



ASPECTA™
A NEW DIMENSION IN FLOORING



Declaration Owner

Aspecta BV

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Product

Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer
Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer

(UNSPSC Class Code 30161707)

EPD represents delivery of product to customers globally.

Functional Unit

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

EPD Number and Period of Validity

SCS-EPD-06059
EPD Valid March 23, 2020 through March 22, 2025
Version: September 6, 2022

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. December 2018.

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

Program Operator

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Declaration Owner:	Aspecta BV																
Address:	Argon 37a, 4751 XC Oud Gastel, The Netherlands																
Declaration Number:	SCS-EPD-06059																
Declaration Validity Period:	March 23, 2020 through March 22, 2025																
Version Date:	September 6, 2022																
Program Operator:	SCS Global Services																
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide																
LCA Practitioner:	Gerard Mansell, Ph.D., SCS Global Services																
LCA Software and LCI database:	OpenLCA 10.1 software and the Ecoinvent v3.8 database																
Product RSL:	Various																
Markets of Applicability:	Global																
EPD Type:	Product-Specific																
EPD Scope:	Cradle-to-Grave																
LCIA Method and Version:	CML-IA and TRACI 2.1																
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external																
LCA Reviewer:	 Tom Gloria, Ph.D., Industrial Ecology Consultants																
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. December 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. May 2018.																
Part B PCR Review conducted by:	Jack Geibig (chair), Ecoform; Thomas Gloria, Industrial Ecology Consultants; Thaddeus Owen																
Independent verification of the declaration and data, according to ISO 14025 and the PCR	<input type="checkbox"/> internal <input checked="" type="checkbox"/> external																
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<p>Disclaimers: This EPD conforms to ISO 14025, 14040, 14044 and 21930.</p> <p>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.</p> <p>Accuracy of Results: Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.</p> <p>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.</p> <p>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.</p>																	

1. Aspecta BV

In business for over one hundred years, Aspecta BV (proud member of HMTX Industries) is leading the industry in Luxury Vinyl Tile (LVT) products. With the frequent introduction of new products, manufacturing methods and novel designs, the ASPECTA™ brand represents the largest assortment of LVT in the market today.

Aspecta offers healthy, high-performing products based on biophilic designs that are inspired by nature. The company focuses on lowering the environmental footprint of its raw materials, products and operations. It embraces product transparency and continually strives to improve the material health of its products and to contribute positively to indoor air quality. As a longtime leader in sustainability, Aspecta fosters collaborative partnerships to encourage, educate and motivate others to invest in a restorative ecosystem.

The ASPECTA™ brand offers a wide range of stylish and functional flooring. These collections contain everything from contemporary to classic plank and tile designs. All Rigid Click flooring is quick and easy to install.

2. Product

2.1 PRODUCT DESCRIPTION

Product	Description
Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer	<p>Introducing the Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer, a new flooring range from Aspecta. Where functionality blends with the latest designs to create floors that are truly special. Whether you will refurbish your house or build a new one, the right choice of flooring for your home depends on the size of rooms and planned use. If convenience, speed of installation and comfort are the main considerations, we recommend floating Rigid Click 0.30 flooring with DropLock 100™ – a glueless installation system.</p> <p>Thanks to the unique characteristics of the Rigid Click 0.30 flooring, you no longer have to worry about choosing the right floor because of its durability. The floor is dimensionally stable and 100% waterproof! The flooring has an excellent surface finish, which is dirt-resistant and easy to care for. We offer a wide range of elegant designs to choose from, it has never been easier to find the perfect floor for your project.</p>
Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer	<p>Introducing Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer, the stunning new flooring range from Aspecta. Where beautiful aesthetics blend with the latest technology to create floors that are truly special. Whether moving in or refurbishing, the right choice of flooring for your home depends on the size of rooms and planned use. If convenience, speed of installation and footstep sound insulation are the main considerations, we recommend floating Rigid Click 0.55 flooring with DropLock 100™ – a glueless installation system.</p> <p>Thanks to the unique characteristics of Rigid Click 0.55 flooring, you no longer have to worry about choosing the right floor because the Rigid Click flooring is durable, dimensionally stable and 100% waterproof! Despite different structures, each model in the collection has a particularly authentic surface finish, is dirt-resistant and easy to care for. With a wide range of elegant designs to choose from, finding the perfect floor for your project has never been easier.</p>

2.2 PRODUCT FLOW DIAGRAM

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



2.3 APPLICATION

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

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation and use, and product disposal. The life cycle phases included in the product system boundary are shown below.

Cut-off and allocation procedures are described below and conform to the PCR and ISO standards.

Table 1. 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	B1	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

X = Module Included | MND = Module Not Declared

2.5 TECHNICAL DATA

Technical specifications for the *Aspecta™ Rigid Click* products are summarized in Table 2 and Table 3.

Table 2. Product specifications for the *Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer* flooring products.

Characteristic		Average Value	Unit	Minimum Value	Maximum Value	
Product thickness		5.20 (0.205)	mm (inch)	5.00 (0.197)	5.40 (0.213)	
Wear layer thickness (where applicable)		0.55 (0.022)	mm (inch)	0.50 (0.020)	0.62 (0.024)	
Product weight		7,890 (25.86)	g/m ² (oz/ft ²)	7,101 (23.27)	8,679 (28.44)	
Sustainable certifications		ISO 9001; ISO 14001; CE				
VOC emissions test method		Floorscore®				
Product Form	Tiles	Width	448.0 (17.64)	mm (inch)	447.8 (17.63)	448.2 (17.65)
		Length	906.0 (35.67)	mm (inch)	905.7 (35.6)	906.3 (35.68)
	Planks	Width	180.0 (7.09)	mm (inch)	179.8 (7.08)	180.2 (7.09)
		Length	1210.0 (47.64)	mm (inch)	1209.4 (47.61)	1210.4 (47.65)
	Planks	Width	220.0 (8.66)	mm (inch)	219.9 (8.66)	220.2 (8.67)
		Length	1510.0 (59.45)	mm (inch)	1509.5 (59.43)	1510.5 (59.47)

Table 3. Product specifications for the *Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer* flooring products.

Characteristic		Average Value	Unit	Minimum Value	Maximum Value	
Product thickness		4.80 (0.189)	mm (inch)	4.70 (0.185)	4.92 (0.194)	
Wear layer thickness (where applicable)		0.30 (0.012)	mm (inch)	0.27 (0.011)	0.34 (0.013)	
Product weight		7,940 (26.02)	g/m ² (oz/ft ²)	7,146 (23.42)	8,736 (28.63)	
Sustainable certifications		ISO 9001; ISO 14001; CE				
VOC emissions test method		Floorscore®				
Product Form	Tiles	Width	304.8 (12.0)	mm (inch)	304.6 (11.99)	305.0 (12.01)
		Length	609.6 (24.0)	mm (inch)	609.3 (23.99)	609.9 (24.01)
	Planks	Width	225.0 (8.86)	mm (inch)	224.9 (8.85)	225.2 (8.87)
		Length	1210.0 (47.64)	mm (inch)	1209.4 (47.61)	1210.4 (47.65)

2.6 MARKET PLACEMENT/APPLICATION RULES

Technical specifications and product performance results for the *Rigid Click* products can be found on the manufacturer's website <https://elementalbyaspecta.com>.

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

The products are delivered for installation in the form of tiles and planks.

