ENVIRONMENTAL PRODUCT DECLARATION

MODULAR RESILIENT FLOORING

INTERFACE, INC
4.5 MM LVT

4.5 MM LVT
Luxury Vinyl Tile

Interface®

For more than four decades, Interface has consistently led the industry through design and innovation and is a world leader in environmental sustainability. We are committed to transparency and will continue to share our progress as we work to become a carbon negative company by 2040.

At Interface, we believe Life Cycle Assessment is critical for evaluating the environmental impacts of our products. The LCA-based Environmental Product Declaration is the best way to provide full disclosure of those impacts to our customers.

Interface was one of the first companies to develop EPDs for all of our products manufactured globally, and we are committed to providing this level of transparency to our customers, partners and the industry.

For more information visit
www.interface.com

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Interface®

Interface, Inc.
Modular Resilient Flooring
4.5 mm LVT

According to ISO 14025, EN 15804, and ISO21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com/
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v2.5 March 2020	
MANUFACTURER NAME AND ADDRESS	Interface, Inc.; Seoul, South Korea	
DECLARATION NUMBER	4789956802.102.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Interface modular resilient flooring, 4.5 mm LVT	
REFERENCE PCR AND VERSION NUMBER	PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. 10010 Version 3.2. UL Environment. December 2018 PCR Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements. 10010-7 Version 2. UL Environment. September 2018.	
DESCRIPTION OF PRODUCT APPLICATION/USE	Interface modular resilient flooring, 4.5 mm LVT	
PRODUCT RSL DESCRIPTION (IF APPL.)	15 years	
MARKETS OF APPLICABILITY	Global	
DATE OF ISSUE	10/1/2021	
PERIOD OF VALIDITY	5 Years	
EPD TYPE	Product specific	
RANGE OF DATASET VARIABILITY	Industry average	
EPD SCOPE	Cradle to gate with options	
YEAR(S) OF REPORTED PRIMARY DATA	2020	
LCA SOFTWARE & VERSION NUMBER	GaBi 10	
LCI DATABASE(S) & VERSION NUMBER	GaBi 10.5.0.78	
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1/CML 4.2	

The PCR review was conducted by:	UL Environment PCR Review Panel epd@ulenvironment.com
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Thomas P. Gloria, Industrial Ecology Consultants
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Aidan Ganzert, Interface
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

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LIMITATIONS

Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

1. Product Definition and Information

1.1. Description of Company/Organization

Interface, Inc. is a global flooring company specializing in carbon neutral carpet tile and resilient flooring, including luxury vinyl tile (LVT) and nora® rubber flooring. We help our customers create high-performance interior spaces that support well-being, productivity, and creativity, as well as the sustainability of the planet. Our mission, Climate Take Back™, invites you to join us as we commit to operating in a way that is restorative to the planet and creates a climate fit for life.

1.2. Product Description

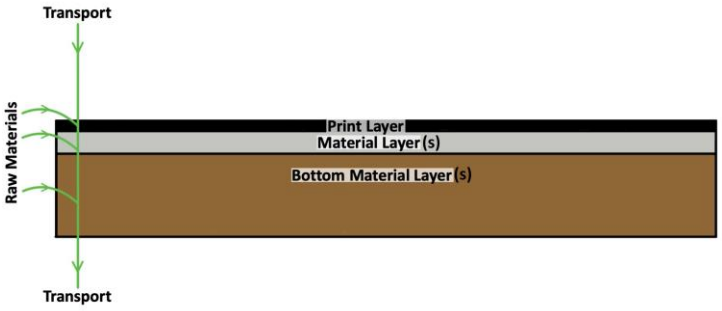
Product Identification

This Environmental Product Declaration covers all styles and patterns of 4.5 mm modular resilient flooring, LVT (Luxury Vinyl Tile). The products are manufactured in Seoul, South Korea.

Product Specification

CSI code: 09650

Flow Diagram



A1-A3 measured flows include manufacturing processes, transport, and raw material inputs for each product layer and sub-layers.

Product Average

The product average of 6880 grams per square meter was based on a sales weighted average.

1.3. Application

Application of product is intended for modular installation of resilient floor covering in commercial buildings.

1.4. Declaration of Methodological Framework

The data is retrieved from a cradle to grave LCA study. This EPD covers the entire life cycle of the product from cradle to grave (modules A1 to D) excluding modules for which there are no inputs/outputs. No known flows are deliberately excluded from this EPD. The description of the study boundaries is declared in Section 2.2.

For this product, the stated RSL is 15 years. It should be noted, however, that the service life of carpet tiles may vary depending on the amount and nature of floor traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of its experience of flooring manufacture and supply.

The description of study boundaries is declared in Table 7.

