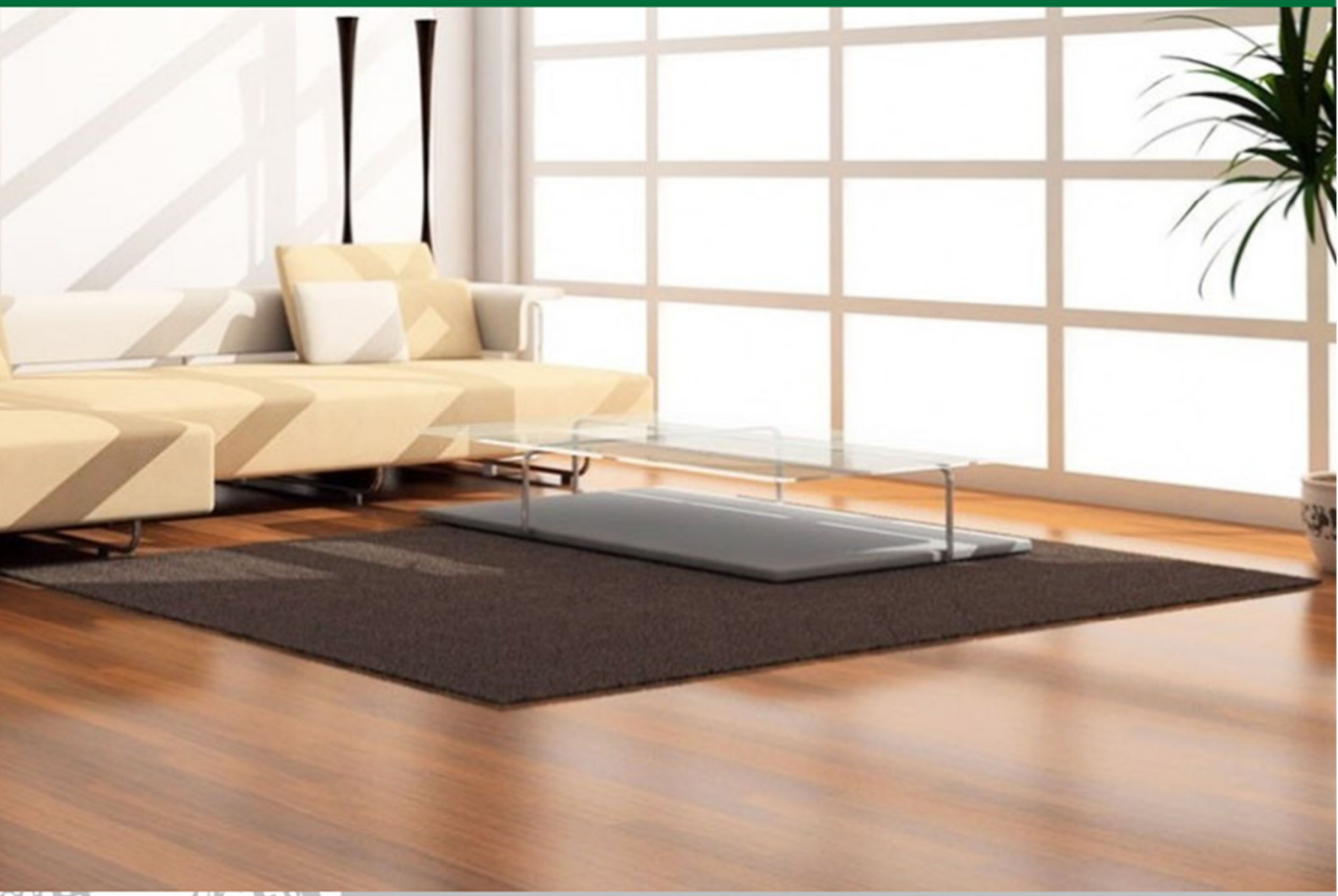
GLOBAL GREEN TAG INTERNATIONAL PTY LTD

EPD™

Environmental Product Declaration

Environmental Product Declaration
Global GreenTag^{CertTM} EPD Program

Compliant to EN 15804:2012+A1 2013



WALRUS®

ZHEJIANG WALRUS NEW MATERIAL CO,LTD

Walrus Premium resilient flooring products

GLOBAL GREENTAG® INTERNATIONAL

1. General information

Table1. General information of EPD program

Owner of the declaration	ZHEJIANG WALRUS NEW MATERIAL CO.,LTD	
	NO.380 Haifeng Road Haichang District	
	Haining City Zhejiang Province China	
	www.haixiang.com.cn	
EPD Program holder	Global Green Tag International Pty Ltd	
Product Category Rules (PCR)	EN 15804:2012+A1:2013- Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products	
Independent Verification	X internal	☐ external
Approved and verified by	Dr Nana Bortsie- Aryee, Global GreenTag International	
EPD prepared by	IKE Environmental Technology Co. Ltd.	
	Tel & Fax: +86-028-85404099 www.ike-global.com support@ike-global.com	
LCA Software and LCI database:	eFootprint software CLCD database0.8/0.9, Ecoinvent v3.1 database	
Registration Numbers: Issue date:	ZHE-001-2020 December 1, 2020	
Valid to:	December 1, 2025	
Markets of Applicability:	USA, Canada, Germany, Holland	
EPD Type:	Product Specific	
EPD Scope:	Cradle to Grave	
Time representativeness:	2019	
LCIA Method and Version:	CML-IA	

2. Product Information

2.1 Product Specification

Table 2.6 Flooring Products Specification

Walrus Premium resilient flooring products	
Product Code	Thickness
1 LVT Click	3.2-5.0mm
2 LVT Dryback	2.0-4.0mm
3 LVT loosely	5.0mm
4 WPC	5.5-12.0mm
5 SPC Continue line	3.2-8.0mm
6 SPC ABA/AB	4.5-8.0mm

2.2 Material Composition

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

Table 3. Material content for the haixiang flooring products, 1m^2

Component	Material	Percent
PVC	polyvinyl chloride	18~27%
filler	CaCO3	59~81%
binder	polyurethane	0~0.8%
coating	UV painting	0.2~0.5%
colourants	carbon black	0.1~0.2%
heat stabilizer	Ca-Zn organic liquid complex	0.5~1.9%
process aids	foaming agent	0.3~0.7%
additives	lubricating agent	0.2~0.3%

No substances required to be reported as hazardous are associated with the production of this product

2.3 Packing

