Declaration Owner

HMTX Industries
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Product

- ASPECTA ESSENTIALS™ RIGID CLICK 30
- ASPECTA ESSENTIALS™ RIGID CLICK 55 – 5.2 mm
- ASPECTA ESSENTIALS™ RIGID CLICK 55 – 6 mm

(UNSPSC Class Code 30161700/CSI Code 09 65 00)

Functional Unit

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

EPD Number and Period of Validity

SCS-EPD-10302
EPD Valid December 18, 2024 through December 17, 2029

Product Category Rule

PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL 10010, UL v.4.0, March 2022.
PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements, v.2.0,[1] validity extended to December 31, 2024.

Program Operator

SCS Global Services
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Declaration Owner:	HMTX Industries
Address:	29 Oakwood Ave, Norwalk, CT, 06850, USA
Declaration Number:	SCS-EPD-10302
Declaration Validity Period:	EPD Valid December 18, 2024 through December 17, 2029
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 v2.1 software and the Ecoinvent v3.10 database
Product RSL:	20 years
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	☐ internal ☒ external
LCA Reviewer:	Lindita Bushi, Ph.D., Athena Sustainable Materials Institute
Part A Product Category Rule:	PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL 10010, UL v.4.0, March 2022.
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, v.2.0,[1] validity extended to December 31, 2024.
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	☐ internal ☒ external
EPD Verifier:	Lindita Bushi, Ph.D., Athena Sustainable Materials Institute
Declaration Contents:	

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

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

1. HMTX Industries

Headquartered in Norwalk, Connecticut, HMTX Industries is a global flooring company serving a diverse cross section of the construction and renovation marketplaces. The HMTX family of companies includes four subsidiaries. Halstead is the leading supplier of resilient flooring to the home center market. Metroflor provides flooring products under its signature residential brand Metroflor™ in North America. HMTX Commercial markets the Teknoflor™ and Aspecta™ commercial brands to designers and architects in North America; and HMTX Global serves the residential and commercial sectors worldwide through diverse channel partners focused on Aspecta™, Allure™, and OEM-private label brands.

As a global leader in sustainable practices, HMTX sets industry standards for quality and performance as well as superior product design. Its manufacturing processes, workplaces and product ingredients all reflect a significant dedication to sustainability, transparency, and societal impact. HMTX has received numerous accolades for innovation, supply chain performance, online excellence, and customer partnership.

2. Product

2.1 PRODUCT DESCRIPTION

ASPECTA™ RIGID CLICK collections offer a wide range of stylish and functional flooring. An easy to install click system with two wear layer thicknesses, 0.30 mm and 0.55mm, is the optimal choice for residential purposes and light commercial. The Duraspect™ finish will assure a high micro-scratch protection and stain resistance.

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™ RIGID CLICK products provide the primary function of flooring for various residential and commercial interior 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 assessment is conducted following an attributional LCA approach. Cut-off and allocation procedures are described below and conform to the PCR and ISO standards.

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

Table 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	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material extraction and processing	Transport to manufacturing facilities	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 = included | MND = Module Not Declared

2.5 TECHNICAL DATA

Technical specifications for the ASPECTA™ RIGID CLICK flooring products are summarized in Table 2 through Table 4.

Table 2. *Product specifications for* ***ASPECTA ESSENTIALS™ RIGID CLICK 30.***

Characteristic			Description			
Sustainable certifications			ISO 9001; ISO 14001; CE Mark; Eurofins Indoor Air Comfort GOLD			
VOC emissions test method			EN 16516			
Characteristic			**Average Value**	**Unit**	**Min Value**	**Max Value**
Product thickness			4.80 (0.189)	mm (in)	4.70 (0.185)	4.90 (0.193)
Wear layer thickness (where applicable)			0.30 (0.012)	mm (in)	0.30 (0.012)	0.35 (0.014)
Product weight			8,000 (26.22)	g/m^2 (oz/ft^2)	7,600 (24.91)	8,400 (27.53)
Product Form	Tiles	Width	304.8 (12.00)	mm (in)	304.6 (11.99)	305.0 (12.01)
		Length	609.6 (24.00)	mm (in)	609.3 (23.99)	609.9 (24.01)
Product Form	Planks	Width	225.0 (8.86)	mm (in)	224.9 (8.85)	225.1 (8.86)
		Length	1,210.0 (47.64)	mm (in)	1,209.5 (47.62)	1,210.5 (47.66)

Table 3. *Product specifications for* ***ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm.***

Characteristic			Description			
Sustainable certifications			ISO 9001; ISO 14001; CE Mark; Eurofins Indoor Air Comfort GOLD			
VOC emissions test method			EN 16516			
Characteristic			**Average Value**	**Unit**	**Min Value**	**Max Value**
Product thickness			5.20 (0.205)	mm (in)	5.10 (0.201)	5.30 (0.209)
Wear layer thickness (where applicable)			0.55 (0.022)	mm (in)	0.55 (0.022)	0.60 (0.024)
Product weight			8,400 (27.53)	g/m^2 (oz/ft^2)	7,980 (26.15)	8,820 (28.90)
Product Form	Tiles	Width	448.0 (17.64)	mm (in)	447.8 (17.63)	448.2 (17.65)
		Length	906.0 (35.67)	mm (in)	905.7 (35.66)	906.3 (35.68)
Product Form	Planks	Width	220.0 (8.66)	mm (in)	219.9 (8.66)	220.1 (8.67)
		Length	1,510.0 (59.45)	mm (in)	1,509.5 (59.43)	1,510.5 (59.47)

Table 4. *Product specifications for* ***ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm.***

Characteristic			Description			
Sustainable certifications			ISO 9001; ISO 14001; CE Mark; Eurofins Indoor Air Comfort GOLD			
VOC emissions test method			EN 16516			
Characteristic			**Average Value**	**Unit**	**Min Value**	**Max Value**
Product thickness			6.00 (0.236)	mm (in)	5.80 (0.228)	6.20 (0.244)
Wear layer thickness (where applicable)			0.55 (0.022)	mm (in)	0.55 (0.022)	0.62 (0.024)
Product weight			10,360 (33.95)	g/m^2 (oz/ft^2)	9,842 (32.25)	10,900 (35.72)
Product Form	Tiles	Width	448.0 (17.64)	mm (in)	447.8 (17.63)	448.2 (17.65)
		Length	906.0 (35.67)	mm (in)	905.7 (35.66)	906.3 (35.68)
Product Form	Planks	Width	220.0 (8.66)	mm (in)	219.9 (8.66)	220.1 (8.67)
		Length	1,510.0 (59.45)	mm (in)	1,509.5 (59.43)	1,510.5 (59.47)

2.6 MARKET PLACEMENT/APPLICATION RULES

Technical specifications of the ASPECTA™ RIGID CLICK flooring products are summarized above. Detailed product performance results can be found on the manufacturer's website https://hmtx.global.