2.8 MATERIAL COMPOSITION

The primary materials include polyvinyl chloride (PVC), plasticizers, calcium carbonate filler, stabilizers, other additives (i.e., pigments), surface coating, and foam underlayment.

Table 4. Material content for the Rigid Click flooring products in kg per square meter and percent of total mass.

Component	Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)		Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)		Rigid Click 4.8 mm_0.30 Wear-Layer	
	Mass (kg/m ²)	Percent mass	Mass (kg/m ²)	Percent mass	Mass (kg/m ²)	Percent mass
PVC	2.32	30%	2.27	27%	2.07	27%
Calcium Carbonate	4.56	59%	5.32	64%	4.98	64%
Plasticizer	0.115	1.50%	0.147	1.8%	8.20x10 ⁻²	1.10%
Stabilizer	0.225	2.90%	0.175	2.1%	0.203	2.60%
Other (Underlayment/Additives/Coatings/Pigments)	0.551	7.10%	0.386	4.7%	0.405	5.20%
Product Total	7.77	100%	8.30	100%	7.74	100%

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

2.9 MANUFACTURING

Aspecta™ Rigid Click flooring is produced at the manufacturing facilities in China. The flooring is made primarily from polyvinyl chloride (PVC), calcium carbonate (mineral reinforcement), plasticizers, additives (i.e., pigments and stabilizers), surface coating, and foam underlayment. The production of the Rigid Click flooring, structurally consisted of a hot pressed solid polymer core (SPC) board and a foam underlayment, involves the following general manufacturing process:

- Properly mixed raw materials are calendared into a transparent wear layer.
- The wear layer, a printed PVC deco film, and other mixed raw materials are extruded/hot pressed (can be a one-step process) into the SPC board, which is then UV-coated, embossed, annealed, and cut into individual tiles or planks.
- These tiles or planks are profiled per the locking mechanism, attached with the foam underlayment, and then appropriately packed in the packaging boxes.
- Quality checks are made at each step of the production process.

The 5.2mm product is manufactured at both the Elegant and Yihua facilities. Results are presented separately for each.

2.10 PACKAGING

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

Table 5. Material content for the Rigid Click product packaging, in kg per square meter and percent of total mass.

Component	Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)		Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)		Rigid Click 4.8 mm_0.30 Wear-Layer	
	Mass (kg/m ²)	Percent mass	Mass (kg/m ²)	Percent mass	Mass (kg/m ²)	Percent mass
Corrugated	0.203	51%	0.279	51%	0.223	49%
Plastic	9.20x10 ⁻³	2.30%	4.30x10 ⁻³	0.79%	5.50x10 ⁻³	1.20%
Wood	0.182	46%	0.264	48%	0.224	50%
Packaging Total	0.394	100%	0.547	100%	0.452	100%

2.11 PRODUCT INSTALLATION

Installation of the product is accomplished using hand tools with negligible impacts and waste. The impacts associated with packaging disposal are included with the installation phase as per PCR requirements.

2.12 USE CONDITIONS

No special conditions of use are noted.

2.13 PRODUCT REFERENCE SERVICE LIFE AND BUILDING ESTIMATED SERVICE LIFE

The Reference Service Life (RSL) of the flooring product is based on the manufacturer's warranted lifetime and is summarized below. The building Estimated Service Life (ESL) is 75 years, consistent with the PCR.

2.14 RE-USE PHASE

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

2.15 DISPOSAL

At end-of-life, the products may be disposed of in a landfill or via incineration. Although in some instances vinyl flooring can be recycled into other products, the practice is not typical, nor widely available as a disposal route for the products in the consumer markets considered. It is assumed that no components of the product are recycled at end-of-life.

2.16 FURTHER INFORMATION

Further information on the product can be found on the manufacturers' website at <https://lementalbyaspecta.com>.

3. LCA: Calculation Rules

3.1 FUNCTIONAL UNIT

The functional unit used in the study is defined as 1 m² of floor covering installed for use over a 75-year period. The corresponding reference flow for each product system is presented in Table 5. For the present assessment, a reference service lifetime (RSL) corresponding to the manufacturer's warranted lifetime is assumed. The total number of required product lifecycles during the 75-year period over which the product system is modeled is also summarized for each product in Table 6.

Table 6. Reference flows and RSL for the Aspecta™ Rigid Click flooring products.

Product	Reference Flow (kg/m ²)	Reference Service Life (RSL)	Replacement Cycle (ESL/RSL-1)
Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)	7.77	20	2.8
Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)	8.30	20	2.8
Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer	7.74	10	6.5

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 the EPD scope are described in Table 7 and illustrated in Figure 1.

Table 7. *The modules and unit processes included in the scope for the Rigid Click products.*

Module	Module description from the PCR	Unit Processes Included in Scope
A1	Extraction and processing of raw materials; any reuse of products or materials from previous product systems; processing of secondary materials; generation of electricity from primary energy resources; energy, or other, recovery processes from secondary fuels	Extraction and processing of raw materials for the vinyl flooring components.
A2	Transport (to the manufacturer)	Transport of component materials to the manufacturing facilities
A3	Manufacturing, including ancillary material production	Manufacturing of flooring products and packaging (incl. upstream unit processes*)
A4	Transport (to the building site)	Transport of product (including packaging) to the building site
A5	Construction-installation process	Impacts from the installation of the product are assumed negligible. Only impacts from packaging disposal are included in this phase.
B1	Product use	Use of the flooring in a commercial building setting. There are no associated emissions or impacts from the use of the product
B2	Product maintenance	Maintenance of products over the 75-year ESL, including periodic cleaning.
B3	Product repair	The flooring is not expected to require repair over its lifetime. Impacts from this phase are reported as zero.
B4	Product replacement	The materials and energy required for replacement of the product over the 75-year ESL of the assessment are included in this phase.
B5	Product refurbishment	The flooring is not expected to require refurbishment over its lifetime. Impacts from this phase are reported as zero
B6	Operational energy use by technical building systems	There is no operational energy use associated with the use of the product
B7	Operational water use by technical building systems	There is no operational water use associated with the use of the product
C1	Deconstruction, demolition	Demolition of the product is accomplished using hand tools with no associated emissions and negligible impacts
C2	Transport (to waste processing)	Transport of flooring product to waste treatment at end-of-life
C3	Waste processing for reuse, recovery and/or recycling	The product is disposed of by incineration and/or landfilling which require no waste processing
C4	Disposal	Disposal of flooring product in municipal landfill or incineration
D	Reuse-recovery-recycling potential	Module Not Declared