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

Table 4. Material content for the Korlok product packaging, per square meter.

Component	Material	Percent
Plastic strapping	PE	14%
Cardboard Box	Paper	86%

2.4 Reference service life(RSL)

The Reference Service Life (RSL) of the flooring product is 10 years.

3. LCA Calculation rules

3.1 Functional unit and Declared Unit

The functional unit is 1 m² of 6 installed floor covering products with an average weight of 8.40 kg/m²cradle to Grave.

The declared unit is 1 kilogram (kg) of 6 installed floor covering products from cradle to gate.

The manufacturer declares a 5-year commercial warranty and lifetime residential warranty for their products. For the present assessment, a reference service lifetime (RSL) of 10 years is assumed based on the manufacturer's recommendation and consistent with similar, industry-wide LCAs.

3.2 System boundaries

It is a cradle to grave with options EPD. The system boundary is based on the EN 15804 description.

The table below shows the system boundaries according to EN 15804

Table 5. System boundaries according to EN 15804

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**	**NR**	**NR**	**NR**	**NR**	**NR**	**X**	**X**	**X**	**X**	**X**

The description of life cycle stage A-D are as follows:

A1 Extraction and processing of raw materials for the flooring components.

A2 Transport of component materials to the manufacturing facilities

A3 Manufacturing of flooring products and packaging

A4 Transport of product (including packaging) to the building site

A5 Installation of product is accomplished using hand tools with no associated emissions and negligible impacts.

B1 Use of the flooring in a building setting. There are no associated emissions or impacts from

the use of the product

B2 Maintenance of products, including periodic cleaning.

B3-B5 The flooring is not expected to require repair or replacement over its lifetime. Impacts from these phases have negligible impact (NR)

B6 There is no operational energy use associated with the use of the product (NR)

B7 There is no operational water use associated with the use of the product (NR)

C1 Demolition of the product is accomplished using hand tools with no associated emissions and negligible impacts

