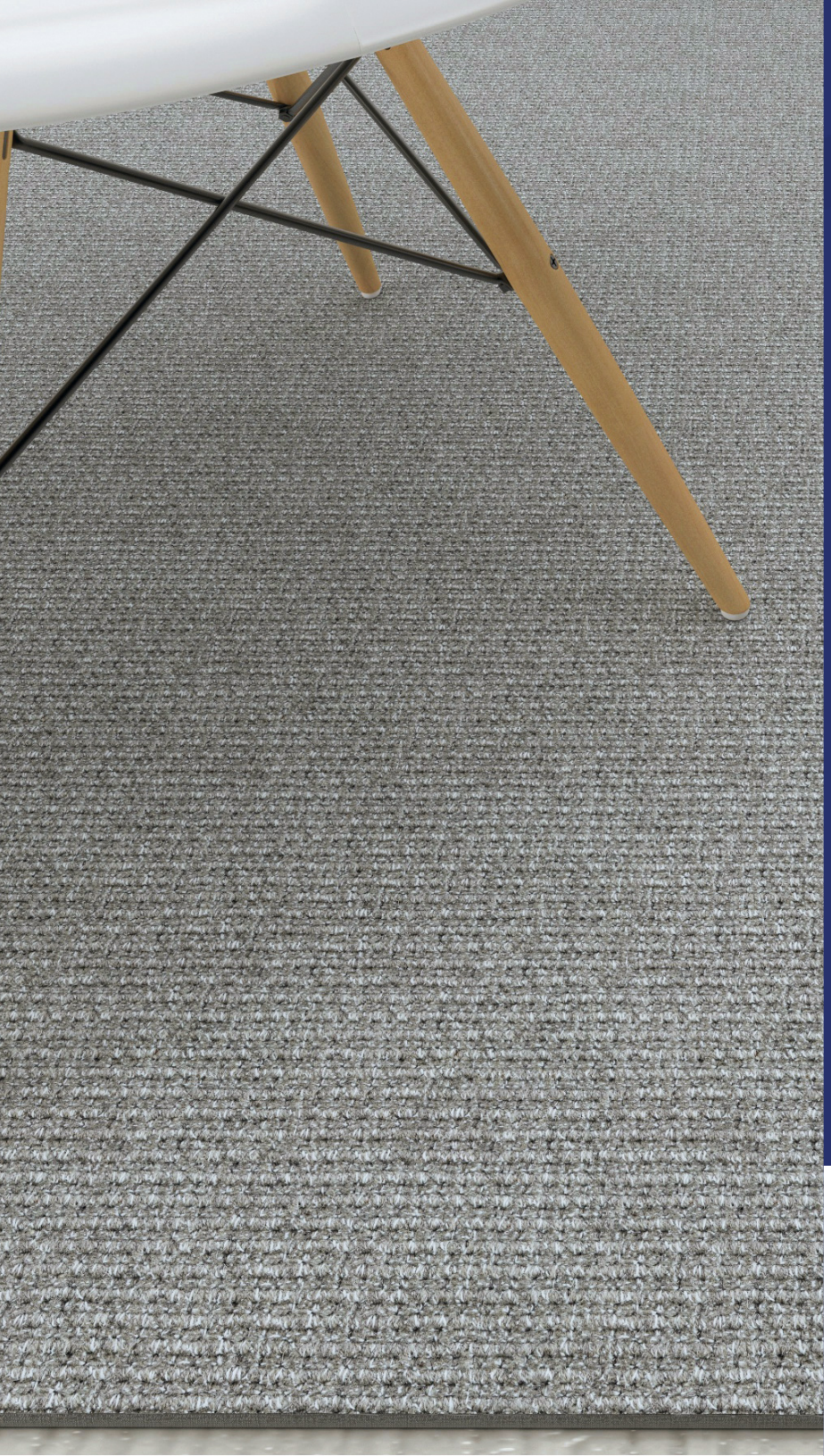

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and ISO 21930:2017

SmartEPD-2023-005-0016-01

100% WOOL CARPET WITH POLYPROPYLENE BACKING

Date of Issue:	Expiration:	Last updated:
Sep 22, 2023	Sep 22, 2028	Sep 22, 2023

SMART EPD
CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION

General Information

EPD Holder:

Bloomsburg Carpet Ind.

