

**Declaration Owner**

Altro

80 Industrial Way - Suite 1, Wilmington, MA 01887

www.altro.com | support@altrofloors.com | 800.377.5597

Product

Rubber Flooring (NSPSC Class Code 30161705):

- *Ollero Rubber Flooring – 4mm*
- *Ollero Rubber Flooring – 12mm*
- *Ollero 8mm Heterogeneous Rubber Flooring*
- *Ollero 10mm Heterogeneous Rubber Flooring*
- *Ollero 12mm Heterogeneous Rubber Flooring*

Functional Unit

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

EPD Number and Period of Validity

SCS-EPD-08937

EPD Valid May 1, 2023 through April 30, 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. September 2018.

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

Program Operator

SCS Global Services

2000 Powell Street, Ste. 600, Emeryville, CA 94608

+1.510.452.8000 | www.SCSglobalServices.com



Declaration Owner:	Altro
Address:	80 Industrial Way - Suite 1, Wilmington, MA 01887
Declaration Number:	SCS-EPD-08937
Declaration Validity Period:	May 1, 2023 through April 30, 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 v1.10 software and the Ecoinvent v3.8 database
Product RSL:	Various
Markets of Applicability:	North America
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:	 Thomas 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. September 2018
Part A PCR Review conducted by:	Lindita Bushi, PhD (Chair); Hugues Imbeault-Tétreault, ing., M.Sc.A.; Jack Geibig
Part B Product Category Rule:	PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. December 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:	 Thomas Gloria, Ph.D., Industrial Ecology Consultants
Declaration Contents:	1. Altro 2 2. Product 2 3. LCA: Calculation Rules 6 4. LCA: Scenarios and Additional Technical Information 12 5. LCA: Results 15 6. LCA: Interpretation 25 7. Additional Environmental Information 25 8. References 26
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. Altro

Family-owned and operated since 1919, Altro is a world-leading manufacturer and innovator in commercial floors and walls. We work with architects, designers, contractors and end users in healthcare, education, food service and other sectors, and from safety to aesthetics, use our expertise to help them transform everyday spaces into thriving environments. Sitting at the heart of our culture, we value not only each other, but our customers. We've set the standard through our commitment to product performance, customer partnerships and ventures into new possibilities. We challenge the norm to improve the ways people live and work, wherever in the world that may be. Family-owned and operated since 1919, Altro is a world-leading manufacturer and innovator in commercial floors and walls. We challenge the norm to improve the ways people live and work, wherever in the world that may be.

2. Product

2.1 PRODUCT DESCRIPTION

The products include rubber floor mats containing recycled styrene butadiene (SBR) and ethylene propylene diene monomer (EPDM) rubber. The flooring products included in this EPD are manufactured from a combination of recycled styrene butadiene (SBR) and ethylene propylene diene monomer (EPDM) rubber, binders, catalysts and pigments and manufactured at the company's facility in Salmon Arm, British Columbia. The rubber mats are available in square cut and interlocking formats.

Altro Ollero Product Description

Altro Ollero is a recycled rubber flooring tile available in a range of colors with a mixture of solid, speckled, neutral and vibrant tones. Their integrated impact and sound absorption properties can help reduce fatigue and excess noise in high traffic areas. With no need for additional finishes or wax, Altro Ollero is easy to clean and maintain without the use of harsh chemicals, making it a cost efficient option for retail, education and recreational areas. These precision water-jet cut tiles are easy to install and come in a square-edge glue-down format or an adhesive-free interlocking format with four different thickness options.

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

2.4 DECLARATION OF METHODOLOGICAL FRAMEWORK

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

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

Table 1. Life cycle phases included in the product system boundary.

Product			Construction Process		Use							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MND

X = included | MND = Module Not Declared

2.5 TECHNICAL DATA

Technical specifications for the rubber flooring product are summarized in Table 2 and Table 3.

Table 2. Product specifications for the **Ollo** rubber flooring products.

Product Characteristics		Average value	Unit	Minimum value	Maximum value
Product Thickness		8.0 (0.315)	mm (inch)	4.0 (0.157)	12.0 (0.472)
Wear layer thickness		4.0 (0.157)	mm (inch)	4.0 (0.157)	4.0 (0.157)
Product Weight		20,000 (65.54)	g/m ² (oz./ft ²)	10,000 (32.8))	27,000 (88.5)
VOC emissions test method		FloorScore®			
Sustainable certifications		ISO 9001; ISO 14001; CE			
Product Form	Tiles	Width	965.2 (38.0)	mm (inch)	965.2 (38.0)
		Length	965.2 (38.0)	mm (inch)	965.2 (38.0)

Table 3. Product specifications for the **Ollero Heterogeneous** rubber flooring products.

Product Characteristics			Nominal value	Unit	Minimum value	Maximum value
Product Thickness			10.00 (0.39)	mm (inch)	12.00 (0.47)	8.00 (0.31)
Wear layer thickness			n/a	mm (inch)		
Product Weight			13,750 (45.1)	g/m2 (oz./ft2)	16,505 (54.1)	10,964 (35.9)
VOC emissions test method			FloorScore®			
Sustainable certifications			ISO 9001; ISO 14001; CE			
Product Form	Tiles	Width	965.2 (38.0)	mm (inch)	965.2 (38.0)	965.2 (38.0)
		Length	965.2 (38.0)	mm (inch)	965.2 (38.0)	965.2 (38.0)

2.6 MARKET PLACEMENT/APPLICATION RULES

Technical specifications of the flooring products are summarized below. Detailed product performance results can be found on the manufacturer's website www.altro.com.

2.7 PROPERTIES OF DECLARED PRODUCT AS DELIVERED

The rubber flooring products are delivered for installation in the form of mats and tiles of various dimensions.



2.8 MATERIAL COMPOSITION

The primary materials include recycled and virgin EPDM and SBR rubber, binders, catalysts and pigments.

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

Component	Ollero		Ollero 8mm Heterogeneous	Ollero 10mm Heterogeneous	Ollero 12mm Heterogeneous
	4mm	12mm	8mm	10mm	12mm
Recycled/Scrap Rubber	3.35	10.6	7.47	9.72	12.2
	78%	78%	68%	71%	74%
Rubber	0.404	1.27	2.31	2.31	2.31
	9.4%	9.4%	21%	17%	14%
PUR	0.490	1.55	0.787	1.36	1.55
	11%	11%	7.2%	9.9%	9.4%
Adhesive	0.00	0.00	0.258	0.263	0.263
	0%	0%	2.4%	1.9%	1.6%
Other	2.69×10^{-4}	8.50×10^{-4}	2.15×10^{-2}	2.15×10^{-2}	3.23×10^{-2}
	0.0063%	0.0063%	0.2%	0.16%	0.2%
Water	2.53×10^{-2}	7.99×10^{-2}	0.112	7.53×10^{-2}	9.69×10^{-2}
	0.59%	0.59%	1%	0.55%	0.59%
Product Total	4.27	13.5	11.0	13.7	16.5
	100%	100%	100%	100%	100%

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

2.9 MANUFACTURING

The flooring products all share a similar composition, manufactured from a combination of SBR and EPDM rubber, bonded with a binder, and manufactured at the production facility in Salmon Arm, British Columbia.

To manufacture the products, ingredients are mixed, poured into a mold, pressed into a block, cured, sliced, and edges are trimmed with a water jet. After curing, the products are ready to be packaged for shipment on wooden pallets, covered with a plastic hood, and secured by steel strapping.