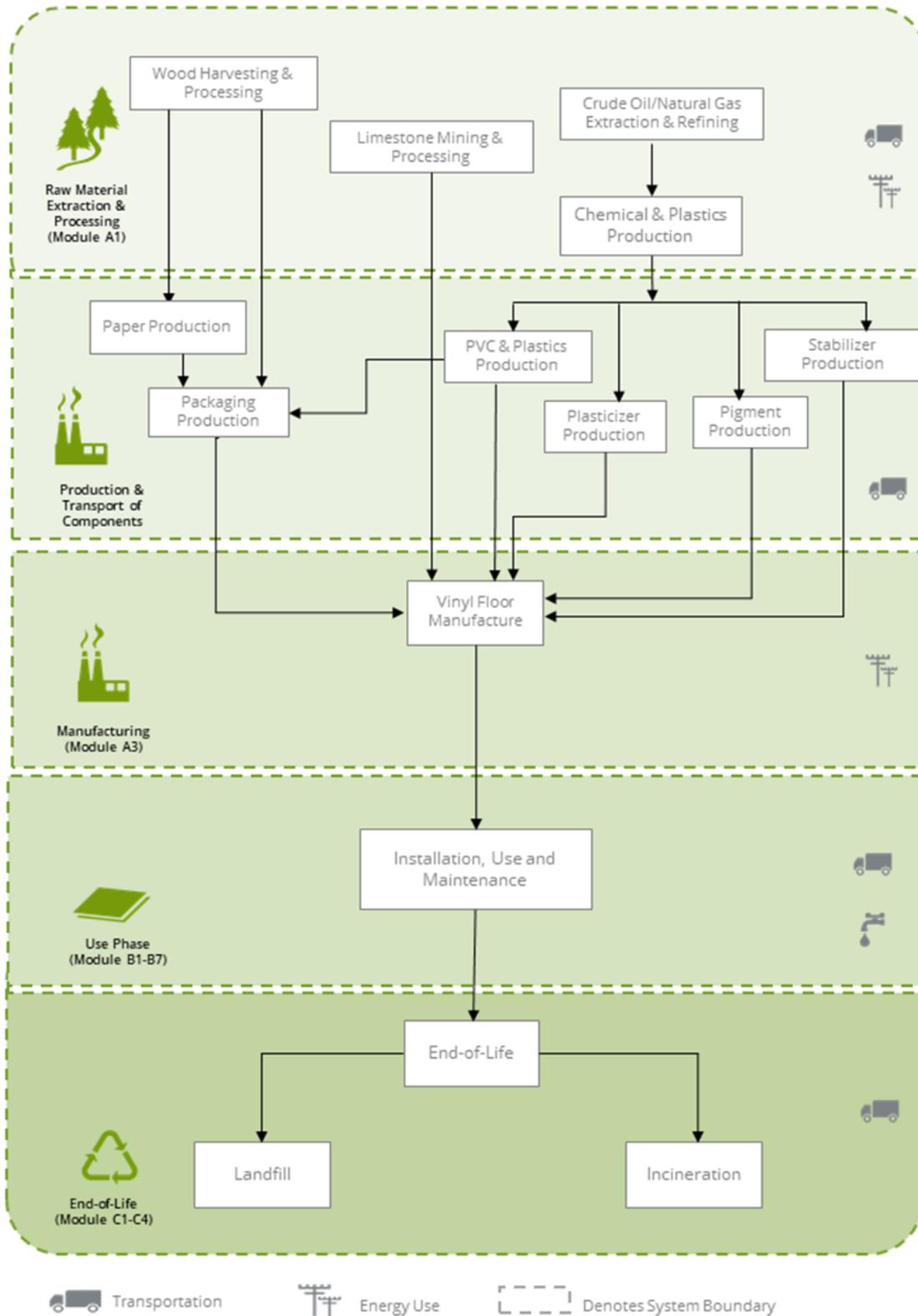


Figure 1. Flow Diagram for the life cycle of the Rigid Click product system.

3.3 PRODUCT SPECIFIC CALCULATION FOR USE PHASE

The recommended cleaning regime is highly dependent on the use of the premises where the floor covering is installed. In high traffic areas more frequent cleaning will be needed compared to areas where there is low traffic. For the purposes of this EPD, average maintenance (moderate traffic levels) is presented based on typical installations.

3.4 UNITS

All data and results are presented using SI units with a "." decimal separator.

3.5 ESTIMATES AND ASSUMPTIONS

- The Aspecta facilities under review are located in eastern China. An Ecoinvent inventory dataset for the Chinese energy grid mix was used to model resource use and emissions from electricity use at the Aspecta manufacturing facilities.
- Life cycle inventory data for the plasticizer, a dioctyl terephthalate (DOTP) mixture, were not available. An inventory dataset for similar common plasticizers were developed using chemical process data from Overcash¹ and Ecoinvent v3.8 unit process datasets. Inventory data developed for diisooheptyl phthalate (DIHP) was used as a surrogate to represent DOTP in the LCA model.
- Disposal of the product 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 and product materials. No components of the product are assumed recycled.
- For final disposal of the packaging material and vinyl flooring at end-of-life, all materials are assumed to be transported ~32 km (20 miles) by diesel truck to either a landfill, incineration facility, or material reclamation facility (for recycling). Datasets representing disposal in a landfill and waste incineration are from Ecoinvent.

The PCR requires the results for several inventory flows related to construction products to be reported including energy and resource use and waste and outflows. These are aggregated inventory flows, and do not characterize any potential impact; results should be interpreted considering this limitation.

3.6 CUT-OFF RULES

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.

3.7 DATA SOURCES

Primary data were provided by Aspecta for its manufacturing facilities. The sources of secondary LCI data are the Ecoinvent database.

¹ Overcash, M. LCI gate-to-gate database, Department of Chemical and Biomolecular Engineering, NCSU, Raleigh, NC, 1998-2004.

Table 8. Data sources for the Aspecta™ Rigid Click product system.

Component	Dataset	Data Source	Publication date
PRODUCT			
PVC			
Polyvinyl Chloride	polyvinylchloride production, bulk polymerisation polyvinylchloride, bulk polymerised Cutoff, S/RoW	EI v3.8	2021
Filler			
Calcium Carbonate	limestone production, crushed, washed limestone, crushed, washed Cutoff, S/RoW	EI v3.8	2021
Plasticizer			
PVC Plasticizer*	diisooheptyl phthalate (DIHP)* {GLO} market for Alloc Rec U System	EI v3.8	2021
Stabilizer			
Stabilizer	market for chemical, organic chemical, organic Cutoff, S/GLO	EI v3.8	2021
	market for chemicals, inorganic chemical, inorganic Cutoff, S/GLO	EI v3.8	2021
	market for limestone, crushed, washed limestone, crushed, washed Cutoff, S/RoW	EI v3.8	2021
	market for zinc oxide zinc oxide Cutoff, S/GLO	EI v3.8	2021
Pigments			
Carbon Black	market for carbon black carbon black Cutoff, S/GLO	EI v3.8	2021
Titanium dioxide	market for titanium dioxide titanium dioxide Cutoff, S/RoW	EI v3.8	2021
Other			
Organic chemicals	market for chemical, organic chemical, organic Cutoff, S/GLO	EI v3.8	2021
Urethane acrylate	market for polyurethane, flexible foam polyurethane, flexible foam Cutoff, S/RoW	EI v3.8	2021
Methyl acrylate	methyl acrylate production methyl acrylate Cutoff, S/GLO		
PACKAGING			
Cardboard	containerboard production, linerboard, kraftliner containerboard, linerboard Cutoff, S/RoW	EI v3.8	2021
Wrapping film	packaging film production, low density polyethylene packaging film, low density polyethylene Cutoff, S/RoW	EI v3.8	2021
Plastics	polyethylene terephthalate production, granulate, amorphous polyethylene terephthalate, granulate, amorphous Cutoff, S/RoW; polyethylene production, low density, granulate polyethylene, low density, granulate Cutoff, S/RoW; polypropylene production, granulate polypropylene, granulate Cutoff, S/RoW	EI v3.8	2021
Wood	market for EUR-flat pallet EUR-flat pallet Cutoff, S/GLO	EI v3.8	2021
TRANSPORT			
Road transport	market for transport, freight, lorry 16-32 metric ton, EURO4 transport, freight, lorry 16-32 metric ton, EURO4 Cutoff, S/RoW	EI v3.8	2021
Rail transport	transport, freight train, diesel transport, freight train Cutoff, S/RoW	EI v3.8	2021
Ship transport	transport, freight, sea, container ship transport, freight, sea, container ship Cutoff, S/GLO	EI v3.8	2021
RESOURCES			
Grid electricity	market group for electricity, medium voltage electricity, medium voltage Cutoff, S/CN	EI v3.8	2021
Heat – natural gas	heat production, natural gas, at boiler modulating >100kW heat, district or industrial, natural gas Cutoff, S/RoW	EI v3.8	2021
Heat – fuel oil	heat production, light fuel oil, at industrial furnace 1MW heat, district or industrial, other than natural gas Cutoff, S/RoW	EI v3.8	2021
Heat – diesel	diesel, burned in building machine diesel, burned in building machine Cutoff, S/GLO	EI v3.8	2021
Heat – steam	market for heat, from steam, in chemical industry heat, from steam, in chemical industry Cutoff, S/RoW	EI v3.8	2021

