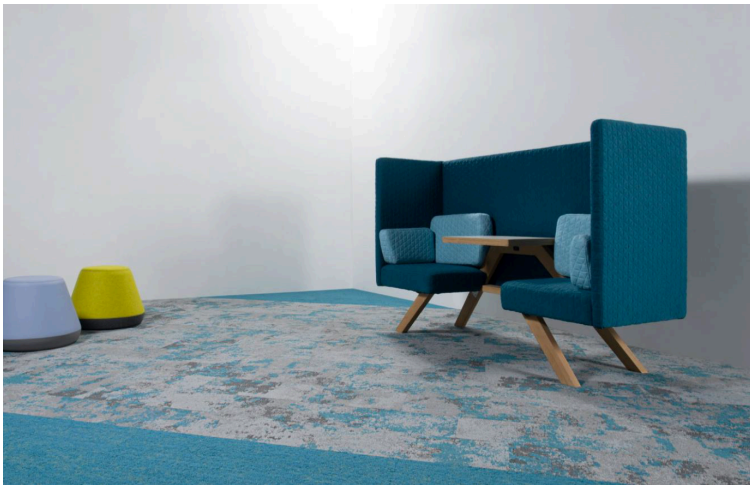
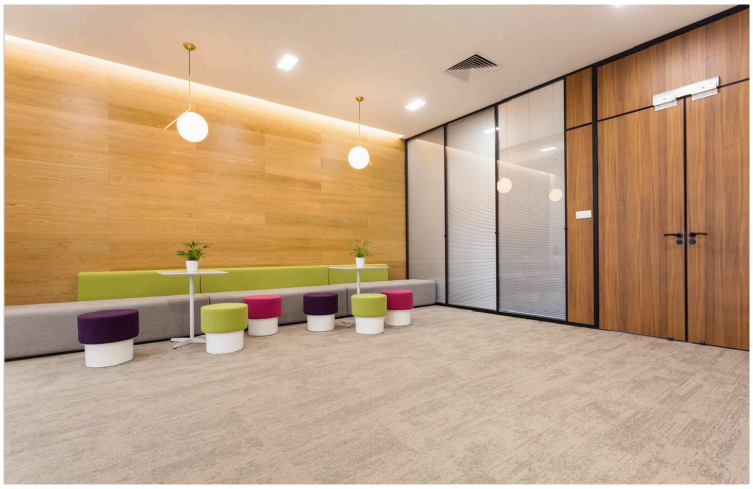
Environmental Product Declaration

Carpet Tile: SDN 6/6.6 Cushion Backing

VOXFLOR INDUSTRIAL PARK CO., LTD
SDN 6/ 6.6 CARPET TILE WITH CUSHION BACKING





Mix-Bac®, SDN6
Mix-Bac®, SDN6.6
C-Bac®, SDN6
C-Bac®, SDN6.6

VOXFLOR

VOXFLOR is a forward-looking company which proactively addresses both social and environmental footprints. VOXFLOR is committed to reduce the environmental footprint of carpet through effort such as GreenWorks™ system focusing on the recycle process and energy recovery during production process.
"Your Color Story" shows VOXFLOR's commitment to make the world a better place through design. From product research, development to service, VOXFLOR provides products that meet environmental requirements, uses tailored colors to suit personal aesthetic needs, creates solution to care for people and designs for a better future.

For more information visit:
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UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
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ENVIRONMENTAL PRODUCT DECLARATION

VOXFLOR

SDN 6/6.6 CARPET TILE
CUSHION-BACKED CARPET TILE

According to ISO 14025, EN 15804, and ISO 21930:2017

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 Version 2.2 June 2017
MANUFACTURER NAME AND ADDRESS	VOXFLOR Industrial Park Co., Ltd. Dongxing Road, high and new technology development zone, Xinyu, Jiangxi province, China
DECLARATION NUMBER	4788747028.101.1
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	SDN 6/6.6 Carpet Tile Cushion-Backed, 1 m^2
REFERENCE PCR AND VERSION NUMBER	Product Category Rules for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements, *Standard 10010, Version 3.2* Part B: Flooring EPD Requirements, *UL 10010-7, Version 2.0*, September 2018
DESCRIPTION OF PRODUCT APPLICATION/USE	Carpet for commercial spaces
PRODUCT RSL DESCRIPTION	10 Years
MARKETS OF APPLICABILITY	Global, NA/EU
DATE OF ISSUE	October 1, 2019
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product-specific
EPD SCOPE	Cradle to grave
YEAR(S) OF REPORTED PRIMARY DATA	2018
LCA SOFTWARE & VERSION NUMBER	SimaPro 8.4
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent, Ecoinvent 3- CN, ELCD
LCIA METHODOLOGY & VERSION NUMBER	CML-IA (baseline) & TRACI

The PCR review was conducted by:	UL Environment PCR Peer Review Panel
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria Thomas P. Gloria, Industrial Ecology Consultants

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

VOXFLOR is a professional carpet tile manufacturer. It has over 120 dealers in more than 50 countries all over the world. Inspired by nature's beauty, VOXFLOR's design concept focuses on recreating natural beauty with sophisticated carpet texture and the most vivid colors. Texture, color and techniques are the essences of the carpet products.

VOXFLOR has been awarded certificates for compliance with the following standards:

- ISO 9001:2008 - Quality Management System
- ISO 14001:2015 - Environmental Management System
- OHSAS 18001:2007 - Occupational Health and Safety Management System

1.2 Product Description

1.2.1 Product Identification

This declaration covers four types of cushion backed carpet tiles produced by VOXFLOR, and each following type consists of a range of styles and colors.

- Mix-Bac®, SDN6
- Mix-Bac®, SDN6.6
- C-Bac®, SDN6
- C-Bac®, SDN6.6

1.2.2 Product Specification

VOXFLOR cushion backed carpet tiles are nylon carpet tiles with environmental cushion backing system with low VOC emissions. There are two kinds of cushion back: Mix-Bac® and C-Bac®. Mix-Bac® is developed as VOXFLOR's high end new sustainable carpet tile backing system. It has an average of 34% recycled content by weight, and it is 100% recyclable. The Mix-Bac® cushion backing contributes to absorbing foot impact, and as a result, enhances comfort and roller mobility. The main physical difference between Mix- Bac® and C-Bac® lies in the density of secondary backing:

- Density of secondary backing for Mix-Bac® 1100g/m^2
- Density of secondary backing for C-Bac® 450g/m^2

The following figure shows the structure of cushion backed carpet tile. From bottom up, the tile is composed of five layers, i.e. Secondary Backing, Bitumen, Pre-coating, Primary Backing and Yarn.

