Declaration Owner

Moland
Strandvejen 16, 7800 Skive, Denmark, Europe
+0045 9614 5000 | https://www.moland.dk/

Products
Bastion Wideplank Design 5,2/0,55mm

(UNSPSC Class Code 30161707)

EPD represents delivery of products 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-09411
EPD Valid: September 13, 2023 through September 12, 2028

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
SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608, USA
+1.510.452.8000 | www.SCSglobalServices.com

Declaration Owner:	Moland
Address:	Strandvejen 16, 7800 Skive, Denmark, Europe
Declaration Number:	SCS-EPD-09411
Declaration Validity Period:	EPD Valid: September 13, 2023 through September 12, 2028
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:	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:	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	☐ internal ☒ external
EPD Verifier:	Tom Gloria, Ph.D., Industrial Ecology Consultants
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.

1. Moland

If you choose Moland, you are making it easy for yourself. Easy, because all our products are of the highest quality and live up to our demanding clients' expectations. Easy, because you are sure to have your products ready for shipment the day after. And easy, because you have our whole team of advisors with you if you have any questions about dimensioning, installation and choice of materials.

We are working on making it even easier for you to recognise all our Moland products. We have attached the Moland name to the different companies in our family, to make the affiliation more recognisable. This makes it easy for you to spot our quality seal, no matter if it is wooden flooring, facades, fences, cladding for terraces or plaster that you are looking for. You just need to look for the Moland name.

2. Products

2.1 PRODUCT DESCRIPTION

Product	Description
Bastion Wideplank Design 5,2/0,55mm	Introducing Bastion Wideplank Design, the stunning new flooring range from Moland. Where beautiful aesthetics blend with the latest technology to create floors that are truly special. If design, durability, and performance are the main considerations, we recommend Moland floating Rigid Click 0.55 flooring – a glueless installation system. Thanks to the unique characteristics of Rigid Click 0.55 flooring, you no longer have to worry about choosing the right floor because it 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.

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 Moland 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 manufacturing, 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 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 = Module Included | MND = Module Not Declared

2.5 TECHNICAL DATA

Technical specifications for the *Moland Bastion Wideplank Design* flooring products are summarized in Table 2.

Table 2. *Product specifications for the Moland Bastion Wideplank Design 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)	447.7 (17.63)	448.3 (17.65)
		Length	906.0 (35.67)	mm (inch)	905.7 (35.66)	906.3 (35.68)
	Planks	Width	180.0 (7.09)	mm (inch)	179.8 (7.08)	180.2 (7.10)
		Length	1210.0 (47.64)	mm (inch)	1209.6 (47.62)	1210.4 (47.65)
	Planks	Width	220.0 (8.66)	mm (inch)	219.8 (8.65)	220.2 (8.67)
		Length	1510.0 (59.45)	mm (inch)	1509.5 (59.43)	1510.5 (59.47)
	Planks	Width	220 (8.66)	mm (inch)	219.8 (8.65)	220.2 (8.67)
		Length	1828.0 (71.97)	mm (inch)	1827.5 (71.95)	1828.5 (71.99)

2.6 MARKET PLACEMENT/APPLICATION RULES

Technical specifications and product performance results for the *Bastion Wideplank Design* products can be found on the manufacturer's website https://www.moland.dk/

2.7 PROPERTIES OF DECLARED PRODUCTS 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 (e.g., pigments), surface coating, and foam underlayment.

Table 4. *Material content for the Moland Bastion Wideplank Design flooring products in kg per square meter and percent of total mass.*

Component	Bastion Wideplank Design[1]		Bastion Wideplank Design[2]	
	Mass (kg/m^2)	Percent mass	Mass (kg/m^2)	Percent mass
PVC	2.32	30%	2.27	27%
Calcium Carbonate	4.56	59%	5.32	64%
Plasticizer	0.115	1.50%	0.147	1.8%
Stabilizer	0.225	2.90%	0.175	2.1%
Other (Underlayment/Additives/Coatings/Pigments)	0.551	7.10%	0.386	4.7%
Product Total	**7.77**	**100%**	**8.30**	**100%**

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*
[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.*

No substances required to be reported as hazardous are associated with the production of these products.

2.9 MANUFACTURING

Moland™ Bastion Wideplank Design 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 Bastion Wideplank Design 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.