2.10 PACKAGING

The products are packaged for shipment using plastic wrap, steel strapping and wooden pallets.

Table 5. Material content for the flooring product packaging in kg per square meter of flooring.

Component	Ollero		Ollero 8mm Heterogeneous	Ollero 10mm Heterogeneous	Ollero 12mm Heterogeneous
	4mm	12mm	8mm	10mm	12mm
LDPE	1.08×10^{-2}	1.13×10^{-2}	1.30×10^{-2}	1.64×10^{-2}	1.85×10^{-2}
	3.6%	3.6%	3.6%	3.6%	3.6%
Steel	4.48×10^{-3}	4.72×10^{-3}	5.44×10^{-3}	6.81×10^{-3}	7.69×10^{-3}
	1.5%	1.5%	1.5%	1.5%	1.5%
Wood	0.283	0.298	0.343	0.430	0.486
	95%	95%	95%	95%	95%
Packaging Total	0.299	0.314	0.362	0.453	0.512
	100%	100%	100%	100%	100%

2.11 PRODUCT INSTALLATION

Installation of the product is accomplished using hand tools with negligible impacts. 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 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 are disposed of in a landfill.

2.16 FURTHER INFORMATION

Further information on the product can be found on the manufacturer's website www.altro.com.

3. LCA: Calculation Rules

3.1 FUNCTIONAL UNIT

The functional unit used in the study is defined as 1 m² of floor covering installed for use over a 75-year period. The corresponding reference flow for each product system is presented in Table 6. For the present assessment, a reference service lifetime (RSL) corresponding to the manufacturer's estimated 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 product in Table 6.

Table 6. Reference flows and RSL for the rubber flooring products.

Product	Reference Flow (kg/m ²)	Reference Service Lifetime (yr)	Replacement Cycle (ESL/RSL-1)
Ollero - 4mm	4.27	25	2
Ollero - 12mm	13.49	25	2
Ollero 8mm Heterogeneous	10.96	10	6.5
Ollero 10mm Heterogeneous	13.75	10	6.5
Ollero 12mm Heterogeneous	16.51	10	6.5

3.2 SYSTEM BOUNDARY

The scope of the EPD is cradle-to-grave, including raw material extraction and processing, transportation, product manufacture, product delivery, installation and use, and product disposal. The life cycle phases included in the EPD scope are described in Table 7 and illustrated in Figure 1.

Table 7. *The modules and unit processes included in the scope for the 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 flooring components.
A2	Transport (to the manufacturer)	Transport of component materials to the manufacturing facility
A3	Manufacturing, including ancillary material production	Manufacturing of flooring products and packaging (incl. upstream unit processes)
A4	Transport (to the building site)	Transport of product (including packaging) to the building site
A5	Construction-installation process	The product is installed using the manufacturer's recommended, or similar, adhesives with negligible impacts. Only impacts from packaging disposal are included in this phase.
B1	Product use	Use of the flooring in a commercial building setting. There are no associated emissions or impacts from the use of the product
B2	Product maintenance	Maintenance of products over the 75-year ESL, including periodic cleaning.
B3	Product repair	The flooring is not expected to require repair over its lifetime.
B4	Product replacement	The materials and energy required for replacement of the product over the 75-year ESL of the assessment are included in this phase
B5	Product refurbishment	The flooring is not expected to require refurbishment over its lifetime.
B6	Operational energy use by technical building systems	There is no operational energy use associated with the use of the product
B7	Operational water use by technical building systems	There is no operational water use associated with the use of the product
C1	Deconstruction, demolition	Demolition of the product is accomplished using hand tools with no associated emissions and negligible impacts
C2	Transport (to waste processing)	Transport of flooring product to waste treatment at end-of-life
C3	Waste processing for reuse, recovery and/or recycling	The product is disposed of by landfilling which require no waste processing
C4	Disposal	Disposal of flooring product in municipal landfill
D	Reuse-recovery-recycling potential	Module Not Declared

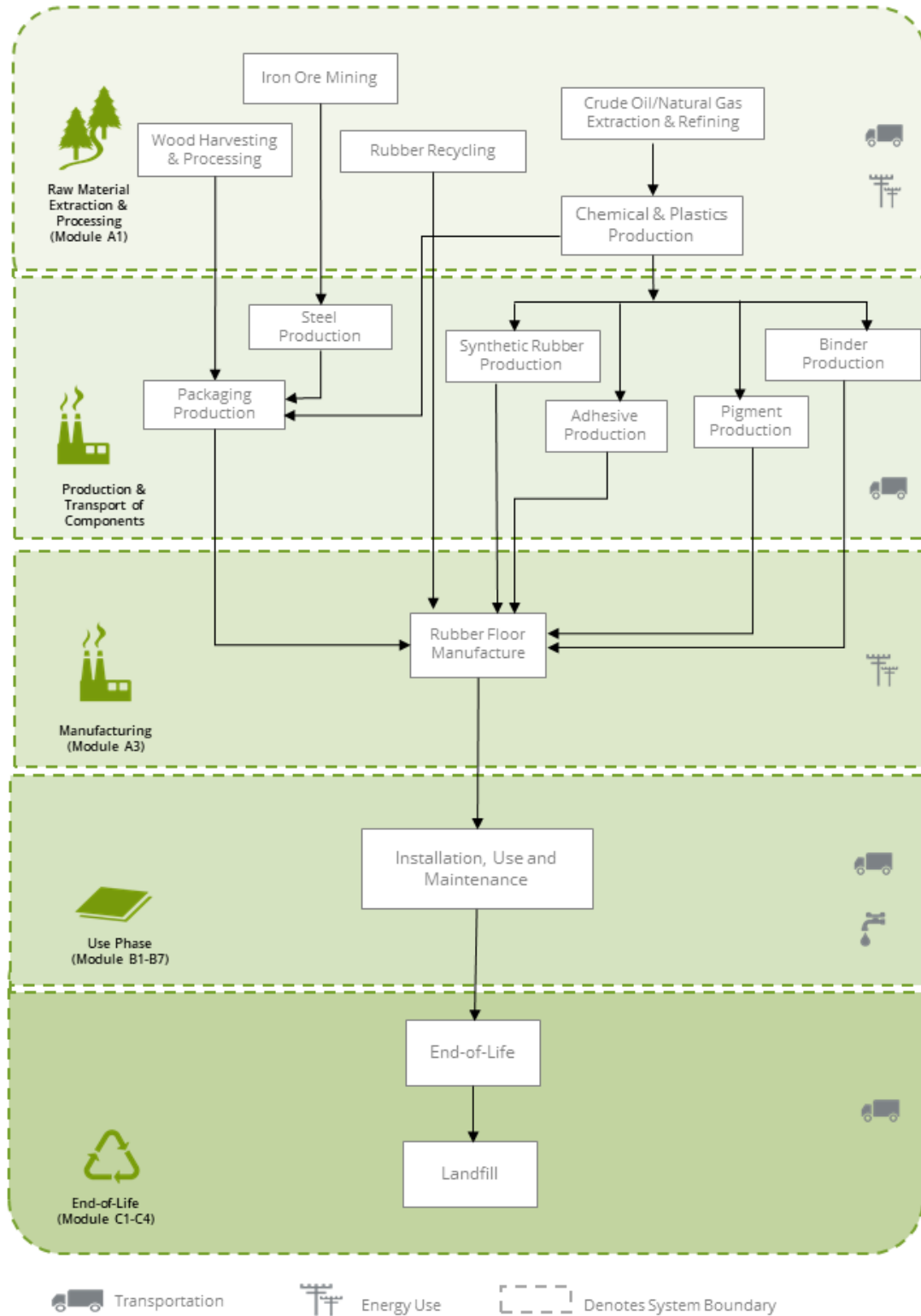


Figure 1. Flow Diagram for the life cycle of the rubber flooring products.

