DOP	Dioctyl phthalate	$9.77x10^{-2}$	2.0%	41%	0.0%
Stabilizer	PA530, KVM2127G	$5.41x10^{-2}$	1.1%	0.0%	0.0%
Additive & Pigment	Ba-St, Epoxy	$3.00x10^{-2}$	0.62%	0.0%	0.0%
Coating	Polyurethane	$7.23x10^{-3}$	0.15%	0.0%	0.0%
TOTAL		**4.86**	**100%**	**29%**	**0.0%**
Packaging Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Boards & Pallets	Wood	0.101	53%	0.0%	0.0%
Corrugated Board	Corrugated board	$8.90x10^{-2}$	47%	0.0%	0.0%
Straps	Polyester	$6.48x10^{-4}$	0.34%	0.0%	0.0%
Film	Polyethylene	$2.52x10^{-4}$	0.13%	0.0%	0.0%
TOTAL		**0.191**	**100%**	**0.0%**	**0.0%**

Table 7. Product and packaging composition per m^2 of 3mm *Phoenix*.

Product Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Recycled PVC	Polyvinyl chloride	2.25	46%	100%	0.0%
Filler	Calcite	1.84	38%	0.0%	0.0%
PVC	Polyvinyl chloride	0.52	11%	0.0%	0.0%
DOTP	Dioctyl terephthalate	0.185	3.8%	0.0%	0.0%
Stabilizer	PA530, KVM2127G	$5.88x10^{-2}$	1.2%	0.0%	0.0%
Additive & Pigment	Ba-St, Epoxy	$2.38x10^{-2}$	0.49%	0.0%	0.0%
Coating	Polyurethane	$1.25x10^{-2}$	0.26%	0.0%	0.0%
TOTAL		**4.89**	**100%**	**46%**	**0.0%**
Packaging Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Boards & Pallets	Wood	0.113	63%	0.0%	0.0%
Corrugated Board	Corrugated board	$6.36x10^{-2}$	36%	0.0%	0.0%
Straps	Polyester	$1.12x10^{-3}$	0.63%	0.0%	0.0%
Film	Polyethylene	$4.35x10^{-4}$	0.24%	0.0%	0.0%
TOTAL		**0.178**	**100%**	**0.0%**	**0.0%**

Table 8. Product and packaging composition per m^2 of 5mm *Modular Acoustic Flooring*.

Product Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Filler	Calcite	4.02	47%	7.9%	0.0%
Recycled PVC	Polyvinyl chloride	2.14	25%	59%	0.0%
PVC	Polyvinyl chloride	1.53	18%	12%	0.0%
DOTP	Dioctyl terephthalate	0.529	6.2%	1.2%	0.0%
DINP	Di-iso-nonyl phthalate	0.113	1.3%	41%	0.0%
Stabilizer	PA530, KVM2127G	$8.28x10^{-2}$	0.97%	0.0%	0.0%
Additive & Pigment	Ba-St, Epoxy	$6.29x10^{-2}$	0.74%	0.0%	0.0%
Glass Fiber	Glass fiber	$2.28x10^{-2}$	0.27%	0.0%	0.0%
Coating	Polyurethane	$1.20x10^{-2}$	0.14%	0.0%	0.0%
TOTAL		**8.51**	**100%**	**21%**	**0.0%**
Packaging Composition					
Component	Material	Amount (kg/m^2)	Percent of Total (%)	Recycled Content	
				Pre-consumer (%)	Post-consumer (%)
Boards & Pallets	Wood	0.196	61%	0.0%	0.0%
Corrugated Board	Corrugated board	0.126	39%	0.0%	0.0%
Straps	Polyester	$1.07x10^{-3}$	0.33%	0.0%	0.0%
Film	Polyethylene	$4.18x10^{-4}$	0.13%	0.0%	0.0%
TOTAL		**0.323**	**100%**	**0.0%**	**0.0%**

2.6 Manufacture

TAJ Flooring products in this EPD are manufactured at two production facilities in Chungcheongnam-do, South Korea. The primary component materials include calcite, polyvinyl chloride, dioctyl terephthalate, stabilizers, additives, and pigments. Resources use at the fabrication facilities is allocated to the product based on mass.

2.7 Environment and Health during Manufacture

No environmental or health impacts are expected during the manufacture of the TAJ Flooring products in this EPD.

2.8 Product Processing/Installation

Installation of TAJ Flooring products in this EPD require application of adhesive. The manufacturer recommends a maximum of 5 lb of moisture per 1,000 ft^2 (2.3 kg of moisture per 93 m^2) per 24 hours per ASTM F1869 Calcium Chloride Tests or a max RH of 80% per ASTM F2170 In Situ Relative Humidity Test. The recommended adhesive is an acrylic base polymer with an application rate of 0.005 lb per ft^2 (0.024 kg/m^2). It is assumed that the scrap generated during installation is negligible in this EPD.

2.9 Packaging

TAJ Flooring products in this EPD are packaged for shipment using boards, pallets, corrugated board, strapping, and packaging film, which are specified in Section 2.5. Packaging disposal rates are based on statistics for the United States that were provided by the UL Part A PCR.

2.10 Condition of Use

No special conditions of use are noted.

2.11 Environment and Health during use

No environmental or health impacts are expected due to normal use of the TAJ Flooring products in this EPD.

2.12 Reference Service Life

The Reference Service Life (RSL) of the TAJ Flooring products in this EPD is 75 years.

2.13 Extraordinary Effects

No environmental or health impacts are expected due to extraordinary effects, such as fire or water damage, and product destruction. Product performance test results are provided in Section 2.3.

