ENVIRONMENTAL PRODUCT DECLARATION

ECOWORX® CARPET TILE WITH ECOSOLUTION Q® FACE FIBER

EcoWorx Carpet Tile has a non-PVC backing and an environmental guarantee that Shaw Contract will take it back for free at the end of life.

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We design products that empower our clients to create safe, sustainable, enduring spaces.

We are not trying to get to zero - our goal is more than zero. By adhering to Cradle to Cradle design principles, our goal is not to do less bad, but to do more good.

We don't focus on just one attribute, because this doesn't help our clients or the planet. It all matters - and we're taking every detail into account.

This is our philosophy and it permeates throughout our entire company. The *Cradle to Cradle Certified*™ Product Standard holds us accountable to this commitment while supporting our drive for continuous improvement. All while contributing to the circular economy.

UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
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ENVIRONMENTAL PRODUCT DECLARATION

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EcoWorx® Carpet Tile with EcoSolution Q® Face Fiber
Commercial Carpet tile

According to ISO 14025 and EN 15804

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. 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, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Shaw Industries, Inc.
DECLARATION NUMBER	4787366550.119.1
DECLARED PRODUCT	EcoWorx with EcoSolution Q
REFERENCE PCR	IBU and UL Environment. PCR for Building-Related Products and Services – Part A: Calculation Rules for the LCA and Requirements Project Report, (IBU/UL E, V1.2, 03.04.2013, and V1.3, 06.19.2014) IBU. Part B: Requirements on the EPD for Floor Coverings (IBU, V1.6, July 30, 2014) UL Environment: Part B Addendum: IBU PCR for Floor Coverings (UL E, V1.0 Aug 27, 2014)
DATE OF ISSUE	April 1, 2016
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	UL Environment Review Panel
	Thomas Gloria (Chairperson)
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Britt Willingham
	Britt Willingham
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas Gloria
	Thomas Gloria

This EPD conforms with EN 15804

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EcoWorx® Carpet Tile with EcoSolution Q® Face Fiber
Commercial Carpet tile

According to ISO 14025

Product

Product Description

The product is a commerical carpet tile with EcoSolution Q face fiber on the EcoWorx backing system. EcoSolution Q face fiber is nylon 6 with 25% post-industrial recycled content. The EcoWorx backing system consists of polyolefin compound, recycled materials, and a fiberglass reinforcement layer. The face fiber is tufted into a primary backing sheet containing recycled content, latex is added to hold in the fiber, and the EcoWorx backing system is applied.

This declaration covers all products consisting of EcoWorx tile backing and EcoSolution Q face fiber, with face weights ranging from 14 oz per sq. yd. (osy) to 42 osy, and a weighted average face weight of 20.3 osy.

Application

The product is intented to be used in all commerical settings.

A United States equivalent to *EN 1307: 2008, Textile floor coverings – Classification of pile caret* does not exist.

Technical Data

Name	Value	Unit
Product Form	Tiles	-
Type of Manufacture	Tufted	-
Yarn Type	Nylon 6	-
Secondary Backing	Polyolefin Composite	-
Total Carpet Weight	3140 (avg)	g/m^2
Total Pile Weight	688 (avg)	g/m^2
Radiant Panel	Class I	-
NBS Smoke	<450	-
Green Label Plus (indoor air quality)	GLP 9968	-

Table 1: Constructional Data

Delivery Status

EcoWorx carpet tile is available to the customer in the following sizes, depending on the style chosen: 24”x24”, 18”x36”, 9”x36”, hexagon (14,4” sides), 36”x36”, 6 ft rolls.

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Base Materials

Component	Material	Mass %
Face Yarn	Nylon 6	22
	Post-industrial Nylon 6	
Primary Backing	Nylon 6	4
	Polyester	
Precoat	Adhesive Copolymer	19
	Calcium Carbonate	
	Aluminum Trihydrate	
Secondary Backing	Polyolefin Composite	53
	Elutriated Heavies	
	Calcium Carbonate or Glass Cullet	
Stabilization Layer	Fiberglass	2

Table 2: Base materials

Manufacture

EcoWorx® carpet tile is made with Shaw's Eco Solution Q® Nylon 6 face fiber.

