ENVIRONMENTAL PRODUCT DECLARATION

TUFTED NYLON CARPET ON WELDLOK BACKING

MOHAWK GROUP
HIGH PERFORMANCE BROADLOOM CARPET

Sustainability is a core value for Mohawk. In addition to being the largest flooring company in the world, Mohawk is unique among other flooring manufacturers in that we produce every component of the carpet: fiber, yarn, carpet cushion, and carpet backing. Our culture drives us to seek innovation and efficiency throughout the life cycle of our product, thus reducing our consumption of water, energy, and raw materials. Mohawk also has the most diverse recycling programs in the industry. Through our nation-wide network of partners, we recycle post- consumer carpet and fiber which is subsequently repurposed in the manufacture of other products. Additionally, Mohawk is the nation's largest recycler of plastic bottles which are processed and spun into carpet and backing at our own facilities. Through third party verification, Mohawk embraces transparency for the benefit of both itself and its customer.

For more information visit:
www.mohawkgroup.com

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Tufted Nylon Broadloom Carpet on Weldlok Backing
High Performance Broadloom Carpet Flooring

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	UL General Program Instructions July 2018 v. 2.4
MANUFACTURER NAME AND ADDRESS	Mohawk Industries, LLC 160 South Industrial Blvd. Calhoun, GA 30701
DECLARATION NUMBER	4788979446.106.1
DECLARED PRODUCT & FUNCTIONAL UNIT	Tufted Nylon Carpet on Weldlok Backing Functional Unit = 1 m2
REFERENCE PCR AND VERSION NUMBER	PCR for Building-Related Products and Services – Part A: Calculation Rules for LCA and Requirements, (UL Environment, V3.2), Part B: Flooring EPD Requirements UL 10010-7 v2.0 September 2018
DESCRIPTION OF PRODUCT APPLICATION/USE	Broadloom Carpet Floor
PRODUCT RSL DESCRIPTION (IF APPL.)	Reference service life of Tufted Nylon Broomloom Carpet on Weldok Unitary Backing 15 Years
MARKETS OF APPLICABILITY	North America-Commercial Floor Covering Applications
DATE OF ISSUE	October 1, 2019
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product Specific
RANGE OF DATASET VARIABILITY	N/A
EPD SCOPE	Cradle to Grave
YEAR(S) OF REPORTED PRIMARY DATA	2018
LCA SOFTWARE & VERSION NUMBER	GaBi ts
LCI DATABASE(S) & VERSION NUMBER	GaBi 2017 LCI Database
LCIA METHODOLOGY & VERSION NUMBER	CML 2001, April 2013 and TRACI 2.1

This PCR review was conducted by:	UL Environment, PCR Review Panel Jack Geibig, Chair jgeibig@ecoform.com
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.

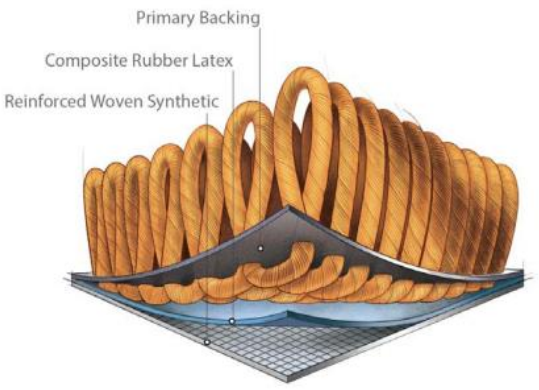
1. Product Definition and Information

1.1. Description of Company/Organization

Mohawk Flooring is a leading manufacturer of carpet, wood, laminate and luxury vinyl tile flooring that began in 1878. Mohawk is committed to growing in ways that are environmentally sound, socially responsible and that make sense for their stakeholders. The Mohawk Group strives to design and manufacture innovative products with reduced environmental and social impacts. As part of the world's largest flooring manufacturer, Mohawk feels a profound sense of responsibility to advance their shared mission of a more sustainable future.

1.2. Product Description

Product Identification



Broadloom Carpet on Weldlok is one of Mohawk's high performance commercial broadloom floor coverings with a nylon backing and face fiber. The Weldlok platform consists of various styles, colors, and patterns made with a nylon pile fiber layer and Weldlok backing. The pile fiber wear layer contains Type 6, 6.6, or Recycled Type 6, which may be yarn dyed, solution dyed, or a a combination of yarn and solution dyed.

