

ENVIRONMENTAL PRODUCT DECLARATION

StrataWorx[®] Carpet Tile with EcoSolution Q100[™] Face Fiber



Pictured above: Diffuse, StrataWorx[®] Carpet Tile with EcoSolution Q100[™] Face Fiber for Shaw Contract[®].

ShawContract[®]

At Shaw Contract[®], we aim to create products and solutions that positively impact people and the planet. We are a total flooring solutions provider and strive for design excellence in everything we do – from conception to production to installation. Every day, we take on creative challenges to research, design and innovate flooring solutions that transform spaces across the globe. And, when we talk about sustainability, we holistically consider both people and planet – combining social and environmental concerns. This includes a focus on four key areas: material health; circular economy; diversity, equity & inclusion; and carbon impact. To learn more about our products and our sustainability pledge, People Together, Planet Forever, visit shawcontract.com.





EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Rd, Northbrook, IL 60062
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Rules v 2.7 2022
MANUFACTURER NAME AND ADDRESS	Shaw Industries, Inc. 230 Douthit Ferry Road, Cartersville, GA 30120
DECLARATION NUMBER	4791140099.118.1
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	StrataWorx® Carpet Tile with EcoSolution Q100™ Face Fiber Functional unit = 1 m ² of flooring over RSL of 15 years
REFERENCE PCR AND VERSION NUMBER	ISO 21930:2017; UL Environment PCR Part A:2018, UL 10010, v3.2; UL Environment PCR Part B:2018, UL 10010-7, v2.0
DESCRIPTION OF PRODUCT APPLICATION/USE	Commercial flooring
PRODUCT RSL DESCRIPTION (IF APPL.)	15 years
MARKETS OF APPLICABILITY	North America
DATE OF ISSUE	August 1, 2021
PERIOD OF VALIDITY	5 Year
EPD TYPE	Product-specific
RANGE OF DATASET VARIABILITY	N/A
EPD SCOPE	Cradle-to-grave
YEAR(S) OF REPORTED PRIMARY DATA	2022
LCA SOFTWARE & VERSION NUMBER	LCA for Experts (LfE) 2023 (formerly GaBi)
LCI DATABASE(S) & VERSION NUMBER	LCA for Experts (LfE) (GaBi) Sphera database, content update 2023
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1, IPCC AR6, and CML v4.7

This PCR review was conducted by:	UL Environment - PCR Review Panel - epd@ul.com
This declaration was independently verified in accordance with ISO 21930:2017, UL Part A, and ISO 14025:2006.	<i>Cooper McCollum</i> Cooper McCollum, UL Environment
<input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	
The life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	<i>Thomas P. Gloria</i> 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 – 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. Comparison of the environmental performance of flooring products using EPD information shall be based on the product’s use and impacts at the building level. Therefore, this EPD may not be used when comparing flooring products that are not construction works energy use phase.





ShawContract®

Commercial Carpet Tile – StrataWorx® with EcoSolution Q100™ Face Fiber

According to ISO 21930:2017,
UL Part A, & ISO 14025:2006

1. Product Definition and Information

1.1. Description of Company/Organization

Shaw Industries Group, Inc. (Shaw) offers a diverse portfolio of carpet, resilient, hardwood, tile & stone, and laminate flooring products, synthetic turf, and other specialty items for residential and commercial markets worldwide via its brands Anderson Tuflex™, COREtec®, Patcraft®, Philadelphia Commercial®, Shaw Contract®, Shaw Floors™, Shaw Sports Turf®, Southwest Greens®, and more. We are a wholly owned subsidiary of Berkshire Hathaway, Inc. with more than 20,000 associates worldwide. Shaw is headquartered in Dalton, Georgia, with salespeople and/or offices located throughout the U.S., as well as globally.

1.2. Product Description, Identification and Specification

This Environmental Product Declaration (EPD) covers the StrataWorx® carpet tile with EcoSolution Q100™ face fiber, ranging from 12 ounces/yd² to 60 ounces/yd², with a weighted average face weight of 15.26 ounces/yd². The carpet tiles are manufactured in Plant 15 (Cartersville, Georgia) and Plant T1 (Adairsville, Georgia). EcoSolution Q100™ face fiber is Nylon 6 with 100% post-industrial (pre-consumer) recycled content. The StrataWorx® backing system is 100% PVC-free, consisting of a thermoplastic polyolefin compound, recycled materials (100% post-industrial filler and 100% post-industrial regrind), and a fiberglass secondary reinforcement layer. The face fiber is tufted into a polyester primary backing and latex (high-performance precoat) is added to hold in the fiber. The properties of this product include (a) higher stability but 40% less weight than PVC, (b) lower VOCs and lower smoke density than PVC, and (c) superior delamination and edge ravel strength. The StrataWorx® backing system with a secondary fiberglass backing is then applied followed by a topical layer. The StrataWorx® carpet tile with EcoSolution Q100™ face fiber is intended for indoor application in a commercial setting.

