ENVIRONMENTAL PRODUCT DECLARATION

# CARPET TILE - WELLBAC® COMFORT BACKING

North America – Solution Dyed Nylon
R/EN Nylon 6.6
*Manufactured using Renewable Energy*

WellBAC® Comfort is Milliken's cushion back modular tile. In addition to providing superior underfoot comfort and significantly improving the carpet's wear performance, WellBAC® Comfort also offers installation, ergonomic, acoustic, safety and environmental benefits.

Milliken has a rich history of delivering innovative flooring solutions from our research center, manufacturing facilities and our creative collective of inspired problem solvers. Milliken's reliable and stylish flooring products offer great design solutions built from unique insights and an exceptional array of technical capabilities.

We believe material health is essential to enable circularity. The use of materials that don't contain harmful chemicals is a critical pathway to end-of-life product recycling. Our carpet products have 100% transparency in materials to 100ppm. Material transparency and a continued focus on improving material health is core to our commitment to the environment. Our carpet, resilient flooring, and entryway tile are recyclable. We will continue to invest in new technology and create flooring products that enable you to make better choices.

For More Information or contact us at:
Millikenfloors.com | 800.824.2246

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

Carpet Tile - WellBAC® Comfort Backing
North America - Solution Dyed Nylon 6,6

According to ISO 14025 and ISO 21930:2017

| | |
|---|---|
| EPD Program and Program Operator Name, Address, Logo, and Website | UL Solutions<br>333 Pfingsten Rd, Northbrook IL, 60062<br>www.UL.com<br>www.spot.ul.com |
| General Program Instructions and Version Number | Program Operator Rules v 2.7 2022 |
| Manufacturer Name and Address | Milliken, 300 Lukken Industrial Dr., LaGrange GA 30240 |
| Declaration Number | 4791117385.114.1 |
| Declared Product & Functional Unit or Declared Unit | 1 $m^2$ of North America Carpet Tile - WellBAC® Comfort Backing with Solution Dyed Nylon 6.6 installed in a building with a 75 year service life. |
| Reference PCR and Version Number | Part A: Life Cycle Assessment Calculation Rules and Report Requirements, (UL Environment, V4.0, 2022) and Part B: Flooring EPD Requirements (UL Environment V2.0, 2018) |
| Description of Product Application/Use | Carpet flooring for interior use |
| Product RSL Description (if Appl.) | 15 Years |
| Markets of Applicability | Americas |
| Date of Issue | October 30th 2024 |
| Period of Validity | 5 Years |
| EPD Type | Manufacturer Specific |
| EPD Scope | Cradle to Grave |
| Year(s) of Reported Primary Data | 2022 |
| LCA Software & Version Number | Sphera LCA FE 10.9 |
| LCI Database(s) & Version Number | MLC Database 2024.2 |
| LCIA Methodology & Version Number | TRACI 2.1, CML 2001-Jan 2016, and IPCC AR5 |
| LCA Model Version | 0.2 |

| | |
|---|---|
| The PCR review was conducted by: | UL Solutions<br>PCR Review Panel<br>epd@ul.com |
| This declaration was independently verified in accordance with ISO 21930:2017 and ISO 14025: 2006.<br>☐ INTERNAL ■ EXTERNAL | Cooper McCollum, UL Solutions |
| This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by: | WAP Sustainability |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by: | James Mellentine, thrive ESG |

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: This EPD meets all comparability requirements stated in ISO 21930:2017 and ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers or programs, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the construction works level per ISO 21930:2017 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-by-case basis. Examples of variations: Different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.

# 1. Product Definition and Information

## 1.1. Description of Company/Organization

The Milliken Floor Covering division is part of Milliken & Company, an innovation company that has been exploring, discovering and creating ways to enhance people's lives since 1865. The company is a privately held for-profit corporation. The company is headquartered in Spartanburg, South Carolina, and operates flooring design and manufacturing facilities in the United States, United Kingdom, Australia and China. In 2023, Milliken was recognized as one of the world's most ethical companies for the seventeenth consecutive year.