The Life Cycle Analysis was conducted on an average face weight of 58.78 oz/sq yd, which is the average of the annual sales. Unless noted in the report, the average face weight of 58.78 (osy) is presented for the impacts.

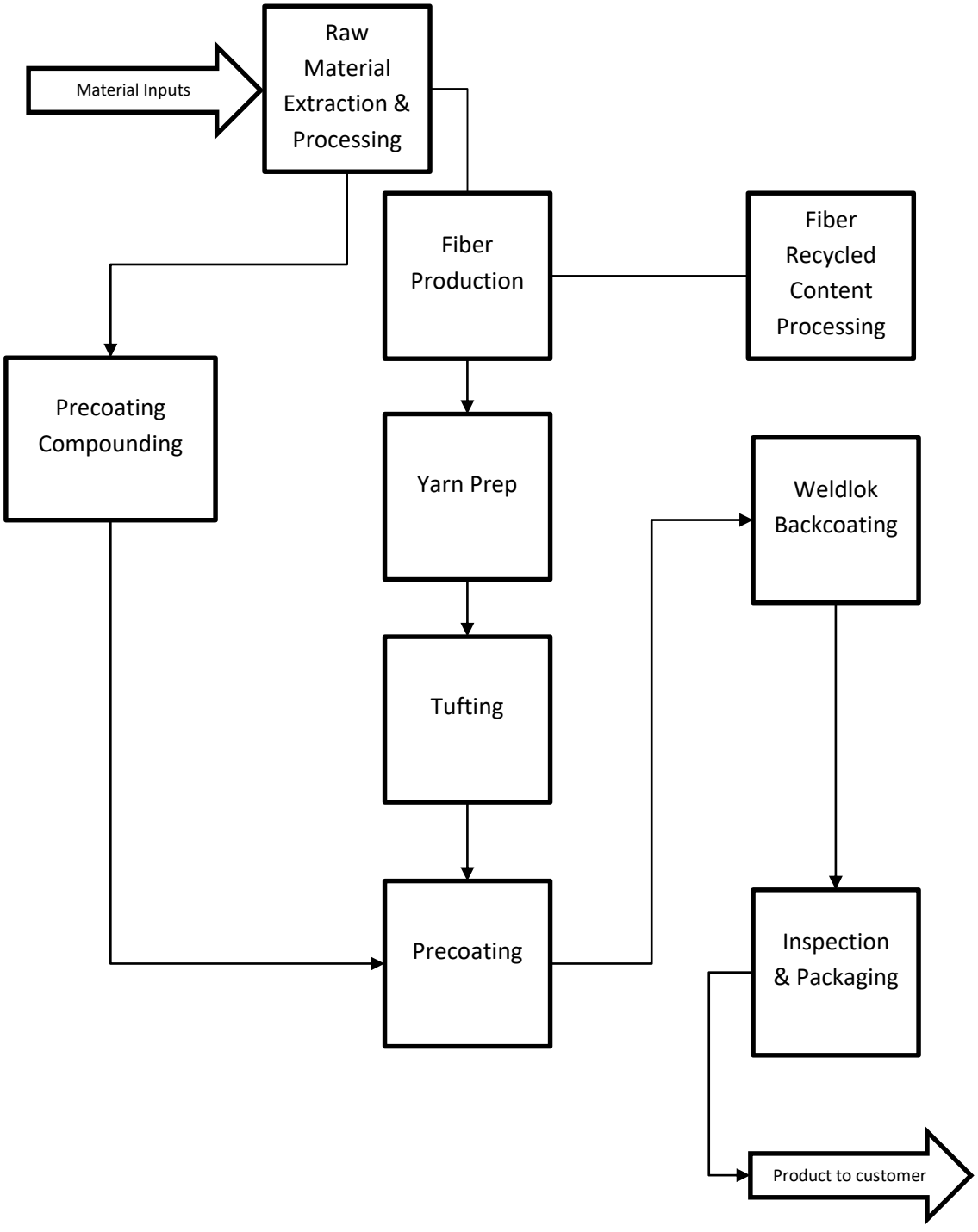
Product Specification

The product is described using the specifications outlined in Table 2. Additionally, the product has performance characteristics outlined in Table 1. This product is covered by UNSPSC code 30161700 and CSI Masterformat code 09 60 00 – Flooring.