C2 Transport of flooring product to waste treatment and recycle at end-of-life

C3 The product is disposed of by landfilling which require no waste processing

C4 Disposal of flooring product in municipal landfill

D Recycle of flooring product

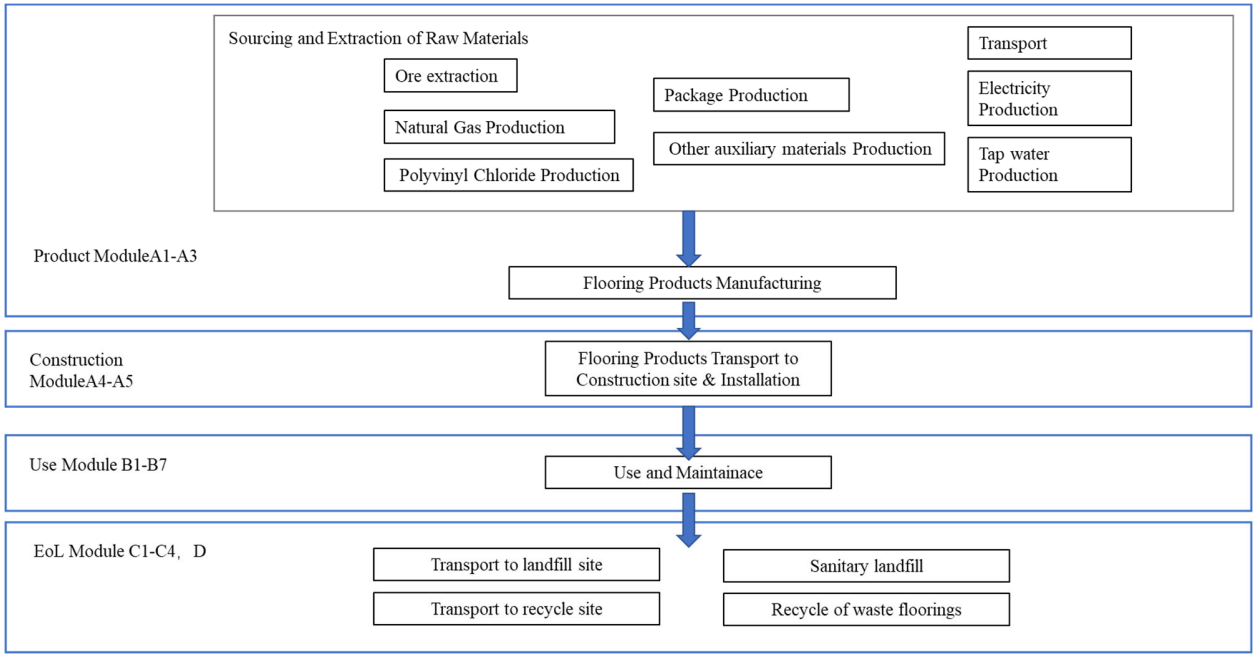


Figure 1. 6 Flooring Products Cradle to Grave System Boundary

3.3 Time period

Manufacturer-supplied data (primary data) are based on annualized production for 2019.

3.3 Estimates and assumptions

Stage B2 - use: there are various cleaning procedures for the floor dependent on its intended use. We assume a cleaning regime of a daily (working day) dust mop, a weekly damp mop and a monthly floor restore. The use of an electric device (1.5 kWh/year) and tap water(5kg/year).

Stage C - end of life: it is assumed that the product is disposed of by landfilling 80% which require no waste processing and transport distance of flooring product to landfill site is 50km.

Stage D – benefits and loads beyond the system boundary: includes reuse, recovery and/or recycling, and transport to recycling operations. We assume a 20% recycle content and transport distance of flooring product to recycle site is 50km.

3.4 Cut-off criteria

In this study, all available data from production are considered, i.e. raw materials used and electric power consumption. The total sum of neglected processes does not exceed 5% of energy usage and mass for the overall life cycle. The manufacturer provided data on the transport expenditure for all relevant material flows. Machines and facilities required during production are not included.

3.5 Background data

For life cycle modelling of the considered products, the online software eFootprint has been used to model the product systems considered in this study. All relevant background datasets are taken from the CLCD 0.8/0.9 and Ecoinvent V3.1(EI v3.1) database. The datasets from CLCD and Ecoinvent date from 2014 to 2018 and are documented in the online documentation.