The products fall under CSI 09 6800, UNSPSC 30161701, and UNSPSC 30161719 classification codes (CSI, 2023; UNSPSC, 2023a, 2023b).

For this EPD, StrataWorx® carpet tile with EcoSolution Q100™ face fiber refers to the Shaw Contract® brand.

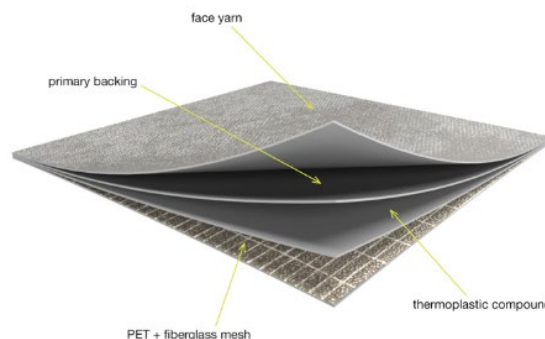


Figure 1: Cross section of StrataWorx® carpet tile



1.3. Product

The production data used in this EPD considers the StrataWorx® carpet tile with EcoSolution Q100™ face fiber produced during the 2022 calendar year. The product is manufactured in Cartersville, Georgia and Adairsville, Georgia. EPD results are based on the StrataWorx® carpet tile with EcoSolution Q100™ face fiber. All material and energy inputs, technical data, production data, transportation data, and life cycle datasets apply exclusively to the StrataWorx® carpet tile.

1.4. Application

This product is intended for use as flooring in commercial settings. The product meets the requirements of ISO 2424 and ISO 1765 (ISO, 1986, 2007).

This EPD is “cradle-to-grave” in scope with all modules included.

1.5. Declaration of Methodological Framework

This EPD is “cradle-to-grave” in scope with all modules, except D, declared. In modules A1-A3, allocation was used in the calculation of the recycled content for both the face fiber and the polymer backing material. No cut-off criteria are defined for this study. Reference service life for this product is 15 years. There are no known flows excluded from this EPD.

1.6. Technical Data

The table below presents technical data and properties for the StrataWorx® carpet tile.

Table 1: Technical data and properties for the StrataWorx® carpet tile

Name	Structured	Unit
Yarn type	Nylon 6 (100% post-industrial)	--
Primary backing	Polyester	--
Secondary backing	Fiberglass	--
CRI rating	3.5	2.5 Moderate, 3.0 Heavy, 3.5 Severe
Product size	60.96 × 60.96 (standard); optional sizes available	cm
Total thickness	6.05	mm
Product weight	1,949.69	g/m ²
Surface pile thickness	2.01	mm
Surface pile weight	498.40	g/m ²

1.7. Market Placement/Application Rules

StrataWorx® carpet tile with EcoSolution Q100™ face fiber meets all required performance standards to comply with building codes. A summary of these standards is provided below:

- This product is made in the USA, in an ISO 9001 and ISO 14001 certified facility or equivalent (ISO, 2015a, 2015b)



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- Meets Class 1 when tested in accordance with ASTM E 648/NFPA 253: Standard test method for critical radiant flux of floor-covering systems using a radiant heat energy source (ASTM, 2020)
- Meets ANSI/NSF 140 compliance: Sustainability assessment for carpet brochure (NSF/ANSI, 2019)
- Meets Green Label Plus Certification for compliance to California DPH Section 01350 Version 1.2 (CDPH, 2017)
- Meets the recommended static coefficient of friction (> 0.60) for ADA walking surfaces and accessible routes.

1.8. Material Composition

Table 2: Raw materials in Shaw’s StrataWorx® carpet tile

Product Layer	Recycled Content (%)	Chemical	Weight (g/m ²) of material in product	% Product Weight
Face Yarn	100	Nylon 6 (post-industrial)	517.40	26.54
Primary Backing		Polyester	100.02	5.13
Latex Backing		Vinyl Acetate Ethylene Calcium Carbonate Alumina Trihydrate Sodium Polyacrylate	576.39	29.56
Polymer Backing	100 100	Low-density Polyethylene High-density Polyethylene Hydrocarbon Resin Calcium Carbonate (post-industrial) Recycled Content (post-industrial)	678.11	34.78
Secondary Backing		Fiberglass	66.12	3.39
Topical Layer		Sodium Polyacrylate	11.64	0.60

1.9. Manufacturing

Carpet tile is produced in several stages beginning with fiber polymerization and extrusion. Nylon 6 fiber is produced internally at Shaw, then turned into yarn through a variety of processes depending on the desired look of the finished product. The face fiber is tufted into a polyester primary backing and latex (high-performance precoat) is applied to ensure maximum tuft bind. The StrataWorx® backing system with a secondary fiberglass backing is then applied followed by a topical layer. The carpet is then cut into tiles. Finally, the carpet is placed in cardboard box packaging for transportation to end users.