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

The ASPECTA™ RIGID CLICK flooring products are delivered for installation in the form of tiles and planks of various dimensions.

2.8 MATERIAL COMPOSITION

The ASPECTA™ RIGID CLICK flooring is made primarily from polyvinyl chloride (PVC), calcium carbonate (mineral reinforcement), stabilizers and certain other substances. The rigid click flooring is structured with a top board and an attached foam underlayment. The board consists of a vinyl wear layer with the protective surface coating, a printed decorative film, a vinyl backing layer, and a solid polymer composite core extruded in a one-step process.

Table 5. *Material content for the ASPECTA™ RIGID CLICK flooring products in kg per square meter and percent of total mass.*

Material	ASPECTA ESSENTIALS™ RIGID CLICK 30		ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm		ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm	
	kg/m^2	percent	kg/m^2	percent	kg/m^2	percent
Polymer Binder	2.17	27%	2.50	29%	2.92	29%
Filler	5.41	67%	5.46	64%	6.61	65%
Stabilizer	0.153	1.9%	0.156	1.8%	0.19	1.90%
Other Plastics	7.63×10^{-2}	0.94%	9.54×10^{-2}	1.1%	0.15	1.50%
Pigment	7.22×10^{-3}	0.089%	7.34×10^{-3}	0.086%	1.00×10^{-2}	0.10%
Others	0.285	3.5%	0.291	3.4%	0.358	3.50%
Total Product	**8.10**	**100%**	**8.51**	**100%**	**10.24**	**100%**

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

2.9 MANUFACTURING

The products are manufactured at production facilities in China. The manufacturer provided primary data for its annual production, resource use, electricity consumption, and waste generation at the facilities. Electricity consumption is

modeled using Ecoinvent datasets for the regional electricity grid resource mix. No green power sources or CO_2 certificates are included in the present study.

The production of rigid click flooring involves the following general manufacturing processes:

- The properly mixed raw materials are calendared into the wear layer.
- The wear layer, the printed decorative film, and other properly mixed raw materials are extruded into the top board, which is then UV-coated, 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.

2.10 PACKAGING

The products are packaged for shipment using corrugated board, plastic wrap and wooden pallets.

Table 6. *Material content for the ASPECTA™ RIGID CLICK flooring product packaging in kg per square meter of flooring.*

Material	ASPECTA ESSENTIALS™ RIGID CLICK 30		ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm		ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm	
	kg/m²	percent	kg/m²	percent	kg/m²	percent
Corrugate/Paper	0.226	51%	0.258	47%	0.261	48%
Plastic	$5.47x10^{-3}$	1.2%	$7.93x10^{-3}$	1.5%	$7.93x10^{-3}$	1.50%
Wood	0.207	47%	0.280	51%	0.273	50%
Total Packaging	**0.439**	**100%**	**0.546**	**100%**	**0.542**	**100%**

2.11 PRODUCT INSTALLATION

Installation of this product primarily involves hand tools for measuring and cutting floor materials. Approximately 4.5% of the total material is assumed to be trimmed and discarded as waste. While some of this waste could be recycled, this scrap is modeled as being disposed of in a landfill. No adhesive is required for product installation.

2.12 USE CONDITIONS

No special conditions of use are noted.

2.13 REFERENCE SERVICE LIFE

The Reference Service Life (RSL) of the flooring products varies based on the manufacturer's warranted lifetime.

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 ASPECTA™ RIGID CLICK products can be found on the manufacturer's website https://hmtx.global.

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 corresponding reference flow for each product system is presented in Table 6. For the present assessment, a reference service lifetime (RSL) corresponding to the manufacturer's warranted lifetime is assumed. The total number of required product lifecycles during the 75-year period over which the product system is modeled is also summarized for the products in Table 7.

Table 7. *Reference flow and RSL for the flooring products.*

Product Line	Reference flow (kg/m^2)	Reference Service Life – RSL (years)	Total # of Products Modeled
ASPECTA ESSENTIALS™ RIGID CLICK 30	8.10	20	3.80
ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	8.51	20	3.80
ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm	10.24	20	3.80

3.2 SYSTEM BOUNDARY

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacturing, product delivery, installation and use, and product disposal. The life cycle phases included in the EPD scope are described in Table 8 and illustrated in Figure 1.

Table 8. *The modules and unit processes included in the scope for the flooring product system.*

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 product 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 (including upstream unit processes)
A4	Transport (to the building site)	Transport of product (including packaging) to the building site
A5	Construction-installation process	Impacts from product installation. Impacts from the production, transport and disposal of waste material associated with installation are included in this phase in addition to impacts from packaging disposal
B1	Product use	Use of the product 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 product RSL, including periodic cleaning.
B3	Product repair	The product is not expected to require repair over its lifetime
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 product is not expected to require refurbishment over its lifetime
B6	Operational energy use by technical building systems	There is no operational energy use associated with the use of the product
B7	Operational water uses 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 the product to waste treatment at end-of-life
C3	Waste processing for reuse, recovery and/or recycling	The products are disposed of by landfilling which require no waste processing
C4	Disposal	Disposal of the product
D	Reuse-recovery-recycling potential	Module Not Declared