3.8 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.

Table 9. Data quality assessment for the Rigid Click 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 2016). 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 annual production for 2018 and 2020.
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 regional power mixes from the Ecoinvent LCI database. Surrogate data used in the assessment are representative of global or North American operations. Data representative of global operations are considered sufficiently similar to actual processes. Data representing product disposal are based on US 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 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	Precision of results are not quantified due to a lack of data. 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. In some instances, surrogate data used to represent upstream and downstream operations may be missing some data which is propagated in the model. 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. Data sources of similar quality and age are used; with a bias towards Ecoinvent v3.8 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 manufacturing facilities represent an annual average and are considered of high 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. For secondary LCI data, Ecoinvent v3.8 LCI data are used.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the products and packaging is low. Actual supplier data for all upstream operations were not available and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years) but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment method required by the PCR includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.9 PERIOD UNDER REVIEW

The period of review is calendar year 2018 for the Yihua facility and calendar year 2020 for the Elegant facility.

3.10 ALLOCATION

Manufacturing resource use was allocated to the products based on mass. Impacts from transportation were allocated based on the mass of material and distance transported.

3.11 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.

4. LCA: Scenarios and Additional Technical Information

Delivery and Installation stage (A4 - A5)

Distribution of the flooring products to the point of installation is included in the assessment based on information provided by the manufacturer. Transportation parameters for modeling transport to consumer markets are summarized in Table 10.

Distribution of the flooring products to the point of installation is included in the assessment. Transportation parameters for modeling product distribution are summarized in Table 10. Production-weighted average distances by transport mode were used to represent global product distribution.

Table 10. *Product distribution parameters, per 1 m² (A4).*

Parameter	Value		
Diesel truck – Fuel utilization (L/100 km)	18.7		
Diesel truck – Capacity utilization (%)	76%		
Ocean freighter – Fuel utilization (g/tkm)	2.5		
Ocean freighter – Capacity utilization (%)	65%		
Product	Transport distance (km)		Mass (kg)
	Truck	Ship	
Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)	739	21,000	8.17
Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)	739	21,000	8.85
Rigid Click 4.8 mm_0.30 Wear-Layer	739	21,000	8.19

The impacts associated with the product installation are assumed negligible. The impacts associated with packaging disposal are included with the installation phase as per PCR requirements.

Table 11. Installation parameters for the Rigid Click flooring products, per 1 m² (A5).

Parameter	Value			
Ancillary materials	neg.			
Net freshwater consumption (m ³)	-			
Electricity consumption (kWh)	-			
Product loss per functional unit (kg)	negligible			
Waste materials generated by product installation (kg)	negligible			
Output materials resulting from on-site waste processing (kg)	na			
Direct emissions (kg)	-			
Product	Mass of packaging waste (kg)			Biogenic carbon in packaging (kg CO ₂)
	Plastic	Paper/Corrugate	Wood	
Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)	9.20x10 ⁻³	0.203	0.182	0.705
Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)	4.30x10 ⁻³	0.279	0.264	0.995
Rigid Click 4.8 mm_0.30 Wear-Layer	5.50x10 ⁻³	0.223	0.224	0.819

Use stage (B1)

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

Maintenance stage (B2)

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

Table 12. Maintenance parameters for the flooring products, per 1 m².

Parameter	Unit	Value
Maintenance process	-	Damp mopping
Net freshwater consumption	m ³ /m ² /yr	0.0058
Cleaning agent	kg/m ² /yr	0.0119
Maintenance process	-	Spray buffing
Electricity	kWh/m ² /yr	0.022
Further assumptions	-	Moderate traffic

Repair/Refurbishment stage (B3; B5)

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

Replacement stage (B4)

The materials and energy required for replacement of the product over the 75-year estimated service lifetime of the assessment are included in this stage.

Building operation stage (B6 – B7)

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

Disposal stage (C1 – C4)

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

Transportation of waste materials at end-of-life (C2) assumes a 20 mile (~32 km) average distance to disposal, consistent with assumptions used in the US EPA WARM model. The recycling rates used for the product packaging are based on national waste disposal statistics regarding recycling rates for North America as specified in the PCR. No recycling of the product materials is assumed at end-of-life. The relevant disposal statistics used for the packaging are summarized in Table 14.

Table 13. *Recycling rates for packaging materials at end-of-life.*

Material	Recycling Rate
Packaging	
Paper & Pulp	78%
Wood	26%
Plastics	15%
Disposal of Non-recyclables	
Landfill	80%
Incineration	20%

Table 14. *End-of-life disposal scenario parameters for the flooring product.*

Parameter	Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer (Yihua)	Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer (Elegant)	Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer
Assumptions for scenario development	100% landfill	100% landfill	100% landfill
Collection process			
Collected with mixed construction waste (kg)	8.17	8.85	8.19
Recovery	n/a	n/a	
Landfill disposal (kg)	8.17	8.85	8.19
Removals of biogenic carbon (kg CO ₂ eq)	n/a	n/a	n/a

5. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The following environmental impact category indicators 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 and CML-IA.

CMLI-A Impact Category	Unit	TRACI 2.1 Impact Category	Unit
Global Warming Potential (GWP)	kg CO ₂ eq	Global Warming Potential (GWP)	kg CO ₂ eq
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq	Ozone Depletion Potential (ODP)	kg CFC 11 eq
Acidification Potential of soil and water (AP)	kg SO ₂ eq	Acidification Potential (AP)	kg SO ₂ eq
Eutrophication Potential (EP)	kg PO ₄ ³⁻ eq	Eutrophication Potential (EP)	kg N eq
Photochemical Oxidant Creation Potential (POCP)	kg C ₂ H ₄ eq	Smog Formation Potential (SFP)	kg O ₃ eq
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq	Fossil Fuel Depletion Potential (ADP _{fossil})	MJ Surplus, LHV
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, LHV		

These impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

The following inventory parameters, specified by the PCR, are also reported.