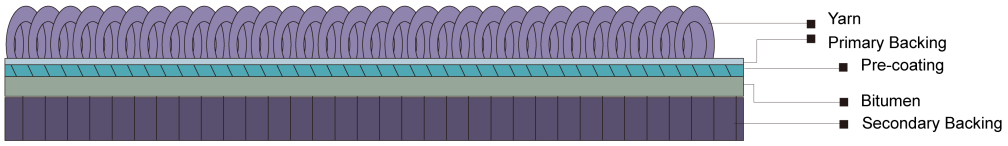

Figure 1 Cushion backed carpet tile product construction

Table 1. Technical specifications of the VOXFLOR cushion carpet tiles

EUROPEAN STANDARDS	AMERICAN STANDARDS
EN 13501 FIRE TEST	ASTM E648 RADIANT PANE ASTM E662 SMOKE DENSITY
EN986 DIMENSIONAL STABILITY	AACHEN DIMENSIONAL STABILITY
EN1307 CLASSIFICATION OF PILE	ASTM D5252 HEXAPOD DRUM
ISO105 COLOR FASTNESS TO LIGHT	AATCC 16E COLORFASTNESS TO LIGHT
ISO105 COLOR FASTNESS TO WATER	AATCC 107 COLORFASTNESS TO WATER
ISO105 COLOR FASTNESS TO RUBBING	AATCC 165 COLORFASTNESS TO CROCKING
ISO6356 ELECTRICAL PROPENSITY	AATCC 134 ELECTROSTATIC
EN ISO 354 SOUND ABSORPTION COEFFICIENT	
EN ISO 10140 IMPACT SOUND INSULATION	

1.2.3 Product Specific EPD

This declaration covers four types of cushion-backed carpet tiles. The differences among the products lies in the raw material yarn and the density of secondary backing. The main manufacturing process is totally the same. However, each product was analyzed individually and the LCA results are presented separately in this declaration.

While allocating energy and auxiliary materials within the production site, allocation was carried out based on either mass or size of the product produced on a yearly average.

1.3 Application

The products covered in this declaration are for application in corporate/commercial office spaces, in store spaces, hospitality & leisure spaces, education & healthcare spaces, government/institutional spaces and transport spaces.

1.4 Declaration of Methodological Framework

In this project, a full LCA approach is considered with some simplification on data modeling using generic data for most background system. The EPD analysis uses a cradle-to-grave system boundary. No known flows are deliberately excluded from this EPD.

To calculate product use and replacement, a 10-year reference service life was assumed for the declared products.

Additional details on assumptions, cut-off and allocation procedures are found in sections 2.4, 2.5 and 2.9 respectively.

1.5 Technical Requirements

The VOXFLOR cushion carpet tiles cover various types and colors. Therefore, the following technical data provides a range of values for some parameters. The CRI rating helps to determine the right commercial carpet for specific areas of use. VOXFLOR cushion carpet tiles are appropriate to be applied in situations from moderate (2.5) to even severe (3.5) use.

Table 2. Technical data for VOXFLOR cushion carpet tiles

	SDN 6 + Mix-Bac®	SDN 6.6 + Mix-Bac®	SDN 6 + C-Bac®	SDN 6.6 + C-Bac®	Unit
YARN TYPE	Nylon 6	Nylon6.6	Nylon 6	Nylon6.6	
PRIMARY BACKING TYPE	Polyethylene terephthalate	Polyethylene terephthalate	Polyethylene terephthalate	Polyethylene terephthalate	
SECONDARY BACKING TYPE	Polyethylene terephthalate	Polyethylene terephthalate	Polyethylene terephthalate	Polyethylene terephthalate	
CRI RATING	2.5-3.5	2.5-3.5	2.5-3.5	2.5-3.5	
TOTAL THICKNESS	8-13	8-13	6-11	6-11	mm
PRODUCT WEIGHT	4080-5080	4080-5080	3430-4230	3430-4230	g/m^2
SURFACE PILE THICKNESS	3-7	3-7	3-7	3-7	mm
SURFACE PILE WEIGHT	440-1200	440-1200	440-1200	440-1200	g/m^2

1.6 Placing on the Market / Application Rules

VOXFLOR cushion-backed carpet tile has fulfilled the criteria of the following accreditation bodies and also has the technical specifications as shown in Table 1:

- Declare
- CRI Green Label Plus

1.7 Material Composition

Table 3. Material Composition

COMPONENT	MATERIALS	SDN 6 + Mix-Bac®	SDN 6.6 + Mix-Bac®	SDN 6 + C-Bac®	SDN 6.6 + C-Bac®
Yarn	**Nylon 6**	15%-24%		15%-24%	
Yarn	**Nylon 66**		15%-24%		15%-24%
Primary Backing/ Secondary Backing	**Polyethylene terephthalate**	14%-27%	14%-27%	14%-27%	14%-27%
Backing	**Aluminum Hydroxide**	4%-5%	4%-5%	4%-5%	4%-5%
Backing	**Vinyl Acetate Ethylene**	2%-3%	2%-3%	2%-3%	2%-3%
Backing	**Calcium Carbonate**	24%-30%	24%-30%	24%-30%	24%-30%
Backing	**Bitumen**	24%-31%	24%-31%	24%-31%	24%-31%

Solution dyed yarn is made of either nylon 6 or nylon 66. After post-spinning, it can meet the carpet performance and design requirements. Polyester non-woven fabric is used as the base layer (primary backing) for yarn tufting and secondary backing as well. Secondary backing provides support for the carpet and guarantees dimensional stability, sound absorption and use comfort. As an important part of the backing, bitumen is used to bond pre-coated matte and secondary backing.