1.5. Technical Requirements

Name	Value	Unit
Product form	Tiles (squares and planks)	-
Product thickness	4.5	mm
Total weight	6880	g/m^2

ISO 10874 Classes 33/42

1.6. Material Composition

Component	Value	Unit
Polyvinyl Chloride	25-40	%
Di(2-ethylhexyl) terephthalate	9-18	%
Recycled Limestone	Minimum 39	%
Limestone	11-23	%
Glass	<1	%
Titanium dioxide	<1	%
Carbon black	<1	%

The LVT product is produced through hot mixing and a continuous lamination process with a printed design layer. The product is then cut into tiles and packaged.

1.7. Manufacturing

LVT is manufactured in Seoul, South Korea.

1.8. Packaging

Planks and tiles are packaged in cardboard boxes. Packaging waste should be reused or sent local cardboard recycling facilities.

1.9. Transportation

Delivery is represented as transport by truck over a distance of 500 miles (805 km), and additionally transport by ship over a distance of 4400 miles (7125km) .

1.10. Product Installation

Product may be installed with adhesive. For full installation instructions, For full installation instructions, see the appropriate Interface Installation Guide via the website download.

1.11. Use

During the life of the product, it should be cleaned in accordance with the product maintenance instructions including dust and damp mop cleaning and buffing. The frequency is dependent upon the expected foot traffic and local conditions.

Product has low VOC emissions as indicated by compliance with FloorScore Flooring Products Certification Program for Indoor Air Quality and GreenGuard Gold certification.

1.12. Reference Service Life and Estimated Building Service Life

Reference service life (RSL) is 15 years based on product warranty. Estimated Building Service Life (ESL) is 75 years.

1.13. Reuse, Recycling, and Energy Recovery

The modular aspect of the product allows for easy reuse of the product. The product is intended to be recycled through Interface's ReEntry process.

1.14. Disposal

At end of life the product should be returned to Interface through Interface's ReEntry process by contacting Interface at +1 888-733-6873. Disposal in municipal landfill or commercial incineration facilities is permissible in accordance with local regulations.

2. Life Cycle Assessment Background Information

2.1. Functional or Declared Unit

The functional unit is one square meter of floorcovering.

Modular Resilient Flooring	Value	Unit
Declared unit	1	m^2
Mass*	6.8	kg/ m^2

**nominal value*

2.2. System Boundary

The LCA is “cradle-to-gate with options” for one square meter of flooring. While the warranted service life is 15 years, modules **B1**, **B3**, **B4**, and **B5** are not declared, so the maintenance (**B2**) is represented for one year. The system boundaries include:

- **A1** Raw material extraction and processing, and processing of recycled materials
- **A2** Transport to the factory
- **A3** Manufacturing including materials, packaging, energy, and waste disposal or recycling
- **A4** Transport to installation sites (Asia, US, and Europe)
- **A5** Installation including ancillary materials required for installation and trim-waste disposal
- **B2** Maintenance: Includes the energy for vacuuming, extraction cleaning, and the production and transport of cleaning agents. The treatment of the waste-water from extraction cleaning is included. This is for one year of use.
- **C2** Transport of waste to local disposal
- **C4** Disposal
- **D** Reuse, recovery and recycling potential

2.3. Estimates and Assumptions

The datasets for materials upstream from manufacturing are a combination of information from the GaBi database and supplier provided datasets. Inventories for all materials are not available and when unavailable, conservative proxy datasets were chosen based on similarity of material.

2.4. Cut-off Criteria

The cut-off criteria is less than 1% for energy use and less than 1% of total mass per unit process, the sum of which shall not exceed 5% of either energy or mass. If a flow met the cut-off criteria for exclusion, yet was thought to have significant environmental impact, then it was included.

2.5. Data Sources

The datasets for materials upstream from manufacturing are a combination of information from the GaBi database version 10.5.0.78 and supplier provided datasets.

2.6. Data Quality

The data quality ranges from good to very good. The temporal quality of the data is very good with both the manufacturing specific data and the GaBi background data being from 2020.

2.7. Period Under Review

The data collection and the product described are an average product manufactured in 2020.

2.8. Allocation

Where relevant, the background data incorporates some allocation such as in the power mix. There are no co-products produced in the process, so the LCA model does not include allocation. No credits were taken for recycling of production waste.