2.14 Re-Use Phase

The TAJ Flooring products in this EPD are not typically 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 manufacturers' website at https://tajflooring.com/

3. LCA: Calculation Rules

3.1 Functional Unit

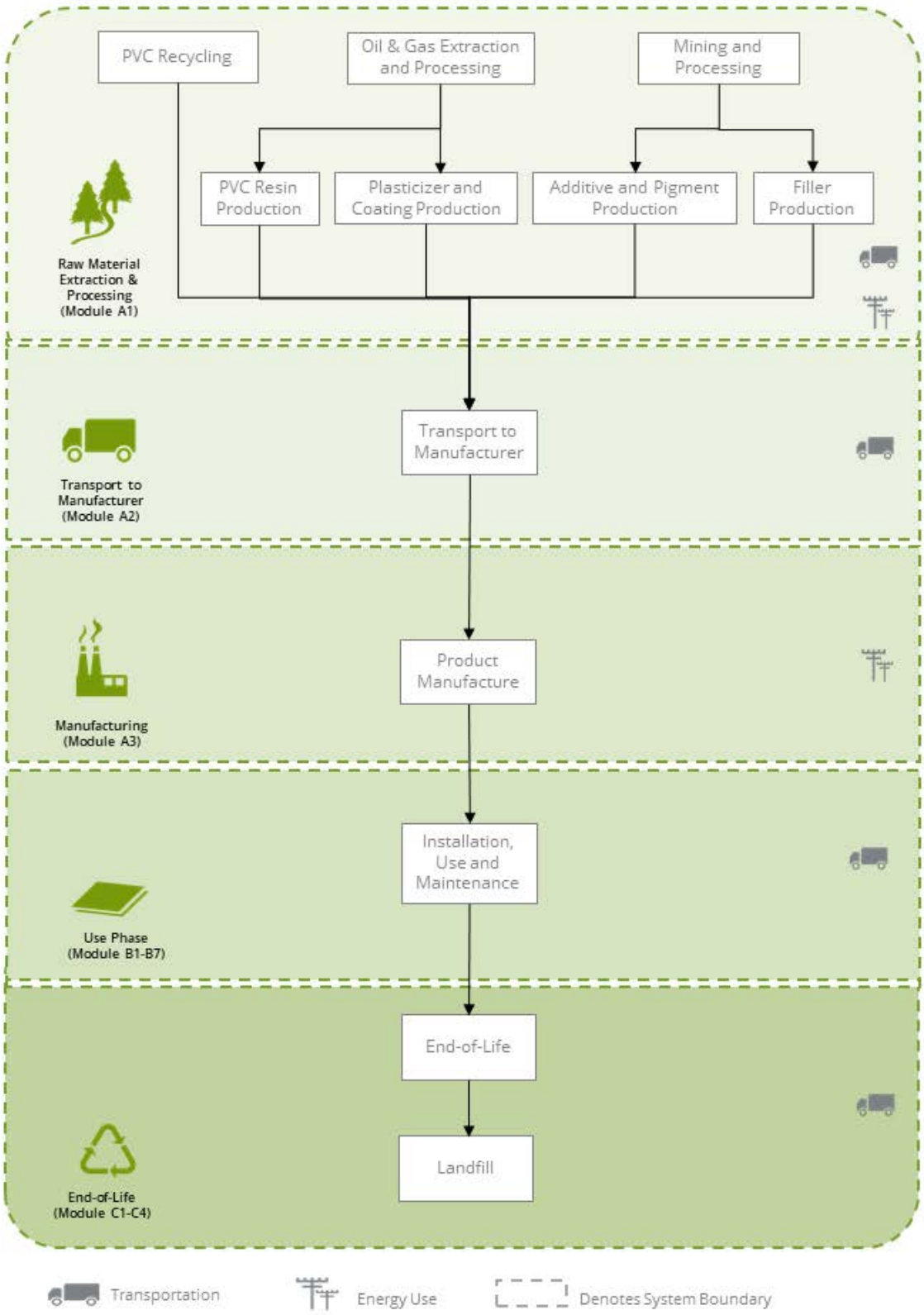
The functional unit used in the study is defined as 1 m^2 of floor covering installed for use over a 75-year period. The reference flows for the product systems are summarized below.

Parameter	*Select*	*Phoenix*	*Modular Acoustic Flooring*	Unit
Functional Unit	1.0	1.0	1.0	m^2
Thickness	3.0	3.0	5.0	mm
Mass	10.2	10.7	9.90	kg/m^2
Replacements	5	4	5	# of Replacements