Table 1: Technical Product Specifications

NAME	VALUE	UNIT
Surface Flammability FF 1-70	Pass	-
Radiant Panel (ASTM E 648)	Class 1	-
Smoke Density (ASTM E 662)	≤ 450	-
Electrostatic Propensity (AATCC 134)	≤ 3.5	KV
Colorfastness to Light (AATCC 16 Option 3)	≥ 4.0	@ 40 AFUs
Hexapod (ASTM D 5252) & Surface Appearance Change (ASTM D 7330)	≥ 3.0	Severe Traffic
Tuft Bind (ASTM D 1335)	≥ 10	Lbs.
CRI Green Label Plus	GLP 6678	-
California Specification 01350	Meets Criteria	-

Flow Diagram



Product Average

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.

1.3. Application

Weldlok products are designed to be used in commercial applications such as health care, education, hospitality, and retail. The product can also be used residentially if desired.

1.4. Declaration of Methodological Framework

This LCA is a cradle-to-grave study. A summary of the life cycle stages can be found in Table 13.

The reference service life is outlined in Table 10 and is only applicable if all manufacturing guidelines are followed regarding site-selection and installation, found online.

The cut-off criteria are described in Section 2.4 and allocation procedures are described in Section 2.8. No known flows are deliberately excluded from this EPD.

1.5. Technical Requirements

The following technical data describe the product undergoing the life cycle assessment.

Table 2: Carpet Technical Data

NAME	VALUE	UNIT
Yarn Type	Nylon	-
Primary Backing Type	Polypropylene	-
Secondary Backing	Weldlok Backing, Calcium Carbonate, Ethylene Vinyl Acetate	-
CRI Rating	Heavy	2.5 Moderate, 3.0 Heavy, 3.5 Severe
Product Weight	2201	g/m^2
Surface Pile Weight	1034.1	g/m^2

1.6. Properties of Declared Product as Delivered

The broadloom carpet is packaged in polyethlene wrapping for shipment. The Mohawk Group encourages installers to recycle the packaging in local recycling programs.

1.7. Material Composition

The materials that make up the flooring product are indicated in

Table 3.

Table 3: Material Composition

COMPONENT	MATERIAL	MASS %
Face fiber	Nylon	46%
Primary backing	Polypropylene	5%
Weldlok backing	Weldlok Backing, Calcium Carbonate, Ethylene Vinyl Acetate	3%
Pre-coat / Coating	Calcium Carbonate, Styrene Butadiene	17%

Unless indicated in the table above, the product does not contain hazardous substances per the applicable regional-specific legislation, as indicated in Section 2.8.6 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment.

1.8. Manufacturing

Broadloom Carpet on Weldlok Backing products are manufactured in various facilities in Georgia. Nylon fiber is tufted into primary backing, a latex precoat is applied, then a secondary coating is adhered to the back with the Weldlok backing. These sheets are then rolled, packaged, and loaded into trucks for shipment to customers.

1.9. Packaging

Packaging utilized in the shipment of the product is described in Table 4.

Table 4: Packaging

PACKAGING TYPE	MATERIAL	AMOUNT (OZ/ SQ. YD)	DISPOSAL PATHWAY
Plastic Wrap	Polyethylene film	1.43	Landfill, incineration, recycle
Cardboard	Cardboard	1.2	Landfill, incineration, recycle

1.10. Transportation

It is assumed that all raw materials are distributed by truck, based on global region. An average distance using this information was calculated and used in the model. Transport of raw material from supplier to the manufacturing facility was calculated for each raw material but only an average has been listed here due to simplicity.

The shipping distance from the manufacturing location to the customer was assumed to 800 kilometers. The transportation distance for all waste flows is assumed to be 160 km based on best available data.

1.11. Product Installation

Detailed installation instructions can be found online. While installation equipment is required to install the flooring product, it is not included in the study as these are multi-use tools and the impacts per functional unit is considered negligible. All waste generated during installation, including packaging waste, is disposed of according to the tables found in Section 2.8.5 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment.

1.12. Use

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.