3. Life Cycle Assessment Scenarios

Table 1. Transport to the building site (A4)

Name	Value	Unit
Fuel type	Diesel	
Liters of fuel	0.040	l/100km
Vehicle type	Truck 34-40	tons
Transport distance (truck)	805	km
Transport distance (ship)	7125	km
Capacity utilization (including empty runs, mass based)	85	%
Weight of products transported*	3.2	kg
Volume of products transported*	0.001	m^3
Capacity utilization volume factor	1	

*nominal values

Table 2. Installation into the building (A5)

Name	Value	Unit
Ancillary materials	0.107	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	0.07	kg
Waste materials at the construction site before waste processing, generated by product installation	0.16	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Biogenic carbon contained in packaging	0.1	kg CO_2
Direct emissions to ambient air, soil and water	-	kg
VOC content	-	µg/m^3

Table 3. Reference Service Life

NAME	VALUE	UNIT
RSL	15	years

Table 4. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance values taken in reference to Interface's LVT Maintenance manual, available online as a technical document.		
Maintenance cycle per RSL	15	cycle(s)/ RSL
Maintenance cycle per ESL	75	cycle(s)/ ESL
Maintenance cycle	1	cycle(s)/ year
Dust mop (dry) cleaning	365	cycle(s)/ year
Dust mop (dry) cleaning per RSL	5460	cycle(s)/ RSL
Damp mop with cleaner	52	cycle(s)/ year
Damp mop with cleaner per RSL	780	cycle(s)/ RSL
Buffing	12	cycle(s)/ year
Buffing per RSL	180	cycle(s)/ RSL
Net freshwater consumption	5.8	kg/year
Net freshwater consumption	.0058	m^3/year
Net freshwater consumption per RSL	0.87	m^3/ RSL
Ancillary materials (cleaning agent)	.119	kg/year
Ancillary materials (cleaning agent) per RSL	1.79	kg/ RSL
Energy: Electricity consumption	.565	MJ/year
Energy: Electricity consumption	9.42	kW/year
Energy: Electricity consumption per RSL	141	kW/ RSL
Waste materials from maintenance	-	kg
Direct emissions to ambient air, soil and water (waste water)	-	kg/year

Maintenance cycle for B2 stage is measured for 1 year per the functional unit.

Table 5. End of life (C1-C4)

NAME	VALUE	UNIT
Transport to disposal	32.2	km
Landfilling	6.88	kg

Table 6. Reuse, recovery, recycling potential (D)

NAME	VALUE	UNIT
Avoided energy burden (thermal energy to natural gas)	-.17	MJ
Kg diverted from landfill	6.88	kg

4. Life Cycle Assessment Results

Table 7. Description of the system boundary modules (X=declared; MND=module not declared)

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				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 supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
EPD Type	X			X	X	MND	X	MND	MND	MND	MND	MND	MND	X	MND	X	X

4.1. Life Cycle Impact Assessment Results

Table 8. North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B2	C2	C4	D
GWP [kg CO2 eq]	9.13E+00	1.00E+00	5.08E-02	5.01E-01	1.09E-02	4.62E-01	-7.72E-02
ODP [kg CFC-11 eq]	5.66E-06	1.76E-16	8.67E-10	1.67E-08	1.87E-18	1.59E-15	-7.89E-18
AP [kg SO_2 eq]	2.72E-02	2.53E-02	1.64E-04	1.64E-03	5.48E-05	1.26E-03	-4.36E-05
EP [kg N eq]	3.04E-03	9.28E-04	4.78E-05	8.49E-05	5.12E-06	5.98E-04	-2.59E-06
SFP [kg O_3 eq]	3.96E-01	4.88E-01	2.28E-03	2.06E-02	1.26E-03	2.13E-02	-1.32E-03
ADP_{fossil} [MJ, LHV]	2.91E+01	1.82E+00	1.06E-01	1.47E+00	2.05E-02	9.23E-01	-1.99E-01

Key	GWP 100 = global warming potential; ODP = ozone depletion potential; AP = acidification potential; EP = eutrophication potential; SFP = smog formation potential; ADP fossil = abiotic resource depletion potential of non-renewable (fossil) energy resources

Table 9. EU Impact Assessment Results

CML v4.2	A1-A3	A4	A5	B2	C2	C4	D
GWP 100 [kg CO2 eq]	9.20E+00	1.01E+00	5.16E-02	5.04E-01	1.10E-02	4.68E-01	-7.76E-02
ODP [kg R11 eq]	4.22E-06	1.76E-16	6.62E-10	1.53E-08	1.87E-18	1.59E-15	-7.89E-18
AP [kg SO_2 eq]	2.57E-02	2.34E-02	1.62E-04	1.68E-03	3.97E-05	1.21E-03	-3.41E-05
EP [kg PO_4^{-3} eq]	3.54E-03	2.67E-03	1.05E-04	1.30E-04	1.17E-05	1.32E-03	-7.37E-06
POCP [kg ethene eq]	3.27E-03	7.21E-04	1.62E-05	1.58E-04	-1.72E-05	1.09E-04	-5.75E-06
$ADP_{element}$ [kg Sb-eq]	2.42E-05	5.14E-08	7.70E-09	4.66E-07	3.47E-09	8.97E-08	-4.16E-09
ADP_{fossil} [MJ, LHV]	2.28E+02	1.27E+01	8.07E-01	1.11E+01	1.54E-01	6.98E+00	-1.33E+00