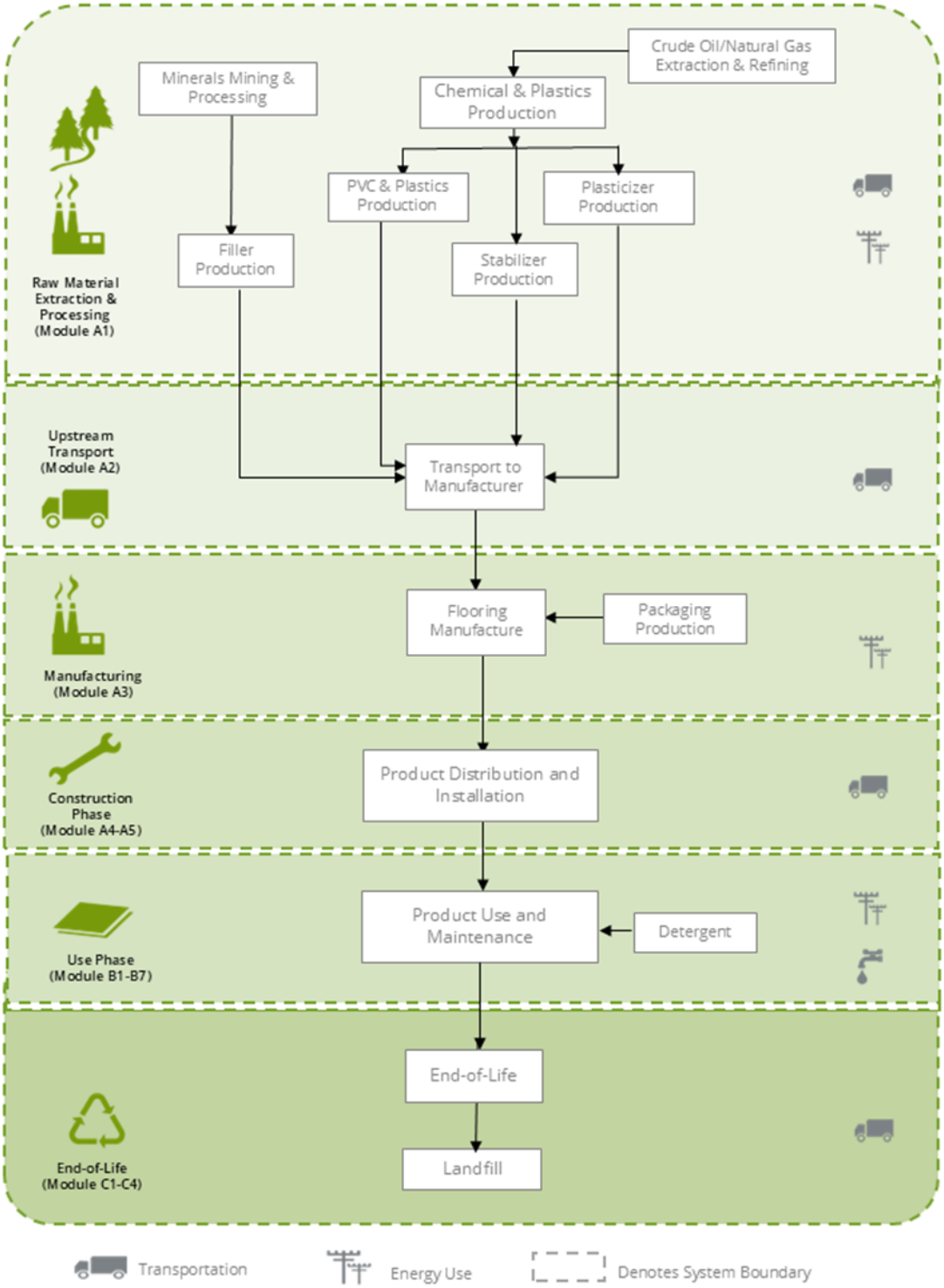

Figure 1. *Flow diagram for the life cycle of the flooring products.*

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.

3.5 ESTIMATES AND ASSUMPTIONS

- Electricity use at the manufacturing facility was allocated to a product based on the product area as a fraction of the total production.
- The manufacturing facility under review is located in China. Ecoinvent inventory datasets for the appropriate regional energy grids were used to model resource use and emissions from electricity use at the manufacturing facilities.
- Inventory data for some material components were unavailable and modeled using proxy datasets from the Ecoinvent LCI databases.
- The Reference Service Life (RSL) of the products was modeled based on information provided by the manufacturers assuming their products are installed and maintained as recommended and used for the specific application noted.
- Downstream transport was modeled based on information provided by the manufacturers representing transport for product distribution to North America.
- The maintenance phase of the product life cycle was modeled based on information provided by the manufacturers including recommended installation and cleaning methods, as well as cleaning frequency.
- For the product end-of-life, disposal of product and product packaging is modeled based on the PCR guidance regarding recycling rates of products and packaging materials.
- For final disposal of the packaging material and flooring products at end-of-life, all materials are assumed to be transported 161 km by diesel truck to either a landfill 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 taking into account 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 for the manufacturing facilities and select suppliers. The sources of secondary LCI data are the Ecoinvent database.

Table 9. *Data sources for the flooring products.*

Component	Dataset	Data Source	Publication Date
PRODUCT			
Polymer Binder			
Polyvinyl Chloride	polyvinylchloride production, bulk polymerisation | polyvinylchloride, bulk polymerised | Cutoff, S/RoW; extrusion, co-extrusion of plastic sheets | extrusion, co-extrusion | Cutoff, S/RoW; extrusion, plastic film | extrusion, plastic film | Cutoff, S/RoW	EI v3.10	2023
Filler			
Calcium Carbonate	limestone production, crushed, washed | limestone, crushed, washed | Cutoff, S/RoW	EI v3.10	2023
Stabilizer			
Stabilizer	market for chemical, organic | chemical, organic | Cutoff, S/GLO	EI v3.10	2023
	market for chemicals, inorganic | chemical, inorganic | Cutoff, S/GLO	EI v3.10	2023
	solvent production, organic | solvent, organic | Cutoff, S/GLO	EI v3.10	2023
	limestone production, crushed, washed | limestone, crushed, washed | Cutoff, S/RoW	EI v3.10	2023
	market for zinc oxide | zinc oxide | Cutoff, S/GLO	EI v3.10	2023
Pigments		**EI v3.10**	**2023**
TiO2	market for titanium dioxide | titanium dioxide | Cutoff, S/RoW		
Carbon Black	market for carbon black | carbon black | Cutoff, S/GLO	EI v3.10	2023
Others			
MMA	methyl methacrylate production | methyl methacrylate | Cutoff, S/RoW	EI v3.10	2023
Additives	chemical production, organic | chemical, organic | Cutoff, S/GLO; chemical production, inorganic | chemical, inorganic | Cutoff, S/GLO	EI v3.10	2023
Adhesive	polyurethane adhesive production | polyurethane adhesive | Cutoff, S/GLO	EI v3.10	2023
Coating	market for chemical, organic | chemical, organic | Cutoff, S/GLO	EI v3.10	2023
PACKAGING			
Cardboard/Paper	corrugated board box production | corrugated board box | Cutoff, S/RoW; containerboard production, linerboard, testliner | containerboard, linerboard | Cutoff, S/RoW	EI v3.10	2023
Wrapping film	packaging film production, low density polyethylene | packaging film, low density polyethylene | Cutoff, S/RoW	EI v3.10	2023
Plastics	polypropylene production, granulate | polypropylene, granulate | Cutoff, S/RoW	EI v3.10	2023
Wood	EUR-flat pallet production | EUR-flat pallet | Cutoff, S/RoW	EI v3.10	2023
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 v3.10	2023
Ship transport	transport, freight, sea, container ship | transport, freight, sea, container ship | Cutoff, S/GLO	EI v3.10	2023
MAINTENANCE			
Neutral cleaner	ethoxylated alcohol (AE7) production, petrochemical | ethoxylated alcohol (AE7) | Cutoff, S/RoW; fatty acid production, from palm oil | fatty acid | Cutoff, S/RoW; tap water production, conventional treatment | tap water | Cutoff, S/RoW	EI v3.10	2023
Electricity	market for electricity, low voltage | electricity, low voltage | Cutoff, S/US	EI v3.10	2023
Water	tap water production, conventional treatment | tap water | Cutoff, S/RoW	EI v3.10	2023
WASTE DISPOSAL			
Landfill	treatment of municipal solid waste, sanitary landfill | municipal solid waste | Cutoff, S/RoW	EI v3.10	2023
	treatment of waste polyvinylchloride, sanitary landfill | waste polyvinylchloride | Cutoff, S/RoW	EI v3.10	2023
RESOURCES			
Grid electricity - China	market group for electricity, medium voltage | electricity, medium voltage | Cutoff, S/CN	EI v3.10	2023
Water	tap water production, conventional treatment | tap water | Cutoff, S/RoW	EI v3.10	2023