## 1.2. Product Description

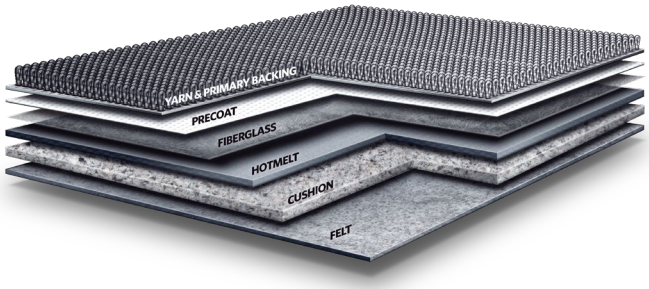


**Figure 1: Illustration of Milliken Carpet Tile Construction**

**Product Identification**

This EPD represents Milliken's WellBac® Comfort Backed Carpet Tile manufactured in the US using renewable energy through the use of Renewable Energy Certificates (RECs). The face fiber used in the carpet is solution dyed nylon 6,6. (See this document to determine which collections are covered under Milliken's EPDs). The product addressed in the body of this EPD is an average product from the running line collections of this family. To account for custom products and new collections, additional results for products in this family with different face weights are presented in Section 8 and embodied carbon values for all possible faceweights are provided in Section 4.5.

A carpet tile's backing is critical to its performance, durability and appearance retention. The right backing will not only ensure the carpet tile remains dimensionally stable and flat on the floor, it can provide acoustic, insulation and sustainability benefits. In addition to providing superior underfoot comfort and significantly improving the carpet's wear performance, WellBAC® Comfort also offers installation, ergonomic, acoustic, safety and environmental benefits.

**Product Specification**

The product's performance characteristics are outlined in Table 1, with additional product-specific information found on the product's specification sheet. The product is described using the specifications outlined in Table 2.

**Table 1: Carpet Performance Testing**

| NAME | VALUE | UNIT |
|---|---|---|
| Static Electricity (AATCC 134) | ≤ 3.5 | kV |
| Flammability (ASTM E 648) | ≥0.45 (Class I) | - |
| Smoke Density (ASTM E 662) | ≤450 | - |
| Methenamine Pill Test (CPSC FF-1-70 or ASTM D 2859) | Self-Extinguishing | - |

### Product Average

An average 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 face weight.

## 1.3. Application

Milliken & Company's floor coverings are quiet, healthy, and provide a desired aesthetic for any office, hotel, school, home or commercial environment around the world.

## 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 7.

The reference service life is outlined in Table 8 and is only applicable if all manufacturing guidelines are followed regarding site-selection and installation.

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 |
|---|---|---|
| Product Form | Carpet tile | - |
| Type of Manufacturing | Solution Dyed Nylon, Tufted Nylon 6,6 on coated backing | - |
| Yarn Type | Nylon 6,6 | - |
| Primary Backing Type | Polyester, Nylon 6 | - |
| Cushion Backing | Open Cell Polyurethane | - |
| Product Weight | 3.21-3.82 | kg/m$^2$ |
| Surface Pile Thickness | 1.4-4.1 | mm |
| Surface Pile Weight | 0.407 - 1.02 | kg/m$^2$ |
| CRI Rating | Heavy (>3) | - |
| Total Thickness | 7.2-10.7 | mm |
| *This product family covers a range of face fiber weights. The results presented in this EPD represent an average face weight of 22.75 oz/m$^2$ (0.638 kg/m$^2$). Scenarios for additional face weights are presented in Section 8. | | |

## 1.6. Properties of Declared Product as Delivered

WellBAC® Comfort backed modular carpet tiles come in sizes of 1mx1m, 50cmx50cm, 25cmx1m, and 50cmx1m. The tiles are stacked on a wooden pallet and a cardboard wrapping is placed around the stack to protect the product during shipment