1.8 Manufacturing

The manufacturing process of VOXFLOR cushion backed carpet tiles mainly includes yarn treatment, tufting process, pre-coating, backing, cutting and packaging.

The yarn is first processed (Post Spinning) to meet the carpet performance and design requirements, and then tufted on the primary backing by tufting equipment to form a tuft cloth. Afterwards, the pre-coating process will be applied to the back of the carpet surface to fasten off the yarn and finish the backing process. In the end, the finished product will be diced and packaged.

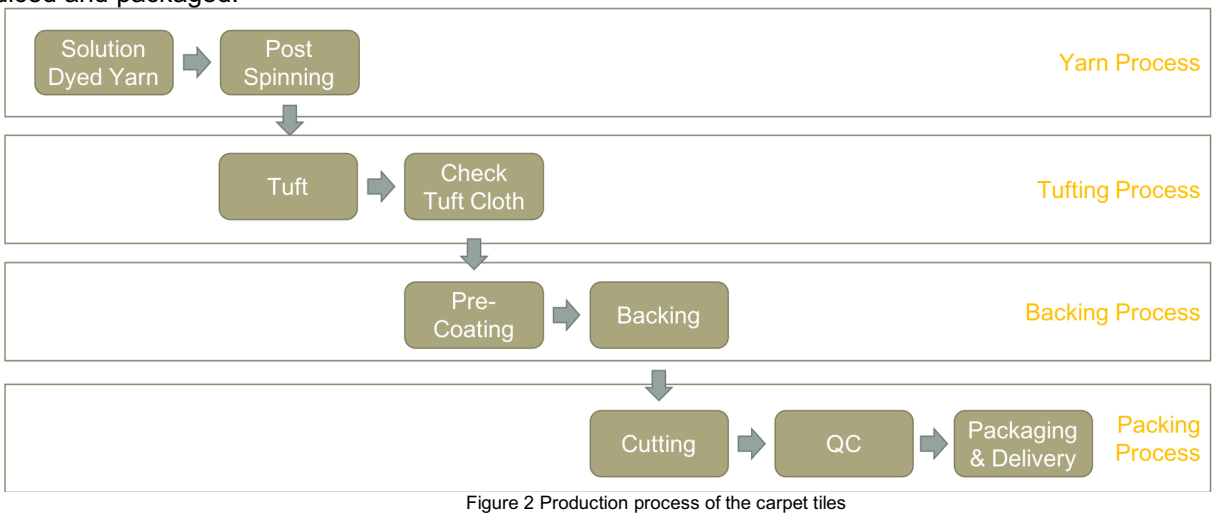

Figure 2 Production process of the carpet tiles

1.9 Packaging

Packaging materials consist of cardboard and wood pallet. 54.1% of VOXFLOR carpet tiles are consumed in China and 45.9% are consumed overseas. In the calculation model, the disposal of packaging materials adopts a rough country and region weighted average disposal mode following the UL PCR for Building-Related Products and Services Part A Section 2.8.5.

1.10 Transportation

54.1% of VOXFLOR carpet tiles are consumed in China and 45.9% are transported overseas.
Oceanic and road transportation distance for product delivery was estimated with reference to external resources. Table 7 demonstrates the data used for stage A4 in the LCA modelling.

1.11 Product Installation

For the installation of VOXFLOR carpet tiles, a full spread (65g/m^2) of carpet adhesive should be applied with a paint roller. Allow the adhesive to dry until it becomes transparent. The adhesive should not transfer to the back of the tile.

Tools like paint roller, knife and scissors are reusable, thus the production and disposal stages of tools were omitted in this study.

1.12 Use condition

After installation, cleaning is required for regular maintenance and upkeep of the product. The cleaning schedule depends on several factors: weight capacity, terminal function and dust amount entering into the building, etc. For the purposes of this EPD, average maintenance is presented based on typical installations. For the calculations the cleaning routine presented in Table was considered.

1.13 Reference Service Life and Estimated Building Service Life

VOXFLOR cushion backed carpet tiles will be used for commercial purpose with a RSL of 10 years.

1.14 Reuse, Recycling, and Energy Recovery

VOXFLOR has different treatment solutions for waste generated at different stages:

- Waste yarn and waste carpet tiles (not pre-coated) generated from mass production are sold to specialized recycling manufacturers for plastic granulation.
- Scraps left over from cutting process is recycled and used as filler or crushed into pallets for the production of shoe soles.

1.15 Disposal

54.1% of VOXFLOR carpet tiles are consumed in China and 45.9% are consumed overseas. For the model calculation, the disposal of the used carpet tile adopts a country and region weighted average disposal mode. End of life disposal treatment process (C4) from Ecoinvent was used in this LCA calculation. In accordance with disposal routes and waste classification referenced in PCR part A section 2.8.5 and 2.8.6, for Chinese market, the disposal scenario was modelled with 5% recycle, 95% landfill and 0% incineration. For carpet tiles in overseas market, the disposal scenario (20% recycle, 70% landfill, 10% incineration) was taken as an average of the countries representing overseas market.

2. Life Cycle Assessment Background Information

2.1 Functional Unit

In this study, the functional unit was defined as 1 (one) m^2 of carpet tile.

Table 4. Functional unit information

NAME		VALUE	UNIT
FUNCTIONAL UNIT		1 m^2	
MASS	MIX-BAC®, SDN6	4.08-5.08	kg
	MIX-BAC®, SDN6.6	4.08-5.08	kg
	C-BAC®, SDN6	3.43-4.23	kg
	C-BAC®, SDN6.6	3.43-4.23	kg

2.2 System Boundary

The life cycle stages considered in this LCA study are from cradle to grave.

The product stage for carpet tiles includes extraction and processing of raw materials, transportation to the factory and manufacturing processes with packaging and etc. The construction process stage includes transportation of carpet to the building site from the factory and the installation phase. The use stage includes maintenance of carpet. And the end of life stage includes deconstruction, transportation of waste products to final disposition site, disposal and etc.

Over through the life cycle stages of products, all energy and material inputs have been traced back to the extraction of resources, emissions from the whole system have been quantified and waste management scenarios have also been included.