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 10. *Data quality assessment for the 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. 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 2023.
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 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 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 v3.10 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 v3.10 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 calendar year 2023.

3.10 ALLOCATION

Resource use at the manufacturing facilities (e.g., water and energy) was allocated to the products based on the product area as a fraction of the total facility production volume (i.e., area-based allocation). Area-based allocation was deemed most appropriate for the flooring products as total facility production was available as total square meters of product. Electricity use at the manufacturing facilities was modeled using ecoinvent inventory datasets for the country-specific electrical grid.

The product systems include the use of recycled materials. 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. At end-of-life, materials which are recycled leave the system boundaries with no additional burden.

Impacts from transportation, including product distribution to point of sale, were attributed to the products 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 products 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 11.

Table 11. *Product distribution parameters by transport mode and consumer market.*

Parameter	Unit	ASPECTA™ RIGID CLICK	
Ground transport			
Fuel type	-	Diesel	
Liters of fuel	L/100km	18.7	
Vehicle type	-	Diesel truck	
Capacity utilization	%	76	
Ocean transport			
Fuel type	-	Fuel oil	
Liters of fuel	L/tkm	2.23	
Vehicle type	-	Ocean freighter	
Capacity utilization	%	70	
Product Name	**Gross mass transported (kg)**	**Transport Distance (km)**	
		Road	**Ship**
ASPECTA ESSENTIALS™ RIGID CLICK 30	8.54	723	18,207
ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	9.05	768	18,207
ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm	10.78	768	18,207

Installation and maintenance of the products are based on typical application and intended use. Approximately 4.5% of the product mass is assumed lost as waste during product installation which is disposed of via landfilling. Impacts from the production, transport and disposal of waste material associated with installation are included in this phase. The VOC emissions associated with the installation, use and maintenance of the products are negligible.

The impacts associated with packaging disposal are included with the installation phase as per PCR requirements. The recycling rates used for the product packaging are based on the PCR guidance for disposal practices in the US. The relevant disposal statistics used for the packaging are summarized in Table 12. For material not recycled, 80% are assumed landfilled and 20% incinerated. Modeling parameters for product installation are summarized in Table 13.

Table 12. *Recycling rates for packaging materials at end-of-life.*

Material	Recycling rate (%)
Recycling Rates	
Plastics	9.0%
Paper & Pulp	68%
Wood	0%
Disposal of Non-recyclables	
Landfill	80%
Incineration	20%

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

Table 13. *Installation parameters for the ASPECTA™ RIGID CLICK flooring products, per 1 m^2.*

Parameter		ASPECTA ESSENTIALS™ RIGID CLICK 30	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm
Ancillary materials (kg)		0.00	0.00	0.00
Net freshwater consumption (m^3)		0.00	0.00	0.00
Electricity consumption (kWh)		0.00	0.00	0.00
Product loss per functional unit (kg)		0.365	0.383	0.461
Waste materials generated by product installation (kg)		0.803	0.928	1.00
Output materials resulting from on-site waste processing (kg)		0.00	0.00	0.00
Mass of packaging waste (kg)	Plastic	$5.47x10^{-3}$	$7.93x10^{-3}$	$7.93x10^{-3}$
	Corrugate	0.226	0.258	0.261
	Wood	0.207	0.280	0.273
Biogenic carbon contained in packaging (kg CO_2)		0.794	0.986	0.979
Direct emissions (kg)		0.00	0.00	0.00

Use stage (B1)

No impacts are associated with the use of the products 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 14. *Maintenance parameters for the ASPECTA™ RIGID CLICK flooring products, per 1 m^2.*

Parameter	Unit	ASPECTA ESSENTIALS™ RIGID CLICK 30	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm
Maintenance process	-	Damp mopping	Damp mopping	Damp mopping
Maintenance cycle	Cycles / RSL	1,040	1,040	1,040
Maintenance cycle	Cycles / ESL	3,900	3,900	3,900
Net freshwater consumption	$m^3/m^2/yr$	0.0058	0.0058	0.0058
Cleaning agent	$kg/m^2/yr$	0.0119	0.0119	0.0119
Maintenance process	-	Machine cleaning	Machine cleaning	Machine cleaning
Maintenance cycle	Cycles / RSL	240	240	240
Maintenance cycle	Cycles / ESL	900	900	900
Electricity	$kWh/m^2/yr$	0.022	0.022	0.022
Further assumptions	-	Moderate traffic	Moderate traffic	Moderate traffic

Repair/Refurbishment stage (B3; B5)

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

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. Impacts associated with the production, transport, waste processing, and disposal of all materials required for the replacement of the product over the 75-year assessment period are included. Modeling parameters for the product replacement stage are summarized in Table 15.

Table 15. *Product replacement parameters for the ASPECTA™ RIGID CLICK flooring products, per 1 m^2.*

Product	Unit	ASPECTA ESSENTIALS™ RIGID CLICK 30	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm
Reference service life	Years	20	20	20
Replacement cycle	-	2.8	2.8	2.8
Energy input	kWh	-	-	-
Freshwater consumption	m^3	-	-	-
Ancillary materials	kg	Negligible	Negligible	Negligible
Replacement parts	kg	23.91	25.35	30.18

Building operation stage (B6 – B7)

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

Disposal stage (C1 - C4)

The disposal stage includes removal 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 or is burned in an incinerator (C4). For the flooring products, no emissions are generated during demolition (C1) while no waste processing (C3) is required for incineration or landfill disposal.

Transportation of waste materials at end-of-life (*C2*) assumes a 161 km (~100 mile) average distance to disposal, consistent with the PCR. No recycling of the product materials is assumed at end-of-life. The relevant disposal parameters used for the product system are summarized in Table 16.

