# ENVIRONMENTAL PRODUCT DECLARATION

## TUFTED NYLON BROADLOOM CARPET ON UNIBOND PLUS ONGUARD

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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# ENVIRONMENTAL PRODUCT DECLARATION

**Tufted Nylon Broadloom Carpet on Unibond Plus OnGuard 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 | 4788979446.104.1 |
| DECLARED PRODUCT & FUNCTIONAL UNIT | Unibond Plus OnGuard carpet flooring 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<br>Jack Geibig, Chair<br>jgeibig@ecoform.com |
| This declaration was independently verified in accordance with ISO 14025: 2006.<br>☐ INTERNAL ☒ EXTERNAL | Grant R. Martin<br>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<br>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.

**Tufted Nylon Broadloom Carpet on Unibond Plus OnGuard Backing**
High Performance Broadloom Carpet Flooring

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

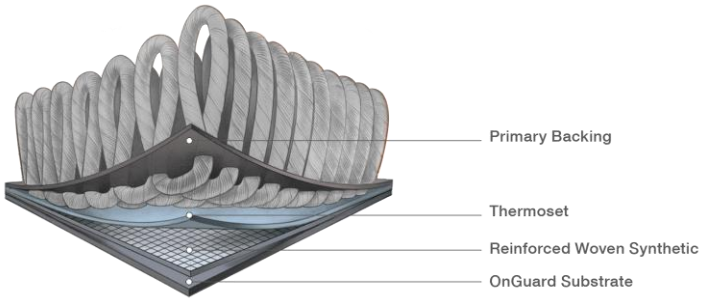
# 1. Product Definition and Information

## 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




Unibond Plus OnGuard is one of Mohawk's high performance commercial broadloom floor coverings with a nylon backing and face fiber. The Unibond Plus OnGuard platform consists of various styles, colors, and patterns made with a nylon pile fiber layer and polypropylene backing. The pile fiber contains Type 6, 6.6, or Recycled Type 6 nylon with a PET attached cusion, 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 66.53 oz/sq yd, which is the average of the annual sales. Unless noted in the report, the average face weight of 66.53 (osy) is presented for the impacts.

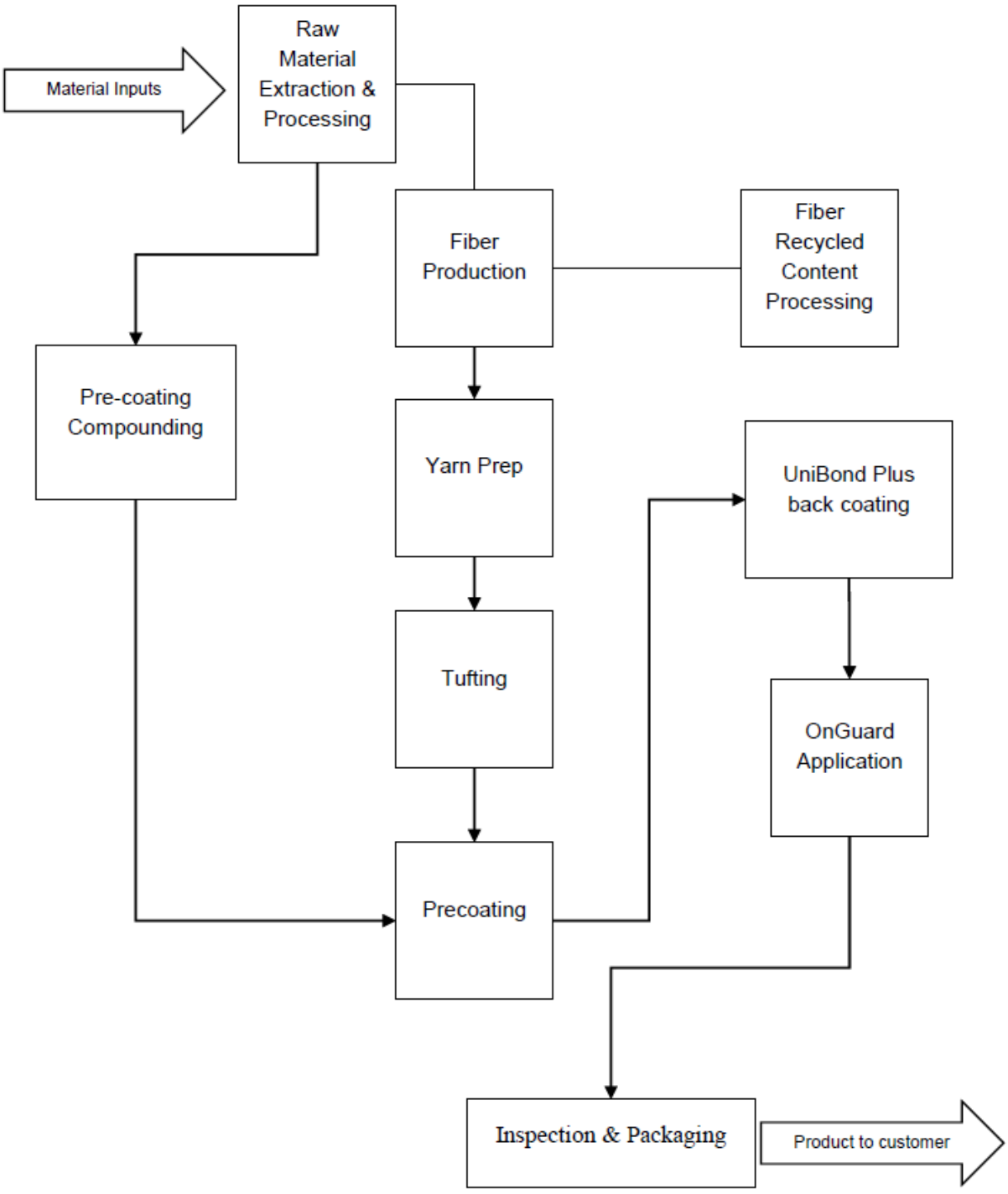
### Product Specification

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 | - |
| 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) | ≥ 3.5 | Severe Traffic |
| Tuft Bind (ASTM D 1335) | ≥ 10 | Lbs. |
| Delamination (ASTM D 3936) | ≥ 2.5 | Lbs. |
| CRI Green Label Plus | GLP 3802 | - |
| 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

Broadloom floor coverings on Unibond Plus OnGuard Backing are intended for commercial high performance environments, and will deliver long term performance and durability.