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

- The manufacturing facility is located in south-central British Columbia. Ecoinvent inventory datasets were used to represent the specific energy mix for Canada to estimate resource use and emissions from electricity use at the Dinoflex manufacturing facility.
- Electricity use at the Salmon Arm, British Columbia, Canada manufacturing facility was allocated to the flooring products based on the product mass as a fraction of the total facility production volume.
- The Reference Service Life (RSL) of the products was modeled based on information provided by the manufacturer 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 manufacturer representing transport for global product distribution.
- The use and maintenance phase of the product life cycle was modeled based on information provided by the manufacturer 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 product 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.
- Modeling of recycled materials follows the recycled content method (also known as 100-0 method or cut-off method) whereby only the burdens of reprocessing the waste material are allocated to the product system using the recycled material.

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 by the manufacturing facility and select suppliers. The sources of secondary LCI data are the Ecoinvent database.

Table 8. Data sources for the rubber flooring products.

Component	Dataset	Data Source	Publication date
PRODUCT			
Rubber			
Recycled SBR/Crumb rubber	Recycled Rubber - AERP	Primary data; EI v3.8	2021
EPDM	synthetic rubber production synthetic rubber Cutoff, S/RoW	EI v3.8	2021
Binder	polyurethane production, flexible foam polyurethane, flexible foam Cutoff, S/RoW	EI v3.8	2021
Adhesive	methylene diphenyl diisocyanate production methylene diphenyl diisocyanate Cutoff, S/RoW; polyurethane adhesive production polyurethane adhesive Cutoff, S/GLO	EI v3.8	2021
Catalyst	chemical production, organic chemical, organic Cutoff, S/GLO	EI v3.8	2021
Pigment	market for titanium dioxide titanium dioxide Cutoff, S/RoW	EI v3.8	2021
Cork	cork slab production cork slab Cutoff, S/RER	EI v3.8	2021
Water	market group for tap water tap water Cutoff, S/GLO	EI v3.8	2021
PACKAGING			
Wrapping Film	packaging film production, low density polyethylene packaging film, low density polyethylene Cutoff, S/RoW	EI v3.8	2021
Steel Strapping	steel production, converter, low-alloyed steel, low-alloyed Cutoff, S/RoW	EI v3.8	2021
Wood	EUR-flat pallet production EUR-flat pallet Cutoff, S/RoW	EI v3.8	2021
TRANSPORT			
Road transport	transport, freight, lorry 16-32 metric ton, EURO4 transport, freight, lorry 16-32 metric ton, EURO4 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 for electricity, medium voltage electricity, medium voltage Cutoff, S/CA-BC	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 – propane	heat production, propane, at industrial furnace >100kW heat, district or industrial, other than natural gas Cutoff, S/RoW		

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 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 2019.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Electricity use for product manufacture is modeled using representative data for Canada. Surrogate data used in the assessment are representative of global or European operations. Data representative of European operations are considered sufficiently similar to actual processes. Data representing product disposal are based on regional statistics.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative fabrication datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data values for each data expressed	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 the manufacturing facility represents 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 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 October 2018 – September 2019.

3.10 ALLOCATION

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

3.11 COMPARABILITY

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

4. LCA: Scenarios and Additional Technical Information

Delivery and Installation stage (A4 - A5)

Distribution of the flooring products to the point of installation is included in the assessment. Transportation parameters for modeling transport to regional consumer markets are summarized in Table 10. A distance of 800 km is assumed for transport by diesel truck from the distribution center to point of installation, consistent with PCR guidance.

Table 10. *Product distribution parameters, per 1 m².*

Parameter	Unit	Value	
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
Ollero - 4mm	4.57	1,226	984
Ollero - 12mm	13.80	1,226	984
Ollero 8mm Heterogeneous	11.33	1,226	984
Ollero 10mm Heterogeneous	14.20	1,226	984
Ollero 12mm Heterogeneous	17.02	1,226	984

Installation of the product is accomplished using hand tools with no associated emissions and negligible impacts. The impacts associated with packaging disposal are included with the installation phase as per PCR requirements.

Table 11. *Installation parameters for the rubber flooring products, per 1 m².*

Parameter	Value			
Ancillary materials (kg)	negligible			
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	Steel	Wood	
Ollero - 4mm	1.08x10 ⁻²	4.48x10 ⁻³	0.283	0.519
Ollero - 12mm	1.13x10 ⁻²	4.72x10 ⁻³	0.298	0.547
Ollero 8mm Heterogeneous	1.30x10 ⁻²	5.44x10 ⁻³	0.343	0.629
Ollero 10mm Heterogeneous	1.64x10 ⁻²	6.81x10 ⁻³	0.430	0.789
Ollero 12mm Heterogeneous	1.85x10 ⁻²	7.69x10 ⁻³	0.486	0.890

Use stage (B1)

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

Maintenance stage (B2)

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

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

Parameter	Unit	Value
Maintenance cycle	Cycles / RSL	Weekly
Maintenance cycle	Cycles / ESL	3,900
Maintenance process	-	Mopping
Net freshwater consumption	m ³ /m ² /yr	0.0058
Cleaning agent	kg/m ² /yr	0.0119
Maintenance process	-	Machine cleaning
Electricity	kWh/m ² /yr	0.022
Further assumptions	-	Moderate traffic; weekly maintenance

Repair/Refurbishment stage (B3; B5)

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

Replacement stage (B4)

The materials and energy required for replacement of the product over the 75-year estimated service lifetime of the assessment are included in this stage. Modeling parameters for the product replacement stage are summarized in Table 13.

Table 13. Product replacement parameters for the flooring products, per 1 m².

Parameter	Ollero - 4mm	Ollero - 12mm	Ollero 8mm Heterogeneous	Ollero 10mm Heterogeneous	Ollero 12mm Heterogeneous
Reference service life (years)	25	25	10	10	10
Replacement cycle	2	2	6.5	6.5	6.5
Ancillary materials (kg)	-	-	-	-	-
Replacement parts (kg)	26.23	9.14	73.62	92.32	110.61
Direct emissions (kg)	-	-	-	-	-

Building operation stage (B6 – B7)

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

Disposal stage (C1 - C4)

The disposal stage includes demolition of the products (C1); transport of the flooring products to waste treatment facilities (C2); waste processing (C3); and associated emissions as the product degrades in a landfill (C4). For the rubber 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 161 km average distance to disposal, consistent with the PCR. 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 14. Recycling rates for packaging materials at end-of-life.

Material	Value
Recycling Rates	
Steel	5.4%
Plastics	14.5%
Wood	26.1%
Disposal of Non-recyclables	
Incineration	45%
Landfill	55%

Table 15. End-of-life disposal scenario parameters for the flooring products.