Resources	Unit	Waste and Outflows	Unit
RPR _E : Renewable primary re- sources used as energy carrier (fuel)	MJ, LHV	HWD: Hazardous waste disposed	kg
RPR _M : Renewable primary re- sources with energy content used as material	MJ, LHV	NHWD: Non-hazardous waste disposed	kg
NRPR _E : Non-renewable primary re- sources used as an energy carrier (fuel)	MJ, LHV	HLRW: High-level radioactive waste, conditioned, to final repository	kg
NRPR _M : Non-renewable primary re- sources with energy content used as material	MJ, LHV	ILLRW: Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
SM: Secondary materials	MJ, LHV	CRU: Components for re-use	kg
RSF: Renewable secondary fuels	MJ, LHV	MR: Materials for recycling	kg
NRSF: Non-renewable secondary fuels	MJ, LHV	MER: Materials for energy recovery	kg
RE: Recovered energy	MJ, LHV	EE: Recovered energy exported from the product system	MJ, LHV
FW: Use of net fresh water re- sources	m ³		

Table 15. Life Cycle Impact Assessment (LCIA) results for the **Aspecta™ Rigid Click 5.2 mm, 0.55 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits. (Manufactured at Yihua)

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML-IA									
GWP (kg CO ₂ eq)	7.91	0.622	6.84	2.63	8.41x10 ⁻²	9.21	61.0	0.317	3.39
	8.6%	0.68%	7.4%	2.9%	0.091%	10%	66%	0.34%	3.7%
AP (kg SO ₂ eq)	3.13x10 ⁻²	2.42x10 ⁻³	2.78x10 ⁻²	4.60x10 ⁻²	9.54x10 ⁻⁵	4.33x10 ⁻²	0.308	1.48x10 ⁻³	9.01x10 ⁻⁴
	6.8%	0.53%	6%	10%	0.021%	9.4%	67%	0.32%	0.2%
EP (kg (PO ₄) ³⁻ eq)	1.03x10 ⁻²	5.60x10 ⁻⁴	6.23x10 ⁻³	5.59x10 ⁻³	4.29x10 ⁻⁴	1.61x10 ⁻²	0.126	3.16x10 ⁻⁴	2.16x10 ⁻²
	5.5%	0.3%	3.3%	3%	0.23%	8.6%	67%	0.17%	12%
POCP (kg C ₂ H ₄ eq)	2.18x10 ⁻³	8.26x10 ⁻⁵	1.18x10 ⁻³	1.21x10 ⁻³	1.63x10 ⁻⁵	2.80x10 ⁻³	1.52x10 ⁻²	4.87x10 ⁻⁵	7.23x10 ⁻⁴
	9.3%	0.35%	5%	5.2%	0.069%	12%	65%	0.21%	3.1%
ODP (kg CFC-11 eq)	3.29x10 ⁻⁶	1.08x10 ⁻⁷	2.20x10 ⁻⁷	4.32x10 ⁻⁷	3.22x10 ⁻⁹	4.41x10 ⁻⁷	1.16x10 ⁻⁵	5.48x10 ⁻⁸	2.09x10 ⁻⁸
	20%	0.67%	1.4%	2.7%	0.02%	2.7%	72%	0.34%	0.13%
ADPE (kg Sb eq)	1.09x10 ⁻⁴	2.16x10 ⁻⁶	6.32x10 ⁻⁶	5.78x10 ⁻⁶	2.28x10 ⁻⁸	1.84x10 ⁻⁴	3.48x10 ⁻⁴	2.79x10 ⁻⁷	4.50x10 ⁻⁷
	17%	0.33%	0.96%	0.88%	0.0035%	28%	53%	0.042%	0.068%
ADPF (MJ eq)	174	9.21	70.1	35.8	0.266	197	830	4.34	2.27
	13%	0.7%	5.3%	2.7%	0.02%	15%	63%	0.33%	0.17%
TRACI 2.1									
GWP (kg CO ₂ eq)	7.81	0.621	6.75	2.63	7.16x10 ⁻²	9.12	58.7	0.317	2.76
	8.8%	0.7%	7.6%	3%	0.081%	10%	66%	0.36%	3.1%
AP (kg SO ₂ eq)	3.21x10 ⁻²	2.83x10 ⁻³	2.93x10 ⁻²	4.92x10 ⁻²	1.19x10 ⁻⁴	4.43x10 ⁻²	0.327	1.83x10 ⁻³	1.46x10 ⁻³
	6.6%	0.58%	6%	10%	0.024%	9.1%	67%	0.37%	0.3%
EP (kg N eq)	2.02x10 ⁻²	6.78x10 ⁻⁴	1.05x10 ⁻²	3.47x10 ⁻³	1.14x10 ⁻³	3.18x10 ⁻²	0.265	2.32x10 ⁻⁴	5.85x10 ⁻²
	5.2%	0.17%	2.7%	0.89%	0.29%	8.1%	68%	0.059%	15%
SFP (kg O ₃ eq)	0.416	6.80x10 ⁻²	0.407	0.933	3.15x10 ⁻³	0.510	5.31	5.17x10 ⁻²	1.88x10 ⁻²
	5.4%	0.88%	5.3%	12%	0.041%	6.6%	69%	0.67%	0.24%
ODP (kg CFC-11 eq)	3.39x10 ⁻⁶	1.44x10 ⁻⁷	3.21x10 ⁻⁷	5.76x10 ⁻⁷	4.28x10 ⁻⁹	5.45x10 ⁻⁷	1.27x10 ⁻⁵	7.31x10 ⁻⁸	2.79x10 ⁻⁸
	19%	0.81%	1.8%	3.2%	0.024%	3.1%	71%	0.41%	0.16%
FFD (MJ eq)	23.4	1.32	4.75	5.22	3.92x10 ⁻²	26.2	99.9	0.654	0.293
	14%	0.81%	2.9%	3.2%	0.024%	16%	62%	0.4%	0.18%

Table 16. Resource use and waste flows for the **Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits. (Manufactured at Yihua)

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPR _E (MJ)	6.09	0.107	13.9	0.317	2.26x10 ⁻³	20.6	57.6	1.69x10 ⁻²	8.95x10 ⁻²
	6.2%	0.11%	14%	0.32%	0.0023%	21%	58%	0.017%	0.091%
RPR _M (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
NRPR _E (MJ)	INA								
NRPR _M (MJ)	INA								
SM (kg)	1.29	0.00	0.00	0.00	0.00	0.00	3.56	0.00	0.00
	27%	0%	0%	0%	0%	0%	73%	0%	0%
RSF/NRSF (MJ)	Neg.								
RE (MJ)	Neg.								
FW (m ³)	0.572	6.44x10 ⁻³	0.249	1.81x10 ⁻²	1.75x10 ⁻⁴	1.16	2.38	1.37x10 ⁻³	4.72x10 ⁻³
	13%	0.15%	5.7%	0.41%	0.004%	26%	54%	0.031%	0.11%
Wastes									
HWD (kg)	9.38x10 ⁻⁵	2.47x10 ⁻⁵	4.58x10 ⁻⁵	6.00x10 ⁻⁵	6.75x10 ⁻⁷	1.12x10 ⁻⁴	6.82x10 ⁻⁴	1.18x10 ⁻⁵	6.78x10 ⁻⁶
	9%	2.4%	4.4%	5.8%	0.065%	11%	66%	1.1%	0.65%
NHWD (kg)	0.861	0.474	0.458	0.835	0.151	0.824	29.7	2.21x10 ⁻²	7.79
	2.1%	1.2%	1.1%	2%	0.37%	2%	72%	0.054%	19%
HLRW (kg)	2.99x10 ⁻⁵	4.72x10 ⁻⁷	5.83x10 ⁻⁶	1.28x10 ⁻⁶	1.04x10 ⁻⁸	3.63x10 ⁻⁵	1.07x10 ⁻⁴	6.87x10 ⁻⁸	4.69x10 ⁻⁷
	17%	0.26%	3.2%	0.71%	0.0057%	20%	59%	0.038%	0.26%
ILLRW (kg)	1.75x10 ⁻⁴	6.05x10 ⁻⁵	9.67x10 ⁻⁵	2.43x10 ⁻⁴	1.79x10 ⁻⁶	2.12x10 ⁻⁴	1.74x10 ⁻³	3.07x10 ⁻⁵	1.24x10 ⁻⁵
	6.8%	2.4%	3.8%	9.5%	0.07%	8.2%	68%	1.2%	0.48%
CRU (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MR (kg)	0.00	0.00	0.00	0.00	0.207	0.00	0.570	0.00	0.00
	0%	0%	0%	0%	27%	0%	73%	0%	0%
MER (kg)	Neg.								
EE (MJ)	Neg.								