2.10 PACKAGING

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

Table 5. *Material content for the Moland Bastion Wideplank Design flooring product packaging, in kg per square meter and percent of total mass.*

Component	Bastion Wideplank Design[1]		Bastion Wideplank Design[2]	
	Mass (kg/m^2)	Percent mass	Mass (kg/m^2)	Percent mass
Corrugated	0.203	51%	0.279	51%
Plastic	$9.20x10^{-3}$	2.30%	$4.30x10^{-3}$	0.79%
Wood	0.182	46%	0.264	48%
Packaging Total	**0.394**	**100%**	**0.547**	**100%**

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks..*
[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.*

2.11 PRODUCT INSTALLATION

Installation of the products 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 products 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 products are recycled at end-of-life.

2.16 FURTHER INFORMATION

Further information on the products can be found on the manufacturers' website at https://www.moland.dk/.

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 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 Moland Bastion Wideplank Design flooring products.*

Product	Reference Flow (kg/m^2)	Reference Service Life (RSL)	Replacement Cycle (ESL/RSL-1)
Bastion Wideplank Design[1]	7.77	20	2.8
Bastion Wideplank Design[2]	8.30	20	2.8

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*
[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.*

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 7 and illustrated in Figure 1.

Table 7. *The modules and unit processes included in the scope for the Bastion Wideplank Design 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 manufacturing facilities)	Transport of component materials to manufacturing facilities
A3	Manufacturing, including ancillary material production	Manufacturing of flooring products and packaging (incl. upstream unit processes*)
A4	Transport (to building sites)	Transport of products (including packaging) to building sites
A5	Construction-installation process	Impacts from the installation of the products 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 products
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 products 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 products
B7	Operational water use by technical building systems	There is no operational water use associated with the use of the products
C1	Deconstruction, demolition	Demolition of the products is accomplished using hand tools with no associated emissions and negligible impacts
C2	Transport (to waste processing)	Transport of flooring products to waste treatment at end-of-life
C3	Waste processing for reuse, recovery and/or recycling	The products are disposed of by incineration and/or landfilling which require no waste processing
C4	Disposal	Disposal of flooring products in municipal landfill or incineration
D	Reuse-recovery-recycling potential	Module Not Declared