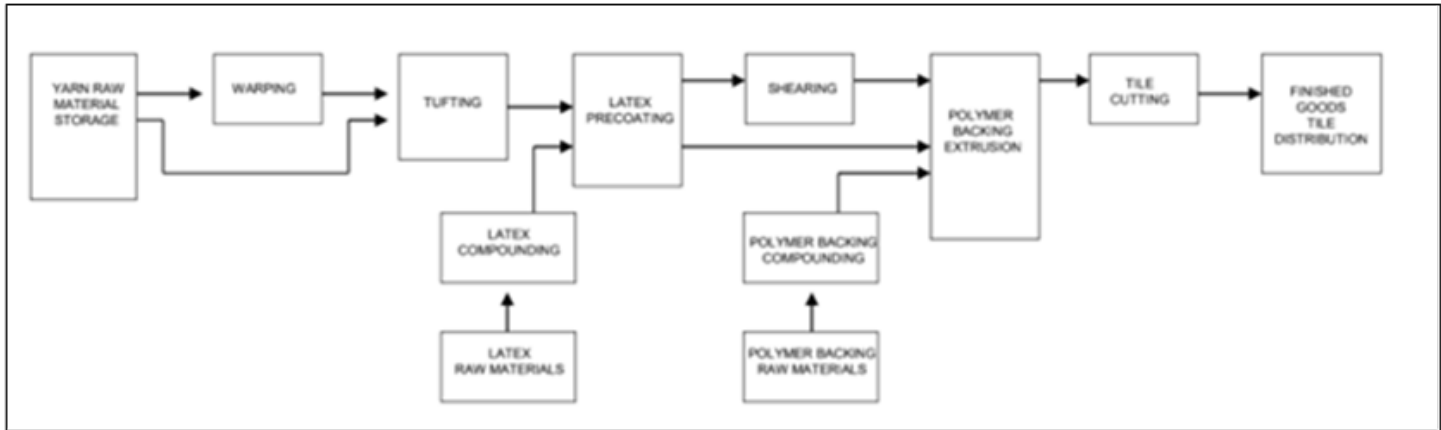


Figure 2: Process flow diagram of StrataWorx® carpet tile manufacturing

1.10. Packaging

Polyethylene shrink wrap, corrugated cardboard boxes/sleeves, and wood pallets are used to package the carpet tiles. These materials may contain recycled content and are provided by local packaging suppliers. Disposal of packaging is modeled in conformance with PCR Part A requirements (ULE, 2018a). Landfill emissions from paper, plastic, and wood packaging are allocated to installation.

1.11. Product Installation

This study includes transportation to the construction site by truck and flooring installation in the building. Carpet 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. Installation of this product primarily involves hand tools for measuring and cutting floor materials. Approximately, five percent (5%) of the total material is assumed to be trimmed and discarded as waste. While some of this waste could be recycled, this scrap is modeled as being disposed of in a landfill.

StrataWorx® carpet tile utilizes a pressure-sensitive adhesive for installation. Normal procedure after installation is to let rooms with installed flooring ventilate well for a minimum of 72 hours prior to occupancy.

1.12. Use Conditions

The service life of carpet tile will vary depending on the amount of floor traffic and the type and frequency of maintenance. The level of maintenance is also dependent on the actual use and desired appearance of the floor. The recommended cleaning regime is highly dependent on the use of the premises where the floor covering is installed and can vary based on manufacturer warranty. 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 data is provided in Table 7. This EPD accounts for two cleaning processes within the use phase: hot water extraction and vacuuming.

Indoor emissions during the use stage have been evaluated via indoor air quality testing, in accordance with the Green Label Plus testing program. No health-related concerns are present during the normal use of the flooring.





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1.13. Product Reference Service Life and Building Estimated Service Life

The service life of floor coverings strongly depends on the location of installation and adherence to cleaning and maintenance instructions given by the manufacturer. The reference service life (RSL) for StrataWorx® carpet tile is 15 years, based on the manufacturer’s warranty, meaning that the product will meet its functional requirements for an average of 15 years before replacement. Estimated building service life is 75 years, as specified by the PCR.