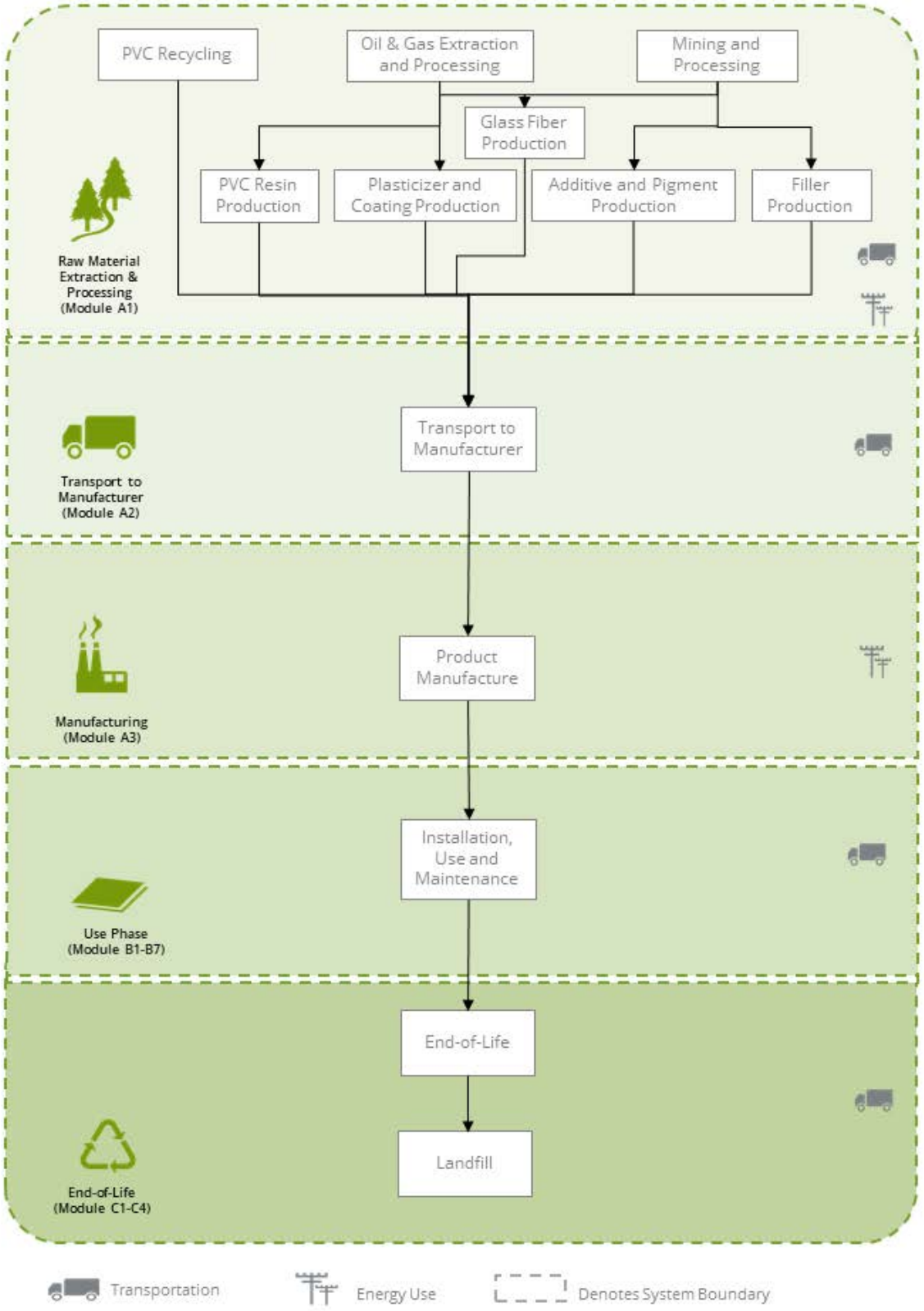
3.2 System Boundary

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 life cycle phases included in each product system boundary are the following pages.

Select* and *Phoenix



Modular Acoustic Flooring



3.3 Estimates and Assumptions

- Electricity and resource use at each manufacturing facility were allocated to the TAJ Flooring products based on product mass relative to total facility production volume. The manufacturing stage was subsequently derived from a production weighted average of the two facilities.
- Representative inventory data were used to reflect the energy mix for electricity use at the manufacturing facilities. The Ecoinvent v3.5 dataset, "market for electricity, medium voltage | electricity, medium voltage | Cutoff, U – KR" was used to represent electricity use at the manufacturing facilities in Korea.
- Representative inventory data for the extraction and production of raw materials are modeled with unit process data taken from the Ecoinvent life cycle database to the extent that they were applicable. Life cycle inventory data for the plasticizers dioctyl terephthalate (DOTP) and Dioctyl phthalate (DOP) were not available. An inventory dataset for similar common plasticizers were developed using chemical process data from Overcash, Ecoinvent v3.5 datasets, and Plastics Europe Eco-profiles. These include 2-ethylhexyl phthalate (DEHP) and well as diisoheptyl phthalate (DIHP). The inventory data developed for DEHP were used as a surrogate to represent DOTP and DOP components in the model.
- For the installation of TAJ Flooring products, it is assumed that 0.024 kg/m^2 acrylic binder is used.
- Product maintenance involves daily cleaning as well as routine cleaning, based on the level of wear conditions and foot traffic. Product maintenance in this EPD was based on a moderate traffic level. An estimated 0.11 kg/m^2 of cleaning solution (specified cleaner and water mixture) is assumed to be used for each cleaning. It is assumed that electricity for use of an auto scrubber requires $6.83x10^4$ kWh/m^2.
- Disposal of product and packaging is modeled based on regional statistics regarding municipal solid waste generation and disposal in the United States, as specified in the PCR. The data include end-of-life recycling rates of packaging materials.
- For final disposal of materials, it is assumed to be transported approximately 20 miles (~32 km) by diesel truck to disposal site. Datasets representing disposal in a landfill is from Ecoinvent.

It should also be noted that LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The PCR requires the results for several inventory flows to be reported, including energy and resource use, and waste and outflows. These are aggregated inventory flows and do not characterize any potential impact; as such, results should be interpreted taking into account this limitation.

3.4 Cut-off criteria

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No data gaps were allowed which were expected to significantly affect the outcome of the indicator results. No known flows are deliberately excluded from this EPD

3.5 Background Data

Primary data were provided by TAJ Flooring and their manufacturing facilities. The sources of secondary data are taken from Ecoinvent and Overcash databases.

Table 9. Data sources for this EPD.

Flow	Dataset	Data Source(s)	Database Year
Product Materials			
PVC resin	polyvinylchloride production, emulsion polymerisation | polyvinylchloride, emulsion polymerised | Cutoff, U - RoW	Ecoinvent	2018
Plasticizers	2-ethylhexyl phthalate (DEHP) {GLO} | market for | Alloc Rec U	Ecoinvent; Overcash	2018; 2004
Stabilizer & Additives	chemical production, organic | chemical, organic | Cutoff, U - GLO	Ecoinvent	2018
Pigment	carbon black production | carbon black | Cutoff, U - GLO	Ecoinvent	2018
Filler	market for limestone, crushed, for mill | limestone, crushed, for mill | Cutoff, U - RoW	Ecoinvent	2018
Coating	Polyurethane {RoW} | production | Alloc Rec U	Ecoinvent; SCS	2018
Glass Fiber	glass fibre production | glass fibre | Cutoff, U - RoW	MSDS; Ecoinvent	2018
Installation			
Adhesive	market for acrylic binder, without water, in 34% solution state | acrylic binder, without water, in 34% solution state | Cutoff, U - RoW	Ecoinvent	2018
Maintenance			
Cleaner	market for chemical, organic | chemical, organic | Cutoff, U - GLO; market for citric acid | citric acid | Cutoff, U - GLO; market for sodium hydroxide, without water, in 50% solution state | sodium hydroxide, without water, in 50% solution state | Cutoff, U - GLO; market for water, deionised, from tap water, at user | water, deionised, from tap water, at user | Cutoff, U - RoW	MSDS; Ecoinvent	2018
Water	market for tap water | tap water | Cutoff, U - RoW	Ecoinvent	2018
Manufacturing			
Electricity	market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - KR	Ecoinvent	2018
Natural Gas	heat and power co-generation, natural gas, combined cycle power plant, 400MW electrical | heat, district or industrial, natural gas | Cutoff, U - KR	Ecoinvent	2018
Propane	market for propane, burned in building machine | propane, burned in building machine | Cutoff, U - GLO	Ecoinvent	2018
Packaging			
Boards and Pallets	EUR-flat pallet production | EUR-flat pallet | Cutoff, U - RoW	Ecoinvent	2018
Corrugated Board	corrugated board box production | corrugated board box | Cutoff, U - RoW	Ecoinvent	2018
Straps	market for polyester resin, unsaturated | polyester resin, unsaturated | Cutoff, U – RoW; market for extrusion, plastic film | extrusion, plastic film | Cutoff, U - GLO	Ecoinvent	2018
Film	packaging film production, low density polyethylene | packaging film, low density polyethylene | Cutoff, U - RoW	Ecoinvent	2018
Transportation			
Truck	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U - RoW	Ecoinvent	2018
Ship	market for transport, freight, sea, transoceanic ship | transport, freight, sea, transoceanic ship | Cutoff, U - GLO	Ecoinvent	2018
Rail	market for transport, freight train | transport, freight train | Cutoff, U - RoW	Ecoinvent	2018