The products declared in this document comply with the following codes or regulations:

- ASTM E 648-17 Radiant Panel
- ASTM E 662-17a Smoke Density
- ASTM D2859 Pill Test
- AATCC 134-2011 GSA Static
- ASTM D5848 Pile weight
- ASTM D5848 Pile Density
- ASTM D6859 Pile Thickness
- ASTM D5793 Stitches
- ASTM D5793 Gauge
- ASTM D7570 AACHEN/ISO 2551 Aachen
- ASTM D1335 Tuft Bind
- AATCC 16.3 Lightfastness

## 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 6,6 | 14-22% |
| Primary backing | Polyester, Nylon 6 | 3-4% |
| Latex | VAE, Calcium carbonate | 13-14% |
| Hotmelt | Calcium carbonate, Polymer-modified bitumen | 35-46% |
| Cushion | Calcium carbonate, Polyurethane | 15-20% |
| Fiberglass | E-glass | 1-2% |
| Felt | Polypropylene, Polyethylene terephthalate | 3-4% |

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

WellBAC® Comfort Backed, solution dyed nylon modular tiles are manufactured at Duncan Stewart, Alma and Live Oak facilities in the US via a process illustrated in Figure 1. Tufting is the process of affixing face fiber to a primary backing system. La. Latex, hotmelt, fiberglass scrim, and polyurethane cushion and felt are added to the tufted primary backed carpet through successive coating operations. The hotmelt layer is primarily composed of polymer-modified bitumen and calcium carbonate. The cushion layer is primarily composed of polyurethane and calcium carbonate. The mixing of these layers occurs in batch containers and is then applied to the primary backing. The method adding design for aesthetic appeal is printing or digital dye injection where the carpet fibers are dyed after the face fiber has been tufted. Finally the carpet is cut and packaged for shipping.

This product is made using renewable electricity in the form of Renewable Energy Certificates (RECs). Milliken & Company purchases Green-e certified RECs to cover the portion of the electricity consumed at the manufacturing facilities in North America required to make this product. For more information related to Milliken's investments in renewable energy, please visit our website.