INA = Indicator not assessed | Neg. = Negligible

Table 17. Life Cycle Impact Assessment (LCIA) results for the **Aspecta™ Rigid Click 5.2 mm, 0.55 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits. (Manufactured at Elegant)

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML-IA									
GWP (kg CO ₂ eq)	7.82	1.04	0.486	2.85	0.112	9.21	46.5	0.338	3.95
	11%	1.4%	0.67%	3.9%	0.16%	13%	64%	0.47%	5.5%
AP (kg SO ₂ eq)	3.01x10 ⁻²	4.05x10 ⁻³	2.19x10 ⁻³	4.98x10 ⁻²	1.32x10 ⁻⁴	4.33x10 ⁻²	0.249	1.58x10 ⁻³	1.01x10 ⁻³
	7.9%	1.1%	0.58%	13%	0.035%	11%	65%	0.41%	0.26%
EP (kg (PO ₄) ³⁻ eq)	9.88x10 ⁻³	9.37x10 ⁻⁴	9.80x10 ⁻⁴	6.05x10 ⁻³	5.83x10 ⁻⁴	1.61x10 ⁻²	0.127	3.38x10 ⁻⁴	2.66x10 ⁻²
	5.2%	0.5%	0.52%	3.2%	0.31%	8.5%	67%	0.18%	14%
POCP (kg C ₂ H ₄ eq)	1.89x10 ⁻³	1.38x10 ⁻⁴	1.54x10 ⁻⁴	1.32x10 ⁻³	2.25x10 ⁻⁵	2.80x10 ⁻³	1.24x10 ⁻²	5.20x10 ⁻⁵	8.42x10 ⁻⁴
	9.7%	0.71%	0.78%	6.7%	0.11%	14%	63%	0.27%	4.3%
ODP (kg CFC-11 eq)	3.23x10 ⁻⁶	1.81x10 ⁻⁷	2.57x10 ⁻⁸	4.68x10 ⁻⁷	4.47x10 ⁻⁹	4.41x10 ⁻⁷	1.12x10 ⁻⁵	5.86x10 ⁻⁸	2.25x10 ⁻⁸
	21%	1.2%	0.16%	3%	0.029%	2.8%	72%	0.38%	0.14%
ADPE (kg Sb eq)	1.06x10 ⁻⁴	3.61x10 ⁻⁶	2.11x10 ⁻⁶	6.26x10 ⁻⁶	3.16x10 ⁻⁸	1.84x10 ⁻⁴	3.34x10 ⁻⁴	2.98x10 ⁻⁷	5.03x10 ⁻⁷
	17%	0.57%	0.33%	0.98%	0.005%	29%	52%	0.047%	0.079%
ADPF (MJ eq)	170	15.4	5.71	38.7	0.369	197	664	4.63	2.47
	15%	1.4%	0.52%	3.5%	0.034%	18%	60%	0.42%	0.22%
TRACI 2.1									
GWP (kg CO ₂ eq)	7.72	1.04	0.480	2.85	9.49x10 ⁻²	9.12	44.1	0.338	3.21
	11%	1.5%	0.7%	4.1%	0.14%	13%	64%	0.49%	4.7%
AP (kg SO ₂ eq)	3.08x10 ⁻²	4.73x10 ⁻³	2.49x10 ⁻³	5.33x10 ⁻²	1.65x10 ⁻⁴	4.43x10 ⁻²	0.265	1.95x10 ⁻³	1.25x10 ⁻³
	7.6%	1.2%	0.62%	13%	0.041%	11%	66%	0.48%	0.31%
EP (kg N eq)	1.94x10 ⁻²	1.13x10 ⁻³	1.88x10 ⁻³	3.76x10 ⁻³	1.55x10 ⁻³	3.18x10 ⁻²	0.278	2.48x10 ⁻⁴	7.13x10 ⁻²
	4.7%	0.28%	0.46%	0.92%	0.38%	7.8%	68%	0.061%	17%
SFP (kg O ₃ eq)	0.400	0.114	4.13x10 ⁻²	1.01	4.37x10 ⁻³	0.510	4.61	5.52x10 ⁻²	2.05x10 ⁻²
	5.9%	1.7%	0.61%	15%	0.065%	7.5%	68%	0.82%	0.3%
ODP (kg CFC-11 eq)	3.34x10 ⁻⁶	2.41x10 ⁻⁷	3.43x10 ⁻⁸	6.24x10 ⁻⁷	5.95x10 ⁻⁹	5.45x10 ⁻⁷	1.22x10 ⁻⁵	7.80x10 ⁻⁸	3.00x10 ⁻⁸
	20%	1.4%	0.2%	3.6%	0.035%	3.2%	71%	0.46%	0.18%
FFD (MJ eq)	23.0	2.20	0.535	5.65	5.45x10 ⁻²	26.2	90.8	0.698	0.316
	15%	1.5%	0.36%	3.8%	0.036%	18%	61%	0.47%	0.21%

Table 18. Resource use and waste flows for the **Aspecta™ Rigid Click 5.2 mm_0.55 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits. (Manufactured at Elegant)