Parameter	Ollero - 4mm	Ollero - 12mm	Ollero 8mm Heterogeneous	Ollero 10mm Heterogeneous	Ollero 12mm Heterogeneous
Assumptions for scenario development	Landfill	Landfill	Landfill	Landfill	Landfill
Collection process	-	-	-	-	-
Collected with mixed construction waste (kg)	4.57	13.80	11.33	14.20	17.02
Recovery	n/a	n/a	n/a	n/a	n/a
Landfill disposal (kg)	0	0	0	0	0
Removals of biogenic carbon (kg CO ₂ eq)	n/a	n/a	n/a	n/a	n/a

5. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All LCA results are stated to three significant figures in agreement with the PCR for this flooring product 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.

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

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

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

Resources	Unit	Waste and Outflows	Unit
RPR_E : Renewable primary 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	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 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, module C1 is likewise not associated with any impact as the floor is manually deconstructed. Additionally, as the rubber 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 16. Life Cycle Impact Assessment results for the rubber 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. **(Altro Ollero - 4mm)**

Impact Category	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML										
GWP	kg CO ₂ eq	4.24	0.620	0.824	0.997	8.52x10 ⁻²	17.4	20.1	0.871	2.43
	%	8.9%	1.3%	1.7%	2.1%	0.18%	37%	42%	1.8%	5.1%
AP	kg SO ₂ eq	1.99x10 ⁻²	3.29x10 ⁻³	1.36x10 ⁻³	4.82x10 ⁻³	3.07x10 ⁻⁴	7.30x10 ⁻²	6.87x10 ⁻²	4.06x10 ⁻³	5.80x10 ⁻⁴
	%	11%	1.9%	0.77%	2.7%	0.17%	41%	39%	2.3%	0.33%
EP	kg (PO ₄) ³⁻ eq	6.81x10 ⁻³	6.98x10 ⁻⁴	1.95x10 ⁻³	9.82x10 ⁻⁴	6.99x10 ⁻⁴	1.83x10 ⁻²	5.60x10 ⁻²	8.69x10 ⁻⁴	1.60x10 ⁻²
	%	6.7%	0.68%	1.9%	0.96%	0.68%	18%	55%	0.85%	16%
POCP	kg C ₂ H ₄ eq	2.06x10 ⁻³	1.05x10 ⁻⁴	1.87x10 ⁻⁴	1.55x10 ⁻⁴	1.35x10 ⁻⁵	4.35x10 ⁻³	6.34x10 ⁻³	1.34x10 ⁻⁴	5.20x10 ⁻⁴
	%	15%	0.75%	1.3%	1.1%	0.098%	31%	46%	0.97%	3.7%
ODP	kg CFC-11 eq	5.99x10 ⁻⁷	9.86x10 ⁻⁸	3.78x10 ⁻⁸	1.73x10 ⁻⁷	1.12x10 ⁻⁸	3.51x10 ⁻⁷	2.16x10 ⁻⁶	1.51x10 ⁻⁷	1.18x10 ⁻⁸
	%	17%	2.7%	1.1%	4.8%	0.31%	9.8%	60%	4.2%	0.33%
ADPF	MJ	84.3	8.96	7.45	14.7	0.899	455	259	11.9	1.35
	%	10%	1.1%	0.88%	1.7%	0.11%	54%	31%	1.4%	0.16%
TRACI										
GWP	kg CO ₂ eq	4.21	0.619	0.757	0.995	8.21x10 ⁻²	17.2	19.0	0.871	1.96
	%	9.2%	1.4%	1.7%	2.2%	0.18%	38%	42%	1.9%	4.3%
AP	kg N eq	1.99x10 ⁻²	3.84x10 ⁻³	1.46x10 ⁻³	5.51x10 ⁻³	3.79x10 ⁻⁴	7.43x10 ⁻²	7.37x10 ⁻²	5.02x10 ⁻³	7.24x10 ⁻⁴
	%	11%	2.1%	0.79%	3%	0.21%	40%	40%	2.7%	0.39%
EP	kg N eq	1.34x10 ⁻²	7.32x10 ⁻⁴	4.76x10 ⁻³	1.10x10 ⁻³	1.81x10 ⁻³	3.39x10 ⁻²	0.127	6.39x10 ⁻⁴	4.13x10 ⁻²
	%	6%	0.33%	2.1%	0.49%	0.8%	15%	57%	0.28%	18%
SFP	kg O ₃ eq	0.281	9.26x10 ⁻²	2.40x10 ⁻²	0.126	1.07x10 ⁻²	0.895	1.38	0.142	1.14x10 ⁻²
	%	9.5%	3.1%	0.81%	4.3%	0.36%	30%	47%	4.8%	0.38%
ODP	kg CFC-11 eq	7.17x10 ⁻⁷	1.31x10 ⁻⁷	4.93x10 ⁻⁸	2.30x10 ⁻⁷	1.49x10 ⁻⁸	4.61x10 ⁻⁷	2.72x10 ⁻⁶	2.01x10 ⁻⁷	1.58x10 ⁻⁸
	%	16%	2.9%	1.1%	5.1%	0.33%	10%	60%	4.4%	0.35%
FFD	MJ surplus	11.2	1.27	1.03	2.10	0.135	62.9	35.3	1.80	0.168
	%	9.6%	1.1%	0.89%	1.8%	0.12%	54%	30%	1.6%	0.14%

Table 17. Resource use and waste flows for the rubber 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. **(Altro Ollero - 4mm)**

Parameter	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources										
RPR _E	MJ	6.20	0.121	11.7	0.169	4.52x10 ⁻³	11.2	36.5	4.65x10 ⁻²	6.42x10 ⁻²
	%	9.4%	0.18%	18%	0.26%	0.0068%	17%	55%	0.07%	0.097%
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	3.35	0.00	0.00	0.00	0.00	0.00	6.71	0.00	0.00
	%	33%	0%	0%	0%	0%	0%	67%	0%	0%
RSF		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m ³	0.304	6.73x10 ⁻³	1.89x10 ⁻²	1.01x10 ⁻²	3.65x10 ⁻⁴	0.992	0.695	3.77x10 ⁻³	3.31x10 ⁻³
	%	15%	0.33%	0.93%	0.5%	0.018%	49%	34%	0.19%	0.16%
Wastes										
HWD	kg	6.34x10 ⁻⁵	2.44x10 ⁻⁵	7.55x10 ⁻⁶	3.84x10 ⁻⁵	2.38x10 ⁻⁶	1.10x10 ⁻⁴	3.46x10 ⁻⁴	3.25x10 ⁻⁵	4.49x10 ⁻⁶
		10%	3.9%	1.2%	6.1%	0.38%	17%	55%	5.2%	0.71%
NHWD	kg	0.511	0.406	0.590	0.729	0.241	1.17	13.6	6.08x10 ⁻²	4.29
	%	2.4%	1.9%	2.7%	3.4%	1.1%	5.4%	63%	0.28%	20%
HLRW	kg	1.36x10 ⁻⁵	5.16x10 ⁻⁷	1.20x10 ⁻⁶	7.38x10 ⁻⁷	1.91x10 ⁻⁸	3.95x10 ⁻⁵	3.32x10 ⁻⁵	1.89x10 ⁻⁷	3.40x10 ⁻⁷
	%	15%	0.58%	1.3%	0.83%	0.021%	44%	37%	0.21%	0.38%
ILLRW	kg	2.04x10 ⁻⁴	5.95x10 ⁻⁵	9.64x10 ⁻⁶	9.66x10 ⁻⁵	6.25x10 ⁻⁶	1.67x10 ⁻⁴	9.35x10 ⁻⁴	8.44x10 ⁻⁵	7.09x10 ⁻⁶
	%	13%	3.8%	0.61%	6.2%	0.4%	11%	60%	5.4%	0.45%
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	4.17x10 ⁻³	0.00	8.34x10 ⁻³	0.00	0.00
	%	0%	0%	0%	0%	33%	0%	67%	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