4999 Columbia Blvd.

(800) 233-8773

info@bloomsburgcarpet.com

bloomsburgcarpet.com

Product Name:	100% WOOL CARPET WITH POLYPROPYLENE BACKING
Functional Unit:	1 m2
Declaration Number:	SmartEPD-2023-005-0016-01
Date of Issue:	September 22, 2023
Expiration:	September 22, 2028
Last updated:	September 22, 2023
EPD Scope:	Cradle to grave A1 - A3, A4, A5, B1 - B7, C1 - C4
Market(s) of Applicability:	North America

Reference Standards

Standard(s): ISO 21930:2017

Core PCR:

UL PCR for Building-Related Products and Services Part A v.3.2, ISO 21930:2017 — Date of issue: December 12, 2018

Sub-category PCR:

UL Part B: Flooring v.2 — Date of issue: September 28, 2018

Valid until: September 28, 2023

Sub-category PCR review panel: Contact Smart EPD for more information.

General Program Instructions: Smart EPD General Program Instructions v.1.0, November 2022

Verification Information

LCA Author/Creator:

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071: External

Anna Lasso — Smart EPD

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Independent external verification of EPD, according to ISO 14025 and reference PCR(s): External

Anna Lasso — Smart EPD

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Limitations, Liability, and Ownership

Environmental declarations from different programs (ISO 14025) may not be comparable.

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, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.

Full conformance with the PCR for Flooring Products 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.

Organization Information

Bloomsburg Carpet Industries is a renowned carpet manufacturing company, situated in the picturesque Susquehanna Valley of Pennsylvania, was founded in 1976 by Raymond P. Habib along with twelve experienced employees dedicated to maintaining the craft of carpet weaving in the U.S.A. As the company continues to grow and expand, their commitment to quality and design remains strong. They are dedicated to producing highly styled carpets of superior quality and are proud to be notably recognized as the only carpet mill in the world to offer Wilton, Axminster, Velvet, and Loc-Weave weaving all under one roof.

It is worth noting that Bloomsburg's carpet products are certified from the Carpet and Rug Institute (CRI) Green Label Plus, California DPH Section 01350 Version 1.2 and LEED v4.1 EQ Credit Low-Emitting Materials.

Further information can be found at:
https://bloomsburgcarpet.com/about/

Product Description

This EPD covers the life cycle of Bloomsburg 100% wool carpets with polypropylene (PP) backing. These carpets are produced using traditional weaving techniques coupled with cutting-edge technology. Bloomsburg carpets offer a wide range of carpet styles, pa

tterns, colors and have earned the CRI Green Label Plus certification.

This study covers all products and styles with tufted wool fiber on polypropylene backing. Due to a range of face weights offered with this product, an average face weight of 47 oz./sy (1593.57 g/m2) was used, which is an average based on annual sales.

Further information can be found at:
https://bloomsburgcarpet.com/about/

Product Information

Functional Unit:	1 m2
Mass:	2.44 kg
Reference Service Life:	15 Years
EPD Type:	✗ Industry Average
	✓ Product Specific

Averaging:

An average based on product construction was utilized for the life cycle assessment. The average was created by utilizing the standard formulation for the backing and the weighted sales average for the face fiber. This is deemed to be an accurate representation of an average flooring product of this family.
The functional unit for carpet products is one (1) m2 of floor covering used and maintained over a 75 year building life.

Plants

THE BLOOMSBURG CARPET MILL
4999 Columbia Blvd, Bloomsburg, PA 17815, USA

Product Specifications

Product SKU(s):	K101/5, K100/11
Product Classification Codes:	Masterformat - 09 68 00 UNSPSC - 30161701
Flooring type:	Carpet
Product thickness:	9.53 mm
Product weight:	2439.51 g/m2
Carpet specifications:	
Recycled content:	3 %
Material composition:	100% Wool
Material composition of primary backing type:	Polypropylene
Material composition of secondary backing type:	Polyester
CRI rating:	2.5 Moderate
Surface pile weight:	1593.57 g/m2

Material Composition

Material/Component Category	Origin	% Mass
Wool	India	61.1
Creel waste	US	6.5
Polypropylene	Turkey	11.9
Polyester	India	4.9
Latex	US	15.6