3.6 Data Quality

The data quality assessment addressed the following parameters: time-related coverage, geographical coverage, technological coverage, precision, completeness, representativeness, consistency, reproducibility, sources of data, and uncertainty.

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The most recent available data are used, based on other considerations such as data quality and similarity to the actual operations. Typically, these data are less than 10 years old. All the primary data used represented an average of one year's worth of data collection. Manufacturer supplied data are based on calendar year 2017.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Actual processes for upstream operations are primarily in the Republic of Korea, while downstream processes are primarily in the United States. Representative data used in the assessment are representative of Korea, US, Global, or "Rest-of-World" (average for all countries in the world with uncertainty adjusted). Datasets chosen are considered sufficiently similar to actual processes.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative datasets, specific to the type of material or as a proxy, are used to represent the actual processes where primary data were not available.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Manufacturer data, and representative data used for upstream processes were typically averaged for one or more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	The LCA model included all known mass and energy flows for production of luxury vinyl flooring. In some instances, surrogate datasets used to represent upstream processes may be missing some data which is propagated in the model. Missing data represent less than 5% of the mass or energy flows.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represent typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used; with a bias towards Ecoinvent data where available. Different portions of the product life cycle are equally considered.
Reproducibility: Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Based on the description of data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documented.
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at the manufacturing facilities represent an annual average and are considered of good quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. A mass and energy balance check were completed during the data collection period. For secondary LCI datasets, Ecoinvent, Overcash, and PlasticsEurope Eco-profiles databases are used, with a bias towards Ecoinvent data.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the luxury vinyl flooring and packaging is low. Primary data for upstream processes were not available; as such, the study relied upon use of existing representative datasets for these cases. These representative datasets contained relatively recent data (~10 years, or more recent), but in some instances lacked perfect geographical and technological representativeness. Uncertainty related to the impact assessment methods used in the study are relatively high since they lack characterization of thresholds or tipping points.

3.7 Period under review

The period of review is calendar year 2017.

3.8 Allocation

For the raw material supply and all secondary datasets used for this LCA study, processes were modelled using the cut-off system model of Ecoinvent v3.5 database.

For the transport stage, impacts were allocated based on the mass of the material and distance transported to each facility.

This study follows the allocation guidelines of ISO-14044 and allocation rules specified in the PCR and sought to minimize the use of allocation wherever possible.

For the manufacturing stage, mass allocation was deemed the most accurate and reproducible way of calculating resource use, emissions, and wastes for the two facilities. Primary data for resource use (e.g., electricity, natural gas, water, etc.), waste, and emissions released at each facility were allocated to the product on a mass-basis as a fraction of total annual production. The manufacturing stage for each product system is based on a weighted average of total production for the two facilities.

Each product includes some amount of recycled content, which are allocated using the recycled content allocation method, also known as the 100-0 cut-off method. Using the recycled content allocation approach, system inputs with recycled content do not receive any burden from the previous life cycle other than reprocessing of the waste material. However, no data were available for the processing of waste polyvinyl chloride and therefore no impacts are assessed for this process. At the end-of-life, materials which are recycled leave the system boundary with no additional burden.

3.9 Comparability

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.

4. LCA: Scenarios and Additional Technical Information

Delivery and Installation stage (A4 - A5)

Distribution of the TAJ Flooring products to the point of installation is included in the assessment. Average transport distance for distribution of *Select* and *Modular Acoustic Flooring* from the manufacturing facility to the point of installation is approximately 919 km by diesel truck, 15,964 km by transoceanic freighter, and 165 km by train. Similarly, transport distance for distribution of *Phoenix* from the manufacturing facility to the point of installation is approximately 910 km by diesel truck and 20,176 km by transoceanic freighter. Transportation parameters for modeling are summarized in Tables 10 and 11.

Table 10. Transport parameters per m^2 *Select* and *Modular Acoustic Flooring* (A4).

Parameter	Value	Unit
Liters of fuel	15.5	l/100 km
Transport distance	919	km
Capacity utilization (including empty runs)	67	%
Weight of final packaged product transported - *Select*	5.05	kg/m^2
Weight of final packaged product transported – *Modular Acoustic Flooring*	8.83	kg/m^2

Table 11. Transport parameters per m^2 *Phoenix* (A4).

Parameter	Value	Unit
Liters of fuel	15.5	l/100 km
Transport distance	910	km
Capacity utilization (including empty runs)	67	%
Weight of final packaged product transported - *Phoenix*	5.06	kg/m^2

Installation of TAJ Flooring products in this EPD require application of adhesive. The recommended adhesive is an acrylic base polymer with an application rate of 0.005 lb per ft^2 (0.024 kg/m^2). It is assumed that the scrap generated during installation is negligible in this EPD.

The impacts associated with packaging disposal are included with the installation phase, as per PCR requirements. Using the recycling rates for packaging, there are $4.8x10^{-2}$, $4.5x10^{-2}$, and $8.2x10^{-2}$ kg of packaging waste disposed for *Select*, *Phoenix*, and *Modular Acoustic Flooring*, respectively. A summary of biogenic carbon uptake for product packaging is provided in Table 12.

Table 12. Biogenic carbon uptake for per m^2 of TAJ Flooring product.