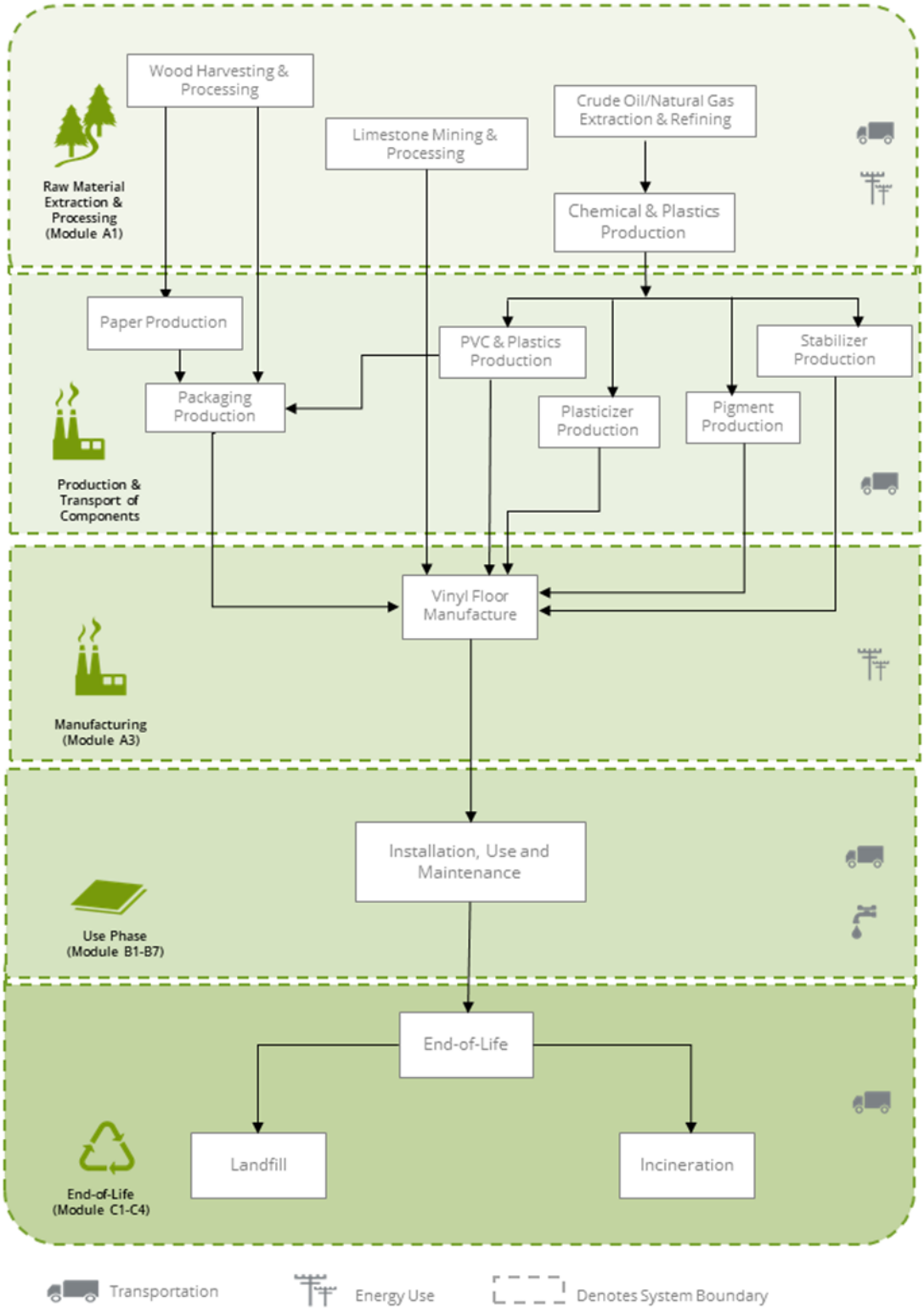

Figure 1. *Flow Diagram for the life cycle of the Bastion Wideplank Design flooring product system.*

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 manufacturing 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 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 Overcash[1] and Ecoinvent v3.8 unit process datasets. Inventory data developed for diisoheptyl 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 products are assumed recycled.

- For final disposal of the packaging materials 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 the manufacturer for its 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 Moland Bastion Wideplank Design flooring 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*	diisoheptyl 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
PE Underlayment			
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		
PE Underlayment			
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 Bastion Wideplank Design 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 manufacturing 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 one manufacturing facility and calendar year 2020 for the other manufacturing 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 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 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. *Moland Bastion Wideplank Design flooring product distribution parameters, per 1 m^2 (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)		
	Truck	Ship	Mass (kg)
Bastion Wideplank Design[1]	739	21,000	8.17
Bastion Wideplank Design[2]	739	21,000	8.85

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*

[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) planks.*

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 Moland Bastion Wideplank Design flooring products, per 1 m^2 (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	
Bastion Wideplank Design[1]	$9.20x10^{-3}$	0.203	0.182	0.705
Bastion Wideplank Design[2]	$4.30x10^{-3}$	0.279	0.264	0.995

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*
[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) planks.*

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 12. *Maintenance parameters for the flooring products, per 1 m^2.*

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 products.

Replacement stage (B4)

The materials and energy required for replacement of the products 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 products.

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 products degrade in a landfill (*C4*). For the 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 Moland Bastion Wideplank Design flooring products.*

Parameter	Bastion Wideplank Design[1]	Bastion Wideplank Design[2]
Assumptions for scenario development	100% landfill	100% landfill
Collection process		
Collected with mixed construction waste (kg)	8.17	8.85
Recovery	n/a	n/a
Landfill disposal (kg)	8.17	8.85
Removals of biogenic carbon (kg CO_2 eq)	n/a	n/a

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*

[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.*

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_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 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 **Moland Bastion Wideplank Design**[1] 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)	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_2H_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%

[1] *Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.*

Table 16. *Resource use and waste flows for the* ***Moland Bastion Wideplank Design[1]*** *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)	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	INA	INA	INA	INA	INA	INA	INA	INA
$NRPR_M$ (MJ)	INA	INA	INA	INA	INA	INA	INA	INA	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.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE (MJ)	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	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.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE (MJ)	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

INA = Indicator not assessed | Neg. = Negligible

[1] Products include 180.0 x 1210 mm (7.09 x 47.64 in) and 220.0 x 1828.8 mm (8.66 x 71.97 in) planks.

Table 17. *Life Cycle Impact Assessment (LCIA) results for the* ***Moland Bastion Wideplank Design***[2] *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)	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_2H_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%

[2] *Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.*

Table 18. *Resource use and waste flows for the* ***Moland Bastion Wideplank Design[2]*** *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)	5.85	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	INA	INA	INA	INA	INA	INA	INA	INA
$NRPR_M$ (MJ)	INA	INA	INA	INA	INA	INA	INA	INA	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.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE (MJ)	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	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.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
EE (MJ)	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

INA = Indicator not assessed | Neg. = Negligible

[2] Products include 448.0 x 906.0 mm (17.64 x 35.67 in) tile and 220.0 x 1510.0 mm (8.66 x 59.45 in) plank.

6. LCA: Interpretation

Excluding product replacements (*B4*), the contributions to indicator results for the product system over the life cycle of the products 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.