Packaging Material	Origin	kg Mass
Corrugated Cardboard	US	0.0543
Polypropylene film (PP)	US	0.00828

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year: 2022

Manufacturing Specificity:

- ✗ Manufacturer Specific
- ✓ Plant Specific
- ✗ Batch Specific

Software and LCI Data Sources

LCA Software: LCA for Experts v. 10.7

LCI Foreground Database(s):

Managed LCA Content v. 2023.1 — North America

Mass based

LCI Background Database(s):

Managed LCA Content v. 2023.1 — North America

Mass based

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	✓
	B2	Maintenance	✓
	B3	Repair	✓
	B4	Replacement	✓
	B5	Refurbishment	✓
	B6	Operational Energy Use	✓
	B7	Operational Water Use	✓
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Life Cycle Module Descriptions

The system boundary of this study is cradle-to-grave, i.e., all stages of the life cycle have been considered including raw material extraction, manufacturing, maintenance, and disposal. The following modules are defined by PCR Part A for building products (UL Environment, 2018).

Modules B1, B3, B5, B7 are zero for these carpet products. Similarly, module B6 is zero as no electricity is consumed during operation. Impacts associated with deconstruction (C1) are zero as manual deconstruction has been assumed. Waste processing (C3) is also zero as no other waste processing is required before landfilling the product. Module D is excluded from this analysis.

A1 Product stage: Raw material supply: It includes Raw material sourcing and processing as defined by secondary data.

A2 Product stage: Transport: It includes shipping from supplier to manufacturing site. Fuel use requirements are estimated based on product weight and reported distance.

A3 Product stage: Manufacturing: It includes energy, water, and material inputs required for manufacturing from raw materials. Packaging materials and manufacturing waste are also included.

A4 Construction process stage: Transport: It includes shipping from manufacturing site to project site. Fuel use requirements are estimated based on product weight and estimated distance.

A5 Construction process stage: Installation: It includes installation process, installation, and packaging waste.

B2 Use stage: Maintenance: It includes cleaning energy, water and materials required for maintenance.

B4 Replacement: Replacement carpet required to fulfil the required function over the building service life (75 years).

C2 End-of-life: Transport: It includes shipping from project site to landfill. Fuel use requirements are estimated based on product weight and estimated distance.

C4 End-of-life: Disposal: It assumes all products are sent to landfill. Landfill impact modeled based on secondary data.

Manufacturing:

At Bloomsburg, the manufacturing process of carpets starts with the sourcing of 100% natural wool animal fiber, renewable nylon fibers, followed by yarn conversion which includes the preparation of the yarn to be introduced in the loom system. Once the design and materials have been determined, the carpet backing is selected. The next step in the process is tufting, where the carpet pile is looped through the backing material using a 12-foot rolling machine with needles that weaves the loops in and out. The next stage is cutting, where sharp blades are gently run over the tufted carpet loops, doubling the number of surface fibers on the piece of carpets. Once the carpet has been woven and taken off the machine, it then goes through a vat dyeing or screen-printing process to apply the required colors and design.

Once this process is completed, a latex adhesive is applied to the backing material. After the latex application, the carpet passes through a dryer to solidify the adhesive. Throughout these stages, the carpets are routinely inspected to locate any imperfections or broken threads.

Packaging:

The broadloom carpets are rolled onto a cardboard core and then wrapped in plastic film for shipping.

Transportation:

Transport of raw materials from suppliers to the Bloomsburg facility was included in the model. Transportation distances and modes of transportation were provided by Bloomsburg.

When transportation information was not available, the default distances from the PCR Part B were used for calculation (UL Environment, 2018).

1. Outbound transportation distances from manufacturing plant to building site were not provided, a default assumption of 800 km is considered as per the PCR.

2. Transportation distance from usage site to waste management facility was not provided, a default assumption of 161 km is considered as per the PCR.

Installation:

Installation is assumed to be manual. Detailed installation instructions can be found on CRI guidelines (CRI, 2016). While installation equipment is required to install the flooring product, it is not included in the study as these are multi-use tool and the impacts per declared unit is considered to be negligible. All waste generated during installation, including packaging waste, is disposed off as per Part A: Life Cycle Assessment Calculation Rules and Report Requirements from UL Environment (UL Environment, 2018).