1.14. Re-use Phase

Shaw has implemented a re[TURN]® Reclamation Program for all their carpet products. Through internal research and development, industry partnerships, academic research, and other innovation efforts, they are continually looking for new recycling solutions for our products. For more information on the recycling of Shaw products, call 1-800-509-SHAW (7429) or visit <https://shawinc.com/shawrecycles>.

StrataWorx® is Green Label certified (GLP9968 14X Pre-Dyed Nylon with Amorphous Resin Backing, [GLP9968](#)).

1.15. Disposal

It is assumed that at the end-of-life, the product is 100% disposed of via landfill, 0% is recycled, and 0% is incinerated, per PCR requirements (ULE, 2018a, 2018b). Waste classification is based on the Resource Conservation and Recovery Act (RCRA) (US EPA, 2022b).

1.16. Further Information

For additional product information, visit <https://www.shawcontract.com>.

2. Life Cycle Assessment Calculation Rules

2.1. Functional Unit

Per the PCR, the functional unit is 1 m² of floor covering. StrataWorx® carpet tile is assumed to have a reference service life of 15 years and installation losses of 5%. Therefore, over the 75-year building estimated service life, four replacements take place. The mass per 1 m² of installed StrataWorx® carpet tile is 1,949.69 g/m².

2.2. System Boundary

The EPD is “cradle-to-grave” in scope. See Figure 3 for included life cycle stages and modules. Note that modules B1, B3, B5, B6, B7, and C1 have no environmental impacts and are excluded from results tables to improve readability. Although declared, Module C3 has no environmental impacts due to 100% landfilling scenario. Module D is excluded from this analysis as it represents the benefits/loads beyond the system boundary – in particular, credits from capturing methane gas from landfilling of biodegradable materials which are then used for electricity generation.



	Product Stage			Construction Process Stage		Use Stage							End-of-Life (EoL) Stage				Benefits and Loads Beyond System Boundary
	Raw material supply (extraction, processing, recycled material)	Transport to manufacturer	Manufacturing	Transport to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to EoL	Waste processing for reuse, recovery, or recycling	Disposal	
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
UL EPD	X	X	X	X	X	0	X	0	X	0	0	0	0	X	X	X	MND

Figure 3: Description of the system boundary modules (X = included in LCA, MND = module not declared)

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, water use and treatment, and waste processing or recycling of manufacturing waste.

A4 Transport

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

A5 Installation

Impacts from the installation of the flooring were calculated, including the production and transport of installation materials (e.g., adhesive) and disposal or recycling of installation waste.

B1 Use

Indoor emissions during the use stage have been evaluated via Indoor Air Quality testing (Green Label Plus program). No health-related concerns are present during the normal use of the flooring, and module B1 has been declared with zero environmental impacts.

B2 Maintenance

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





B4 Replacement

This phase represents the impacts of replacing the flooring over the life of the building (75 years). Based on the product RSL, the number of replacements can be calculated. This value is the sum of all impacts, across all lifecycle stages, multiplied by the number of replacements (4).

C1 Deconstruction/Demolition

This phase includes the tearing of the product from the building at the end of its RSL.

C2 Transport to End-of-Life

This phase includes the transportation of the flooring product to an end-of-life facility.

C3 Waste Processing

This phase includes any additional waste processing necessary before material recovery. In this case, none is required.

C4 Disposal

The disposal phase includes any impacts associated with the landfilling or incineration of the product at the end of its useful life.

2.3. 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 an exact match of an LCA dataset to a raw material was not available, an appropriate dataset representing a similar material was chosen as a proxy.

Use-stage environmental impacts depend on product cleaning assumptions. Information on cleaning frequency and products are based on Shaw’s manufacturer recommendations for their products.

Distances for transport to the installation site and from the building site to waste processing are based on assumptions in the PCR (ULE, 2018a, 2018b). The product is transported 497 miles, by diesel-powered truck, from the point of purchase to the building/installation site, and 100 miles, by diesel-powered truck, from the building site to waste processing. Product installation losses and packaging wastes are also transported 100 miles via diesel-powered truck.

Lastly, product and packaging disposal assumptions are consistent with PCR requirements (Table 3).

Table 3. Packaging waste disposal scenarios for installation in the U.S.

Component	Recycled	Landfilled	Incinerated
Paper	80.9%	15.4%	3.7%
Wood	26.9%	58.8%	14.3%
Plastics	13.6%	69.5%	16.9%
Metals (steel and aluminum)	55.7%	35.6%	8.7%
Glass	31.3%	55.4%	13.3%

Source: (US EPA, 2022a)





2.4. Cut-off Rules

No cut-off criteria are defined for this study. The system boundary was defined based on relevance to the goal of the study. For the processes within the system boundary, all energy and material flow data have been included in the model. In cases where no matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts. No known flows were deliberately excluded.