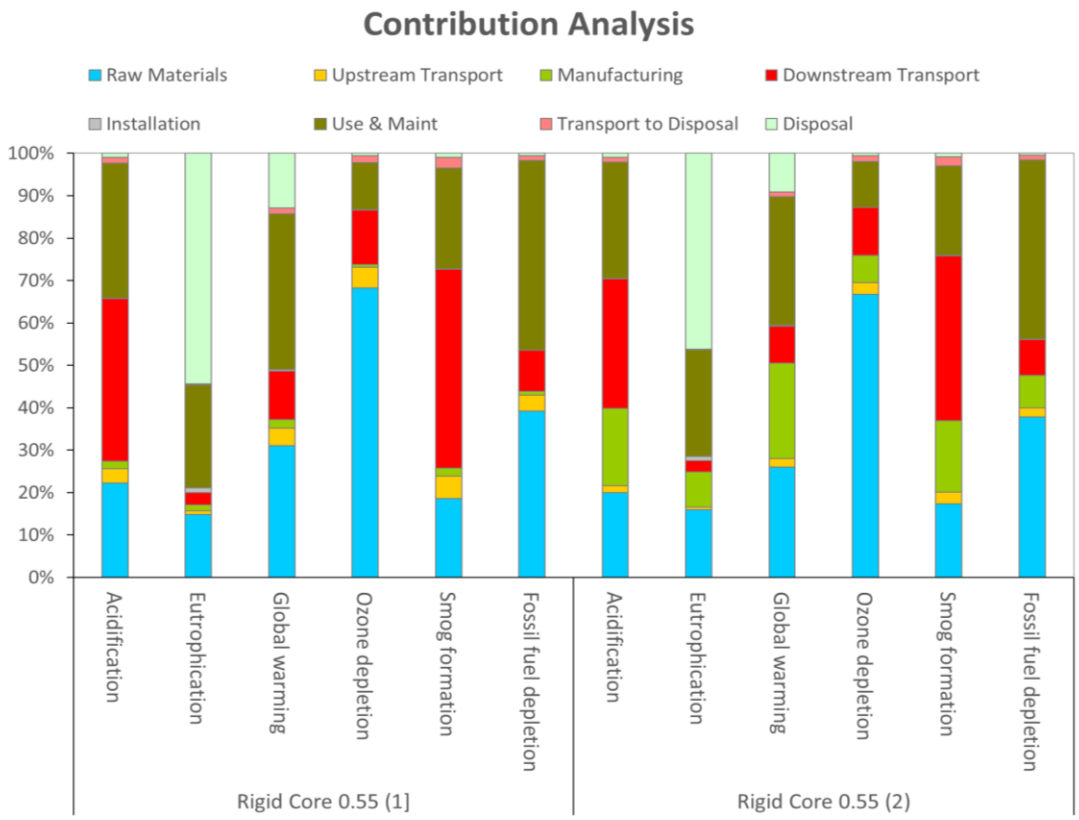

Figure 2. *Contribution analysis for the SPC Rigid Core Click product system – TRACI 2.1.*

7. Additional Environmental Information

7.1 ENVIRONMENT AND HEALTH DURING MANUFACTURING

The Moland manufacturing facilities are certified to ISO 9001 and ISO 14001 – Environmental management systems.

7.2 ENVIRONMENT AND HEALTH DURING INSTALLATION

The flooring products meet the requirements of the following:

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

7.3 ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

For more information on the product certifications and environmental initiatives please view the website at https://www.moland.dk/

8. References

1. Life Cycle Assessment of Luxury Vinyl Tile. SCS Global Services Report. Prepared for Moland. March 2020. Appendix Updated July 2023.
2. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
3. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and Framework
4. ISO 14044: 2006/Amd 1:2017/ Amd 2:2020 Environmental Management – Life cycle assessment – Requirements and Guidelines.
5. 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.
6. PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. May 2018.
7. SCS Type III Environmental Declaration Program: Program Operator Manual. V11.0 November 2021. SCS Global Services.
8. 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
9. 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
10. Ecoinvent Centre (2021) ecoinvent data from v3.8. Swiss Center for Life Cycle Inventories, Dübendorf, 2021, http://www.ecoinvent.org
11. European Joint Research Commission. International Reference Life Cycle Data System handbook. General guide for Life Cycle Assessment – Detailed Guidance. © European Union, 2010.
12. "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

For more information, contact:

Moland
Strandvejen 16, 7800 Skive, Denmark, Europe
+0045 9614 5000 | https://www.moland.dk/

SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608, USA
Main +1.510.452.8000 | fax +1.510.452.8001