Table 18. Life Cycle Impact Assessment results for the rubber 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. (Altro Ollero - 12mm)

Impact Category	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML										
GWP	kg CO ₂ eq	13.4	1.96	2.30	3.01	8.97x10 ⁻²	17.4	62.3	2.75	7.66
	%	12%	1.8%	2.1%	2.7%	0.081%	16%	56%	2.5%	6.9%
AP	kg SO ₂ eq	6.29x10 ⁻²	1.04x10 ⁻²	2.74x10 ⁻³	1.46x10 ⁻²	3.23x10 ⁻⁴	7.30x10 ⁻²	0.211	1.28x10 ⁻²	1.83x10 ⁻³
	%	16%	2.7%	0.7%	3.7%	0.083%	19%	54%	3.3%	0.47%
EP	kg (PO ₄) ³⁻ eq	2.15x10 ⁻²	2.20x10 ⁻³	5.64x10 ⁻³	2.97x10 ⁻³	7.35x10 ⁻⁴	1.83x10 ⁻²	0.173	2.74x10 ⁻³	5.05x10 ⁻²
	%	7.8%	0.8%	2%	1.1%	0.27%	6.6%	62%	0.99%	18%
POCP	kg C ₂ H ₄ eq	6.50x10 ⁻³	3.30x10 ⁻⁴	4.39x10 ⁻⁴	4.68x10 ⁻⁴	1.42x10 ⁻⁵	4.35x10 ⁻³	1.96x10 ⁻²	4.23x10 ⁻⁴	1.64x10 ⁻³
	%	19%	0.98%	1.3%	1.4%	0.042%	13%	58%	1.3%	4.9%
ODP	kg CFC-11 eq	1.89x10 ⁻⁶	3.11x10 ⁻⁷	9.69x10 ⁻⁸	5.21x10 ⁻⁷	1.18x10 ⁻⁸	3.51x10 ⁻⁷	6.69x10 ⁻⁶	4.76x10 ⁻⁷	3.73x10 ⁻⁸
	%	18%	3%	0.93%	5%	0.11%	3.4%	64%	4.6%	0.36%
ADPF	MJ	266	28.3	18.4	44.3	0.946	455	800	37.7	4.25
	%	16%	1.7%	1.1%	2.7%	0.057%	27%	48%	2.3%	0.26%
TRACI										
GWP	kg CO ₂ eq	13.3	1.96	2.09	3.01	8.64x10 ⁻²	17.2	58.7	2.75	6.20
	%	13%	1.9%	2%	2.9%	0.082%	16%	56%	2.6%	5.9%
AP	kg N eq	6.29x10 ⁻²	1.21x10 ⁻²	2.93x10 ⁻³	1.67x10 ⁻²	3.99x10 ⁻⁴	7.43x10 ⁻²	0.226	1.58x10 ⁻²	2.29x10 ⁻³
	%	15%	2.9%	0.71%	4%	0.096%	18%	55%	3.8%	0.55%
EP	kg N eq	4.24x10 ⁻²	2.31x10 ⁻³	1.41x10 ⁻²	3.33x10 ⁻³	1.91x10 ⁻³	3.39x10 ⁻²	0.393	2.02x10 ⁻³	0.130
	%	6.8%	0.37%	2.3%	0.53%	0.31%	5.4%	63%	0.32%	21%
SFP	kg O ₃ eq	0.887	0.293	4.63x10 ⁻²	0.380	1.12x10 ⁻²	0.895	4.20	0.449	3.58x10 ⁻²
	%	12%	4.1%	0.64%	5.3%	0.16%	12%	58%	6.2%	0.5%
ODP	kg CFC-11 eq	2.27x10 ⁻⁶	4.15x10 ⁻⁷	1.26x10 ⁻⁷	6.95x10 ⁻⁷	1.57x10 ⁻⁸	4.61x10 ⁻⁷	8.40x10 ⁻⁶	6.34x10 ⁻⁷	4.97x10 ⁻⁸
	%	17%	3.2%	0.97%	5.3%	0.12%	3.5%	64%	4.9%	0.38%
FFD	MJ surplus	35.2	4.02	2.64	6.34	0.142	62.9	109	5.67	0.530
	%	16%	1.8%	1.2%	2.8%	0.063%	28%	48%	2.5%	0.23%

Table 19. Resource use and waste flows for the rubber 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. **(Altro Ollero - 12mm)**

Parameter	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources										
RPR _E	MJ	19.6	0.384	19.7	0.509	4.75x10 ⁻³	11.2	81.0	0.147	0.203
	%	15%	0.29%	15%	0.38%	0.0036%	8.4%	61%	0.11%	0.15%
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	10.6	0.00	0.00	0.00	0.00	0.00	21.2	0.00	0.00
	%	33%	0%	0%	0%	0%	0%	67%	0%	0%
RSF		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m ³	0.961	2.13x10 ⁻²	4.17x10 ⁻²	3.04x10 ⁻²	3.84x10 ⁻⁴	0.992	2.15	1.19x10 ⁻²	1.04x10 ⁻²
	%	23%	0.5%	0.99%	0.72%	0.0091%	23%	51%	0.28%	0.25%
Wastes										
HWD	kg	2.00x10 ⁻⁴	7.72x10 ⁻⁵	1.64x10 ⁻⁵	1.16x10 ⁻⁴	2.51x10 ⁻⁶	1.10x10 ⁻⁴	1.06x10 ⁻³	1.03x10 ⁻⁴	1.42x10 ⁻⁵
		12%	4.5%	0.97%	6.8%	0.15%	6.5%	62%	6%	0.84%
NHWD	kg	1.61	1.28	1.79	2.20	0.254	1.17	41.7	0.192	13.5
	%	2.5%	2%	2.8%	3.5%	0.4%	1.8%	65%	0.3%	21%
HLRW	kg	4.30x10 ⁻⁵	1.63x10 ⁻⁶	2.83x10 ⁻⁶	2.23x10 ⁻⁶	2.02x10 ⁻⁸	3.95x10 ⁻⁵	1.03x10 ⁻⁴	5.96x10 ⁻⁷	1.07x10 ⁻⁶
	%	22%	0.84%	1.5%	1.2%	0.01%	20%	53%	0.31%	0.56%
ILLRW	kg	6.44x10 ⁻⁴	1.88x10 ⁻⁴	1.97x10 ⁻⁵	2.92x10 ⁻⁴	6.58x10 ⁻⁶	1.67x10 ⁻⁴	2.88x10 ⁻³	2.66x10 ⁻⁴	2.24x10 ⁻⁵
	%	14%	4.2%	0.44%	6.5%	0.15%	3.7%	64%	5.9%	0.5%
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	4.39x10 ⁻³	0.00	8.78x10 ⁻³	0.00	0.00
	%	0%	0%	0%	0%	33%	0%	67%	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

Table 20. Life Cycle Impact Assessment results for the rubber 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. **(Altro Ollero 8mm Heterogeneous)**