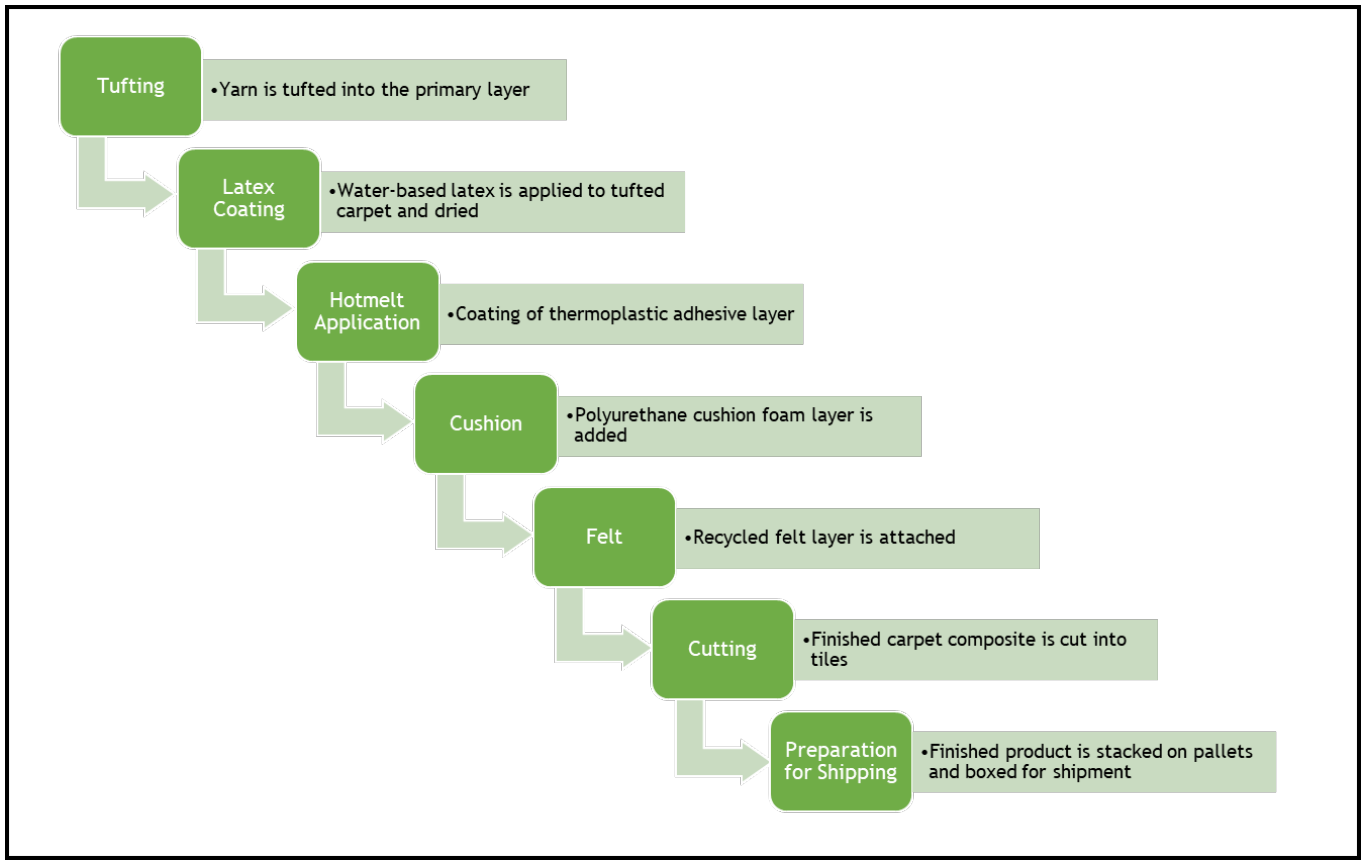


**Figure 2: Production process for Milliken Carpet Tile**

## 1.9. Packaging

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

**Table 4: Packaging**

| Packaging Type | Material | Amount (kg) | Disposal Pathway |
|---|---|---|---|
| Box | Corrugated Cardboard | 0.0759 | Landfill, incineration, recycle |
| Pallet | Wood | 0.182 | Landfill |

## 1.10. Transportation

In the LCA model underlying this EPD, it is assumed that all raw materials are distributed by truck. An distance of 800 km was used to model all raw material transportation and in the model as guided by Section 3.5 of the UL Part B Flooring PCR. This same assumption was used in modeling distribution to customers.

## 1.11. Product Installation

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 declared 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.

Except where exceeded or modified by Milliken Carpet Installation Instructions, Milliken recognizes the CRI Carpet Installation Standard 2011 as the minimum acceptable standard for the installation of its carpet products, for more information, visit our website, www.millikencarpet.com.

**Sub floor moisture**: Milliken warrants that our modular carpet will withstand vapor emission from the slab for the lifetime of the original carpet installation. This means we guarantee our carpet tile and adhesive will form a bond that provides tack and resistance to lateral movement while the pressure sensitive adhesive will allow for the removal of the modular carpet for maintenance of the space throughout the life of the carpet.

**Adhesive:** Milliken modular carpet is designed for installation without permanent adhesives, and Milliken offers different solutions fo easy removal and reinstallation. TractionBack® is a high-friction, factory-applied, coating that that reduces the need for additional adhesives. If TractionBack® is not suitable for a particular installation; Milliken Non-Reactive Standard Adhesive or Milliken Moisture Extreme Spray Adhesive is also available.

Detailed installation instructions are provided online at Milliken Floor Covering's technical documentation webpage.