2.3 Product for Use Phase (Modules B1-B7)

For the calculations for use phase the following cleaning routine was considered:

Table 5. Cleaning and maintenance

CLEANING PROCESS	CLEANING FREQUENCY	CONSUMPTION OF ENERGY AND RESOURCES
VACUUMING	TWICE A WEEK	ELECTRICITY
EXTRACTION CLEANING	TWICE ANNUALLY	HOT WATER AND DETERGENT

Table 6. Inputs in maintenance stage

	AMOUNT	UNITS	SCENARIO
Water	1.93	L/m^2/year	Based on full vacuuming twice a week, extraction cleaning twice annually
Electricity	0.45	kWh/m^2/year	
Detergent	0.007	g/m^2/year	

2.4 Estimates and Assumptions

The main assumptions of this LCA study are as follows:

- The transportation distance of packaging was assumed to be 30 km as more accurate data was unavailable, and a sensitivity analysis was conducted.
- For the waste scenario, 100km of road transportation (C2) distance from home to MSW treatment site was assumed, which is moderate among China and overseas market.
- According to the manufacturer, two specifications (100g/m^2, 120g/m^2) of the primary backing materials were used for the carpet tiles and the primary backing material with the density of 120g/m^2 was used little. Moreover, there was no accurate use ratio data of the two specifications. Therefore, it was assumed that all products used the primary backing material with 100g/m^2, and a sensitivity analysis was conducted to support the analysis.
- Transport assumptions were made where it was not possible to obtain the specific data, which was clearly stated in the LCA report and a sensitivity analysis was conducted.
- Assumptions of electricity consumption data for certain processes during maintenance stage were made, which was clearly stated in the LCA report, and a sensitivity analysis was also conducted.

- As the distribution data of products in foreign markets was unavailable, disposal scenarios were developed in the disposal stage for foreign markets, which was clearly stated in the LCA report, and a sensitivity analysis was also performed for disposal scenarios.
- Waste to energy was not considered in this modelling.

2.5 Cut-off Criteria

The following procedures were followed for the exclusion of inputs and outputs:

- All inputs and outputs to a (unit) process were included in the calculation where data was available. Data gaps were filled by conservative assumptions with average or generic data. Any assumptions for such choices were documented.
- In case of insufficient input data or data gaps for a unit process, according to the PCR requirement, the cut-off criteria chosen is 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows of the cradle to grave stage, e.g. per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5% of energy usage and mass. In this study, the neglected flow is demonstrated in the table below.

Processes that contribute to obviously less than 1% of overall mass and energy contribution were cut off, which include:

- Storage phases and sales of product
- Handling operations at the distribution center and retail outlet
- Secondary and transit packaging
- Transport from distribution warehouse to retail outlet and from retail outlet to consumer household or commercial center

2.6 Data Sources

Generic data from various sources was used, including literature review, public source, database like Ecoinvent, ELCD, Chinese LCI and etc.

For all the major material and energy used for the manufacturing of VOXFLOR carpet tile, Chinese energy, raw material data was used to the best extent to reflect the accuracy and representativeness of results. For instance, the electricity data is based on State Grid Corporation of China (SGCC) inventory. The inventory was prepared by Ecovane LCA consultant. It considers the power plant efficiency, emission factor, power grid loss and also traces back to raw energy materials such as coal and natural gas. And for the raw materials, which are supplied by suppliers from different countries and regions around the world and transported to Xinyu, country of origin or global raw material data was used in the study.

2.7 Data Quality

The principle of using generic data is to ensure that there will be no empty (dummy) process used for major processes associated with the product. Effort has been taken in this study to address the representativeness of generic data, and supply chain data collection was conducted to minimize the distortion of result from using generic data. In some specific cases, Chinese LCI data was deselected due to its lower quality and incompleteness when compared to other database available such as Ecoinvent. For instance, for the road transportation calculation Ecoinvent's data was selected, even though Chinese transportation model was also available.

2.8 Period under Review

Primary data used was derived for the year of 2018.

2.9 Allocation

In this study, in-plant recycling for production was assumed as a close loop, meaning all of the environmental impacts from the recycling of scraps from production and environmental benefits of using recycled material to avoid waste treatment for production were allocated to the process of carpet tiles production.
For recycling process at the end-of-life stage, to be conservative, the environmental benefits of recycling were not included in the product system, and the waste-to-energy benefit from incineration of waste was not declared in the study.

For process-related allocations, a distinction was made between multi-input and multi-output processes.

- Multi-input processes

  While allocating energy and auxiliary materials within the production site, allocation was carried out based on either mass or size of the product produced on a yearly average. The principle for choosing “mass” or “size” is based on the relationship of the input to the output of product. In most cases, the input amount is in linear with the mass of product produced, with exception for pre-coating processes whose inputs are in proportion to size of the product produced, hence the allocation of energy and material related to this kind of processes was following size instead of mass quantity.

- Multi-output processes

  In this study, there were no other by-products produced from the production line, therefore there was quite little occasion that requires allocation for multi-output processes. For waste treatment, one allocation was carried out on the environmental emissions. Relevant processes can be apportioned in a causal way. In the end-of-life stage, the allocation within the disposal scenario followed mass allocation.

2.10 Comparability (Optional)

No comparisons or benchmarking is included in this EPD. LCA results across EPDs can be calculated with different background databases, modeling assumptions, geographic scope and time periods, all of which are valid and acceptable according to the Product Category Rules (PCR) and ISO standards. The user of the EPD should take care when comparing EPDs from different companies. Assumptions, data sources, and assessment tools may all impact the uncertainty of the final results and make comparisons misleading.

3. Life Cycle Assessment Scenarios

54.1% of VOXFLOR carpet tiles are consumed in China and 45.9% are transported overseas. Oceanic and road transportation distance for product delivery was estimated with reference to external resources. The table below demonstrates the data used for stage A4 in the LCA modelling.