Table 16. *End-of-life disposal scenario parameters for the ASPECTA™ RIGID CLICK flooring products.*

Parameter		ASPECTA ESSENTIALS™ RIGID CLICK 30	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm	ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm
Scenario assumptions		Landfill	Landfill	Landfill
Collection process	Collected separately	-		-
	Collected with mixed waste	8.10	8.51	10.24
Recovery		-		-
Disposal	Recycling	0	0	0
	Landfill	8.10	8.51	10.24
	Incineration	0	0	0
Removals of biogenic carbon1		-		-

5. LCA: Results

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

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_2H_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 resources used as energy carrier (fuel)	MJ, LHV	**HWD:** Hazardous waste disposed	kg
RPR_M: Renewable primary resources with energy content used as material	MJ, LHV	**NHWD:** Non-hazardous waste disposed	kg
$NRPR_E$: Non-renewable primary resources used as an energy carrier (fuel)	MJ, LHV	**HLRW:** High-level radioactive waste, conditioned, to final repository	kg
$NRPR_M$: Non-renewable primary resources with energy content used as material	MJ, LHV	**ILLRW:** Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
SM: Secondary materials	kg	**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 freshwater resources	m^3	-	-

Modules B1, B3, B5, B6 and B7 are not associated with any impact and are therefore declared as zero. In addition, no emissions are generated during demolition (C1) while no waste processing (C3) is required for landfill disposal. Additionally, as the flooring products do not typically contain significant amounts of bio-based materials, biogenic carbon emissions and removals are not declared. Module D is not declared. In the interest of space and table readability, these modules are not included in the results presented below.

Table 17. *Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.* ***(ASPECTA ESSENTIALS™ RIGID CLICK 30)***

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML									
GWP (kg CO_2 eq)	8.86	0.828	5.02	2.78	0.983	9.40	66.4	1.81	3.44
	8.9%	0.83%	5%	2.8%	0.99%	9.4%	67%	1.8%	3.5%
AP (kg SO_2 eq)	$3.07x10^{-2}$	$2.60x10^{-3}$	$1.95x10^{-2}$	$4.11x10^{-2}$	$4.64x10^{-3}$	$4.24x10^{-2}$	0.298	$6.88x10^{-3}$	$8.93x10^{-4}$
	6.9%	0.58%	4.4%	9.2%	1%	9.5%	67%	1.5%	0.2%
EP (kg $(PO_4)^{3-}$ eq)	$1.30x10^{-2}$	$7.15x10^{-4}$	$1.56x10^{-2}$	$5.22x10^{-3}$	$3.80x10^{-3}$	$1.72x10^{-2}$	0.310	$1.58x10^{-3}$	$7.09x10^{-2}$
	3%	0.16%	3.6%	1.2%	0.87%	3.9%	71%	0.36%	16%
POCP (kg C_2H_4 eq)	$2.38x10^{-3}$	$1.27x10^{-4}$	$9.16x10^{-4}$	$1.20x10^{-3}$	$2.45x10^{-4}$	$2.78x10^{-3}$	$1.65x10^{-2}$	$3.07x10^{-4}$	$7.31x10^{-4}$
	9.4%	0.51%	3.6%	4.8%	0.97%	11%	66%	1.2%	2.9%
ODP (kg CFC-11 eq)	$2.82x10^{-6}$	$9.88x10^{-9}$	$1.54x10^{-8}$	$3.24x10^{-8}$	$1.31x10^{-7}$	$4.76x10^{-7}$	$8.48x10^{-6}$	$2.21x10^{-8}$	$2.13x10^{-9}$
	23%	0.082%	0.13%	0.27%	1.1%	4%	71%	0.18%	0.018%
ADPF (MJ eq)	169	11.5	41.6	35.8	13.0	198	830	23.3	2.34
	13%	0.87%	3.1%	2.7%	0.98%	15%	63%	1.8%	0.18%
ADPE (kg Sb eq)	$2.67x10^{-5}$	$1.18x10^{-6}$	$1.51x10^{-6}$	$2.32x10^{-6}$	$1.46x10^{-6}$	$1.70x10^{-4}$	$9.48x10^{-5}$	$5.58x10^{-7}$	$1.09x10^{-7}$
	9%	0.4%	0.51%	0.78%	0.49%	57%	32%	0.19%	0.037%
TRACI									
GWP (kg CO_2 eq)	8.86	0.828	4.91	2.78	0.961	9.39	64.3	1.81	2.82
	9.2%	0.86%	5.1%	2.9%	0.99%	9.7%	67%	1.9%	2.9%
AP (kg SO_2 eq)	$3.35x10^{-2}$	$3.13x10^{-3}$	$2.11x10^{-2}$	$4.42x10^{-2}$	$5.12x10^{-3}$	$4.35x10^{-2}$	0.328	$8.78x10^{-3}$	$1.47x10^{-3}$
	6.8%	0.64%	4.3%	9%	1%	8.9%	67%	1.8%	0.3%
EP (kg N eq)	$2.64x10^{-2}$	$8.53x10^{-4}$	$3.67x10^{-2}$	$3.15x10^{-3}$	$9.09x10^{-3}$	$3.44x10^{-2}$	0.764	$8.96x10^{-4}$	0.196
	2.5%	0.08%	3.4%	0.29%	0.85%	3.2%	71%	0.084%	18%
SFP (kg O_3 eq)	0.442	$7.96x10^{-2}$	0.316	0.855	$9.20x10^{-2}$	0.506	5.79	0.265	$1.84x10^{-2}$
	5.3%	0.95%	3.8%	10%	1.1%	6%	69%	3.2%	0.22%
ODP (kg CFC-11 eq)	$3.03x10^{-6}$	$1.34x10^{-8}$	$4.86x10^{-8}$	$4.37x10^{-8}$	$1.43x10^{-7}$	$5.76x10^{-7}$	$9.28x10^{-6}$	$2.97x10^{-8}$	$2.98x10^{-9}$
	23%	0.1%	0.37%	0.33%	1.1%	4.4%	70%	0.23%	0.023%
FFD (MJ surplus)	22.0	1.63	1.55	5.19	1.57	25.9	100	3.52	0.317
	14%	1%	0.96%	3.2%	0.97%	16%	62%	2.2%	0.2%

The embodied carbon of the products is equivalent to the GWP summed across phases A1 through A3.