Table 6. Data sources for the Haixiang flooring product system

Component	Material Description	Material Dataset	Data Source	Publication Date
PRODUCT COMPONENT				
PVC	polyvinyl chloride	Polyvinyl chloride (kg), industry LCA-represents the market or technical average level, China	CLCD0.9.0	2018
filler	$CaCO_3$	market for limestone(kg), industry LCA- represents the market or technical average level, China	CLCD0.9.0	2018
binder	polyurethane	polyurethane, rigid foam-market for polyurethane, rigid foam (Global)	EI v3.1	2014
coating	UV painting	acrylic coating (kg),, industry LCA-represents the market or technical average level, China	CLCD0.9.0	2018
colorants	carbon black	carbon black-market for carbon black (Global)	EI v3.1	2014
heat stabilizer	Ca-Zn stabilizer	Ca-Zn organic liquid complex (kg), industry LCA- represents the market or technical average level, China	CLCD0.9.0	2018
process aids	foaming agent	chemical, organic-market for chemical, organic (Global)	EI v3.1	2014
additives	lubricating agent	lubricating oil-market for lubricating oil (Global)	EI v3.1	2014
PACKAGING				

Component	Material Description	Material Dataset	Data Source	Publication Date
Packaging	Corrugated board	carton box(kg), industry LCA-represents the market or technical average level, China	CLCD0.9.0	2015
Packaging	Stretch wrap	Polyethylene - low density polyethylene (kg), industry LCA-represents the market or technical average level, China	CLCD0.8.0	2013
TRANSPORTATION				
Road transport	Diesel Truck	Heavy diesel truck transport (load: 10t) (t*km, maximum total mass: 17000kg~19000kg), industry LCA-represents the market or technical average level, China	CLCD0.9.0	2015
Ship transport	Diesel Truck	Container ship transport (200TEU) (T *km, 13T /TEU), industry LCA-represents the market or technology average level, China	CLCD0.9.0	2015
Energy				
Electricity	Grid electricity-Product	East China Power Grid (kWh, 220V/380V,50Hz), industry LCA-representing market or technology average level, China	CLCD0.9.0	2015
Electricity	Grid electricity-Use	electricity, high voltage-market for electricity, high voltage(Netherlands	EIv 3.1	2014
Heat	Natural gas	Natural gas(m3), industry LCA-representing the market or technology average, China	CLCD0.9.0	2015
Water	Tapwater	Tap water(t), industry LCA- Represents the market or technology average level, China	CLCD0.9.0	2015
Waste Treatment				
Treatment	Landfill	municipal solid waste-treatment of municipal solid waste, sanitary landfill (Rest of world)	EI v3.1	2014

3.6 Data quality Assessment

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.

Table 7. Data quality assessment for the Haixiang flooring product system

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 5 years old (typically 2015). All of the data used represented an average of at least one year's worth of data collection, and up to three years in some cases. Manufacturer-supplied data (primary data) are based on annualized production for 2019.
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. Electricity use for product manufacture is modeled using representative data for China. Surrogate data used in the assessment are representative of global or European operations. Data representative of European operations are considered sufficiently similar to actual processes. Data representing product disposal are based on regional statistics.
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 fabrication datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data values for each data expressed	Data collected for operations 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 the flooring products. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded.
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. Different portions of the product life cycle are equally considered; however, it must be noted that final disposition of the product is based on assumptions of current practices in China.
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.

Data Quality Parameter	Data Quality Discussion
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at Haixiang's facility in China represent an annual average and are considered of high quality due to the length of time over which these data are collected. For secondary LCI datasets, CLCD 0.8 and 0.9, Ecoinvent v3.1 LCI data are used.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the flooring products and packaging is low. Actual supplier data for upstream operations was not available for all suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years).

3.7 EoL Allocation method

According to ISO 14044/44, allocation is needed in several situations for LCA. One of those is recycling of end-of-life materials.

Therefore, a reasonable recycling method is needed to calculate the environmental benefits of the reprocessed materials at EoL stage. This study will quote "Allocation 50/50 method".

Allocation 50/50 is the most common recycling methods, which has been discussed and accepted by PEF guide It "allocates the impacts and benefits due to recycling equally between the producer using recycled material and the producer producing a recycled product" [Product Environmental Footprint (PEF) Guide,2013].

3.8 Comparability

Environmental product declarations of construction products may not be comparable if they do not comply with EN 15804 and environmental product declarations within the same category from different programs may not be comparable.

4. Life cycle Inventory parameters

All Life cycle inventory parameters results are calculated using eFootprint, using primary and secondary inventory data.