Table 7. Transport to the building site (A4)

NAME		VALUE		UNIT
		ROAD	OCEAN	
Fuel type		DIESEL	HEAVY OIL	
Liters of fuel		31.11 l/100km	10.175 t/100km	l/100km or t/100km
Vehicle type		LORRY	SHIP	
Transport distance		1039.6	10000	km
Capacity utilization (including empty runs, mass based		50	100	%
Gross density of products transported	Mix-Bac®, SDN6	425	425	kg/m^3
	Mix-Bac®, SDN6.6	425	425	
	C-Bac®, SDN6	450	450	
	C-Bac®, SDN6.6	450	450	
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)		0.4	0.4	-

Table 8. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	0.065	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	0.015	m^2/m^2
Waste materials at the construction site before waste processing, generated by product installation	0.015	m^2/m^2
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Mass of packaging waste specified by type	Pulp: 0.184 kg Wood: 0.02 kg	kg
Biogenic carbon contained in packaging	0.68	kg CO_2
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	N/A	µg/m^3

Table 9. Reference Service Life

NAME	VALUE	UNIT
RSL	10	years
Declared product properties (at the gate) and finishes, etc.	Carpet tile	m^2
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	-	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	-	-
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	-	-
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Temperature 15.5°C- 29.5°C; Humidity 40% - 65%; Concrete slab moisture ≤8%; Concrete alkalinity 5 - 9	-
Use conditions, e.g. frequency of use, mechanical exposure.	Commercial use	-
Maintenance, e.g. required frequency, type and quality of replacement components	Full vacuuming twice a week, extraction cleaning twice annually	-

Table 10. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	Full vacuuming twice a week, extraction cleaning twice annually	-
Maintenance cycle	Full vacuuming twice / week extraction cleaning twice / year	Cycles/ RSL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	0.00193 m^3 city water disposed to sewer	m^3/year
Ancillary materials specified by type (e.g. cleaning agent)	0.007 (cleaning agent)	g/m^2/year
Other resources	-	kg
Energy input, specified by activity, type and amount	Electricity consumption 0.45	kWh/m^2/year
Other energy carriers specified by type	-	kWh
Power output of equipment	-	kW
Waste materials from maintenance (specify materials)	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	-	-

As mention above, the VOXFLOR carpet tiles are sold in China and overseas. For Chinese market, the disposal scenario was modelled with 5% recycle, 95% landfill and 0% incineration. For overseas market, the disposal scenario (20% recycle, 70% landfill, 10% incineration) was taken as an average of the countries representing overseas market.

For the waste scenario, 100km of road transportation (C2) distance from home to MSW treatment site was assumed, which is moderate among China and overseas market. And zero input and output were assumed for deconstruction of the tile (C1) and waste processing (C3). The table below demonstrates the data used for stage C1-C4 in the LCA modelling.

Table 11. End of life (C1-C4)

NAME		VALUE		UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		See description above		
Collection process (specified by type)	Collected separately	-		kg
	Collected with mixed construction waste	Mix-Bac®, SDN6	4.25	kg
		Mix-Bac®, SDN6.6	4.25	
		C-Bac®, SDN6	3.6	
		C-Bac®, SDN6.6	3.6	
Recovery (specified by type)	Reuse	-		kg
	Recycling	Mix-Bac®, SDN6	0.505	kg
		Mix-Bac®, SDN6.6	0.505	
		C-Bac®, SDN6	0.428	
		C-Bac®, SDN6.6	0.428	
	Landfill	Mix-Bac®, SDN6	3.550	kg
		Mix-Bac®, SDN6.6	3.550	
		C-Bac®, SDN6	3.007	
		C-Bac®, SDN6.6	3.007	
	Incineration	Mix-Bac®, SDN6	0.195	kg
		Mix-Bac®, SDN6.6	0.195	
		C-Bac®, SDN6	0.165	
		C-Bac®, SDN6.6	0.165	
	Incineration with energy recovery	-		kg
	Energy conversion efficiency rate	-		
Disposal (specified by type)	Product or material for final deposition	0		kg
Removals of biogenic carbon (excluding packaging)		0		kg CO_2

4. Life Cycle Assessment Results

Table 12. Description of the system boundary modules

	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: Cradle-to-grave	X	X	X	X	X	MND	X	MND	MND	MND	MND	MND	X	X	X	X	MND

4.1 Life Cycle Impact Assessment Results

Table 13. North American Impact Assessment Results for Mix-Bac®, SDN 6

Impact category (TRACI)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Ozone depletion	kg CFC-11 eq	2.22E-06	1.72E-06	2.27E-07	5.63E-09	1.04E-07	1.33E-07	3.12E-08
Global warming	kg CO_2 eq	2.40E+01	1.47E+01	9.79E-01	2.29E-01	4.96E+00	5.49E-01	2.57E+00
Smog	kg O_3 eq	1.47E+00	8.63E-01	1.95E-01	4.05E-03	2.93E-01	8.74E-02	2.24E-02
Acidification	kg SO_2 eq	1.04E-01	6.49E-02	9.42E-03	2.96E-04	2.48E-02	3.19E-03	1.55E-03
Eutrophication	kg N eq	7.90E-02	2.09E-02	1.15E-03	1.32E-03	7.08E-03	4.46E-04	4.81E-02
Carcinogenics	CTUh	9.52E-07	7.06E-07	2.64E-08	2.99E-09	9.95E-08	5.11E-09	1.12E-07
Non carcinogenics	CTUh	9.25E-06	1.69E-06	1.79E-07	2.17E-08	4.60E-07	4.16E-08	6.86E-06
Respiratory effects	kg PM2.5 eq	1.24E-02	7.79E-03	8.35E-04	3.95E-05	2.94E-03	4.01E-04	3.84E-04
Ecotoxicity	CTUe	6.33E+02	6.66E+01	4.19E+00	5.01E-01	1.83E+01	6.22E-01	5.43E+02
Fossil fuel depletion	MJ surplus	4.44E+01	3.97E+01	2.01E+00	3.10E-01	8.92E-01	1.18E+00	3.07E-01