Product Packaging	Biogenic Carbon Dioxide Uptake $kg\ CO_2/m^2$
Select	0.29
Phoenix	0.30
Modular Acoustic Flooring	0.53

Use stage (B1)

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

Maintenance stage (B2)

For cleaning of TAJ Flooring products, the manufacturer recommends daily and routine cleaning schedules. For daily cleaning, the manufacturer recommends sweeping and mopping with 0.5 oz neutral cleaner per gallon of water (0.0040 kg cleaner/kg water). Similarly, for routine cleaning, the manufacturer recommends sweeping and auto scrubbing with 1 oz neutral cleaner per 10 oz water (0.102 kg cleaner/kg water). It is assumed that electricity for use of an auto scrubber requires $6.83x10^4$ kWh/m^2. An estimated 0.11 kg/m^2 of cleaning solution (specified cleaner and water mixture) is assumed to be used for each cleaning. The present assessment is based on a moderate traffic level derived from the maintenance schedules for the three traffic levels summarized in Table 13.

Table 13. Cleaning guidelines for TAJ Flooring products in this EPD.

Cleaning Process	Cleaning Frequency / Traffic Level			Method
	Light	Moderate	Heavy	
Daily Maintenance*	234 days/year	208 days/year	156 days/year	Sweep and mop with neutral cleaner
Routine Cleaning	26 days/year	52 days/year	104 days/year	Sweep and clean with auto scrubber with neutral cleaner

*Based on working days per year minus the days for routine cleaning.

Repair/Replacement/Refurbishment stage (B3 - B5)

Product repair, replacement and refurbishment are not relevant during the lifetime of TAJ Flooring products in this EPD. No product replacements are required over the 75-year building lifetime.

Building operation stage (B6 – B7)

There is no operational energy or water use associated with the use of TAJ Flooring products in this EPD and the results for these stages are zero.

Disposal stage (C1 - C4)

The disposal stage includes demolition of the products (*C1*); transport of the products to waste treatment facilities (*C2*); waste processing (*C3*); and associated emissions as the product degrades in a landfill (*C4*). For the TAJ Flooring products in this EPD, 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 20-mile (32 km) average distance to disposal, consistent with assumptions used in the US EPA WARM model. The relevant disposal rates used for the product and packaging are based on regional statistics taken from the PCR. Based on the PCR, it is assumed that 100% of the product at end-of-life is landfilled. The relevant recycling rates used for packaging are summarized in Table 14.

Table 14. *Packaging disposal rates for the United States, provided by the PCR.*

Material	Recycling Rate	Landfill Rate	Incineration Rate
Plastics	15%	68%	17%
Metals	57%	34%	9%
Pulp (cardboard, paper)	75%	20%	5%

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.

Table 15. *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
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

The following environmental impact category indicator are reported using characterization factors based on the U.S. EPA's Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts – TRACI 2.1:

Impact Category	Unit
Global Warming Potential (GWP 100)	kg CO_2 eq
Ozone Depletion Potential (ODP)	kg CFC 11 eq
Acidification Potential (AP)	kg SO_2 eq
Eutrophication Potential (EP)	kg N eq
Smog Formation Potential (POCP)	kg O_3 eq
Fossil Fuel Depletion Potential (FFD)	MJ Surplus, LHV

The following key life cycle inventory data parameters are taken from the PCR, which include resource use, output flows, and waste categories.

Key Life Cycle Inventory Parameter	Acronym	Reporting Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	RPR_E	Megajoules
Use of renewable primary energy resources used as raw materials	RPR_M	Megajoules
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	$NRPR_E$	Megajoules
Use of non-renewable primary energy resources used as raw materials	$NRPR_M$	Megajoules
Use of secondary material	SM	Kilograms
Use of renewable secondary fuels	RSF	Megajoules
Use of non-renewable secondary fuels	NRSF	Megajoules
Use of net fresh water	FW	Cubic meters
Hazardous waste disposed	HWD	Kilograms
Non-hazardous waste disposed	NHWD	Kilograms
High-level radioactive waste disposed	HLRW	Kilograms
Intermediate- and low-level radioactive waste disposed	ILLRW	Kilograms
Components for re-use	CRU	Kilograms
Materials for recycling	MR	Kilograms
Materials for energy recovery	MER	Kilograms
Exported energy	EE	Megajoules

Table 16. Life Cycle Impact Assessment (LCIA) results for ***3mm Select*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	GWP	POCP	AP	EP	ODP	FFD
	(kg CO_2 eq)	(kg O_3 eq)	(kg SO_2 eq)	(kg N eq)	(kg CFC-11 eq)	(MJ eq.)
Total	68.9	5.33	0.384	0.391	$9.60x10^{-6}$	136
	100%	100%	100%	100%	100%	100%
A1	19.8	0.928	$6.52x10^{-2}$	$2.36x10^{-2}$	$8.95x10^{-7}$	61.9
	29%	17%	17%	6.0%	9.3%	46%
A2	1.18	0.13	$5.37x10^{-3}$	$1.35x10^{-3}$	$2.91x10^{-7}$	2.61
	1.7%	2.4%	1.4%	0.34%	3.0%	1.9%
A3	8.78	0.517	$2.89x10^{-2}$	$4.27x10^{-2}$	$8.91x10^{-7}$	8.34
	13%	9.7%	7.5%	11%	9.3%	6.1%
A4	8.53	1.91	0.116	$1.34x10^{-2}$	$1.93x10^{-6}$	17.3
	12%	36%	30%	3.4%	20%	13%
A5	0.352	$1.85x10^{-2}$	$1.19x10^{-3}$	$2.11x10^{-3}$	$3.41x10^{-8}$	0.643
	0.51%	0.35%	0.31%	0.54%	0.36%	0.47%
B1	0	0	0	0	0	0
B2	27.7	1.62	0.156	0.115	$5.23x10^{-6}$	41.8
	40%	30%	41%	29%	54%	31%
B3	0	0	0	0	0	0
B4	0	0	0	0	0	0
B5	0	0	0	0	0	0
B6	0	0	0	0	0	0
B7	0	0	0	0	0	0
C1	0	0	0	0	0	0
C2	1.00	0.160	$5.78x10^{-3}$	$8.10x10^{-4}$	$2.42x10^{-7}$	2.15
	1.4%	3.0%	1.5%	0.21%	2.5%	1.6%
C3	0	0	0	0	0	0
C4	1.56	$4.71x10^{-2}$	$5.76x10^{-3}$	0.193	$9.28x10^{-8}$	0.909
	2.3%	0.89%	1.5%	49%	1.0%	0.67%
D	MND	MND	MND	MND	MND	MND