2.5. Data Sources

As a general rule, specific data derived from specific production processes or average data derived from specific production processes were the first choice as a basis for calculating LCA results. All upstream data have been taken from the LCA for Experts (LfE) (GaBi) Sphera 2023 database (Sphera, 2023), using the LfE Software System for Life Cycle Engineering, developed, and maintained by Sphera. To ensure the highest data quality, all manufacturing data were collected from Shaw's Plant 15 (Cartersville, Georgia) and Plant T1 (Adairsville, Georgia) facilities for the 2022 calendar year. To maximize comparability of results within the LCA, GaBi background data were used for energy, transportation, and auxiliary materials.

2.6. Data Quality

A variety of tests and checks were performed by the LCA professional throughout the project to ensure high quality of the completed LCA. Checks included an extensive review of product specific LCA models as well as the background data used.

Temporal coverage

This EPD is valid for at least the next 5 years, 2024-2029. All results contained in this EPD are based on projected developments occurring within the 5-year period.

Technological coverage

The study is intended to be representative of Shaw's current StrataWorx® carpeting production technology.

Geographical coverage

Shaw carpet products covered by this LCA tool are manufactured at Shaw's Plant 15 (Cartersville, Georgia) and Plant T1 (Adairsville, Georgia) facilities and sold in North America.

Completeness

Each foreground process was checked for mass balance and completeness of the emission inventory. No data were knowingly omitted. Completeness of foreground unit process data is high. All background data are sourced from LfE Sphera 2023 database with the documented completeness. Completeness is high.

2.7. Period Under Review

Primary data collected represent production during the 2022 calendar year.



2.8. Allocation

Multi-output allocation generally follows the requirements of ISO 14044, section 4.3.4.2 (ISO, 2006c). When allocation becomes necessary during the data collection phase, the allocation rule most suitable for the respective process step was applied.

The cut-off allocation approach is adopted in the case of any post-consumer and post-industrial (pre consumer) recycled content, which is assumed to enter the system burden-free. Only environmental impacts from the point-of-recovery and forward (e.g., inbound transports, grinding, processing, etc.) are considered.

In module A1-A3, allocation was used in the calculation of the recycled content of the fiber and backing materials. The recycled content percentage of the fiber was calculated based on the annual mass of recycled content used by all the fiber facilities, divided by the annual mass of fiber produced which contains recycled content. The recycled content of the backing was calculated from the annual mass of the recycled content used in the backing divided by the annual mass of backing produced.

Given that raw materials are key contributors to environmental performance, mass-based allocation was applied for facilities that produced more than one flooring product. No allocation is required for products at end-of-life: plastic is assumed to be inert in landfills, so no landfill gas is produced from product waste. Bio-based packaging waste may decompose and produce landfill gas. However, potential benefits from generation of landfill gas or incineration of packaging waste are excluded from this study due to the use of cut-off approach. Under the polluter-pays principle, the product system carries the burden of landfilling.

2.9. Comparability and Benchmarking

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 PCR (CEN, 2012; ULE, 2018a, 2018b) and ISO standards (ISO, 2006a, 2006b, 2017). Caution should be used when attempting to compare EPD results.

3. Life Cycle Assessment Scenarios and Additional Technical Information

Since modules B1, B3, B5, B6, B7, C1 and C3 are declared as having no environmental impacts, no technical information has been provided for those modules.

Table 4. Transport to the building site (A4)

Name	Value	Unit
Fuel type	Diesel	--
Liters of fuel	38.4	L/100 km-m ²
Vehicle type	Truck	Class 8
Transport distance	800	km
Capacity utilization	65	%
Weight of product transported	1.95	kg/m ²
Capacity utilization volume factor	1	--





It should be noted that the liters of fuel consumed is reported in the units of L/100 km-m², as opposed to L/100 km as required by the PCR. This is based on the truck mileage data obtained from datasets in GaBi, which restrict the calculation of fuel consumption on functional unit basis.