Impact Category	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML										
GWP	kg CO ₂ eq	13.8	2.03	1.91	2.47	0.103	17.4	189	2.24	6.47
	%	5.9%	0.87%	0.81%	1.1%	0.044%	7.4%	80%	0.95%	2.8%
AP	kg SO ₂ eq	6.56x10 ⁻²	1.29x10 ⁻²	2.49x10 ⁻³	1.19x10 ⁻²	3.72x10 ⁻⁴	7.30x10 ⁻²	0.685	1.04x10 ⁻²	1.51x10 ⁻³
	%	7.6%	1.5%	0.29%	1.4%	0.043%	8.5%	79%	1.2%	0.17%
EP	kg (PO ₄) ³⁻ eq	2.12x10 ⁻²	2.63x10 ⁻³	4.64x10 ⁻³	2.43x10 ⁻³	8.47x10 ⁻⁴	1.83x10 ⁻²	0.456	2.23x10 ⁻³	3.62x10 ⁻²
	%	3.9%	0.48%	0.85%	0.45%	0.16%	3.4%	84%	0.41%	6.6%
POCP	kg C ₂ H ₄ eq	6.10x10 ⁻³	3.97x10 ⁻⁴	3.81x10 ⁻⁴	3.84x10 ⁻⁴	1.64x10 ⁻⁵	4.35x10 ⁻³	5.86x10 ⁻²	3.44x10 ⁻⁴	1.39x10 ⁻³
	%	8.5%	0.55%	0.53%	0.53%	0.023%	6%	81%	0.48%	1.9%
ODP	kg CFC-11 eq	2.22x10 ⁻⁶	3.01x10 ⁻⁷	8.25x10 ⁻⁸	4.28x10 ⁻⁷	1.36x10 ⁻⁸	3.51x10 ⁻⁷	2.25x10 ⁻⁵	3.87x10 ⁻⁷	3.03x10 ⁻⁸
	%	8.4%	1.1%	0.31%	1.6%	0.052%	1.3%	86%	1.5%	0.12%
ADPF	MJ	300	28.8	15.8	36.4	1.09	455	2,710	30.6	3.46
	%	8.4%	0.81%	0.44%	1%	0.03%	13%	76%	0.86%	0.097%
TRACI										
GWP	kg CO ₂ eq	13.7	2.03	1.74	2.47	9.95x10 ⁻²	17.2	179	2.24	5.23
	%	6.1%	0.91%	0.78%	1.1%	0.045%	7.7%	80%	1%	2.3%
AP	kg N eq	6.56x10 ⁻²	1.51x10 ⁻²	2.66x10 ⁻³	1.37x10 ⁻²	4.59x10 ⁻⁴	7.43x10 ⁻²	0.729	1.29x10 ⁻²	1.88x10 ⁻³
	%	7.2%	1.6%	0.29%	1.5%	0.05%	8.1%	80%	1.4%	0.21%
EP	kg N eq	4.19x10 ⁻²	2.54x10 ⁻³	1.16x10 ⁻²	2.73x10 ⁻³	2.19x10 ⁻³	3.39x10 ⁻²	1.02	1.64x10 ⁻³	9.42x10 ⁻²
	%	3.5%	0.21%	0.96%	0.23%	0.18%	2.8%	84%	0.14%	7.8%
SFP	kg O ₃ eq	0.881	0.365	4.26x10 ⁻²	0.312	1.30x10 ⁻²	0.895	13.0	0.365	2.92x10 ⁻²
	%	5.5%	2.3%	0.27%	2%	0.081%	5.6%	82%	2.3%	0.18%
ODP	kg CFC-11 eq	2.75x10 ⁻⁶	4.00x10 ⁻⁷	1.08x10 ⁻⁷	5.70x10 ⁻⁷	1.81x10 ⁻⁸	4.61x10 ⁻⁷	2.86x10 ⁻⁵	5.16x10 ⁻⁷	4.05x10 ⁻⁸
	%	8.2%	1.2%	0.32%	1.7%	0.054%	1.4%	85%	1.5%	0.12%
FFD	MJ surplus	39.7	4.07	2.25	5.20	0.163	62.9	367	4.61	0.431
	%	8.2%	0.84%	0.46%	1.1%	0.034%	13%	75%	0.95%	0.089%

Table 21. Resource use and waste flows for the rubber 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. **(Altro Ollero 8mm Heterogeneous)**

Parameter	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources										
RPR _E	MJ	18.1	0.433	18.9	0.418	5.47x10 ⁻³	11.2	248	0.119	0.166
	%	6.1%	0.15%	6.4%	0.14%	0.0018%	3.8%	83%	0.04%	0.056%
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	7.47	0.00	0.00	0.00	0.00	0.00	48.6	0.00	0.00
	%	13%	0%	0%	0%	0%	0%	87%	0%	0%
RSF		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m ³	0.962	2.28x10 ⁻²	3.69x10 ⁻²	2.50x10 ⁻²	4.42x10 ⁻⁴	0.992	6.92	9.67x10 ⁻³	8.54x10 ⁻³
	%	11%	0.25%	0.41%	0.28%	0.0049%	11%	77%	0.11%	0.095%
Wastes										
HWD	kg	2.18x10 ⁻⁴	7.98x10 ⁻⁵	1.46x10 ⁻⁵	9.50x10 ⁻⁵	2.89x10 ⁻⁶	1.10x10 ⁻⁴	3.28x10 ⁻³	8.34x10 ⁻⁵	1.19x10 ⁻⁵
		5.6%	2%	0.37%	2.4%	0.074%	2.8%	84%	2.1%	0.3%
NHWD	kg	1.51	1.17	1.46	1.81	0.292	1.17	113	0.156	11.0
	%	1.1%	0.89%	1.1%	1.4%	0.22%	0.89%	86%	0.12%	8.4%
HLRW	kg	4.88x10 ⁻⁵	1.80x10 ⁻⁶	2.46x10 ⁻⁶	1.83x10 ⁻⁶	2.32x10 ⁻⁸	3.95x10 ⁻⁵	3.66x10 ⁻⁴	4.84x10 ⁻⁷	8.79x10 ⁻⁷
	%	11%	0.39%	0.53%	0.4%	0.005%	8.6%	79%	0.1%	0.19%
ILLRW	kg	8.96x10 ⁻⁴	1.93x10 ⁻⁴	1.78x10 ⁻⁵	2.39x10 ⁻⁴	7.58x10 ⁻⁶	1.67x10 ⁻⁴	1.03x10 ⁻²	2.17x10 ⁻⁴	1.82x10 ⁻⁵
	%	7.4%	1.6%	0.15%	2%	0.063%	1.4%	85%	1.8%	0.15%
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	5.06x10 ⁻³	0.00	3.29x10 ⁻²	0.00	0.00
	%	0%	0%	0%	0%	13%	0%	87%	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

Table 22. Life Cycle Impact Assessment results for the rubber 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. **(Altro Ollero 10mm Heterogeneous)**