## 1.12. Use

The method of maintenance is using a vacuum cleaner to remove dust and debris from carpet with occasional deep cleaning. Vacuuming was assumed to occur five days a week during working weeks. Deep cleaning, which consumes electricity, detergent, and water, was modeled as occurring twice per year.

**Table 5: Use Phase Assumptions**

| Type | Cleanings per Year | Unit |
|---|---|---|
| Vacuuming | 250 | # |
| Deep Cleaning | 2 | # |

Carpet products are traditionally not repaired or refurbished. If a single carpet tile gets stained or damaged, it can be removed and replaced with a new tile assuming the correct installation method was used per the manufacturer's instructions. Detailed maintenance instructions are provided online at Milliken Floor Covering's technical documentation webpage.

## 1.13. Reference Service Life and Estimated Building Service Life

The reference service life of the product is 15 years. For a building's estimated service life of 75 years, the carpet will be replaced four times, meaning 5 $m^2$ of tile 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

Milliken's modular carpet tiles are 100% recyclable. Keeping unnecessary waste out of landfill is a key part of Milliken's environmental commitment. The Milliken Carpet Take Back program provides a non-landfill disposal solution and

ensures that used carpet is recovered and managed in the most environmentally, socially and financially responsible way. In other cases, carpet is downcycled into construction products and plastic composites. Another option, to further reduce global fossil fuel consumption, is to convert the carpet into a fuel source for use in other industries.

### 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. For North American products not made out of metal, this dictates an End-of-Life scenario of 100% landfilling.

## 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. Values in Table 6 represent finished carpet tile, installation materials, packaging, and the mass of product lost during installation for 1 $m^2$ of carpet tile.

**Table 6: Functional Unit**

| NAME | VALUE | UNIT |
|---|---|---|
| Functional Unit | 1 $m^2$ | |
| Mass | 3.88 | kg |

### 2.2. System Boundary

The type of EPD is cradle-to-grave. All LCA modules are included and are summarized in Figure 3 and Table 7.