Use:

Indoor emissions during the use stage have been evaluated via Indoor Air Quality testing (Green Label Plus). No health-related concerns are present during the normal use of the flooring.

The method of maintenance is using a vacuum cleaner to remove dust and debris from carpet. To calculate the use phase energy, three different types of traffic on carpet were modeled: high, medium and low. High traffic areas are vacuumed every work day. Medium traffic areas are vacuumed on alternative work days while low traffic areas are vacuumed once a week.

Carpet products are traditionally not repaired or refurbished and are only replaced if the product fails or a new look is desired. Detailed maintenance instructions are provided online by the Carpet and Rug Institute (CRI, 2016).

Reference Service Life and Estimated Building Service Life

The reference service life of woven broadloom carpets is 15 years. For a building's estimated service life of 75 years, this means the carpet will be replaced 4 times, meaning 5 m2 of carpet is needed over the full life of the building. The reference service life assumes the product was installed according to the manufacturer's recommendations.

End-of-Life:

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 1 m2 of product.

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

Impact Category	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP-total	kg CO2 eq	2.02e+1	2.74e-2	1.62e-2	0	1.94e+0	0	8.89e+1	0	0	0	0	2.53e-2	0	4.99e-2
ODP	kg CFC 11 eq	1.55e-12	7.00e-17	1.56e-16	0	1.98e-13	0	7.01e-12	0	0	0	0	6.48e-17	0	2.38e-15
AP	kg SO2 eq	4.95e-2	8.81e-5	4.52e-5	0	2.75e-3	0	2.10e-1	0	0	0	0	8.15e-5	0	2.57e-4
EP	kg N eq	2.29e-2	8.70e-6	2.72e-5	0	2.05e-4	0	9.24e-2	0	0	0	0	8.05e-6	0	4.11e-4
POCP	kg O3 eq	6.45e-1	2.04e-3	4.87e-4	0	3.69e-2	0	2.74e+0	0	0	0	0	1.88e-3	0	4.68e-3
ADP-fossil	MJ	1.65e+2	3.79e-1	6.77e-2	0	2.39e+1	0	7.56e+2	0	0	0	0	3.50e-1	0	7.51e-1

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Results

Resource Use Indicators

per 1 m2 of product.

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPRE	MJ	1.56e+2	1.52e-2	6.55e-3	0	7.81e+0	0	6.57e+2	0	0	0	0	1.41e-2	0	9.07e-2
RPRM	MJ	4.14e+1	0	0	0	0	0	1.66e+2	0	0	0	0	0	0	0
NRPRE	MJ	1.73e+2	3.82e-1	6.96e-2	0	3.29e+1	0	8.24e+2	0	0	0	0	3.53e-1	0	7.75e-1
NRPRM	MJ	1.70e+1	0	0	0	0	0	6.81e+1	0	0	0	0	0	0	0
SM	kg	1.70e-1	0	0	0	0	0	6.79e-1	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	7.22e-1	5.22e-5	2.37e-5	0	1.32e-2	0	2.94e+0	0	0	0	0	4.83e-5	0	9.60e-5

Results

Waste and Output Flow Indicators

per 1 m2 of product.

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NHWD	kg	0	0	1.42e-1	0	0	0	5.66e-1	0	0	0	0	0	0	2.31e+0
HLRW	kg	1.01e-5	1.30e-9	7.43e-10	0	3.83e-6	0	5.59e-5	0	0	0	0	1.20e-9	0	9.58e-9
ILLRW	kg	8.86e-3	1.09e-6	6.56e-7	0	3.20e-3	0	4.82e-2	0	0	0	0	1.01e-6	0	8.57e-6
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MER	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EE	MJ	0	0	2.18e-2	0	0	0	8.73e-2	0	0	0	0	0	0	0

Results

Carbon Emissions and Removals

per 1 m2 of product.