Table 5. Installation in the building (A5)

Name	Value	Unit
Ancillary materials	0.190	kg/m ²
Product loss per functional unit (at 5%)	0.098	kg/m ²
Waste materials at the construction site before waste processing, generated by product installation	0.359	kg/m ²
Output materials resulting from on-site waste processing – for recycling	0.123	kg/m ²
Output materials resulting from on-site waste processing – for energy recovery	0.027	kg/m ²
Output materials resulting from on-site waste processing – for disposal	0.209	kg/m ²
Mass of packaging waste – Cardboard	0.106	kg/m ²
Mass of packaging waste – Wood	0.122	kg/m ²
Mass of packaging waste – Plastic	0.034	kg/m ²
Biogenic carbon contained in packaging	0.443	kg CO ₂ /m ²

Table 6. Reference service life

Name	Value	Unit
Reference service life	15	years

Table 7. Maintenance (B2)

Name	Value	Unit
Maintenance process information (cite source in report)	Manufacturer's instruction	--
Hot water extraction cycle	2	1/year
Vacuum cycle	52	1/year
Water consumption – city water disposed to sewer	0.028	m ³ /m ² /RSL
Electricity consumption	29.400	kWh/m ² /RSL

Table 8: Replacement (B4)

Name	Value	Unit
Reference Service Life	15	Years
Number of Replacements	4	(ESL/RSL)–1
Ancillary materials - Adhesive	0.190	kg/m ²
Replacement of worn parts – Carpet tile	1.950	kg/m ²

Table 9. End-of-life (C1 – C4)

Name	Value	Unit
Collected as mixed construction waste	1.950	kg/m ²
Recycling	0	kg/m ²



Energy recovery	0	kg/m ²
Landfilling	1.950	kg/m ²
Removals of biogenic carbon (excluding packaging)	0	kg CO ₂ /m ²

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

4. Life Cycle Assessment Results

The results in this EPD are for 1 m² of flooring over the 75-year estimated service life of the building. Caution should be used when comparing the results presented in this EPD to the environmental performance of other carpet tile products as the overall weight of floors and other physical, chemical, and technological factors will influence the environmental impacts. Although the environmental impacts should be reduced for the lighter weight floors due to less raw materials, a heavier floor can have raw materials whose cradle-to-gate impacts are lower compared to a lighter floor. Further, a heavier floor sometimes lasts longer than a lighter floor, counteracting the advantage gained by a lighter floor.

The results in the succeeding tables reflect the environmental impacts of flooring for Modules A1-A3, A4, A5, B2, C2, and C4 over its 15-year reference service life. However, Module B4 (replacement) show the environmental impact of replacements over the next 60 years of the product (2ND, 3RD, 4TH, and 5th replacements) following the initial manufacture. When B4 is added to A1-A3, A4, A5, B2, C2, and C4, the calculated value represents the environmental impact for 1 m² of flooring over the 75-year estimated service life of the building (cradle-to-grave).

4.1. Results of the LCA – Environmental Impact: 1 m² of flooring over ESL of product

Table 10: Environmental Impacts: 1 m² of StrataWorx® carpet tile via TRACI 2.1

Impact	Unit	A1-A3	A4	A5	B2	B4	C2	C4
ADPF	MJ	7.52E+00	3.37E-01	1.39E-01	5.42E+00	5.45E+01	5.05E-02	1.58E-01
AP	kg SO ₂ eq.	6.36E-03	6.30E-04	4.28E-04	8.28E-03	6.43E-02	2.01E-05	3.57E-04
EP	kg N eq.	5.35E-04	5.04E-05	2.68E-04	8.13E-04	8.75E-03	5.28E-06	5.17E-04
GWP	kg CO ₂ eq.	3.23E+00	1.80E-01	8.31E-02	5.85E+00	3.78E+01	2.68E-02	8.13E-02
ODP	kg CFC11 eq.	1.19E-08	2.81E-16	1.49E-13	4.72E-13	4.75E-08	4.27E-17	2.63E-15
SFP	kg O ₃ eq.	1.05E-01	1.27E-02	5.96E-03	1.17E-01	9.99E-01	4.41E-04	6.27E-03

ADPF = abiotic depletion potential for fossil resources; AP = acidification potential; EP = eutrophication potential; GWP = global warming potential; ODP = ozone depletion potential; SFP = smog formation potential

4.2. Results of the LCA – Resource Use: 1 m² of flooring over ESL of product

Table 11: Resource use: 1 m² of StrataWorx® carpet tile via TRACI 2.1

Impact	Unit	A1-A3	A4	A5	B2	B4	C2	C4
RPRE	MJ	2.98E-02	9.70E-02	5.00E+00	2.03E+01	1.02E+02	1.57E-02	1.17E-01
RPRM	MJ	5.59E+00	0.00E+00	-4.09E+00	0.00E+00	5.97E+00	0.00E+00	0.00E+00
RPRT	MJ	5.62E+00	9.70E-02	9.03E-01	2.03E+01	1.08E+02	1.57E-02	1.17E-01
NRPRE	MJ	4.37E+01	2.53E+00	1.25E+00	9.37E+01	5.71E+02	3.81E-01	1.25E+00
NRPRM	MJ	2.52E+01	0.00E+00	-1.50E-01	0.00E+00	1.00E+02	0.00E+00	0.00E+00