MND = Module not declared

Table 17. Resource use for ***3mm Select*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	FW
	(MJ)	(MJ)	(MJ)	(MJ)	(kg)	(MJ)	(MJ)	(m^3)
Total	120	INA	1,010	INA	1.40	0	0	0.449
A1	9.24	INA	386	INA	1.40	0	0	$7.53x10^{-2}$
A2	0.176	INA	17.2	INA	0	0	0	$2.84x10^{-3}$
A3	16.3	INA	127	INA	0	0	0	$1.14x10^{-2}$
A4	2.19	INA	119	INA	0	0	0	$3.64x10^{-2}$
A5	0.160	INA	3.94	INA	0	0	0	$1.89x10^{-3}$
B1	0	0	0	0	0	0	0	0
B2	91.4	INA	333	0	0	0	0	0.318
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	$6.08x10^{-2}$	INA	13.7	INA	0	0	0	$8.70x10^{-4}$
C3	0	0	0	0	0	0	0	0
C4	0.105	INA	6.05	INA	0	0	0	$1.75x10^{-3}$
D	MND	MND	MND	MND	MND	MND	MND	MND

Table 18. Waste and outflows for ***3mm Select*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	HWD	NHWD	HLRW	ILLRW	CRU	MR	MER	EE
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(MJ)
Total	$1.82x10^{-3}$	32.6	$4.40x10^{-4}$	$2.80x10^{-3}$	0	0.727	0	Neg
A1	$6.73x10^{-5}$	0.739	$2.01x10^{-5}$	$3.50x10^{-4}$	0	0	0	Neg
A2	$1.15x10^{-5}$	0.857	$9.21x10^{-7}$	$1.20x10^{-4}$	0	0	0	Neg
A3	$1.16x10^{-3}$	0.633	$2.80x10^{-4}$	$6.10x10^{-4}$	0	$1.71x10^{-2}$	0	Neg
A4	$7.95x10^{-5}$	2.90	$1.49x10^{-5}$	$8.20x10^{-4}$	0	0	0	Neg
A5	$3.95x10^{-6}$	0.223	$8.27x10^{-7}$	$1.34x10^{-5}$	0	0.710	0	Neg
B1	0	0	0	0	0	0	0	0
B2	$4.90x10^{-4}$	2.82	$1.20x10^{-4}$	$7.40x10^{-4}$	0	0	0	Neg
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	$5.18x10^{-6}$	$6.35x10^{-2}$	$3.66x10^{-7}$	$1.00x10^{-4}$	0	0	0	Neg
C3	0	0	0	0	0	0	0	0
C4	$5.11x10^{-6}$	24	$5.84x10^{-7}$	$3.92x10^{-5}$	0	0	0	Neg
D	MND	MND	MND	MND	MND	MND	MND	MND

Table 19. Life Cycle Impact Assessment (LCIA) results for ***3mm Phoenix*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	GWP	POCP	AP	EP	ODP	FFD
	(kg CO_2 eq)	(kg O_3 eq)	(kg SO_2 eq)	(kg N eq)	(kg CFC-11 eq)	(MJ eq.)
Total	47.8	4.15	0.314	0.298	$8.00x10^{-6}$	91.2
	100%	100%	100%	100%	100%	100%
A1	8.86	0.419	$3.01x10^{-2}$	$1.13x10^{-2}$	$4.76x10^{-7}$	28.3
	19%	10%	10%	3.8%	6.0%	31%
A2	0.970	0.106	$4.42x10^{-3}$	$1.11x10^{-3}$	$2.39x10^{-7}$	2.15
	2.0%	2.6%	1.4%	0.37%	3.0%	2.4%
A3	0.393	$3.07x10^{-2}$	$1.72x10^{-3}$	$1.74x10^{-3}$	$4.48x10^{-8}$	0.664
	0.82%	0.74%	0.55%	0.58%	0.56%	0.73%
A4	7.61	1.80	0.112	$1.21x10^{-2}$	$1.72x10^{-6}$	15.4
	16%	43%	36%	4.0%	21%	17%
A5	0.257	$1.44x10^{-2}$	$9.40x10^{-4}$	$1.63x10^{-3}$	$2.68x10^{-8}$	0.510
	0.54%	0.35%	0.30%	0.55%	0.33%	0.56%
B1	0	0	0	0	0	0
B2	27.7	1.62	0.156	0.115	$5.23x10^{-6}$	41.8
	58%	39%	50%	38%	65%	46%
B3	0	0	0	0	0	0
B4	0	0	0	0	0	0
B5	0	0	0	0	0	0
B6	0	0	0	0	0	0
B7	0	0	0	0	0	0
C1	0	0	0	0	0	0
C2	0.802	0.128	$4.65x10^{-3}$	$6.60x10^{-4}$	$1.95x10^{-7}$	1.73
	1.7%	3.1%	1.5%	0.22%	2.4%	1.9%
C3	0	0	0	0	0	0
C4	1.26	$3.79x10^{-2}$	$4.63x10^{-3}$	0.155	$7.46x10^{-8}$	0.731
	2.6%	0.91%	1.5%	52%	0.93%	0.80%
D	MND	MND	MND	MND	MND	MND