Table 14. North American Impact Assessment Results for Mix-Bac®, SDN 6.6

Impact category (TRACI)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Ozone depletion	kg CFC-11 eq	2.24E-06	1.74E-06	2.27E-07	5.63E-09	1.04E-07	1.33E-07	3.12E-08
Global warming	kg CO_2 eq	2.31E+01	1.38E+01	9.79E-01	2.29E-01	4.96E+00	5.49E-01	2.57E+00
Smog	kg O_3 eq	1.40E+00	7.95E-01	1.95E-01	4.05E-03	2.93E-01	8.74E-02	2.24E-02
Acidification	kg SO_2 eq	1.05E-01	6.57E-02	9.42E-03	2.96E-04	2.48E-02	3.19E-03	1.55E-03
Eutrophication	kg N eq	8.55E-02	2.74E-02	1.15E-03	1.32E-03	7.08E-03	4.46E-04	4.81E-02
Carcinogenics	CTUh	9.60E-07	7.14E-07	2.64E-08	2.99E-09	9.95E-08	5.11E-09	1.12E-07
Non carcinogenics	CTUh	9.26E-06	1.70E-06	1.79E-07	2.17E-08	4.60E-07	4.16E-08	6.86E-06
Respiratory effects	kg PM2.5 eq	1.24E-02	7.77E-03	8.35E-04	3.95E-05	2.94E-03	4.01E-04	3.84E-04
Ecotoxicity	CTUe	6.34E+02	6.76E+01	4.19E+00	5.01E-01	1.83E+01	6.22E-01	5.43E+02
Fossil fuel depletion	MJ surplus	4.52E+01	4.05E+01	2.01E+00	3.10E-01	8.92E-01	1.18E+00	3.07E-01

Table 15. North American Impact Assessment Results for C-Bac®, SDN 6

Impact category (TRACI)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Ozone depletion	kg CFC-11 eq	1.81E-06	1.37E-06	1.92E-07	5.63E-09	1.04E-07	1.13E-07	2.67E-08
Global warming	kg CO_2 eq	2.08E+01	1.19E+01	8.30E-01	2.29E-01	4.96E+00	4.65E-01	2.43E+00
Smog	kg O_3 eq	1.20E+00	6.48E-01	1.65E-01	4.05E-03	2.93E-01	7.40E-02	1.91E-02
Acidification	kg SO_2 eq	8.85E-02	5.14E-02	7.98E-03	2.96E-04	2.48E-02	2.70E-03	1.31E-03
Eutrophication	kg N eq	6.63E-02	1.51E-02	9.72E-04	1.32E-03	7.08E-03	3.77E-04	4.14E-02
Carcinogenics	CTUh	8.03E-07	5.65E-07	2.23E-08	2.99E-09	9.95E-08	4.33E-09	1.10E-07
Non carcinogenics	CTUh	8.44E-06	1.05E-06	1.52E-07	2.17E-08	4.60E-07	3.53E-08	6.73E-06
Respiratory effects	kg PM2.5 eq	9.79E-03	5.46E-03	7.07E-04	3.95E-05	2.94E-03	3.39E-04	3.04E-04
Ecotoxicity	CTUe	5.81E+02	4.36E+01	3.55E+00	5.01E-01	1.83E+01	5.27E-01	5.14E+02
Fossil fuel depletion	MJ surplus	3.53E+01	3.11E+01	1.70E+00	3.10E-01	8.92E-01	9.97E-01	2.62E-01

Table 16. North American Impact Assessment Results for C-Bac®, SDN 6.6

Impact category (TRACI)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Ozone depletion	kg CFC-11 eq	1.81E-06	1.36E-06	1.92E-07	5.63E-09	1.04E-07	1.13E-07	2.67E-08
Global warming	kg CO_2 eq	1.98E+01	1.09E+01	8.30E-01	2.29E-01	4.96E+00	4.65E-01	2.43E+00
Smog	kg O_3 eq	1.11E+00	5.52E-01	1.65E-01	4.05E-03	2.93E-01	7.40E-02	1.91E-02
Acidification	kg SO_2 eq	8.74E-02	5.04E-02	7.98E-03	2.96E-04	2.48E-02	2.70E-03	1.31E-03
Eutrophication	kg N eq	7.26E-02	2.15E-02	9.72E-04	1.32E-03	7.08E-03	3.77E-04	4.14E-02
Carcinogenics	CTUh	8.09E-07	5.70E-07	2.23E-08	2.99E-09	9.95E-08	4.33E-09	1.10E-07
Non carcinogenics	CTUh	8.44E-06	1.05E-06	1.52E-07	2.17E-08	4.60E-07	3.53E-08	6.73E-06
Respiratory effects	kg PM2.5 eq	9.63E-03	5.30E-03	7.07E-04	3.95E-05	2.94E-03	3.39E-04	3.04E-04
Ecotoxicity	CTUe	5.82E+02	4.44E+01	3.55E+00	5.01E-01	1.83E+01	5.27E-01	5.14E+02
Fossil fuel depletion	MJ surplus	3.59E+01	3.17E+01	1.70E+00	3.10E-01	8.92E-01	9.97E-01	2.62E-01

Table 17. EU Impact Assessment Results for Mix-Bac®, SDN 6

Impact category (CML)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Abiotic depletion	kg Sb eq	8.22E-05	7.61E-05	2.05E-06	2.65E-07	3.22E-06	3.31E-07	2.49E-07
Abiotic depletion (fossil fuels)	MJ	3.74E+02	3.06E+02	1.51E+01	2.20E+00	3.99E+01	8.32E+00	3.12E+00
Global warming (GWP100a)	kg CO_2 eq	2.40E+01	1.47E+01	9.79E-01	2.29E-01	4.96E+00	5.49E-01	2.57E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	1.67E-06	1.30E-06	1.71E-07	4.47E-09	6.42E-08	1.00E-07	2.39E-08
Human toxicity	kg 1.4-DB eq	9.71E+00	3.79E+00	3.13E-01	1.10E-01	1.09E+00	9.18E-02	4.32E+00
Fresh water aquatic ecotox.	kg 1.4-DB eq	2.56E+01	2.16E+00	7.32E-02	3.62E-02	8.16E-01	1.78E-02	2.25E+01
Marine aquatic ecotoxicity	kg 1.4-DB eq	7.97E+04	7.53E+03	3.23E+02	1.67E+02	5.67E+03	5.78E+01	6.59E+04
Terrestrial ecotoxicity	kg 1.4-DB eq	1.19E-01	1.85E-02	1.41E-03	1.02E-04	9.21E-02	2.12E-04	6.57E-03
Photochemical oxidation	kg C_2H_4 eq	5.64E-03	3.48E-03	2.93E-04	5.84E-05	1.11E-03	1.03E-04	5.91E-04
Acidification	kg SO_2 eq	1.02E-01	6.46E-02	8.56E-03	3.00E-04	2.43E-02	2.62E-03	1.39E-03
Eutrophication	kg $(PO_4)^{3-}$ eq	3.89E-02	1.41E-02	1.31E-03	5.14E-04	4.39E-03	5.53E-04	1.80E-02