Table 5: Use Phase Assumptions

TYPE	VALUE	UNIT
Cleaning per Week	3	#
Weeks per Year Where Cleaning Occurred	52	#

Broadloom carpet products are traditionally not repaired or refurbished, but profesional services may resolve the issue depending on the extent of damage.

1.13. Reference Service Life and Estimated Building Service Life

The reference service life of Weldlok is 15 years. For a building's estimated service life of 75 years, this means the carpet will be replaced 4 times, meaning 5 m^2 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.

1.14. Reuse, Recycling, and Energy Recovery

Mohawk will take back and recycled used carpet via their ReCover Program. Through this program, Mohawk works with a national network of carpet recyclers to ensure used carpet stays out of the landfill.

1.15. Disposal

Disposal pathways in the EPD are modeled in accordance with disposal routes and waste classification referenced in Sections 2.8.5 and 2.8.6 of *Part A: Life Cycle Assessment Calculation Rules and Report Requirements* from UL Environment. This indicates an end-of-life split amongst landfill, recycling, and incineration pathways.

2. Life Cycle Assessment Background Information

2.1. Functional Unit

The functional unit of the flooring product is one (1) m^2 of floor covering, as indicated in Table 6.

Table 6: Functional Unit

NAME	VALUE	UNIT
Functional Unit	1 m^2	
Mass	2.201	kg

2.2. System Boundary

The type of EPD is cradle-to-grave. The LCA modules that are included are summarized in Table 7

Table 7: System Boundary

Module Name	Description	Analysis Period	Summary of Included Elements
A1	Product Stage: Raw Material Supply	2018	Raw Material sourcing and processing as defined by secondary data.
A2	Product Stage: Transport	2018	Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and estimated distance.
A3	Product Stage: Manufacturing	2018	Energy, water and material inputs required for manufacturing products from raw materials. Packaging materials and manufacturing waste are included as well.
A4	Construction Process Stage: Transport	2018	Shipping from manufacturing site to project site. Fuel use requirements estimated based on product weights and mapped distance.
A5	Construction Process Stage: Installation	2018	Installation adhesives, installation waste and packaging material waste.
B1	Use Stage: Use	2018	Use of the product.
B2	Use Stage: Maintenance	2018	Cleaning energy, water, and materials, including refinishing the product.
C2	EOL: Transport	2018	Shipping from project site to landfill. Fuel use requirements estimated based on product weight and mapped distance.
C3	EOL: Waste Processing	2018	Waste processing not required. All waste can be processed as is.
C4	EOL: Disposal	2018	Assumes all products are sent to landfill. Landfill impacts modeled based on secondary data.

2.3. Estimates and Assumptions

All estimates and assumptions are within the requirements of ISO 14040/44. The majority of the estimations are within the primary data. The primary data was collected as annual totals including all utility usage and production information. For the LCA, the usage information was divided by the production to create an energy and water use per square meter. As there are different products produced at this facility, it is assumed all products are using the same amount of energy. Another assumption is that the installation tools are used enough times that the per square meter impacts are negligible.

2.4. Cut-off Criteria

All inputs in which data was available were included. Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the functional unit.

2.5. Data Sources

Primary data were collected by facility personnel and from utility bills and was used for all manufacturing processes. Whenever available, supplier data was used for raw materials used in the production process. When primary data did not exist, secondary data for raw material production was utilized from GaBi Database Version 8.7, Service Pack 36.

2.6. Data Quality

The geographical scope of the manufacturing portion of the life cycle is Georgia. All primary data were collected from the manufacturer. The geographic coverage of primary data is considered excellent. The primary data provided by the manufacturer represent all information for calendar year 2018. Using this data meets the PCR requirements. Time coverage of this data is considered very good. Primary data provided by the manufacturer is specific to the technology that Mohawk uses in manufacturing their product. It is site-specific and considered of good quality. It is worth noting that the energy and water used in manufacturing the product includes overhead energy such as lighting, heating and sanitary use of water. Sub-metering would improve the technological coverage of data quality. Data necessary to model cradle-to-gate unit processes was sourced from GaBi LCI datasets. Improved life cycle data from suppliers would improve technological coverage.

2.7. Period under Review

The period under review is calendar year 2018.

2.8. Allocation

General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. When allocation was necessary it was done on a physical mass basis. Allocation was most prevalent in the secondary GaBi datasets used to represent upstream processes. As a default, GaBi datasets use a physical mass basis for allocation.