## Flow Diagram

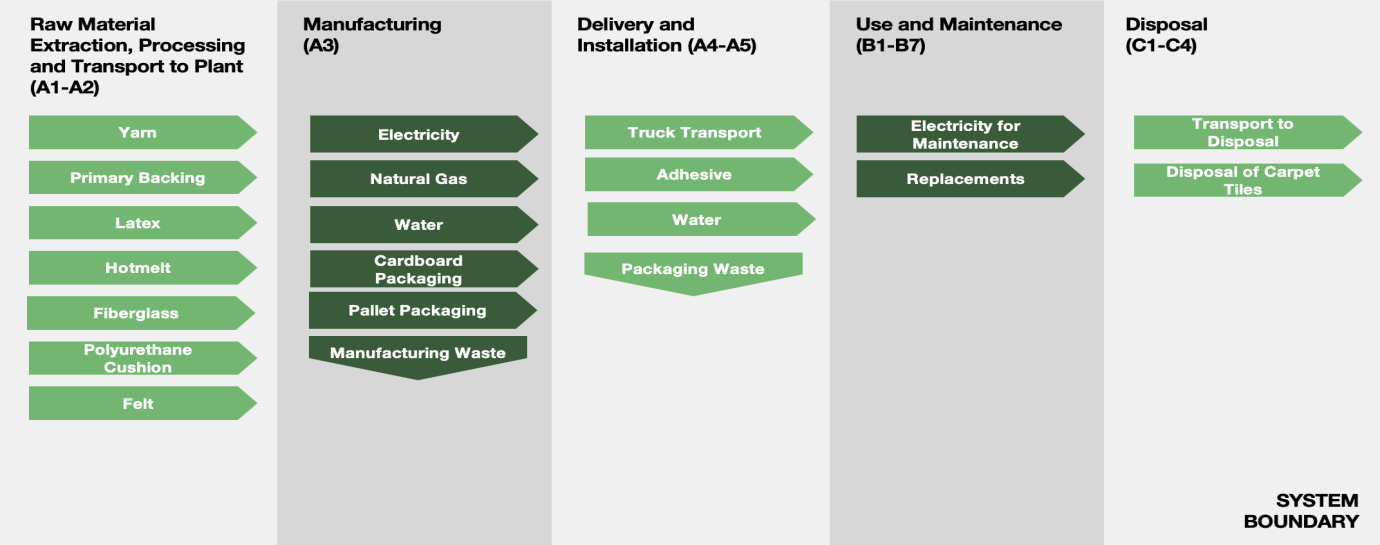


**Figure 3: Flows included in the system boundary**

**Table 7: System Boundary**

| Module Name | Description | Analysis Period | Summary of Included Elements |
|---|---|---|---|
| A1 | Product Stage: Raw Material Supply | 2022 | Raw Material sourcing and processing as defined by secondary data. |
| A2 | Product Stage: Transport | 2022 | Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and estimated distance. |
| A3 | Product Stage: Manufacturing | 2022 | 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 | 2022 | Shipping from manufacturing site to project site. Fuel use requirements estimated based on product weights and mapped distance. |
| A5 | Construction Process Stage: Installation | 2022 | Installation adhesives, installation waste and packaging material waste. |
| B1 | Use Stage: Use | 2022 | Use of the product. |
| B2 | Use Stage: Maintenance | 2022 | Cleaning energy, water, and materials, including refinishing the product. |
| B3 | Use Stage: Repair | 2022 | Materials and energy required to repair the product. |
| B4 | Use Stage: Replacement | 2022 | Total materials and energy required to manufacture a replacement. |
| B5 | Use Stage: Refurbishment | 2022 | Materials and energy required to refurbish the product. |
| B6 | Operational Energy Use | 2022 | Operational Energy Use of Building Integrated System During Product Use |
| B7 | Operational Water Use | 2022 | Operational Water Use of Building Integrated System During Product Use |
| C1 | EOL: Deconstruction | 2022 | No inputs required for deconstruction. |
| C2 | EOL: Transport | 2022 | Shipping from project site to landfill. Fuel use requirements estimated based on product weight and mapped distance. |
| C3 | EOL: Waste Processing | 2022 | Waste processing not required. All waste can be processed as is. |
| C4 | EOL: Disposal | 2022 | Assumes all products are sent to landfill. Landfill impacts modeled based on secondary data. |
| D | Benefits beyond system | 2022 | *Module not declared.* |

## 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. 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 known 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. The excluded materials include:

- Spot cleaning chemicals are not included due to the infrequency of the activity during use phase
- VOC emissions from adhesive curing were excluded from this model. This was justified based on Milliken's installation instructions explicitly calling for the use of a low VOC adhesive.
- No other known flows were excluded in the modeling of this product. Background datasets (from Sphera's Managed LCA Content database) may inherently exclude some flows which were unknown to practitioners creating this model.

## 2.5. Data Sources

Primary data were collected by facility personnel and from utility bills and was used for all manufacturing processes. When primary data did not exist, secondary data for raw material production was utilized from Sphera's Managed LCA Content (MLC) version 2024.2 (formerly GaBi Database).

## 2.6. Data Quality

The geographical scope of the manufacturing portion of the life cycle is Duncan Stewart, Alma and Live Oak facilities in the US. 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 2022. 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 Milliken 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 MLC datasets. Improved life cycle data from suppliers would improve technological coverage.

## 2.7. Period under Review

The period under review is calendar year 2022.

## 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 using area. Allocation by area was deemed appropriate for the type of production used at Milliken & Company facilities as consumption of manufacturing inputs and production of waste outputs is more closely tied to the area of carpet produced than it is to the mass produced. Allocation was also prevalent in the secondary MLC datasets used to represent upstream processes. As a default, MLC datasets use a physical mass basis for allocation.