Impact Category	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML										
GWP	kg CO ₂ eq	17.2	2.35	2.39	3.10	0.129	17.4	233	2.80	7.92
	%	6%	0.82%	0.84%	1.1%	0.045%	6.1%	81%	0.98%	2.8%
AP	kg SO ₂ eq	8.17x10 ⁻²	1.42x10 ⁻²	3.12x10 ⁻³	1.50x10 ⁻²	4.66x10 ⁻⁴	7.30x10 ⁻²	0.841	1.31x10 ⁻²	1.88x10 ⁻³
	%	7.8%	1.4%	0.3%	1.4%	0.045%	7%	81%	1.3%	0.18%
EP	kg (PO ₄) ³⁻ eq	2.71x10 ⁻²	2.92x10 ⁻³	5.80x10 ⁻³	3.05x10 ⁻³	1.06x10 ⁻³	1.83x10 ⁻²	0.598	2.80x10 ⁻³	4.92x10 ⁻²
	%	3.8%	0.41%	0.82%	0.43%	0.15%	2.6%	84%	0.4%	6.9%
POCP	kg C ₂ H ₄ eq	8.13x10 ⁻³	4.40x10 ⁻⁴	4.76x10 ⁻⁴	4.82x10 ⁻⁴	2.06x10 ⁻⁵	4.35x10 ⁻³	7.59x10 ⁻²	4.31x10 ⁻⁴	1.70x10 ⁻³
	%	8.8%	0.48%	0.52%	0.52%	0.022%	4.7%	83%	0.47%	1.8%
ODP	kg CFC-11 eq	2.64x10 ⁻⁶	3.56x10 ⁻⁷	1.03x10 ⁻⁷	5.37x10 ⁻⁷	1.70x10 ⁻⁸	3.51x10 ⁻⁷	2.72x10 ⁻⁵	4.85x10 ⁻⁷	3.80x10 ⁻⁸
	%	8.3%	1.1%	0.33%	1.7%	0.054%	1.1%	86%	1.5%	0.12%
ADPF	MJ	359	33.6	19.9	45.6	1.37	455	3,260	38.4	4.34
	%	8.5%	0.8%	0.47%	1.1%	0.032%	11%	77%	0.91%	0.1%
TRACI										
GWP	kg CO ₂ eq	17.1	2.35	2.18	3.09	0.125	17.2	221	2.80	6.41
	%	6.3%	0.86%	0.8%	1.1%	0.046%	6.3%	81%	1%	2.4%
AP	kg N eq	8.16x10 ⁻²	1.65x10 ⁻²	3.33x10 ⁻³	1.71x10 ⁻²	5.76x10 ⁻⁴	7.43x10 ⁻²	0.895	1.62x10 ⁻²	2.34x10 ⁻³
	%	7.4%	1.5%	0.3%	1.5%	0.052%	6.7%	81%	1.5%	0.21%
EP	kg N eq	5.36x10 ⁻²	2.89x10 ⁻³	1.44x10 ⁻²	3.43x10 ⁻³	2.75x10 ⁻³	3.39x10 ⁻²	1.34	2.06x10 ⁻³	0.127
	%	3.4%	0.18%	0.91%	0.22%	0.17%	2.1%	85%	0.13%	8%
SFP	kg O ₃ eq	1.12	0.400	5.34x10 ⁻²	0.391	1.62x10 ⁻²	0.895	16.1	0.458	3.66x10 ⁻²
	%	5.8%	2.1%	0.27%	2%	0.083%	4.6%	83%	2.4%	0.19%
ODP	kg CFC-11 eq	3.22x10 ⁻⁶	4.75x10 ⁻⁷	1.35x10 ⁻⁷	7.15x10 ⁻⁷	2.26x10 ⁻⁸	4.61x10 ⁻⁷	3.42x10 ⁻⁵	6.47x10 ⁻⁷	5.07x10 ⁻⁸
	%	8.1%	1.2%	0.34%	1.8%	0.057%	1.2%	86%	1.6%	0.13%
FFD	MJ surplus	47.4	4.75	2.82	6.53	0.205	62.9	442	5.78	0.541
	%	8.3%	0.83%	0.49%	1.1%	0.036%	11%	77%	1%	0.094%

Table 23. Resource use and waste flows for the rubber 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. **(Altro Ollero 10mm Heterogeneous)**

Parameter	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources										
RPR _E	MJ	22.7	0.489	23.7	0.524	6.86x10 ⁻³	11.2	311	0.150	0.207
	%	6.1%	0.13%	6.4%	0.14%	0.0019%	3%	84%	0.041%	0.056%
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	9.72	0.00	0.00	0.00	0.00	0.00	63.2	0.00	0.00
	%	13%	0%	0%	0%	0%	0%	87%	0%	0%
RSF		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m ³	1.22	2.62x10 ⁻²	4.63x10 ⁻²	3.13x10 ⁻²	5.54x10 ⁻⁴	0.992	8.73	1.21x10 ⁻²	1.07x10 ⁻²
	%	11%	0.24%	0.42%	0.28%	0.005%	9%	79%	0.11%	0.096%
Wastes										
HWD	kg	2.66x10 ⁻⁴	9.26x10 ⁻⁵	1.82x10 ⁻⁵	1.19x10 ⁻⁴	3.62x10 ⁻⁶	1.10x10 ⁻⁴	4.02x10 ⁻³	1.05x10 ⁻⁴	1.46x10 ⁻⁵
		5.6%	1.9%	0.38%	2.5%	0.076%	2.3%	85%	2.2%	0.31%
NHWD	kg	1.91	1.41	1.82	2.27	0.366	1.17	141	0.196	13.8
	%	1.2%	0.86%	1.1%	1.4%	0.22%	0.71%	86%	0.12%	8.4%
HLRW	kg	5.88x10 ⁻⁵	2.05x10 ⁻⁶	3.08x10 ⁻⁶	2.29x10 ⁻⁶	2.91x10 ⁻⁸	3.95x10 ⁻⁵	4.42x10 ⁻⁴	6.08x10 ⁻⁷	1.10x10 ⁻⁶
	%	11%	0.37%	0.56%	0.42%	0.0053%	7.2%	80%	0.11%	0.2%
ILLRW	kg	9.81x10 ⁻⁴	2.24x10 ⁻⁴	2.23x10 ⁻⁵	3.00x10 ⁻⁴	9.50x10 ⁻⁶	1.67x10 ⁻⁴	1.19x10 ⁻²	2.72x10 ⁻⁴	2.28x10 ⁻⁵
	%	7.1%	1.6%	0.16%	2.2%	0.068%	1.2%	86%	2%	0.16%
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	6.34x10 ⁻³	0.00	4.12x10 ⁻²	0.00	0.00
	%	0%	0%	0%	0%	13%	0%	87%	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

Table 24. Life Cycle Impact Assessment results for the rubber 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. **(Altro Ollero 12mm Heterogeneous)**