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPR _E (MJ)	5.85	0.180	13.8	0.343	3.12x10 ⁻³	20.6	56.8	1.81x10 ⁻²	0.103
	6%	0.18%	14%	0.35%	0.0032%	21%	58%	0.018%	0.11%
RPR _M (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
NRPR _E (MJ)	INA								
NRPR _M (MJ)	INA								
SM (kg)	1.24	0.00	0.00	0.00	0.00	0.00	3.42	0.00	0.00
	27%	0%	0%	0%	0%	0%	73%	0%	0%
RSF/NRSF (MJ)	Neg.								
RE (MJ)	Neg.								
FW (m ³)	0.558	1.08x10 ⁻²	3.19x10 ⁻²	1.96x10 ⁻²	2.42x10 ⁻⁴	1.16	1.76	1.46x10 ⁻³	5.39x10 ⁻³
	16%	0.3%	0.9%	0.55%	0.0068%	33%	50%	0.041%	0.15%
Wastes									
HWD (kg)	9.69x10 ⁻⁵	4.12x10 ⁻⁵	6.16x10 ⁻⁶	6.50x10 ⁻⁵	9.35x10 ⁻⁷	1.12x10 ⁻⁴	6.45x10 ⁻⁴	1.26x10 ⁻⁵	7.64x10 ⁻⁶
	9.8%	4.2%	0.62%	6.6%	0.095%	11%	65%	1.3%	0.77%
NHWD (kg)	0.834	0.793	6.38x10 ⁻²	0.904	0.211	0.824	31.2	2.36x10 ⁻²	8.32
	1.9%	1.8%	0.15%	2.1%	0.49%	1.9%	72%	0.055%	19%
HLRW (kg)	2.87x10 ⁻⁵	7.90x10 ⁻⁷	1.30x10 ⁻⁶	1.39x10 ⁻⁶	1.44x10 ⁻⁸	3.63x10 ⁻⁵	9.19x10 ⁻⁵	7.33x10 ⁻⁸	5.41x10 ⁻⁷
	18%	0.49%	0.81%	0.86%	0.0089%	23%	57%	0.046%	0.34%
ILLRW (kg)	1.85x10 ⁻⁴	1.01x10 ⁻⁴	1.22x10 ⁻⁵	2.63x10 ⁻⁴	2.49x10 ⁻⁶	2.12x10 ⁻⁴	1.71x10 ⁻³	3.28x10 ⁻⁵	1.34x10 ⁻⁵
	7.3%	4%	0.48%	10%	0.098%	8.4%	68%	1.3%	0.53%
CRU (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MR (kg)	0.00	0.00	0.00	0.00	0.287	0.00	0.790	0.00	0.00
	0%	0%	0%	0%	27%	0%	73%	0%	0%
MER (kg)	Neg.								
EE (MJ)	Neg.								

INA = Indicator not assessed | Neg. = Negligible

Table 19. Life Cycle Impact Assessment (LCIA) results for the **Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML-IA									
GWP (kg CO ₂ eq)	6.67	0.610	6.86	2.64	9.15x10 ⁻²	9.21	135	0.316	3.60
	4%	0.37%	4.2%	1.6%	0.055%	5.6%	82%	0.19%	2.2%
AP (kg SO ₂ eq)	2.65x10 ⁻²	2.38x10 ⁻³	2.79x10 ⁻²	4.61x10 ⁻²	1.10x10 ⁻⁴	4.33x10 ⁻²	0.685	1.47x10 ⁻³	9.26x10 ⁻⁴
	3.2%	0.28%	3.3%	5.5%	0.013%	5.2%	82%	0.18%	0.11%
EP (kg (PO ₄) ³⁻ eq)	8.79x10 ⁻³	5.49x10 ⁻⁴	6.29x10 ⁻³	5.61x10 ⁻³	4.93x10 ⁻⁴	1.61x10 ⁻²	0.280	3.15x10 ⁻⁴	2.10x10 ⁻²
	2.6%	0.16%	1.9%	1.7%	0.15%	4.7%	83%	0.093%	6.2%
POCP (kg C ₂ H ₄ eq)	1.75x10 ⁻³	8.10x10 ⁻⁵	1.19x10 ⁻³	1.22x10 ⁻³	1.82x10 ⁻⁵	2.80x10 ⁻³	3.30x10 ⁻²	4.85x10 ⁻⁵	7.68x10 ⁻⁴
	4.3%	0.2%	2.9%	3%	0.045%	6.8%	81%	0.12%	1.9%
ODP (kg CFC-11 eq)	2.90x10 ⁻⁶	1.06x10 ⁻⁷	2.26x10 ⁻⁷	4.34x10 ⁻⁷	3.70x10 ⁻⁹	4.41x10 ⁻⁷	2.44x10 ⁻⁵	5.46x10 ⁻⁸	2.09x10 ⁻⁸
	10%	0.37%	0.79%	1.5%	0.013%	1.5%	85%	0.19%	0.073%
ADPE (kg Sb eq)	9.31x10 ⁻⁵	2.12x10 ⁻⁶	6.47x10 ⁻⁶	5.80x10 ⁻⁶	2.62x10 ⁻⁸	1.84x10 ⁻⁴	7.04x10 ⁻⁴	2.78x10 ⁻⁷	4.62x10 ⁻⁷
	9.3%	0.21%	0.65%	0.58%	0.0026%	18%	71%	0.028%	0.046%
ADPF (MJ eq)	145	9.04	70.2	35.9	0.306	197	1,740	4.32	2.29
	6.6%	0.41%	3.2%	1.6%	0.014%	9%	79%	0.2%	0.1%
TRACI 2.1									
GWP (kg CO ₂ eq)	6.59	0.609	6.77	2.64	7.77x10 ⁻²	9.12	129	0.316	2.92
	4.2%	0.38%	4.3%	1.7%	0.049%	5.8%	82%	0.2%	1.8%
AP (kg SO ₂ eq)	2.72x10 ⁻²	2.78x10 ⁻³	2.94x10 ⁻²	4.93x10 ⁻²	1.36x10 ⁻⁴	4.43x10 ⁻²	0.729	1.82x10 ⁻³	1.46x10 ⁻³
	3.1%	0.31%	3.3%	5.6%	0.015%	5%	82%	0.21%	0.16%
EP (kg N eq)	1.72x10 ⁻²	6.65x10 ⁻⁴	1.06x10 ⁻²	3.48x10 ⁻³	1.31x10 ⁻³	3.18x10 ⁻²	0.586	2.31x10 ⁻⁴	5.66x10 ⁻²
	2.4%	0.094%	1.5%	0.49%	0.19%	4.5%	83%	0.033%	8%
SFP (kg O ₃ eq)	0.352	6.67x10 ⁻²	0.409	0.936	3.62x10 ⁻³	0.510	11.9	5.15x10 ⁻²	1.90x10 ⁻²
	2.5%	0.47%	2.9%	6.5%	0.025%	3.6%	84%	0.36%	0.13%
ODP (kg CFC-11 eq)	2.99x10 ⁻⁶	1.41x10 ⁻⁷	3.28x10 ⁻⁷	5.78x10 ⁻⁷	4.93x10 ⁻⁹	5.45x10 ⁻⁷	2.69x10 ⁻⁵	7.28x10 ⁻⁸	2.79x10 ⁻⁸
	9.5%	0.45%	1%	1.8%	0.016%	1.7%	85%	0.23%	0.088%
FFD (MJ eq)	19.4	1.29	4.75	5.24	4.52x10 ⁻²	26.2	206	0.651	0.294
	7.4%	0.49%	1.8%	2%	0.017%	9.9%	78%	0.25%	0.11%