Nylon 6 face fiber is produced internally at Shaw through polymerization from caprolactam. The EcoSolution Q® Nylon 6 fiber is turned into yarn through a variety of processes depending upon the desired look of the finished product.

The yarn is tufted into the primary backing layer, after which a performance precoat is applied to ensure maximum tuft bind. A first layer of the EcoWorx® thermoplastic polyolefin compound is then applied, followed by the application of a fiberglass reinforcement layer for unmatched stability. A final layer of EcoWorx® backing is then added for stability. The tiles are then die-cut and packaged for distribution.

Environmental, Health, & Safety During Manufacturing

EcoWorx® is manufactured in the US in an ISO 9001 & ISO 14001 certified facility or equivalent.

Shaw strives to adhere to all applicable laws regarding labor, discrimination and harassment, wages and benefits, health and safety, diversity, and equal opportunity. Through associate engagement, structured safety processes, and a commitment to responsible materials sourcing, Shaw works to improve standards for personal and organizational safety every day. Our programs include:

- Shaw Behavior Based Safety Program to ensure continuous training, awareness, education and safety of all Shaw associates and visitors to Shaw facilities.
- Supply chain, raw materials and waste management programs
- ANSI/NSF 140 compliance
- Shaw Management System (SMS) - Based on ISO 9001 and 14001, and OSHAS 18001 standards, SMS brings together Shaw's Quality, Total Productive Manufacturing (TPM), Environmental, Health and Safety systems under one umbrella, providing associates with a "one stop shop" for helping ensure all job steps are followed the same way every time.

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Reference Service Life

While the service life of floor coverings strongly depends on the location of installation and adherance to cleaning and maintenance instructions given by the manufacturer, the reference service life chosen for this study is 15 years, based on warranty and testing information.

Extraordinary Effects

In the event of a flooding situation, the flooring shall be thoroughly dried and can be used as normal, with no impact on the environment. When carpet is mechanically destroyed, there are no impacts on the environment.

LCA: Calculation Rules

Declared Unit

Name	Value	Unit
Declared Unit	1	m^2
Conversion Factor to 1 kg	0.3185	-
Mass (average product)	3.14	kg/m^2

Table 3: Declared Unit

System Boundary

The EPD is considered to be Cradle-to-Grave.

The following modules are declared: A1-A3, A4, A5, B1, B2, C2, C3, C4.

A1-A3 Product Stage

All production-related raw materials and emissions are included from cradle-to-gate, including: energy supply and production, raw material extraction and processing, transport of materials to manufacturing site, packaging materials and transport (including recycled corrugated boxes and cores and plastic film), water use and treatment, and waste processing or recycling of manufacturing and packaging waste.

A4 Transport

Transportation of the finished flooring from the manufacturing site to the installation site was included.

A5 Installation

Impacts from the installation of the flooring were calculated, including: production and transport of installation materials, waste processing or recycling of installation waste.

B1 Use

Indoor emissions during the use stage. No product-related emissions are relevant due to known VOC decay curves and Indoor Air Quality testing (Green Label Plus). No health-related concerns are present during the normal use of the flooring.

B2 Maintenance

Cleaning of the flooring over its lifetime, according to the reference service life. This includes vacuuming and hot water extraction according to the manufacturer's guidelines.

C2 Transport to End of Life

Transportation of the flooring to an end-of-life facility is included. As a conservative estimate, it is assumed the flooring goes to a landfill at the end of life.

C3 Waste Processing

As it is assumed the flooring will go to landfill, there is no additional waste processing needed.