Impact Category	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
CML										
GWP	kg CO ₂ eq	17.8	1.39	2.90	3.71	0.146	17.4	253	3.37	9.55
	%	5.8%	0.45%	0.94%	1.2%	0.047%	5.6%	82%	1.1%	3.1%
AP	kg SO ₂ eq	8.53x10 ⁻²	1.04x10 ⁻²	3.67x10 ⁻³	1.79x10 ⁻²	5.26x10 ⁻⁴	7.30x10 ⁻²	0.883	1.57x10 ⁻²	2.26x10 ⁻³
	%	7.8%	0.96%	0.34%	1.6%	0.048%	6.7%	81%	1.4%	0.21%
EP	kg (PO ₄) ³⁻ eq	2.84x10 ⁻²	2.05x10 ⁻³	7.09x10 ⁻³	3.66x10 ⁻³	1.20x10 ⁻³	1.83x10 ⁻²	0.676	3.36x10 ⁻³	5.82x10 ⁻²
	%	3.6%	0.26%	0.89%	0.46%	0.15%	2.3%	85%	0.42%	7.3%
POCP	kg C ₂ H ₄ eq	8.75x10 ⁻³	3.12x10 ⁻⁴	5.72x10 ⁻⁴	5.77x10 ⁻⁴	2.32x10 ⁻⁵	4.35x10 ⁻³	8.32x10 ⁻²	5.17x10 ⁻⁴	2.05x10 ⁻³
	%	8.7%	0.31%	0.57%	0.58%	0.023%	4.3%	83%	0.52%	2%
ODP	kg CFC-11 eq	2.70x10 ⁻⁶	1.89x10 ⁻⁷	1.23x10 ⁻⁷	6.43x10 ⁻⁷	1.92x10 ⁻⁸	3.51x10 ⁻⁷	2.80x10 ⁻⁵	5.83x10 ⁻⁷	4.56x10 ⁻⁸
	%	8.3%	0.58%	0.38%	2%	0.059%	1.1%	86%	1.8%	0.14%
ADPF	MJ	372	19.3	23.6	54.7	1.54	455	3,390	46.1	5.21
	%	8.5%	0.44%	0.54%	1.3%	0.035%	10%	78%	1.1%	0.12%
TRACI										
GWP	kg CO ₂ eq	17.7	1.39	2.64	3.71	0.141	17.2	238	3.37	7.73
	%	6.1%	0.47%	0.9%	1.3%	0.048%	5.9%	82%	1.2%	2.6%
AP	kg N eq	8.49x10 ⁻²	1.21x10 ⁻²	3.93x10 ⁻³	2.05x10 ⁻²	6.50x10 ⁻⁴	7.43x10 ⁻²	0.938	1.94x10 ⁻²	2.82x10 ⁻³
	%	7.3%	1.1%	0.34%	1.8%	0.056%	6.4%	81%	1.7%	0.24%
EP	kg N eq	5.63x10 ⁻²	1.83x10 ⁻³	1.77x10 ⁻²	4.11x10 ⁻³	3.10x10 ⁻³	3.39x10 ⁻²	1.54	2.47x10 ⁻³	0.151
	%	3.1%	0.1%	0.98%	0.23%	0.17%	1.9%	85%	0.14%	8.4%
SFP	kg O ₃ eq	1.15	0.294	6.27x10 ⁻²	0.469	1.83x10 ⁻²	0.895	16.8	0.549	4.39x10 ⁻²
	%	5.7%	1.4%	0.31%	2.3%	0.09%	4.4%	83%	2.7%	0.22%
ODP	kg CFC-11 eq	3.26x10 ⁻⁶	2.51x10 ⁻⁷	1.61x10 ⁻⁷	8.56x10 ⁻⁷	2.56x10 ⁻⁸	4.61x10 ⁻⁷	3.51x10 ⁻⁵	7.76x10 ⁻⁷	6.09x10 ⁻⁸
	%	8%	0.61%	0.39%	2.1%	0.062%	1.1%	86%	1.9%	0.15%
FFD	MJ surplus	49.0	2.71	3.35	7.82	0.231	62.9	459	6.94	0.649
	%	8.3%	0.46%	0.57%	1.3%	0.039%	11%	77%	1.2%	0.11%

Table 25. Resource use and waste flows for the rubber 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. **(Altro Ollero 12mm Heterogeneous)**

Parameter	Unit	A1	A2	A3	A4	A5	B2	B4	C2	C4
Resources										
RPR _E	MJ	19.3	0.322	27.5	0.628	7.74x10 ⁻³	11.2	313	0.180	0.249
	%	5.2%	0.086%	7.4%	0.17%	0.0021%	3%	84%	0.048%	0.067%
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	12.2	0.00	0.00	0.00	0.00	0.00	79.6	0.00	0.00
	%	13%	0%	0%	0%	0%	0%	87%	0%	0%
RSF		Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
RE	MJ	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
FW	m ³	1.29	1.62x10 ⁻²	5.47x10 ⁻²	3.75x10 ⁻²	6.25x10 ⁻⁴	0.992	9.27	1.46x10 ⁻²	1.28x10 ⁻²
	%	11%	0.14%	0.47%	0.32%	0.0053%	8.5%	79%	0.12%	0.11%
Wastes										
HWD	kg	2.64x10 ⁻⁴	5.43x10 ⁻⁵	2.16x10 ⁻⁵	1.43x10 ⁻⁴	4.09x10 ⁻⁶	1.10x10 ⁻⁴	4.10x10 ⁻³	1.26x10 ⁻⁴	1.76x10 ⁻⁵
		5.5%	1.1%	0.45%	3%	0.085%	2.3%	85%	2.6%	0.36%
NHWD	kg	1.68	0.676	2.24	2.71	0.413	1.17	159	0.235	16.6
	%	0.91%	0.37%	1.2%	1.5%	0.22%	0.63%	86%	0.13%	8.9%
HLRW	kg	6.11x10 ⁻⁵	1.31x10 ⁻⁶	3.66x10 ⁻⁶	2.75x10 ⁻⁶	3.28x10 ⁻⁸	3.95x10 ⁻⁵	4.61x10 ⁻⁴	7.29x10 ⁻⁷	1.32x10 ⁻⁶
	%	11%	0.23%	0.64%	0.48%	0.0057%	6.9%	81%	0.13%	0.23%
ILLRW	kg	9.63x10 ⁻⁴	1.30x10 ⁻⁴	2.63x10 ⁻⁵	3.60x10 ⁻⁴	1.07x10 ⁻⁵	1.67x10 ⁻⁴	1.20x10 ⁻²	3.26x10 ⁻⁴	2.74x10 ⁻⁵
	%	6.9%	0.93%	0.19%	2.6%	0.077%	1.2%	86%	2.3%	0.2%
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	7.15x10 ⁻³	0.00	4.65x10 ⁻²	0.00	0.00
	%	0%	0%	0%	0%	13%	0%	87%	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

6. LCA: Interpretation

The contributions to total impact indicator results are dominated by the product replacement phase (B4) of the assessment. Of the remaining life cycle phases, the raw material extraction and processing (A1) and product distribution (A5) phases are the largest contributors to indicator impact results followed by product disposal (C4) and product maintenance (B2).

7. Additional Environmental Information

7.1 ENVIRONMENT AND HEALTH DURING INSTALLATION

The Altro rubber flooring products meet the requirements of the following:

- FloorScore® Gold (VOC certification)
- CDPH/EHLB Standard Method v1.2-2017 (California Section 01350)

8. References

1. Life Cycle Assessment of Dinoflex Rubber Tiles and Mats SCS Global Services Report. Prepared for client. April 2023.
2. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
3. ISO 14040: 2006/AMD 1:2020 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. September 2018
6. PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. Version 2. UL Environment. December 2018.
7. SCS Type III Environmental Declaration Program: Program Operator Manual. V11.0 November 2021. SCS Global Services.
8. Bare, J. C. Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), Version 2.1 - User's Manual; EPA/600/R-12/554 2012. <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 (2020) ecoinvent data from v3.7. Swiss Center for Life Cycle Inventories, Dübendorf, 2020, <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:

Altro USA, Inc

80 Industrial Way - Suite 1

Wilmington, MA 01887

www.altro.com | support@altrofloors.com | 800.377.5597



SCS Global Services

2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA

Main +1.510.452.8000 | fax +1.510.452.8001