## 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 Type | Polypropylene | - |
| CRI Rating | Heavy | 2.5 Moderate, 3.0 Heavy, 3.5 Severe |
| Product Weight | 2255 | $g/m^2$ |
| Surface Pile Weight | 832 | $g/m^2$ |

## 1.6. Properties of Declared Product as Delivered

Unibond Plus OnGuard broadloom carpet comes in 12” rolls. 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 | 37% |
| Primary backing | Polypropylene | 4% |
| Secondary backing | Polypropylene | 2% |
| Pre-coat/ Coating Layer | Calcium Carbonate, Styrene Butadiene | 44% |
| Adhesive | PE Adhesive | 4% |
| Unibond Plus OnGuard backing | Felt PET | 5% |
| Barrier Film | Polyethylene | 2% |

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

Unibond Plus OnGuard products are manufactured in various locations in Northern Georgia. Nylon fiber is tufted into primary backing, a latex precoat is applied, then a secondary coating is adhered to the back. 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./YD2) | DISPOSAL PATHWAY |
|---|---|---|---|
| Plastic Wrap | Polyethylene film | 2.98 | 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 Unibond Plus OnGuard 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 | 2.255 | 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 | 3,642 | kg |
| | Collected with mixed construction waste | 35,408 | kg |
| Recovery | Reuse | 0 | kg |
| | Recycling | 3,240 | kg |
| | Incineration | 0 | kg |
| | Incineration with energy recovery | 402 | kg |
| | Energy conversion efficiency rate | 1 | % |
| Disposal | Product or material for final deposition | 35,408 | 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] | 0.123 | 0.00352 | 0.000172 | 0 | 0.0814 | 0.00014 1 | 0.00876 |
| EP [kg N eq] | 0.00919 | 0.00028 6 | 1.52E- 005 | 0 | 0.0379 | 1.14E- 005 | 0.00335 |
| GWP 100 [kg $CO_2$ eq] | 65.6 | 0.759 | 0.0986 | 0 | 27.4 | 0.0304 | 0.554 |
| ODP [kg CFC-11 eq] | 2.92E-008 | 2.61E- 014 | 3.12E- 014 | 0 | 3.46E- 011 | 1.04E- 015 | 1.02E- 013 |
| ADPF [MJ, LHV] | 148 | 1.44 | 0.246 | 0 | 26.9 | 0.0575 | 1.11 |
| SFP [kg $O_3$ eq] | 2.26 | 0.116 | 0.00298 | 0 | 0.663 | 0.00465 | 0.0735 |

## 4.2. Life Cycle Inventory Results

**Table 15. Resource Use**

| PARAMETER | A1-A3 | A4 | A5 | B1 | B2 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| $RPR_E$ [MJ, LHV] | 32.6 | 0.266 | 0.0486 | 0 | 47.9 | 0.0107 | 0.627 |
| $RPR_M$ [MJ, LHV] | 0 | - | - | - | - | - | - |
| $NRPR_E$ [MJ, LHV] | 1.18E003 | 10.8 | 1.94 | 0 | 426 | 0.431 | 8.88 |
| $NRPR_M$ [MJ, LHV] | 0 | - | - | - | - | - | - |
| SM [kg] | 3.86 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF [MJ, LHV] | - | - | - | - | - | - | - |
| NRSF [MJ, LHV] | - | - | - | - | - | - | - |
| FW [$m^3$] | 0.169 | 0.0013 | 0.000459 | 0 | 0.147 | 5.19E- 005 | 0.00108 |

**Table 16. Output Flows and Waste Categories**

| PARAMETER | A1-A3 | A4 | A5 | B1 | B2 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 5.44E-007 | 8.38E- 008 | 8.73E- 010 | 0 | 2E-007 | 3.35E- 009 | 3.06E- 008 |
| NHWD [kg] | 1.16 | 0.00040 5 | 0.000921 | 0 | 1.09 | 1.62E- 005 | 12.6 |
| HLRW [kg] or [$m^3$] | 2.17E-005 | 2.86E- 008 | 3.56E- 008 | 0 | 3.85E- 005 | 1.14E- 009 | 1.15E- 007 |
| ILLRW [kg] or [$m^3$] | 1.79E004 | 7.71E- 007 | 9.68E- 007 | 0 | 0.00106 | 3.09E- 008 | 2.74E- 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 Unibond Plus OnGuard carpet products. The top three contributors to each impact category are shown in Table 18.

**Table 18: Highest Contributions by Impact Category**

| IMPACT CATEGORY | CONTRIBUTORS | | |
|---|---|---|---|
| | LARGEST | 2ND | 3RD |
| Global Warming Potential, GWP | A1-A3 | B2 | A4 |
| Ozone Depletion Potential, ODP | A1-A3 | B2 | C4 |
| Acidification Potential of soil and water, AP | A1-A3 | B2 | C4 |
| Eutrophication Potential, EP | B2 | A1-A3 | C4 |
| Depletion of abiotic resources - fossil fuels, ADPF | A1-A3 | B2 | C4 |

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 17.

**Table 17. 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 |