NRPRT	MJ	6.73E+01	2.53E+00	1.10E+00	9.37E+01	6.65E+02	3.81E-01	1.25E+00
SM	MJ	1.22E+00	0.00E+00	0.00E+00	0.00E+00	4.87E+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
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.88E-02	4.11E-04	8.02E-03	3.86E-02	2.64E-01	6.67E-05	1.79E-04

RPRE = use of renewable primary energy excluding renewable primary energy resources used as raw materials; RPRM = use of renewable primary energy resources as raw materials; RPRT = total use of renewable primary energy resources; NRPRE = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; NRPRM = use of non-renewable primary energy resources used as raw materials; NRPRT = 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; RE = use of recovered energy; FW = use of net fresh water

4.3. Results of the LCA – Output Flows and Waste Categories: 1 m² of flooring over ESL of product

Table 12: Output flows and waste categories: 1 m² of StrataWorx® carpet tile via TRACI 2.1

Impact	Unit	A1-A3	A4	A5	B2	B4	C2	C4
HWD	kg	3.34E-09	1.04E-11	2.40E-09	3.68E-09	3.79E-08	1.57E-12	4.68E-11
NHWD	kg	1.74E-01	2.35E-04	1.52E-01	4.55E-02	9.26E+00	3.53E-05	1.94E+00
HLRW	kg	3.50E-06	6.73E-09	1.57E-08	1.09E-05	5.77E-05	1.07E-09	1.25E-08
ILLRW	kg	2.94E-03	5.74E-06	1.55E-05	9.09E-03	4.83E-02	9.00E-07	1.10E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	5.32E-02	0.00E+00	2.13E-01	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
EEE	MJ	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

HWD = hazardous waste disposed; NHWD = non-hazardous waste disposed; HLRW = high level radioactive waste; ILLRW = intermediate and low-level radioactive waste; CRU = components for re-use; MR = materials for recycling; MER = materials for energy recovery; EEE = exported electrical energy; EET = exported thermal energy

4.4. Results of the LCA – GWP (kg CO₂ eq.) for additional product face fiber weights: 1 m² of flooring over ESL of product

Table 13: Output flows and waste categories: 1 m² of StrataWorx® carpet tile via TRACI 2.1

Fiber weight (oz/yd ²)	A1-A3	A4	A5	B2	B4	C2	C4
12	3.170392	0.170133	0.083091	5.847826	37.493675	0.025286	0.076691
13	3.189856	0.173269	0.083091	5.847826	37.591595	0.025752	0.078105
14	3.209320	0.176406	0.083091	5.847826	37.689516	0.026219	0.079518
15	3.228783	0.179542	0.083091	5.847826	37.787436	0.026685	0.080932
16	3.248247	0.182679	0.083091	5.847826	37.885357	0.027151	0.082346
17	3.267711	0.185815	0.083091	5.847826	37.983278	0.027617	0.083760
18	3.287174	0.188952	0.083091	5.847826	38.081198	0.028083	0.085174
19	3.306638	0.192088	0.083091	5.847826	38.179119	0.028549	0.086587
20	3.326102	0.195225	0.083091	5.847826	38.277039	0.029016	0.088001