Table 8. Key life cycle inventory parameters for 1 m^2 of LVT click flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	2.23E+00	1.77E+01	2.10E+01	1.08E+01	5.18E+01
Non-renewable primary energy resources feedstock	MJ	2.75E+02	0.00E+00	0.00E+00	-1.38E+01	2.61E+02
Total Non-renewable primary energy resources	MJ	2.77E+02	1.77E+01	2.10E+01	-2.96E+00	3.13E+02
Renewable primary energy not feedstock	MJ	1.28E-01	0.00E+00	0.00E+00	1.48E-01	2.76E-01
Renewable primary energy feedstock	MJ	5.82E+00	4.20E-02	1.49E+00	-2.91E-01	7.06E+00
Total Renewable primary energy	MJ	5.94E+00	4.20E-02	1.49E+00	-1.43E-01	7.34E+00
Non-renewable secondary fuels	MJ	4.15E-01	1.60E+01	0.00E+00	7.19E-01	1.72E+01
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	7.44E+00	0.00E+00	0.00E+00	-3.72E-01	7.07E+00
Freshwater	m3	9.28E-03	0.00E+00	0.00E+00	-4.64E-04	8.82E-03
Outputs-Waste Generated						
Hazardous waste	kg	7.20E-05	0.00E+00	0.00E+00	-3.60E-06	6.84E-05
Non-hazardous waste	kg	1.51E-03	0.00E+00	0.00E+00	-7.53E-05	1.43E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	1.58E+00	1.58E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

Neg.: Negligible

Table 9. Key life cycle inventory parameters for 1 m^2 of LVT dryback flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	1.14E+00	9.83E+00	2.10E+01	1.70E+00	3.37E+01
Non-renewable primary energy resources feedstock	MJ	6.99E+01	0.00E+00	0.00E+00	-3.50E+00	6.64E+01
Total Non-renewable primary energy resources	MJ	7.11E+01	9.83E+00	2.10E+01	-1.79E+00	1.00E+02
Renewable primary energy not feedstock	MJ	6.51E-02	2.31E-02	1.49E+00	6.14E-02	1.64E+00
Renewable primary energy feedstock	MJ	2.97E+00	0.00E+00	0.00E+00	-1.49E-01	2.82E+00
Total Renewable primary energy	MJ	3.04E+00	2.31E-02	1.49E+00	-8.71E-02	4.46E+00
Non-renewable secondary fuels	MJ	2.10E-01	7.43E+00	0.00E+00	3.70E-01	8.01E+00
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	3.79E+00	0.00E+00	0.00E+00	-1.90E-01	3.60E+00
Freshwater	m3	6.82E-04	0.00E+00	0.00E+00	-3.41E-05	6.48E-04
Outputs-Waste Generated						
Hazardous waste	kg	3.67E-05	0.00E+00	0.00E+00	-1.84E-06	3.49E-05
Non-hazardous waste	kg	7.68E-04	0.00E+00	0.00E+00	-3.84E-05	7.30E-04
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.81E+00	0.81E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

Table 10. Key life cycle inventory parameters for 1 m^2 of LVT loosely flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	2.61E+00	2.64E+01	2.07E+01	3.86E+00	5.36E+01
Non-renewable primary energy resources feedstock	MJ	1.59E+02	0.00E+00	0.00E+00	-7.93E+00	1.51E+02
Total Non-renewable primary energy resources	MJ	1.61E+02	2.64E+01	2.07E+01	-4.07E+00	2.04E+02
Renewable primary energy not feedstock	MJ	1.49E-01	6.25E-02	4.93E-02	1.40E-01	4.01E-01
Renewable primary energy feedstock	MJ	6.76E+00	0.00E+00	0.00E+00	-3.38E-01	6.42E+00
Total Renewable primary energy	MJ	6.91E+00	6.25E-02	4.93E-02	-1.98E-01	6.82E+00
Non-renewable secondary fuels	MJ	4.86E-01	2.13E+01	0.00E+00	8.46E-01	2.26E+01
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	3.79E+00	0.00E+00	0.00E+00	-1.90E-01	3.60E+00
Freshwater	m3	1.09E-02	0.00E+00	0.00E+00	-5.43E-04	1.03E-02
Outputs-Waste Generated						
Hazardous waste	kg	8.43E-05	0.00E+00	0.00E+00	-4.21E-06	8.00E-05
Non-hazardous waste	kg	1.76E-03	0.00E+00	0.00E+00	-8.81E-05	1.67E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	1.85E+00	1.85E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