Indicator	Unit	A1A2A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
BCRP	kg CO2	3.42e+0	0	0	0	0	0	1.37e+1	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	1.37e+1	0	0	0	0	0	0	3.42e+0
BCRK	kg CO2	1.09e-1	0	0	0	0	0	4.38e-1	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	1.09e-1	0	0	0	4.38e-1	0	0	0	0	0	0	0
BCEW	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CCE	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CCR	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWNR	kg CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Liters of Fuel:	0.00496 l/100km
Vehicle Type:	Truck
Transport Distance:	800 km
Capacity Utilization:	
Packaging Mass:	0.0625 kg
Gross density of products transported:	
Weight of products transported:	2.5 kg
Volume of products transported:	
Capacity utilization volume factor:	0.6

Scenarios

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	5 %
Product Lost per Functional Unit:	0.122 kg
Waste Materials at the Construction Site Before Waste Processing:	0.00625 kg
Biogenic Carbon Contained in Packaging:	0.109 kg

Scenarios

Reference Service Life

B1 Module

RSL:	15 Cycles

Scenarios

Maintenance (B2)

B2 Module

Maintenance Cycle:	
Energy Input:	17.4 kWh
Maintenance Process Information:	The maintenance stage considers a routine carpet cleaning which involves the use of water, detergent, and energy consumption for vacuuming to ensure their longevity. The cleaning assumptions used in the LCA model are based on estimates from other published broadloom carpet EPDs in order to help establish comparability with publicly available carpet EPDs.

Scenarios

Repair (B3)

B3 Module

Repair Cycle:	
Repair Process Information:	The module B3 is zero as no repair work of carpets is involved in this study.

Scenarios

Replacement (B4)

B4 Module

Reference Service Life:	15 Years
Replacement Cycle:	4 (ESL/RSL)-1
Replacement of Worn Parts:	2.31 kg
Further assumptions for scenario development:	
Product loss per functional unit:	0.125 kg
Waste materials at the construction site before waste processing, generated by product installation:	0.0626 kg

Scenarios

Refurbishment (B5)

B5 Module

Replacement Cycle: 15 Cycles/RSL

4 Cycles/ESL

Refurbishment Process Description: The module B5 is zero as no refurbishment work of carpets is involved in this study.

Scenarios

Operational Energy Use & Operational Water Use

B6 & B7 Modules

Characteristic Performance:

Modules B6 and B7 are zero as no electricity or water are directly consumed during building operation.

Scenarios

End of Life

C1 - C4 Modules

Collection Process

Collected Separately:	2.31 kg

Recovery

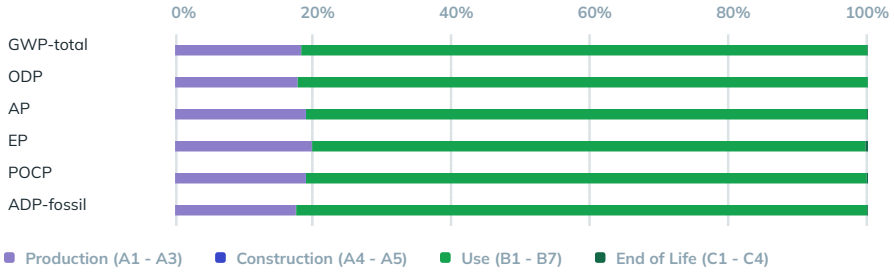
Landfill:	2.31 kg

Disposal

Product or Material for Final Disposal:	2.31 kg

Interpretation

The primary drivers of burden are the replacement (B4) accounting for 80% of all reported categories and indicators. The raw materials (A3) are the second largest contributor and account for 15% of GWP and 19% of EP, due to the wool required for carpet production. Manufacturing (A3) also displays a significant contribution to all impacts categories (3% of GWP, 5% of APDf). The remaining modules contribute to less than 3% of impacts when combined, except for SFP where raw materials transportation (A2) contributes to around 4%. Within the product stage, the largest contributors are the face fiber materials. The higher face weight products have, the higher the expected impact should be.



Additional Environmental Information

Environment and Health During Manufacturing:

More information on Bloomsburg sustainability and environmental programs can be found at https://bloomsburgcarpet.com/.

Environment and Health During Installation:

All personnel must be equipped with personal protective equipment (PPE) at the time of installation process.

Extraordinary Effects:

Fire

ASTM E648-19 (Critical Radiant Flux) Class 1 - 1.06 watts/cm2.

Water

Should the product become flooded, the water should be removed through means of extraction and drying and the product should behave as originally intended. There are no environmental impacts associated with the product being flooded.

Mechanical Destruction

If the product is mechanically destroyed, it should be disposed of using standard procedures and replaced in a timely manner.

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