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21	3.345565	0.198361	0.083091	5.847826	38.374960	0.029482	0.089415
22	3.365029	0.201498	0.083091	5.847826	38.472880	0.029948	0.090829
23	3.384493	0.204634	0.083091	5.847826	38.570801	0.030414	0.092243
24	3.403956	0.207770	0.083091	5.847826	38.668722	0.030880	0.093657
25	3.423420	0.210907	0.083091	5.847826	38.766642	0.031346	0.095070
26	3.442884	0.214043	0.083091	5.847826	38.864563	0.031813	0.096484
27	3.462347	0.217180	0.083091	5.847826	38.962483	0.032279	0.097898
28	3.481811	0.220316	0.083091	5.847826	39.060404	0.032745	0.099312
29	3.501275	0.223453	0.083091	5.847826	39.158324	0.033211	0.100726
30	3.520738	0.226589	0.083091	5.847826	39.256245	0.033677	0.102140
31	3.540202	0.229726	0.083091	5.847826	39.354166	0.034143	0.103553
32	3.559666	0.232862	0.083091	5.847826	39.452086	0.034610	0.104967
33	3.579129	0.235999	0.083091	5.847826	39.550007	0.035076	0.106381
34	3.598593	0.239135	0.083091	5.847826	39.647927	0.035542	0.107795
35	3.618057	0.242272	0.083091	5.847826	39.745848	0.036008	0.109209
36	3.637520	0.245408	0.083091	5.847826	39.843768	0.036474	0.110623
37	3.656984	0.248545	0.083091	5.847826	39.941689	0.036940	0.112036
38	3.676448	0.251681	0.083091	5.847826	40.039610	0.037407	0.113450
39	3.695911	0.254818	0.083091	5.847826	40.137530	0.037873	0.114864
40	3.715375	0.257954	0.083091	5.847826	40.235451	0.038339	0.116278
41	3.734839	0.261091	0.083091	5.847826	40.333371	0.038805	0.117692
42	3.754302	0.264227	0.083091	5.847826	40.431292	0.039271	0.119106
43	3.773766	0.267364	0.083091	5.847826	40.529212	0.039737	0.120519
44	3.793230	0.270500	0.083091	5.847826	40.627133	0.040204	0.121933
45	3.812693	0.273636	0.083091	5.847826	40.725054	0.040670	0.123347
46	3.832157	0.276773	0.083091	5.847826	40.822974	0.041136	0.124761
47	3.851621	0.279909	0.083091	5.847826	40.920895	0.041602	0.126175
48	3.871085	0.283046	0.083091	5.847826	41.018815	0.042068	0.127589
49	3.890548	0.286182	0.083091	5.847826	41.116736	0.042534	0.129002
50	3.910012	0.289319	0.083091	5.847826	41.214656	0.043001	0.130416
51	3.929476	0.292455	0.083091	5.847826	41.312577	0.043467	0.131830
52	3.948939	0.295592	0.083091	5.847826	41.410498	0.043933	0.133244
53	3.968403	0.298728	0.083091	5.847826	41.508418	0.044399	0.134658
54	3.987867	0.301865	0.083091	5.847826	41.606339	0.044865	0.136071
55	4.007330	0.305001	0.083091	5.847826	41.704259	0.045331	0.137485
56	4.026794	0.308138	0.083091	5.847826	41.802180	0.045797	0.138899
57	4.046258	0.311274	0.083091	5.847826	41.900100	0.046264	0.140313
58	4.065721	0.314411	0.083091	5.847826	41.998021	0.046730	0.141727
59	4.085185	0.317547	0.083091	5.847826	42.095942	0.047196	0.143141
60	4.104649	0.320684	0.083091	5.847826	42.193862	0.047662	0.144554





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4.5. LCA Interpretation

As seen from the Table 10 to Table 13, replacement (B4) accounts for 80% of the environmental impacts across all categories and indicators. This can be explained by the fact that the impacts for B4 are four times the sum of impacts from all other stages, for the full lifespan of the building (75 years); therefore, when discussing the total life cycle burden over the RSL, B4 values are excluded.

Besides replacement, the product manufacturing stage, which includes use of raw materials, their transport, and manufacturing of the carpet tile product (A1-A3), is the primary contributor across all the environmental impact categories, as well as across most inventory indicators considered under this study. Any efforts made toward reducing the material used in the product, inclusion of recycled content, or use of renewable energy during the manufacturing of the raw materials or the product will lessen the overall environmental impact. Material footprints are based on industry averages as supplier data is not available, and therefore may not perfectly represent specific materials used.

These six 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 results of this study are significantly influenced by assumptions regarding frequency of cleaning and replacement, as well as the source of electricity used for cleaning. The level of use, site conditions, and location of installation could significantly affect these variables and therefore significantly affect the actual environmental impact of the product over its life cycle.

5. Additional Information

5.1. Mandatory Environmental Information

Shaw's products do not contain any hazardous substances according to RCRA, Subtitle 3 (US EPA, 2022b). The product does not release dangerous substances to the environment, including gamma or ionizing radiation, chemicals released to air or leached to water and soil.

More information on this product can be found at <https://www.shawcontract.com>.

5.2. Environmental Activities and Certifications

The flooring products in this EPD comply with the VOC emissions requirements in the California Department of Public Health (CDPH) Standard Method v1.2 (CDPH, 2017).

5.3. Further Information

Shaw adheres to all applicable laws regarding labor, discrimination and harassment, wages and benefits, health and safety, 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.
- Shaw Management System (SMS) – Based on ISO 9001 and 14001, and ISO 45001 (ISO, 2018) standards. SMS brings together Shaw's Quality, Total Productive Manufacturing (TPM), and Environmental, Health and Safety systems under one umbrella. SMS provides associates with a single repository to find information, which helps ensure all job steps are followed the same way every time.

6. References

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According to ISO 21930:2017,
UL Part A, & ISO 14025:2006

7. Contact Information

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