Table 18. EU Impact Assessment Results for Mix-Bac®, SDN 6.6

Impact category (CML)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Abiotic depletion	kg Sb eq	3.47E-05	2.86E-05	2.05E-06	2.65E-07	3.22E-06	3.31E-07	2.49E-07
Abiotic depletion (fossil fuels)	MJ	3.82E+02	3.13E+02	1.51E+01	2.20E+00	3.99E+01	8.32E+00	3.12E+00
Global warming (GWP100a)	kg CO_2 eq	2.31E+01	1.38E+01	9.79E-01	2.29E-01	4.96E+00	5.49E-01	2.57E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	1.68E-06	1.32E-06	1.71E-07	4.47E-09	6.42E-08	1.00E-07	2.39E-08
Human toxicity	kg 1.4-DB eq	9.71E+00	3.79E+00	3.13E-01	1.10E-01	1.09E+00	9.18E-02	4.32E+00
Fresh water aquatic ecotox.	kg 1.4-DB eq	2.56E+01	2.19E+00	7.32E-02	3.62E-02	8.16E-01	1.78E-02	2.25E+01
Marine aquatic ecotoxicity	kg 1.4-DB eq	7.98E+04	7.65E+03	3.23E+02	1.67E+02	5.67E+03	5.78E+01	6.59E+04
Terrestrial ecotoxicity	kg 1.4-DB eq	1.19E-01	1.84E-02	1.41E-03	1.02E-04	9.21E-02	2.12E-04	6.57E-03
Photochemical oxidation	kg C_2H_4 eq	5.68E-03	3.53E-03	2.93E-04	5.84E-05	1.11E-03	1.03E-04	5.91E-04
Acidification	kg SO_2 eq	1.03E-01	6.62E-02	8.56E-03	3.00E-04	2.43E-02	2.62E-03	1.39E-03
Eutrophication	kg $(PO_4)^{3-}$ eq	3.98E-02	1.49E-02	1.31E-03	5.14E-04	4.39E-03	5.53E-04	1.80E-02

Table 19. EU Impact Assessment Results for C-Bac®, SDN 6

Impact category (CML)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Abiotic depletion	kg Sb eq	7.17E-05	6.60E-05	1.74E-06	2.65E-07	3.22E-06	2.80E-07	2.26E-07
Abiotic depletion (fossil fuels)	MJ	3.04E+02	2.40E+02	1.28E+01	2.20E+00	3.99E+01	7.05E+00	2.57E+00
Global warming (GWP100a)	kg CO_2 eq	2.08E+01	1.19E+01	8.30E-01	2.29E-01	4.96E+00	4.65E-01	2.43E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	1.35E-06	1.03E-06	1.44E-07	4.47E-09	6.42E-08	8.48E-08	2.05E-08
Human toxicity	kg 1.4-DB eq	7.47E+00	2.48E+00	2.65E-01	1.10E-01	1.09E+00	7.77E-02	3.46E+00
Fresh water aquatic ecotox.	kg 1.4-DB eq	2.28E+01	1.52E+00	6.20E-02	3.62E-02	8.16E-01	1.51E-02	2.04E+01
Marine aquatic ecotoxicity	kg 1.4-DB eq	7.55E+04	5.57E+03	2.73E+02	1.67E+02	5.67E+03	4.90E+01	6.38E+04
Terrestrial ecotoxicity	kg 1.4-DB eq	1.14E-01	1.42E-02	1.19E-03	1.02E-04	9.21E-02	1.80E-04	6.44E-03
Photochemical oxidation	kg C_2H_4 eq	4.89E-03	2.81E-03	2.48E-04	5.84E-05	1.11E-03	8.76E-05	5.74E-04
Acidification	kg SO_2 eq	8.69E-02	5.17E-02	7.25E-03	3.00E-04	2.43E-02	2.22E-03	1.15E-03
Eutrophication	kg $(PO_4)^{3-}$ eq	3.28E-02	1.07E-02	1.11E-03	5.14E-04	4.39E-03	4.69E-04	1.55E-02

Table 20. EU Impact Assessment Results for C-Bac®, SDN 6.6

Impact category (CML)	Unit	Total	Production	Transport of product	Installation	Maintenance	Transport of waste	Disposal
			A1-A3	A4	A5	B2	C2	C4
Abiotic depletion	kg Sb eq	2.41E-05	1.84E-05	1.74E-06	2.65E-07	3.22E-06	2.80E-07	2.26E-07
Abiotic depletion (fossil fuels)	MJ	3.11E+02	2.46E+02	1.28E+01	2.20E+00	3.99E+01	7.05E+00	2.57E+00
Global warming (GWP100a)	kg CO_2 eq	1.98E+01	1.09E+01	8.30E-01	2.29E-01	4.96E+00	4.65E-01	2.43E+00
Ozone layer depletion (ODP)	kg CFC-11 eq	1.35E-06	1.03E-06	1.44E-07	4.47E-09	6.42E-08	8.48E-08	2.05E-08
Human toxicity	kg 1.4-DB eq	7.45E+00	2.45E+00	2.65E-01	1.10E-01	1.09E+00	7.77E-02	3.46E+00
Fresh water aquatic ecotox.	kg 1.4-DB eq	2.29E+01	1.53E+00	6.20E-02	3.62E-02	8.16E-01	1.51E-02	2.04E+01
Marine aquatic ecotoxicity	kg 1.4-DB eq	7.56E+04	5.65E+03	2.73E+02	1.67E+02	5.67E+03	4.90E+01	6.38E+04
Terrestrial ecotoxicity	kg 1.4-DB eq	1.14E-01	1.40E-02	1.19E-03	1.02E-04	9.21E-02	1.80E-04	6.44E-03
Photochemical oxidation	kg C_2H_4 eq	4.87E-03	2.79E-03	2.48E-04	5.84E-05	1.11E-03	8.76E-05	5.74E-04
Acidification	kg SO_2 eq	8.66E-02	5.14E-02	7.25E-03	3.00E-04	2.43E-02	2.22E-03	1.15E-03
Eutrophication	kg $(PO_4)^{3-}$ eq	3.34E-02	1.14E-02	1.11E-03	5.14E-04	4.39E-03	4.69E-04	1.55E-02

* Zero input and output were assumed for deconstruction of the tile (C1) and waste processing (C3). Therefore, values for the two modules are zero and not included in the tables.