MND = Module not declared

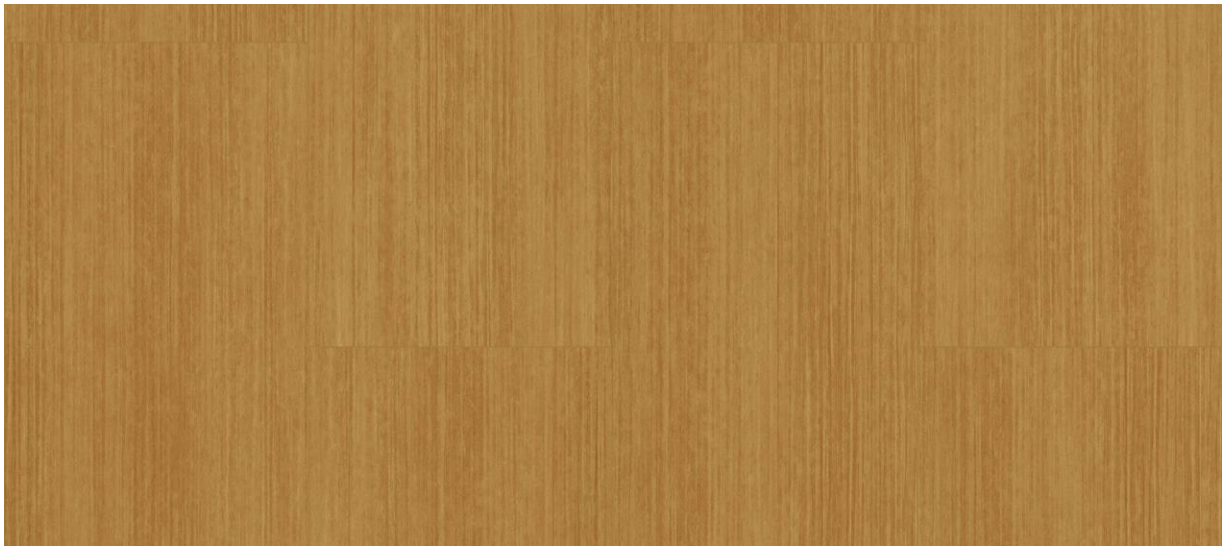


Table 20. Resource use for ***3mm Phoenix*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	FW
	(MJ)	(MJ)	(MJ)	(MJ)	(kg)	(MJ)	(MJ)	(m^3)
Total	111	INA	651	INA	2.25	0	0	0.398
A1	4.19	INA	174	INA	2.25	0	0	$3.73x10^{-2}$
A2	0.145	INA	14.1	INA	0	0	0	$2.33x10^{-3}$
A3	12.8	INA	4.79	INA	0	0	0	$3.45x10^{-3}$
A4	1.96	INA	106	INA	0	0	0	$3.27x10^{-2}$
A5	0.127	INA	3.12	INA	0	0	0	$1.50x10^{-3}$
B1	0	0	0	0	0	0	0	0
B2	91.4	INA	333	0	0	0	0	0.318
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	$4.89x10^{-2}$	INA	11.0	INA	0	0	0	$7.00x10^{-4}$
C3	0	0	0	0	0	0	0	0
C4	$8.43x10^{-2}$	INA	4.87	INA	0	0	0	$1.41x10^{-3}$
D	MND	MND	MND	MND	MND	MND	MND	MND

Table 21. Waste and outflows for ***3mm Phoenix*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	HWD	NHWD	HLRW	ILLRW	CRU	MR	MER	EE
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(MJ)
Total	$6.30x10^{-4}$	26.0	$1.50x10^{-4}$	$1.90x10^{-3}$	0	0.533	0	Neg
A1	$3.46x10^{-5}$	0.332	$1.01x10^{-5}$	$1.80x10^{-4}$	0	0	0	Neg
A2	$9.48x10^{-6}$	0.705	$7.57x10^{-7}$	$1.00x10^{-4}$	0	0	0	Neg
A3	$1.77x10^{-5}$	$7.36x10^{-2}$	$3.57x10^{-6}$	$1.76x10^{-5}$	0	$1.00x10^{-3}$	0	Neg
A4	$6.87x10^{-5}$	2.30	$1.37x10^{-5}$	$7.30x10^{-4}$	0	0	0	Neg
A5	$3.14x10^{-6}$	0.170	$6.59x10^{-7}$	$1.05x10^{-5}$	0	0.532	0	Neg
B1	0	0	0	0	0	0	0	0
B2	$4.90x10^{-4}$	2.82	$1.20x10^{-4}$	$7.40x10^{-4}$	0	0	0	Neg
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	$4.16x10^{-6}$	$5.11x10^{-2}$	$2.94x10^{-7}$	$8.19x10^{-5}$	0	0	0	Neg
C3	0	0	0	0	0	0	0	0
C4	$4.11x10^{-6}$	19.6	$4.70x10^{-7}$	$3.15x10^{-5}$	0	0	0	Neg
D	MND	MND	MND	MND	MND	MND	MND	MND

Table 22. Life Cycle Impact Assessment (LCIA) results for ***5mm Modular Acoustic Flooring*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	GWP	POCP	AP	EP	ODP	FFD
	(kg CO_2 eq)	(kg O_3 eq)	(kg SO_2 eq)	(kg N eq)	(kg CFC-11 eq)	(MJ eq.)
Total	97.3	7.96	0.550	0.599	$1.30x10^{-5}$	201
	100%	100%	100%	100%	100%	100%
A1	33.2	1.57	0.114	$4.32x10^{-2}$	$1.85x10^{-6}$	106
	34%	20%	21%	7.2%	14%	53%
A2	1.36	0.149	$6.20x10^{-3}$	$1.55x10^{-3}$	$3.35x10^{-7}$	3.01
	1.4%	1.9%	1.1%	0.26%	2.6%	1.5%
A3	15.3	0.903	$5.04x10^{-2}$	$7.43x10^{-2}$	$1.56x10^{-6}$	14.5
	16%	11%	9.2%	12%	12%	7.2%
A4	14.9	3.34	0.202	$2.34x10^{-2}$	$3.38x10^{-6}$	30.2
	15%	42%	37%	3.9%	26%	15%
A5	0.373	$1.38x10^{-2}$	$1.03x10^{-3}$	$3.07x10^{-3}$	$2.68x10^{-8}$	0.579
	0.38%	0.17%	0.19%	0.51%	0.21%	0.29%
B1	0	0	0	0	0	0
B2	27.7	1.62	0.156	0.115	$5.23x10^{-6}$	41.8
	28%	20%	28%	19%	40%	21%
B3	0	0	0	0	0	0
B4	0	0	0	0	0	0
B5	0	0	0	0	0	0
B6	0	0	0	0	0	0
B7	0	0	0	0	0	0
C1	0	0	0	0	0	0
C2	1.75	0.280	$1.01x10^{-2}$	$1.43x10^{-3}$	$4.24x10^{-7}$	3.76
	1.8%	3.5%	1.8%	0.24%	3.3%	1.9%
C3	0	0	0	0	0	0
C4	2.74	$8.25x10^{-2}$	$1.01x10^{-2}$	0.338	$1.62x10^{-7}$	1.59
	2.8%	1.0%	1.8%	56%	1.3%	0.79%
D	MND	MND	MND	MND	MND	MND