C4 Disposal

For the purposes of this LCA, it is assumed all of the flooring at the end of its useful life will go to the landfill, and the impacts from landfill disposal are included.

Cut-off Criteria

A cut-off criteria was used as per the PCR, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. This is defined as less than 1% of renewable and non-renewable primary energy usage and less than 1% of the total mass of a unit process, the sum of which shall not exceed 5% of the energy usage and mass.

Background Data and Quality

All upstream data have been taken from the GaBi 2014 LCI database, version 6.110, using GaBi ts software, compilation 7.0.0.19. All manufacturing data has been collected from Shaw facilities for calendar year 2014.

To ensure the highest quality data, first-hand data was collected by Shaw facilities, and consistent background LCI data from the GaBi 2014 database was used where data could not be collected.

Allocation

In module A1-A3, allocation was used in the calculation of the recycled content of the fiber and backing material. The recycled content of the fiber comes from the total mass of recycled content used from all fiber facilities for a year divided by the total amount of fiber with the recycled content claim for a year. The recycled content of the backing comes from the total mass of recycled content used in the backing for a year divided by the total backing weight used for a year.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 1804 and the building context, respectively the product-specific characteristics of performance, are

taken into account.

Estimates and Assumptions

For the purposes of this EPD, the weighted average of the fiber weight over a year's worth of sales data is used. When immediate LCA dataset matches to raw materials were missing, an appropriate similar material was chosen, using the more conservative, higher impact dataset when multiple similar materials were found.

LCA: Scenarios and additional technical information

The following tables refer to the declared modules and can be used for developing specific scenarios in the context of a building assessment. All indicated values refer to the declared functional unit.

Name	Value	Unit
Transport to the construction site (A4)		
Liters of fuel	38.4	l/100km
Transport Distance	1000	km
Capacity utilization	85	%
Installation in the building (A5)		
Auxiliary Material	0.004	kg
Material Loss	0.13	kg
Tile installation requires site testing and conditioning for moisture and alkalinity and proper preparation of the floor, as defined in the installation guidelines found on the manufacturer's website. This EPD assumes installation using LokDots.		
Maintenance (B2)		
Hot Water Extraction Cycle	2	1/year
Hot Water Extraction Cycle (per RSL)	30	1/RSL
Vacuum Cleaning Cycle	4	1/wk
Vacuum Cleaning Cycle (per RSL)	3120	1/RSL
Water Consumption	0.06	m^2/RSL
Electricity Consumption	10.14	kWh/RSL
End of Life (C2-4)		
Collected as mixed construction waste	3.14	kg
Landfilling	3.14	kg
Reference Service Life		
Reference Service Life	15	years

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LCA: Results

The results found in this EPD are for 1 m^2 of flooring over the reference service life of the product.

Description of the System Boundary (X=included in LCA; MND = module not declared)

Product Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits and Loads Beyond the System Boundaries
Raw Material Supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste Processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X			X	X	X	X	MND	MND	MND	MND	MND	MND	X	X	X	MND