Key	GWP 100 = global warming potential; ODP = depletion potential of the stratospheric ozone layer; AP = acidification potential of soil and water; EP = eutrophication potential; POCP = photochemical oxidant creation potential; ADP - elements = abiotic depletion potential for non-fossil resources; ADP - fossil = abiotic resource depletion potential for fossil resources

4.2. Life Cycle Inventory Results

Table 10. Resource Use

Parameter	A1-A3	A4	A5	B2	C2	C4	D
RPRE [MJ, LHV]	6.66E+00	_	_	3.84E-02	_	_	0.00E+00
RPRM [MJ, LHV]	1.54E+01	_	_	1.14E-01	_	_	0.00E+00
NRPRE [MJ, LHV]	1.60E+01	_	_	2.05E-01	_	_	_
NRPRM [MJ, LHV]	2.20E+02	_	_	1.15E+01	_	_	_
SM [kg]	1.83E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ, LHV]	_	_	_	_	_	_	_
NRSF [MJ, LHV]	_	_	_	_	_	_	_
RE [MJ, LHV]	_	_	_	_	_	_	_
FW [m^3]	2.66E-01	3.04E-04	2.59E-04	6.53E-03	2.71E-05	6.63E-05	-5.64E-06

Key	RPRE = Renewable primary resources used as energy carrier (fuel); RPRM = Renewable primary resources with energy content used as material; NRPRE = Non-renewable primary resources used as an energy carrier (fuel); NRPRM = Non-renewable primary resources with energy content used as material; SM = Secondary materials; RSF = Renewable secondary fuels; NRSF = Non-renewable secondary fuels; RE = Recovered energy; FW = Use of net freshwater resources

Table 11. Output Flows and Waste Categories

Parameter	A1-A3	A4	A5	B2	C2	C4	D
HWD [kg]	1.66E-05	2.73E-10	9.89E-11	1.93E-11	1.30E-11	1.29E-09	-2.50E-10
NHWD [kg]	9.33E-02	1.49E-03	5.24E-01	1.92E-03	1.40E-05	6.86E+00	-3.22E-04
HLRW [kg]	_	_	_	_	_	_	_
ILLRW [kg]	_	_	_	_	_	_	_
CRU [kg]	_	_	_	_	_	_	_
MR [kg]	_	_	_	_	_	_	_
MER [kg]	_	_	_	_	_	_	_
EE [MJ, LHV]	_	_	_	_	_	_	_

Key	HWD = hazardous waste disposed; NHWD = non-hazardous waste disposed; HLRW = high-level radioactive waste, conditioned, to final repository; ILLRW = intermediate and low-level radioactive waste, conditioned to final repository; CRU = components for reuse; MR = materials for recycling; MER = materials for energy recovery; EE = Recovered energy exported from the product system

5. LCA Interpretation

The life cycle impacts of modular carpets are driven by the Product Stage and the impacts from this stage are driven by raw materials.

6. Additional Environmental Information

6.1 Extraordinary Effects

Fire

NAME	VALUE
EN13501-1 Reaction to fire	Bfl-s1
ASTM E648 Radiant Panel	Class 1
ASTM E662 Smoke Density	< 450

Water

This product is impervious to water, protecting the subfloor from leaks and spills. Exposure to flooding for long periods may result in damage to the product.

Mechanical Destruction

The product is intended for commercial applications with heavy wear. Performance requires proper installation according to Interface installation guidelines.

7. References

ASTM
ASTM E-648. Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source. https://www.astm.org/Standards/E648.htm
ASTM E-662. Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials. https://www.astm.org/Standards/E662.htm

EN 15804
EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

GaBi 10
GaBi 10:2021: Software-System and Databases for Life Cycle Engineering Copyright, TM. Stuttgart, Echterdingen

ISO 14025
ISO 14025:2006 : Environmental labels and declarations — Type III environmental declarations —Principles and procedures.

ISO 14040
ISO 14040:2006 : Environmental management — Life cycle assessment —Principles and framework. Amd 1:2020.

ISO 14044
ISO 14044:2006 : Environmental management — Life cycle assessment —Requirements and guidelines. Amd 1:2017 / Amd 2:2020

ISO 21930
ISO 21930 :2017 : Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services

UL Environment
UL Environment General Program Instructions March 2020. version 2.5

UL 10010. PCR Part A
PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. UL Environment. https://industries.ul.com/environment

UL 10010-7. PCR Part B

PCR - Part B: Flooring EPD Requirements. Second Edition. Dated September 28. 2018. UL Environment. https://www.ul.com/

Interface
LVT Installation Instructions. Rev. November 1, 2020.
https://www.interface.com/US/en-US/about/modular-system/Installation-Instructions