MND = Module not declared

Table 23. Resource use for ***5mm Modular Acoustic Flooring*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	RPR_E	RPR_M	$NRPR_E$	$NRPR_M$	SM	RSF	NRSF	FW
	(MJ)	(MJ)	(MJ)	(MJ)	(kg)	(MJ)	(MJ)	(m^3)
Total	142	INA	1,470	INA	1.81	0	0	0.571
A1	15.9	INA	652	INA	1.81	0	0	0.160
A2	0.203	INA	19.8	INA	0	0	0	$3.27x10^{-3}$
A3	30.0	INA	222	INA	0	0	0	$1.93x10^{-2}$
A4	3.83	INA	208	INA	0	0	0	$6.37x10^{-2}$
A5	0.159	INA	3.53	INA	0	0	0	$1.89x10^{-3}$
B1	0	0	0	0	0	0	0	0
B2	91	INA	333	0	0	0	0	0.318
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	0.106	INA	24.0	INA	0	0	0	$1.52x10^{-3}$
C3	0	0	0	0	0	0	0	0
C4	0.183	INA	10.6	INA	0	0	0	$3.06x10^{-3}$
D	MND	MND	MND	MND	MND	MND	MND	MND

Table 24. Waste and outflows for ***5mm Modular Acoustic Flooring*** over a 75-yr time horizon. All values are rounded to three significant digits. Results reported in MJ are calculated using lower heating values.

Module	HWD	NHWD	HLRW	ILLRW	CRU	MR	MER	EE
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(MJ)
Total	$2.83x10^{-3}$	54.4	$6.90x10^{-4}$	$4.37x10^{-3}$	0	1.23	0	Neg
A1	$1.40x10^{-4}$	1.27	$4.22x10^{-5}$	$7.20x10^{-4}$	0	0	0	Neg
A2	$1.33x10^{-5}$	0.988	$1.06x10^{-6}$	$1.40x10^{-4}$	0	0	0	Neg
A3	$2.03x10^{-3}$	1.11	$5.00x10^{-4}$	$1.07x10^{-3}$	0	$3.00x10^{-2}$	0	Neg
A4	$1.40x10^{-4}$	5.08	$2.61x10^{-5}$	$1.44x10^{-3}$	0	0	0	Neg
A5	$3.83x10^{-6}$	0.356	$8.23x10^{-7}$	$1.03x10^{-5}$	0	1.21	0	Neg
B1	0	0	0	0	0	0	0	0
B2	$4.90x10^{-4}$	2.82	$1.20x10^{-4}$	$7.40x10^{-4}$	0	0	0	Neg
B3	0	0	0	0	0	0	0	0
B4	0	0	0	0	0	0	0	0
B5	0	0	0	0	0	0	0	0
B6	0	0	0	0	0	0	0	0
B7	0	0	0	0	0	0	0	0
C1	0	0	0	0	0	0	0	0
C2	$9.07x10^{-6}$	0.111	$6.41x10^{-7}$	$1.80x10^{-4}$	0	0	0	Neg
C3	0	0	0	0	0	0	0	0
C4	$8.95x10^{-6}$	42.7	$1.02x10^{-6}$	$6.87x10^{-5}$	0	0	0	Neg
D	MND	MND	MND	MND	MND	MND	MND	MND

6. LCA: Interpretation

Select

- **Acidification:** Module B2 has the largest contribution (41%) due to use of cleaning solution for routine maintenance, followed by Module A4 (30%) due to sea freight.
- **Eutrophication:** Module C4 has the largest contribution (49%) due to the treatment of PVC waste.
- **Fossil Fuel Depletion:** Module A1 has the largest contribution (46%) due to PVC and DOTP production, followed by Module B2 (31%) due to use of cleaning solution for routine maintenance.
- **Global Warming Potential:** Module B2 has the largest contribution (40%) due to use of cleaning solution for routine maintenance, followed by Module A1 (29%) due to PVC and DOTP production.
- **Ozone Depletion:** Module A4 has the largest contribution (36%) due to sea freight, followed by Module B2 (22%) due to use of cleaning solution for routine maintenance.
- **Smog:** Module A4 has the largest contribution (36%) due to sea freight, followed by Module B2 (30%) due to use of cleaning solution for routine maintenance.

Phoenix

- **Acidification:** Module B2 has the largest contribution (50%) due to use of cleaning solution for routine maintenance, followed by Module A4 (36%) due to sea freight.
- **Eutrophication:** Module C4 has the largest contribution (52%) due to the treatment of PVC waste.
- **Fossil Fuel Depletion:** Module B2 has the largest contribution (45%) from use of cleaning solution for routine maintenance, followed by Module A1 (31%) due to PVC and DOTP production.
- **Global Warming Potential:** Module B2 has the largest contribution (58%) due to use of cleaning solution for routine maintenance, followed by Module A1 (19%) due to PVC and DOTP production.
- **Ozone Depletion:** Module B2 has the largest contribution (65%) due to use of cleaning solution for routine maintenance, followed by Module A4 (22%) due to sea freight.
- **Smog:** Module A4 has the largest contribution (43%) due to sea freight, followed by Module B2 (39%) due to use of cleaning solution for routine maintenance.

Modular Acoustic Flooring

- **Acidification:** Module A4 has the largest contribution (37%) due to sea freight, followed by Module B2 (28%) from use of cleaning solution for routine maintenance.
- **Eutrophication:** Module C4 has the largest contribution (56%) due to the treatment of PVC waste.
- **Fossil Fuel Depletion:** Module A1 has the largest contribution (34%) due to PVC and DOTP production, followed by Module B2 (28%) from use of cleaning solution for routine maintenance.
- **Global Warming Potential:** Module B2 has the largest contribution (40%) due to use of cleaning solution for routine maintenance, followed by Module A4 (26%) due to sea freight.
- **Ozone Depletion:** Module A4 has the largest contribution (42%) due to sea freight, followed by Module B2 (20%) due to use of cleaning solution for routine maintenance.
- **Smog:** Module A4 has the largest contribution (42%) due to sea freight, followed by Module B2 (20%) due to use of cleaning solution for routine maintenance.

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