Table 18. *Resource use and waste flows for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits. (**ASPECTA ESSENTIALS™ RIGID CLICK 30**)*

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPR_E (MJ)	7.35	0.154	14.4	0.367	0.658	21.1	42.8	0.102	$6.69x10^{-2}$
	8.5%	0.18%	17%	0.42%	0.76%	24%	49%	0.12%	0.077%
RPR_M (MJ)	0.00	0.00	0.00	0.00	0.350	0.00	22.8	0.00	0.00
	0%	0%	0%	0%	1.5%	0%	98%	0%	0%
$NRPR_E$ (MJ)	134	11.7	45.2	36.2	13.6	212	744	23.5	2.43
	11%	0.96%	3.7%	3%	1.1%	17%	61%	1.9%	0.2%
$NRPR_M$ (MJ)	44.0	0.00	0.00	0.00	$9.11x10^{-3}$	0.00	124	0.00	0.00
	26%	0%	0%	0%	0.0054%	0%	74%	0%	0%
SM (kg)	0.902	0.00	0.00	0.00	$4.06x10^{-2}$	0.00	2.64	0.00	0.00
	25%	0%	0%	0%	1.1%	0%	74%	0%	0%
RSF/NRSF (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW (m^3)	1.38	$1.87x10^{-2}$	0.473	$4.34x10^{-2}$	$8.73x10^{-2}$	3.13	5.67	$1.75x10^{-2}$	$8.02x10^{-3}$
	13%	0.17%	4.4%	0.4%	0.81%	29%	52%	0.16%	0.074%
Wastes									
HWD (kg)	$3.21x10^{-3}$	$8.12x10^{-5}$	$5.45x10^{-5}$	$2.17x10^{-4}$	$1.70x10^{-4}$	$1.51x10^{-4}$	$1.10x10^{-2}$	$1.64x10^{-4}$	$1.57x10^{-5}$
	21%	0.54%	0.36%	1.4%	1.1%	1%	73%	1.1%	0.1%
NHWD (kg)	0.747	0.554	1.13	0.827	0.382	0.828	33.3	0.111	8.13
	1.6%	1.2%	2.5%	1.8%	0.83%	1.8%	72%	0.24%	18%
HLRW (kg)	$3.55x10^{-5}$	$7.03x10^{-7}$	$1.23x10^{-5}$	$1.65x10^{-6}$	$2.30x10^{-6}$	$3.79x10^{-5}$	$1.49x10^{-4}$	$5.30x10^{-7}$	$3.63x10^{-7}$
	15%	0.29%	5.1%	0.68%	0.95%	16%	62%	0.22%	0.15%
ILLRW (kg)	$9.37x10^{-5}$	$1.66x10^{-6}$	$3.55x10^{-5}$	$3.91x10^{-6}$	$6.16x10^{-6}$	$1.91x10^{-4}$	$4.01x10^{-4}$	$1.25x10^{-6}$	$9.14x10^{-7}$
	13%	0.23%	4.8%	0.53%	0.84%	26%	55%	0.17%	0.12%
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	0.161	0.00	0.451	0.00	0.00
	0%	0%	0%	0%	26%	0%	74%	0%	0%
MER (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 19. *Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.* ***(ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm)***

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML									
GWP (kg CO_2 eq)	9.97	0.917	4.99	3.07	1.09	9.40	71.2	1.90	3.49
	9.4%	0.86%	4.7%	2.9%	1%	8.9%	67%	1.8%	3.3%
AP (kg SO_2 eq)	$3.44x10^{-2}$	$2.88x10^{-3}$	$1.97x10^{-2}$	$4.49x10^{-2}$	$5.11x10^{-3}$	$4.24x10^{-2}$	0.322	$7.22x10^{-3}$	$9.22x10^{-4}$
	7.2%	0.6%	4.1%	9.4%	1.1%	8.8%	67%	1.5%	0.19%
EP (kg $(PO_4)^{3-}$ eq)	$1.45x10^{-2}$	$7.92x10^{-4}$	$1.44x10^{-2}$	$5.72x10^{-3}$	$4.53x10^{-3}$	$1.72x10^{-2}$	0.327	$1.66x10^{-3}$	$7.52x10^{-2}$
	3.1%	0.17%	3.1%	1.2%	0.98%	3.7%	71%	0.36%	16%
POCP (kg C_2H_4 eq)	$2.83x10^{-3}$	$1.41x10^{-4}$	$9.20x10^{-4}$	$1.31x10^{-3}$	$2.79x10^{-4}$	$2.78x10^{-3}$	$1.83x10^{-2}$	$3.22x10^{-4}$	$7.41x10^{-4}$
	10%	0.51%	3.3%	4.7%	1%	10%	66%	1.2%	2.7%
ODP (kg CFC-11 eq)	$3.39x10^{-6}$	$1.09x10^{-8}$	$1.60x10^{-8}$	$3.58x10^{-8}$	$1.57x10^{-7}$	$4.76x10^{-7}$	$1.02x10^{-5}$	$2.32x10^{-8}$	$2.23x10^{-9}$
	24%	0.077%	0.11%	0.25%	1.1%	3.3%	71%	0.16%	0.016%
ADPF (MJ eq)	190	12.8	42.4	39.6	14.5	198	913	24.5	2.45
	13%	0.89%	2.9%	2.8%	1%	14%	64%	1.7%	0.17%
ADPE (kg Sb eq)	$2.98x10^{-5}$	$1.31x10^{-6}$	$1.61x10^{-6}$	$2.59x10^{-6}$	$1.63x10^{-6}$	$1.70x10^{-4}$	$1.05x10^{-4}$	$5.86x10^{-7}$	$1.14x10^{-7}$
	9.5%	0.42%	0.52%	0.83%	0.52%	54%	34%	0.19%	0.036%
TRACI									
GWP (kg CO_2 eq)	9.97	0.917	4.89	3.07	1.07	9.39	69.1	1.90	2.87
	9.7%	0.89%	4.7%	3%	1%	9.1%	67%	1.8%	2.8%
AP (kg SO_2 eq)	$3.76x10^{-2}$	$3.46x10^{-3}$	$2.14x10^{-2}$	$4.83x10^{-2}$	$5.65x10^{-3}$	$4.35x10^{-2}$	0.356	$9.22x10^{-3}$	$1.56x10^{-3}$
	7.1%	0.66%	4.1%	9.2%	1.1%	8.3%	68%	1.7%	0.3%
EP (kg N eq)	$2.96x10^{-2}$	$9.44x10^{-4}$	$3.35x10^{-2}$	$3.48x10^{-3}$	$1.10x10^{-2}$	$3.44x10^{-2}$	0.804	$9.41x10^{-4}$	0.208
	2.6%	0.084%	3%	0.31%	0.98%	3.1%	71%	0.084%	18%
SFP (kg O_3 eq)	0.496	$8.81x10^{-2}$	0.321	0.935	0.103	0.506	6.27	0.278	$1.91x10^{-2}$
	5.5%	0.98%	3.6%	10%	1.1%	5.6%	70%	3.1%	0.21%
ODP (kg CFC-11 eq)	$3.75x10^{-6}$	$1.49x10^{-8}$	$4.96x10^{-8}$	$4.83x10^{-8}$	$1.76x10^{-7}$	$5.76x10^{-7}$	$1.14x10^{-5}$	$3.11x10^{-8}$	$3.11x10^{-9}$
	23%	0.093%	0.31%	0.3%	1.1%	3.6%	71%	0.19%	0.019%
FFD (MJ surplus)	24.7	1.81	1.64	5.74	1.78	25.9	111	3.69	0.332
	14%	1%	0.93%	3.2%	1%	15%	63%	2.1%	0.19%

The embodied carbon of the products is equivalent to the GWP summed across phases A1 through A3.