4.2 Life Cycle Inventory Results

Table 21. Resource Use

PARAMETER	UNIT	MIX-BAC®, SDN6	MIX-BAC®, SDN6.6	C-BAC®, SDN6	C-BAC®, SDN6.6
RPR_E: Renewable primary resources used as energy carrier (fuel)	[MJ]	1.86E+01	1.92E+01	1.69E+01	1.75E+01
RPR_M: Renewable primary resources with energy content used as material	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$NRPR_E$: Non-renewable primary resources used as an energy carrier (fuel)	[MJ]	3.69E+02	3.79E+02	3.08E+02	3.17E+02
$NRPR_M$: Non-renewable primary resources with energy content used as material	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM: Secondary materials	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF: Renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF: Non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE: Recovered energy	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW: Use of net fresh water resources	[m^3]	9.58E-05	9.58E-05	9.58E-05	9.58E-05

Table 22. Output Flows and Waste Categories

PARAMETER	UNIT	MIX-BAC®, SDN6	MIX-BAC®, SDN6.6	C-BAC®, SDN6	C-BAC®, SDN6.6
HWD : Hazardous waste disposed	[kg]	3.20E-06	3.20E-06	3.20E-06	3.20E-06
NHWD: Non-hazardous waste disposed	[kg]	3.97E-06	3.97E-06	3.97E-06	3.97E-06
HLRW: High-level radioactive waste, conditioned, to final repository	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ILLRW: Intermediate- and low-level radioactive waste, conditioned, to final repository	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU: Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR: Materials for recycling	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER: Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE: Recovered energy exported from the product system	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 23. Carbon Emissions and Removals

PARAMETER	UNITS	MIX-BAC®, SDN6	MIX-BAC®, SDN6.6	C-BAC®, SDN6	C-BAC®, SDN6.6
BCRP	[kg CO_2]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEP	[kg CO_2]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCRK	[kg CO_2]	6.80E-01	6.80E-01	6.80E-01	6.80E-01
BCEK	[kg CO_2]	5.06E-01	5.06E-01	5.06E-01	5.06E-01
BCEW	[kg CO_2]	N/A	N/A	N/A	N/A
CCE	[kg CO_2]	N/A	N/A	N/A	N/A
CCR	[kg CO_2]	N/A	N/A	N/A	N/A
CWNR	[kg CO_2]	N/A	N/A	N/A	N/A

5. LCA Interpretation

The life cycle inventory includes data collection from a variety of publicly available sources, taking into consideration of representativeness in technology, temporal and geographical scales. Chinese regionalized LCI database has been utilized to the best extent. In case of missing data, Ecoinvent and regional database such as ELCD and some other relevant databases were referred to. Sensitivity analysis was conducted to calculate the validity of the results using parameters to reflect reality.

Analysis of impact categories on various life cycle stages reveals that production, transportation (oceanic and road), maintenance and end of life treatment of carpet tile are the main contributors to environment impacts. The process contribution analysis reveals that nylon, electricity consumption, transportation, and incineration and landfill process for waste treatment contribute the most of the environmental impacts.

The sensitivity analysis shows that change in assumptions such as transportation distance, inputs during maintenance and disposal scenario can lead to certain fluctuation of the final LCA results, hence it is recommended to revise the

model to get up-to-date results in case the assumption or process parameters would be changed in the future, or in case that data with higher quality would be available.

The LCA study has been carried out based on available information, regional and global database and experience to achieve more accuracy, completeness and representative of the results.

6. Additional Environmental Information

6.1 Environment and Health During Manufacturing

No substances required to be reported as hazardous, as listed in the "List of Toxic Chemicals Severely Restricted on the Import and Export in China (Circular No. 65 [2005]) and Measures for the Administration of Restricted Use of Hazardous Substances in Electrical and Electronic Products (Circular No. 32 [2016])", are associated with the production of this product.

6.2 Environment and Health During Installation

All recommended personal protective equipment (PPE) should be utilized during installation, as indicated on the SDS and installation guidelines. It is suggested to use the glue recommended by VOXFLOR for the installation on the purpose of higher indoor air quality.

6.3 Extraordinary Effects

Fire

EN 13501-1:2002 Fire classification of construction products and building elements: C_{fl} – S1
ASTM E648 Radiant Panel: requirements fulfilled
ASTM E662 Smoke Density: requirements fulfilled

Water

In daily use, the carpet should be protected from water splash and liquid beverage. 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 VOXFLOR installation guidelines.

6.4 Further Information

The total VOC emission of this product is no more than 0.5 mg/m^3. The product complies with California DPH Section 01350 Version 1.2 Private Office Scenario.

7. References

UL ENVIRONMENT

UL Environment General Program Instructions April 2017, version 2.1

Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (September 2018, version 3.2)

Part B: Flooring EPD Requirements UL 10010-7

SUSTAINABILITY REPORTING STANDARDS

European Standards. (2013). EN 15804+A1 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

ISO. (2006). ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines.

ISO. (2009). ISO 14040: Environmental management - Life cycle assessment - principles and frameworks.

ISO. (2011). ISO 14025: Environmental labels and declarations - Type III environmental declarations - principles and procedures.

ISO. (2017). ISO 21930 Sustainability in building construction - Environmental declaration of building products.

8. Contact Information

8.1 EPD Owner

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8.2 LCA Practitioner

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