Table 20. Resource use and waste flows for the **Aspecta™ Rigid Click 4.8 mm_0.30 Wear-Layer** flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPR _E (MJ)	5.18	0.105	15.6	0.318	2.58x10 ⁻³	20.6	138	1.68x10 ⁻²	9.35x10 ⁻²
	2.9%	0.058%	8.6%	0.18%	0.0014%	11%	77%	0.0093%	0.052%
RPR _M (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0%	0%	0%	0%	0%	0%	0%	0%	0%
NRPR _E (MJ)	INA								
NRPR _M (MJ)	INA								
SM (kg)	1.30	0.00	0.00	0.00	0.00	0.00	8.44	0.00	0.00
	13%	0%	0%	0%	0%	0%	87%	0%	0%
RSF/NRSF (MJ)	Neg.								
RE (MJ)	Neg.								
FW (m ³)	0.489	6.31x10 ⁻³	0.250	1.82x10 ⁻²	2.00x10 ⁻⁴	1.16	5.00	1.36x10 ⁻³	4.91x10 ⁻³
	7%	0.091%	3.6%	0.26%	0.0029%	17%	72%	0.02%	0.071%
Wastes									
HWD (kg)	8.16x10 ⁻⁵	2.42x10 ⁻⁵	4.64x10 ⁻⁵	6.02x10 ⁻⁵	7.75x10 ⁻⁷	1.12x10 ⁻⁴	1.51x10 ⁻³	1.18x10 ⁻⁵	7.06x10 ⁻⁶
	4.4%	1.3%	2.5%	3.3%	0.042%	6%	81%	0.64%	0.38%
NHWD (kg)	0.740	0.465	0.463	0.837	0.177	0.824	68.0	2.20x10 ⁻²	7.76
	0.93%	0.59%	0.58%	1.1%	0.22%	1%	86%	0.028%	9.8%
HLRW (kg)	2.56x10 ⁻⁵	4.63x10 ⁻⁷	5.89x10 ⁻⁶	1.29x10 ⁻⁶	1.19x10 ⁻⁸	3.63x10 ⁻⁵	2.20x10 ⁻⁴	6.84x10 ⁻⁸	4.92x10 ⁻⁷
	8.8%	0.16%	2%	0.44%	0.0041%	13%	76%	0.024%	0.17%
ILLRW (kg)	1.56x10 ⁻⁴	5.93x10 ⁻⁵	9.76x10 ⁻⁵	2.44x10 ⁻⁴	2.06x10 ⁻⁶	2.12x10 ⁻⁴	3.91x10 ⁻³	3.06x10 ⁻⁵	1.24x10 ⁻⁵
	3.3%	1.3%	2.1%	5.2%	0.044%	4.5%	83%	0.65%	0.26%
CRU (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MR (kg)	0.00	0.00	0.00	0.00	0.233	0.00	1.52	0.00	0.00
	0%	0%	0%	0%	13%	0%	87%	0%	0%
MER (kg)	Neg.								
EE (MJ)	Neg.								

INA = Indicator not assessed | Neg. = Negligible

6. LCA: Interpretation

Excluding product replacements (B4), the contributions to indicator results for the product system over the life cycle of the product are dominated by the product maintenance phase (B2), followed by the raw material and extraction phase (A1), product manufacturing (A3), and product distribution (A4). With the exception of the Eutrophication Potential indicator, contributions from product disposal (C1-C4) are minimal.

Contribution Analysis

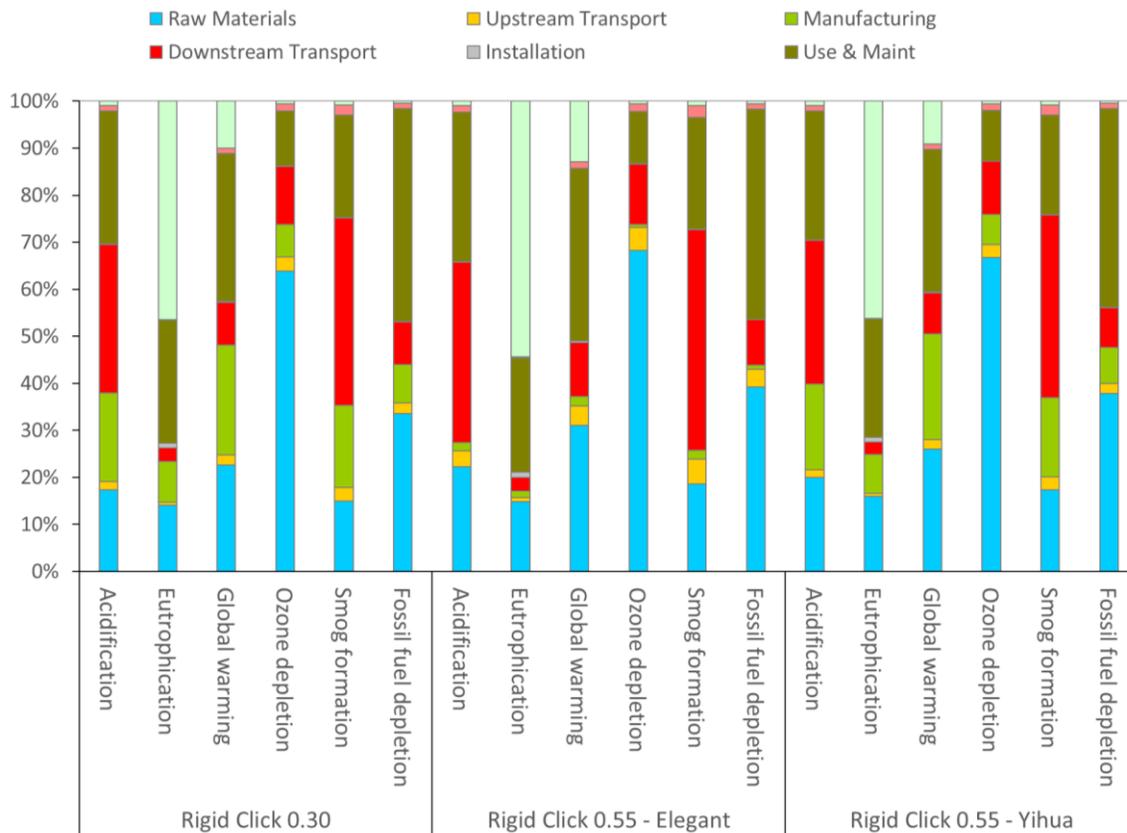


Figure 2. Contribution analysis for the Rigid Click product system – TRACI 2.1.

7. Additional Environmental Information

7.1 ENVIRONMENT AND HEALTH DURING MANUFACTURING

The Aspecta manufacturing facility is certified to ISO 9001 and ISO 14001 – Environmental management systems.

7.2 ENVIRONMENT AND HEALTH DURING INSTALLATION

The Rigid Click flooring products meet the requirements of the following:

1. CDPH/EHLB Standard Method v1.2-2017 (California Section 01350)

7.3 ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

For more information on Rigid Click product certifications and environmental initiatives please view the website at <https://elementalbyaspecta.com>.

8. References

2. Life Cycle Assessment of Luxury Vinyl Tile. SCS Global Services Report. Prepared for Aspecta BV. July 2022.
3. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
4. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and Framework
5. ISO 14044: 2006/Amd 1:2017/ Amd 2:2020 Environmental Management – Life cycle assessment – Requirements and Guidelines.
6. PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. UL Environment. December 2018.
7. PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. May 2018.
8. SCS Type III Environmental Declaration Program: Program Operator Manual. V11.0 November 2021. SCS Global Services.
9. Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI). Dr. Bare, J., <https://www.epa.gov/chemical-research/tool-reduction-and-assessment-chemicals-and-other-environmental-impacts-traci>
10. CML-IA Characterization Factors. Leiden University, Institute of Environmental Sciences. April 2013. <https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors>
11. Ecoinvent Centre (2021) ecoinvent data from v3.8. Swiss Center for Life Cycle Inventories, Dübendorf, 2021, <http://www.ecoinvent.org>
12. European Joint Research Commission. International Reference Life Cycle Data System handbook. General guide for Life Cycle Assessment – Detailed Guidance. © European Union, 2010.
13. “WARM Model Transportation Research – Draft.” Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004. https://19january2017snapshot.epa.gov/www3/epawaste/conserve/tools/warm/pdfs/retail_transport-memo.pdf





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