Table 11. Key life cycle inventory parameters for 1 m^2 of WPC flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	1.72E+00	2.52E+01	2.10E+01	3.69E+00	5.16E+01
Non-renewable primary energy resources feedstock	MJ	1.87E+02	0.00E+00	0.00E+00	-9.36E+00	1.78E+02
Total Non-renewable primary energy resources	MJ	1.89E+02	2.52E+01	2.10E+01	-5.67E+00	2.29E+02
Renewable primary energy not feedstock	MJ	1.49E-01	5.96E-02	1.49E+00	1.34E-01	1.84E+00
Renewable primary energy feedstock	MJ	6.24E+00	0.00E+00	0.00E+00	-3.12E-01	5.92E+00
Total Renewable primary energy	MJ	6.38E+00	5.96E-02	1.49E+00	-1.77E-01	7.76E+00
Non-renewable secondary fuels	MJ	1.46E-01	2.27E+01	0.00E+00	1.01E+00	2.39E+01

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	4.93E+00	0.00E+00	0.00E+00	-2.47E-01	4.68E+00
Freshwater	m3	2.51E-04	0.00E+00	0.00E+00	-1.25E-05	2.38E-04
Outputs-Waste Generated						
Hazardous waste	kg	9.86E-05	0.00E+00	0.00E+00	-4.93E-06	9.37E-05
Non-hazardous waste	kg	2.06E-03	0.00E+00	0.00E+00	-1.03E-04	1.96E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	2.16E+00	2.16E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

Table 12. Key life cycle inventory parameters for 1 m^2 of SPC continue line flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	3.93E+00	2.17E+01	2.10E+01	4.03E+00	5.07E+01
Non-renewable primary energy resources feedstock	MJ	1.69E+02	0.00E+00	0.00E+00	-8.43E+00	1.60E+02
Total Non-renewable primary energy resources	MJ	1.73E+02	2.17E+01	2.10E+01	-4.40E+00	2.11E+02
Renewable primary energy not feedstock	MJ	1.22E-01	5.14E-02	1.49E+00	1.49E-01	1.82E+00
Renewable primary energy feedstock	MJ	6.33E+00	0.00E+00	0.00E+00	-3.16E-01	6.01E+00
Total Renewable primary energy	MJ	6.45E+00	5.14E-02	1.49E+00	-1.67E-01	7.83E+00
Non-renewable secondary fuels	MJ	1.81E-01	1.96E+01	0.00E+00	9.01E-01	2.07E+01
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	6.75E+00	0.00E+00	0.00E+00	-3.38E-01	6.41E+00
Freshwater	m3	1.14E-02	0.00E+00	0.00E+00	-5.69E-04	1.08E-02
Outputs-Waste Generated						
Hazardous waste	kg	8.82E-05	0.00E+00	0.00E+00	-4.41E-06	8.38E-05
Non-hazardous waste	kg	1.84E-03	0.00E+00	0.00E+00	-9.22E-05	1.75E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	1.94E+00	1.94E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

Table 13. Key life cycle inventory parameters for 1 m^2 of SPC ABA/AB flooring using 10 years

Parameter	Units	Product A1-3	Construction A4-5	Use B1-7	EoL C1-4,D	Total
Inputs-Energy						
Non-renewable primary energy resources not feedstock	MJ	4.79E+00	2.35E+01	2.10E+01	4.55E+00	5.39E+01
Non-renewable primary energy resources feedstock	MJ	1.91E+02	0.00E+00	0.00E+00	-9.56E+00	1.82E+02
Total Non-renewable primary energy resources	MJ	1.96E+02	2.35E+01	2.10E+01	-5.00E+00	2.35E+02
Renewable primary energy not feedstock	MJ	1.40E-01	5.57E-02	1.49E+00	1.69E-01	1.86E+00
Renewable primary energy feedstock	MJ	7.18E+00	0.00E+00	0.00E+00	-3.59E-01	6.82E+00
Total Renewable primary energy	MJ	7.32E+00	5.57E-02	1.49E+00	-1.90E-01	8.68E+00
Non-renewable secondary fuels	MJ	2.05E-01	2.12E+01	0.00E+00	1.02E+00	2.24E+01
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Inputs-Water and Material						
Secondary material	kg	7.66E+00	0.00E+00	0.00E+00	-3.83E-01	7.28E+00
Freshwater	m3	1.29E-02	0.00E+00	0.00E+00	-6.45E-04	1.23E-02
Outputs-Waste Generated						
Hazardous waste	kg	1.00E-04	0.00E+00	0.00E+00	-5.00E-06	9.50E-05
Non-hazardous waste	kg	2.09E-03	0.00E+00	0.00E+00	-1.05E-04	1.99E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	2.20E+00	2.20E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.
Recovered energy	MJ	Neg.	Neg.	Neg.	Neg.	Neg.