Results of the LCA – Environmental Impact: 1 m^2 of flooring over RSL of product

Methodology	Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3	C4
CML	ADPE	kg Sb eq.	1.24E-05	4.64E-08	1.34E-08	0.00E+00	1.12E-06	1.62E-09	0.00E+00	1.88E-08
	ADPF	MJ	2.16E+02	4.95E+00	3.32E-01	0.00E+00	7.86E+01	1.72E-01	0.00E+00	6.61E-01
	AP	kg SO_2 eq.	3.12E-02	1.09E-03	2.78E-05	0.00E+00	2.22E-02	4.01E-05	0.00E+00	3.07E-04
	EP	kg $(PO_4)^{3-}$ eq	3.35E-03	2.76E-04	3.42E-06	0.00E+00	1.68E-03	1.02E-05	0.00E+00	4.22E-05
	GWP	kg CO_2 eq	1.21E+01	3.58E-01	1.34E-02	0.00E+00	6.84E+00	1.25E-02	0.00E+00	5.06E-02
	ODP	kg CFC11 eq	3.18E-09	2.21E-12	8.40E-12	0.00E+00	2.41E-09	7.70E-14	0.00E+00	8.10E-13
	POCP	kg ethane eq	2.84E-03	1.36E-04	4.02E-06	0.00E+00	1.38E-03	4.97E-06	0.00E+00	2.88E-05
TRACI	AP	kg SO_2 eq	3.24E-02	1.40E-03	2.86E-05	0.00E+00	2.12E-02	5.20E-05	0.00E+00	3.34E-04
	EP	kg N eq	1.86E-03	1.37E-04	2.02E-06	0.00E+00	1.81E-03	4.95E-06	0.00E+00	2.90E-05
	GWP	kg CO_2 eq	1.21E+01	3.58E-01	1.34E-02	0.00E+00	6.84E+00	1.25E-02	0.00E+00	5.06E-02
	ODP	kg CFC11 eq	3.34E-09	2.35E-12	8.93E-12	0.00E+00	2.56E-09	8.19E-14	0.00E+00	8.60E-13
	Smog	kg O_3 eq	4.57E-01	4.33E-02	4.60E-04	0.00E+00	1.89E-01	1.62E-03	0.00E+00	6.45E-03
caption	ADPE = abiotic depletion potential for non-fossil resources; ADPF = abiotic depletion potential for fossil resources; AP = acidification potential; EP = eutrophication potential; GWP = global warming potential; ODP = ozone depletion potential; POCP = Smog = formation of tropospheric ozone photochemical oxidants									

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Results of the LCA – Resource Use: 1 m^2 of flooring over RSL of product

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3	C4
PERE	MJ	5.16E+00	7.59E-02	5.25E-03	0.00E+00	9.33E+00	2.64E-03	0.00E+00	6.77E-02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.16E+00	7.59E-02	5.25E-03	0.00E+00	9.33E+00	2.64E-03	0.00E+00	6.77E-02
PENRE	MJ	1.78E+02	4.97E+00	3.41E-01	0.00E+00	9.93E+01	1.73E-01	0.00E+00	6.88E-01
PENRM	MJ	5.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.34E+02	4.97E+00	3.41E-01	0.00E+00	9.93E+01	1.73E-01	0.00E+00	6.88E-01
SM	kg	1.18E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.73E+00	1.50E-02	4.18E-03	0.00E+00	5.15E+00	5.23E-04	0.00E+00	3.32E-02
caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

Results of the LCA – Output Flows and Waste Categories: 1 m^2 of flooring over RSL of product

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3	C4
HWD	kg	4.33E-05	7.13E-07	3.11E-08	0.00E+00	2.93E-02	2.48E-08	0.00E+00	2.14E-07
NHWD	kg	1.43E-01	1.56E-04	7.67E-05	0.00E+00	8.04E-02	5.44E-06	0.00E+00	3.15E+00
RWD	kg	7.13E-03	8.18E-06	3.63E-06	0.00E+00	8.14E-03	2.85E-07	0.00E+00	1.09E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	5.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy								

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Interpretation of Results

The majority of the impact of the flooring is contained within the product stage (A1-A3), with the maintenance piece of the use stage (B2) making up most of the remaining impact. Within the product stage, the largest contributor is the face fiber. As the fiber weight of a specific style changes within the specified range, so do the impacts. The higher face weight products have a higher impact than this average, and the lower face weight products have a lower impact than this average.

References

PCR Part A: Calculation Rules for the Life Cycle Assessment and Requirements of the Project Report
Adapted for UL Environment from the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Version 1.3, 19.06.2014

PCR Part B: Requirements on the EPD for Floor Coverings
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PCR Part B: Requirements on the EPD for Floor Coverings, Addendum
PCR Addendum for IBU Part B: Floor coverings. Version 1, 8/27/2014

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

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