Table 20. *Resource use and waste flows for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.* ***(ASPECTA ESSENTIALS™ RIGID CLICK 55 - 5.2 mm)***

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPRE (MJ)	8.26	0.171	17.2	0.407	0.745	21.1	48.4	0.107	$6.87x10^{-2}$
	8.6%	0.18%	18%	0.42%	0.77%	22%	50%	0.11%	0.071%
RPRM (MJ)	0.00	0.00	0.00	0.00	0.437	0.00	28.4	0.00	0.00
	0%	0%	0%	0%	1.5%	0%	98%	0%	0%
NRPRE (MJ)	148	12.9	46.0	40.0	15.2	212	810	24.6	2.53
	11%	0.99%	3.5%	3%	1.2%	16%	62%	1.9%	0.19%
NRPRM (MJ)	51.1	0.00	0.00	0.00	$1.32x10^{-2}$	0.00	144	0.00	0.00
	26%	0%	0%	0%	0.0068%	0%	74%	0%	0%
SM (kg)	0.910	0.00	0.00	0.00	$4.09x10^{-2}$	0.00	2.66	0.00	0.00
	25%	0%	0%	0%	1.1%	0%	74%	0%	0%
RSF/NRSF (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW (m3)	1.54	$2.07x10^{-2}$	0.481	$4.82x10^{-2}$	$9.57x10^{-2}$	3.13	6.20	$1.84x10^{-2}$	$8.27x10^{-3}$
	13%	0.18%	4.2%	0.42%	0.83%	27%	54%	0.16%	0.072%
Wastes									
HWD (kg)	$3.58x10^{-3}$	$8.99x10^{-5}$	$6.10x10^{-5}$	$2.40x10^{-4}$	$1.91x10^{-4}$	$1.51x10^{-4}$	$1.22x10^{-2}$	$1.73x10^{-4}$	$1.64x10^{-5}$
	21%	0.54%	0.37%	1.4%	1.1%	0.9%	73%	1%	0.098%
NHWD (kg)	0.830	0.613	0.978	0.929	0.456	0.828	34.9	0.117	8.53
	1.7%	1.3%	2%	1.9%	0.95%	1.7%	72%	0.24%	18%
HLRW (kg)	$4.01x10^{-5}$	$7.78x10^{-7}$	$1.25x10^{-5}$	$1.83x10^{-6}$	$2.53x10^{-6}$	$3.79x10^{-5}$	$1.64x10^{-4}$	$5.57x10^{-7}$	$3.72x10^{-7}$
	15%	0.3%	4.8%	0.7%	0.97%	15%	63%	0.21%	0.14%
ILLRW (kg)	$1.06x10^{-4}$	$1.83x10^{-6}$	$3.60x10^{-5}$	$4.34x10^{-6}$	$6.76x10^{-6}$	$1.91x10^{-4}$	$4.39x10^{-4}$	$1.31x10^{-6}$	$9.36x10^{-7}$
	13%	0.23%	4.6%	0.55%	0.86%	24%	56%	0.17%	0.12%
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	0.184	0.00	0.515	0.00	0.00
	0%	0%	0%	0%	26%	0%	74%	0%	0%
MER (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 21. *Life Cycle Impact Assessment results for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.* ***(ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm)***

Impact Category	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML									
GWP (kg CO_2 eq)	13.6	1.19	5.97	3.65	1.34	9.40	90.3	2.29	4.23
	10%	0.9%	4.5%	2.8%	1%	7.1%	68%	1.7%	3.2%
AP (kg SO_2 eq)	$4.69x10^{-2}$	$3.75x10^{-3}$	$2.00x10^{-2}$	$5.35x10^{-2}$	$6.10x10^{-3}$	$4.24x10^{-2}$	0.392	$8.69x10^{-3}$	$1.11x10^{-3}$
	8.2%	0.65%	3.5%	9.3%	1.1%	7.4%	68%	1.5%	0.19%
EP (kg $(PO_4)^{3-}$ eq)	$1.96x10^{-2}$	$1.03x10^{-3}$	$2.83x10^{-2}$	$6.82x10^{-3}$	$5.40x10^{-3}$	$1.72x10^{-2}$	0.430	$2.00x10^{-3}$	$9.06x10^{-2}$
	3.3%	0.17%	4.7%	1.1%	0.9%	2.9%	72%	0.33%	15%
POCP (kg C_2H_4 eq)	$3.84x10^{-3}$	$1.84x10^{-4}$	$1.13x10^{-3}$	$1.56x10^{-3}$	$3.47x10^{-4}$	$2.78x10^{-3}$	$2.34x10^{-2}$	$3.88x10^{-4}$	$8.98x10^{-4}$
	11%	0.53%	3.3%	4.5%	1%	8.1%	68%	1.1%	2.6%
ODP (kg CFC-11 eq)	$4.30x10^{-6}$	$1.42x10^{-8}$	$1.65x10^{-8}$	$4.26x10^{-8}$	$1.98x10^{-7}$	$4.76x10^{-7}$	$1.29x10^{-5}$	$2.80x10^{-8}$	$2.68x10^{-9}$
	24%	0.079%	0.092%	0.24%	1.1%	2.7%	72%	0.16%	0.015%
ADPF (MJ eq)	262	16.6	42.9	47.1	18.3	198	1,170	29.5	2.95
	15%	0.93%	2.4%	2.6%	1%	11%	66%	1.6%	0.16%
ADPE (kg Sb eq)	$4.30x10^{-5}$	$1.70x10^{-6}$	$1.64x10^{-6}$	$3.08x10^{-6}$	$2.27x10^{-6}$	$1.70x10^{-4}$	$1.47x10^{-4}$	$7.05x10^{-7}$	$1.37x10^{-7}$
	12%	0.46%	0.44%	0.83%	0.61%	46%	40%	0.19%	0.037%
TRACI									
GWP (kg CO_2 eq)	13.6	1.19	5.69	3.65	1.30	9.39	87.3	2.29	3.48
	11%	0.93%	4.4%	2.9%	1%	7.3%	68%	1.8%	2.7%
AP (kg SO_2 eq)	$5.09x10^{-2}$	$4.51x10^{-3}$	$2.17x10^{-2}$	$5.76x10^{-2}$	$6.72x10^{-3}$	$4.35x10^{-2}$	0.432	$1.11x10^{-2}$	$1.87x10^{-3}$
	8.1%	0.72%	3.4%	9.1%	1.1%	6.9%	69%	1.8%	0.3%
EP (kg N eq)	$4.02x10^{-2}$	$1.23x10^{-3}$	$7.15x10^{-2}$	$4.14x10^{-3}$	$1.31x10^{-2}$	$3.44x10^{-2}$	1.07	$1.13x10^{-3}$	0.250
	2.7%	0.083%	4.8%	0.28%	0.88%	2.3%	72%	0.076%	17%
SFP (kg O_3 eq)	0.653	0.115	0.326	1.11	0.119	0.506	7.52	0.335	$2.31x10^{-2}$
	6.1%	1.1%	3%	10%	1.1%	4.7%	70%	3.1%	0.22%
ODP (kg CFC-11 eq)	$4.68x10^{-6}$	$1.94x10^{-8}$	$5.02x10^{-8}$	$5.75x10^{-8}$	$2.19x10^{-7}$	$5.76x10^{-7}$	$1.42x10^{-5}$	$3.75x10^{-8}$	$3.75x10^{-9}$
	24%	0.098%	0.25%	0.29%	1.1%	2.9%	72%	0.19%	0.019%
FFD (MJ surplus)	34.2	2.35	1.71	6.84	2.29	25.9	146	4.45	0.400
	15%	1%	0.76%	3%	1%	12%	65%	2%	0.18%