3. Life Cycle Assessment Scenarios

Table 8. Transport to the building site (A4)

NAME	VALUE	UNIT
Fuel type	Diesel	-
Liters of fuel	38.8	l/100km
Vehicle type	Truck – Trailer	-
Transport distance	800	km
Capacity utilization	78	%
Gross density of products transported	690	kg/m^3
Capacity utilization volume factor	1	-

Table 9. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	0.152	kg
Net freshwater consumption specified by water source and fate	0	m3
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Product loss per functional unit	0.0727	kg
Waste materials at the construction site before waste processing, generated by product installation	0.0727	kg
Output materials resulting from on-site waste processing	0	kg
Biogenic carbon contained in packaging	0.04	kg CO2
Direct emissions to ambient air, soil and water	0	kg
VOC content of flooring	0	µg/m3

Table 10. Reference Service Life

NAME	VALUE	UNIT
RSL	15	years
Declared product properties (at the gate) and finishes, etc.	See Table 1	-
Design application parameters	Installation per recommendation by manufacturer	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Accepted industry standard	-
Indoor environment (if relevant for indoor applications)	Normal building operating conditions	-
Use conditions, e.g. frequency of use, mechanical exposure	Normal building operating conditions	-

Table 11. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information	Manufacturer recommended	-
Maintenance cycle	2,340	Number/ RSL
Maintenance cycle	11,700	Number/ ESL
Net freshwater consumption specified by water source and fate	0.01072, evaporated	m^3/m^2 floor/yr
Detergent	0.0072	kg/m^2 floor/yr
Electricity for vacuuming and deep cleaning	3.71	kWh/m^2 floor/yr
Power output of equipment	1.4	kW
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development	Vacuuming thrice a week, deep cleaning bi-monthly	

Table 12. End of life (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development		Product is either disposed of with the underlying floor or manually removed via scraping	
Collection process	Collected separately	538,114	kg
	Collected with mixed construction waste	5,231,760	kg
Recovery	Reuse	0	kg
	Recycling	478,704	kg
	Incineration	0	kg
	Incineration with energy recovery	59,410	kg
	Energy conversion efficiency rate	98	%
Disposal	Product or material for final deposition	5,231,760	kg
Removals of biogenic carbon (excluding packaging)		0	0

4. Life Cycle Assessment Results

Table 13. 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	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
EPD Type	X			X	X	X	X	MND	MND	MND	MND	MND	X	MND	X	MND

4.1. Life Cycle Impact Assessment Results

Table 14. North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B1	B2	C2	C4
AP [kg SO_2 eq]	0.0967	0.00293	0.000172	0	0.0814	0.00011 7	0.00731
EP [kg N eq]	0.0085	0.00023 9	1.52E- 005	0	0.0379	9.55E- 006	0.00279
GWP 100 [kg CO_2 eq]	50	0.633	0.0986	0	27.4	0.0253	0.462
ODP [kg CFC-11 eq]	1.39E-008	2.17E- 014	3.12E- 014	0	3.46E- 011	8.69E- 016	8.51E- 014
ADPF [MJ, LHV]	116	1.2	0.246	0	26.9	0.0479	0.927
SFP [kg O_3 eq]	1.8	0.0969	0.00298	0	0.663	0.00387	0.0613

4.2. Life Cycle Inventory Results

Table 15. Resource Use

PARAMETER	A1-A3	A4	A5	B1	B2	C2	C4
RPR_E [MJ, LHV]	27.5	0.222	0.0486	0	47.9	0.00889	0.523
RPR_M [MJ, LHV]	0	-	-	-	-	-	-
$NRPR_E$ [MJ, LHV]	921	8.98	1.94	0	426	0.359	7.41
$NRPR_M$ [MJ, LHV]	0	-	-	-	-	-	-
SM [kg]	4.5	0	0	0	0	0	0
RSF [MJ, LHV]	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-
FW [m^3]	0.457	0.00108	0.000459	0	0.147	4.32E- 005	0.000896