5. LCA Scenarios and Additional Technical Information

5.1 Transport to the building site(A4)

Distribution of the flooring products to the point of installation is included in the assessment. Transportation parameters for modeling transport to product distribution centers are summarized in Table 14.

Table 14. Transport parameters (A4)

Vehicle type used for transport	Vehicle load capacity	Average Distance to building site	Capacity utilization factor
Diesel truck	17~19ton	180km	1
Ocean diesel freighter	2600ton	8821km	1

5.2 Installation in the building (A5)

Installation of the product is accomplished using hand tools with no associated emissions and negligible impacts and no waste generated.

5.3 Use stage (B1)

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

5.4 Maintenance stage (B2)

According to the manufacturer, typical maintenance involves regular sweeping and damp mopping, as well as periodic buffing of the vinyl flooring. The present assessment is based on a recommended weekly cleaning schedule including sweeping and damp mopping with a neutral cleaner and monthly buffing.

Table 15. Maintenance parameters for the flooring products, per 1 m^2

Parameter	Value	Unit
Maintenance process	Damp, mopping	--
Maintenance cycle	520	Cycles/RSL
Net fresh water consumption	0.005	m^3/m^2/year
Cleaning electricity	0.2	kwh/m^2/year

5.5 Repair/Replacement/Refurbishment stage (B3 - B5)

Product repair, replacement and refurbishment are not relevant during the lifetime of the

product.

5.6 Building operation stage (B6 – B7)

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

5.7 EoL stage (C1 - C4, D)

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

Benefit includes reuse, recovery and/or recycling, and transport to recycling operations.

The 20% recycled content and 50% value correction factor of floorings is based upon empirical data.

Transportation of waste materials at end-of-life (C2) and recycle assumes a 50 km average distance.

Table 15. EoL parameters for the flooring products, per 1 m2

Processes	Unit	LVT click	LVT dryback	LVT loosely	WPC	SPC Continualline	SPC ABA/AB
collection process	kg collected separately	7.90	4.03	9.25	10.82	9.68	10.98
recovery system	kg for recycling	1.58	0.81	1.85	2.16	1.94	2.20
disposal	kg for final disposal	6.32	3.23	7.40	8.66	7.74	8.78
transportation	km	50	50	50	50	50	50

6. LCA Results

The environmental impact category indicators are also reported based on the CML-IA characterization factors according to EN15804.

Table 16. LCA impact indicators

Impact Category	Unit
Global Warming Potential (GWP)	kg CO2 eq
Ozone Depletion Potential (ODP)	kg CFC 11 eq
Eutrophication Potential (EP)	kg $(PO4)^{3-}$ eq
Acidification -soil and water (AP)	kg SO2 eq
Photochemical Oxidant Creation Potential (POCP)	kg C_2H_4 eq
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq

Caution should be used when comparing the results presented in this EPD to the environmental performance of other vinyl flooring products as the thickness or weight of floors will influence the environmental impacts. Results of the Life Cycle Assessment are presented below.

Table 17. Cradle to Grave LCA results for 6 flooring products

LCIA Impact	Unit	LVT click	LVT dryback	LVT loosely	WPC	SPC Continue line	SPC ABA/AB
GWP	kg CO_2 eq	2.21E+01	1.20E+01	2.58E+01	2.49E+01	2.45E+01	2.76E+01
ODP	kg CFC-11 eq	4.19E-07	2.60E-07	4.96E-07	5.03E-07	4.85E-07	5.31E-07
EP	kg PO_4^{3-}eq	3.68E-02	2.31E-02	4.23E-02	4.60E-02	4.26E-02	4.70E-02
AP-soil and water	kg SO_2 eq	1.96E+02	1.06E+02	2.30E+02	2.63E+02	2.39E+02	2.68E+02
POCP	kg C_2H_4 eq	7.24E-02	3.73E-02	8.93E-02	9.48E-02	8.61E-02	9.70E-02
ADP-fossil fuels	MJ	3.00E-03	1.58E-03	3.59E-03	3.98E-03	3.62E-03	4.08E-03
ADP-non fossil	kg Sb eq	1.16E-02	7.51E-03	1.31E-02	1.21E-02	1.23E-02	1.35E-02

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