The embodied carbon of the products is equivalent to the GWP summed across phases A1 through A3.

Table 22. *Resource use and waste flows for the flooring products over a 75-yr time horizon. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.* ***(ASPECTA ESSENTIALS™ RIGID CLICK 55 - 6 mm)***

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources									
RPRE (MJ)	11.2	0.223	17.1	0.485	0.882	21.1	57.3	0.129	$8.30x10^{-2}$
	10%	0.21%	16%	0.45%	0.81%	19%	53%	0.12%	0.077%
RPRM (MJ)	0.00	0.00	0.00	0.00	0.433	0.00	28.2	0.00	0.00
	0%	0%	0%	0%	1.5%	0%	98%	0%	0%
NRPRE (MJ)	215	16.8	46.5	47.6	19.1	212	1,060	29.6	3.05
	13%	1%	2.8%	2.9%	1.2%	13%	64%	1.8%	0.19%
NRPRM (MJ)	61.0	0.00	0.00	0.00	$1.32x10^{-2}$	0.00	172	0.00	0.00
	26%	0%	0%	0%	0.0057%	0%	74%	0%	0%
SM (kg)	0.992	0.00	0.00	0.00	$4.46x10^{-2}$	0.00	2.90	0.00	0.00
	25%	0%	0%	0%	1.1%	0%	74%	0%	0%
RSF/NRSF (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW (m3)	2.11	$2.70x10^{-2}$	0.483	$5.74x10^{-2}$	0.122	3.13	7.93	$2.22x10^{-2}$	$9.99x10^{-3}$
	15%	0.19%	3.5%	0.41%	0.88%	23%	57%	0.16%	0.072%
Wastes									
HWD (kg)	$4.80x10^{-3}$	$1.17x10^{-4}$	$6.45x10^{-5}$	$2.86x10^{-4}$	$2.49x10^{-4}$	$1.51x10^{-4}$	$1.61x10^{-2}$	$2.08x10^{-4}$	$1.98x10^{-5}$
	22%	0.53%	0.29%	1.3%	1.1%	0.69%	73%	0.95%	0.09%
NHWD (kg)	0.958	0.798	2.73	1.11	0.552	0.828	46.3	0.141	10.3
	1.5%	1.3%	4.3%	1.7%	0.87%	1.3%	73%	0.22%	16%
HLRW (kg)	$5.33x10^{-5}$	$1.01x10^{-6}$	$1.26x10^{-5}$	$2.18x10^{-6}$	$3.16x10^{-6}$	$3.79x10^{-5}$	$2.05x10^{-4}$	$6.70x10^{-7}$	$4.50x10^{-7}$
	17%	0.32%	4%	0.69%	1%	12%	65%	0.21%	0.14%
ILLRW (kg)	$1.44x10^{-4}$	$2.39x10^{-6}$	$3.62x10^{-5}$	$5.17x10^{-6}$	$8.57x10^{-6}$	$1.91x10^{-4}$	$5.58x10^{-4}$	$1.58x10^{-6}$	$1.13x10^{-6}$
	15%	0.25%	3.8%	0.55%	0.9%	20%	59%	0.17%	0.12%
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	0.186	0.00	0.521	0.00	0.00
	0%	0%	0%	0%	26%	0%	74%	0%	0%
MER (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE (MJ)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6. LCA: Interpretation

The contributions to total impact indicator results are dominated by the product replacement phase of the assessment. Of the remaining life cycle phases, the raw material extraction and processing and product maintenance phases are generally the largest contributors to the overall impacts, depending on the specific indicator, followed by the product manufacturing and distribution phases.

7. Additional Environmental Information

The ASPECTA™ RIGID CLICK flooring products are certified to various environmental standards, as summarized below (certified standards vary with product).

CE Mark is a certification symbol that indicates a product's compliance with the essential health, safety, and environmental protection requirements set by the European Union (EU). By affixing the CE Mark, manufacturers declare that their products meet EU regulatory standards and are allowed to be sold in the European Economic Area (EEA).It is a key part of the EU's efforts to standardize product regulations across member states and facilitate free trade within the internal market.

Administered by Eurofins, Indoor Air Comfort GOLD certification helps manufacturers comply with the low VOC emissions criteria in Europe that has been established by a multitude of bodies/countries and/or programs. For more information, visit: https://www.eurofins.com/consumer-product-testing/industries/construction-building/indoor-air-comfort/indoor-air-comfort-certification/.

8. References

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- 14040: 2006/Amd1:2020 Environmental Management – Life cycle assessment – Principles and Framework
- ISO 14044: 2006/Amd 1:2017/ Amd 2:2020 Environmental Management – Life cycle assessment – Requirements and Guidelines.
- PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL 10010, UL v.4.0, March 2022.
- PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements, v.2.0,[1] validity extended to December 31, 2024.
- SCS Type III Environmental Declaration Program: Program Operator Manual. V12.0 December 2023. SCS Global Services.
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