Table 16. Output Flows and Waste Categories

PARAMETER	A1-A3	A4	A5	B1	B2	C2	C4
HWD [kg]	2.71E-005	6.99E- 008	8.73E- 010	0	2E-007	2.79E- 009	2.55E- 008
NHWD [kg]	0.782	0.00033 7	0.000921	0	1.09	1.35E- 005	10.5
HLRW [kg] or [m^3]	1.57E-005	2.38E- 008	3.56E- 008	0	3.85E- 005	9.52E- 010	9.6E-008
ILLRW [kg] or [m^3]	1.27E004	6.43E- 007	9.68E- 007	0	0.00106	2.57E- 008	2.29E- 006
CRU [kg]	0	0	0	0	0	0	0
MER [kg]	0	0	0	0	0	0	0
EE [MJ, LHV]	0	0	0	0	0	0	0

5. LCA Interpretation

The analysis results represent the cradle-to-grave environmental performance of Weldlok carpet products. The top three contributors to each impact category are shown in Table 17.

Table 17: Highest Contributions by Impact Category

IMPACT CATEGORY	CONTRIBUTORS		
	LARGEST	2ND	3RD
Global Warming Potential, GWP	A1-3	B2	A4
Ozone Depletion Potential, ODP	A1-3	B2	A4
Acidification Potential of soil and water, AP	A1-3	B2	C4
Eutrophication Potential, EP	B2	A1-3	C4
Depletion of abiotic resources - fossil fuels, ADPF	A1-3	B2	A4

Under the 1-year product life assumption, the product section (A1-3) was the largest contributor in most of the five impact categories considered. The production of raw materials represents a substantial fraction of the life cycle impacts, even over the product service life. Maintenance (B2) was the second highest contributor for much of the 5 impact categories. For the Eutrophication Potential (EP) category, Maintenance (B2) was the largest contributor. Disposal (C4) and Transport to Gate Site (A4) were the third contributors for all the categories.

As a total, Raw Material Supply & Transport and Product Manufacturing (A1-A3) represent most of each of the impact categories considered. Within the raw materials, the nylon face fiber has a very large contribution to the environmental impacts even though it represents less than 20% of the total mass of the product. Maintenance (B2) has the second largest impact overall, followed by Transport to Gate Site (A4) and Disposal (C4).

6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

More information on the manufacturer's sustainability and environmental programs, including a corporate sustainability report, can be found online.

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, found online.

6.3. Extraordinary Effects

Fire

The product's fire performance can be found in the technical specifications found in Table 1.

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.

6.4. Environmental Activities and Certifications

The flooring product has received the Green Label Plus certification for low-emitting materials. More information on the certification and associated product certificates can be found at www.carpet-rug.org.

7. Supporting Documentation

The full text of the acronyms found in Section 4 are found in Table 15.

Table 15. Acronym Key

Acronym	Text	Acronym	Text
LCA Indicators			
ADP-elements	Abiotic depletion potential for non-fossil resources	GWP	Global warming potential
ADP-fossil	Abiotic depletion potential for fossil resources	OPD	Depletion of stratospheric ozone layer
AP	Acidification potential of soil and water	POCP	Photochemical ozone creation potential
EP	Eutrophication potential	Resources	Depletion of non-renewable fossil fuels
LCI Indicators			
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERM	Use of renewable primary energy resources used as raw materials	SM	Use of secondary materials
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	RSF	Use of renewable secondary fuels
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	NRSF	Use of non-renewable secondary fuels
PENRM	Use of non-renewable primary energy resources used as raw materials	FW	Net use of fresh water
HWD	Disposed-of-hazardous waste	MFR	Materials for recycling
NHWD	Disposed-of non-hazardous waste	MET	Materials for energy recovery
RWD	Disposed-of Radioactive waste	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

8. References

EN 15804	DIN EN 15804:2012-04: Sustainability of construction works -Environmental Product Declarations - Core rules for the product category of construction products
EN ISO 14025	EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
EN ISO 14040	EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework
EN ISO 14044	EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines
GABI TS	GaBi ts dataset documentation for the software-system and databases, LBP, University of Stuttgart and Thinkstep, Leinfelden-Echterdingen, 2017 (http://documentation.gabi-software.com/)
ISO 21930: 2017	ISO 21930:2017, Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
UL ENVIRONMENT	UL Environment General Program Instructions April 2017, version 2.1
UL ENVIRONMENT PART A:	Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (September 2018, version 3.2)
UL ENVIRONMENT PART B:	UL PCR Part B for Flooring version 2.0 September, 2018