In the manufacturing phase (A1-A3), allocation of renewable energy certificates (RECs) is used to reduce the impacts associated with electricity used in production. In a given calendar year, the total number of RECs retired is equal to the electricity used per unit of production multiplied by the total yearly production of products made using renewable energy.

## 3. Life Cycle Assessment Scenarios

**Table 8. Reference Service Life**

| Name | Value |
|---|---|
| Product Reference Service Life (RSL) | 15 years |
| Building Estimated Service Life (ESL) | 75 Years |
| Declared product properties (at the gate) and finishes, etc. | See Table 1 |
| Design application parameters | 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 9. Transport to the building site (A4)**

| Name | Value | Unit |
|---|---|---|
| Fuel type | Diesel | - |
| Liters of fuel | 38.8 | l/100km |
| Vehicle type | Truck - Trailer, basic enclosed/ 45,000 lb payload | - |
| Transport distance | 800 | km |
| Capacity utilization | 0.67 | % |
| Gross density of products transported | 370 | kg/m$^3$ |
| Capacity utilization volume factor | 0.85 | - |

**Table 10. Installation into the building (A5)**

| Name | Value | Unit |
|---|---|---|
| Adhesive | 0.097 | kg |
| Product loss per functional unit | 0.069 | kg |
| Waste materials at the construction site before waste processing, generated by product installation | 0.327 | kg |
| Output materials resulting from on-site waste processing | 0 | kg |
| Biogenic carbon contained in cardboard packaging | 0.120 | kg CO2 |
| Biogenic carbon contained in wooden pallet | 0.288 | kg CO2 |
| Direct emissions to ambient air, soil and water | - | kg |
| VOC content of flooring[1] | <0.5 | µg/m3 |

**Table 11. Maintenance (B2)**

| Name | Value | Unit |
|---|---|---|
| Maintenance process information | Manufacturer recommended | - |
| Vacuuming Maintenance cycle | 3750 | Number/ RSL |
| Vacuuming Maintenance cycle | 18,750 | Number/ ESL |
| Electricity for vacuuming | 0.95 | kWh/m$^2$ floor/yr |
| Power output of vacuum | 1.65 | kW |
| Deep Cleaning Maintenance Cycle | 30 | Number/ RSL |
| Deep Cleaning Maintenance Cycle | 150 | Number/ ESL |
| Electricity for Deep Cleaning | 0.05 | kWh/m$^2$ floor/yr |
| Power Output of Equipment | 1.4 | kW |
| Water for Deep Cleaning | 1.9 | kg/m2/y |
| Detergent for Deep Cleaning | 0.1 | kg/m2/y |

**Table 12. Repair (B3)**

| Name | Value | Unit |
|---|---|---|
| Repair process information | Product typically not repaired during use | |

**Table 13. Replacement (B4)**

| Name | Value | Unit |
|---|---|---|
| Replacement cycle | 0 | Number/ RSL |
| Replacement cycle | 4 | Number/ ESL |
| Energy input, specified by activity, type and amount | 0 | kWh |
| Net freshwater consumption specified by water source and fate | 0 | m$^3$ |
| Adhesive | 0.097 | kg/ replacement |
| Direct emissions to ambient air, soil and water | - | kg |
| Further assumptions for scenario development, e.g. frequency and time period of use | | As appropriate |

[1] Milliken Carpet products are certified to GRI Green Label Plus which adheres to the Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2 CA Specification 01350.

**Table 14. Refurbishment (B5)**

| NAME | VALUE | UNIT |
|---|---|---|
| Refurbishment process description | Product typically not refurbished during use | |

**Table 15: Operational Energy Use (B6) and Operational Water Use (B7)**

| NAME | VALUE | UNIT |
|---|---|---|
| Operational Energy/Water Description | Product does not use energy or water | |

**Table 16: 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 | 0 | kg |
| | Collected with mixed construction waste* | 3.55 | kg |
| Recovery | Reuse | 0 | kg |
| | Recycling | 0 | kg |
| | Landfill* | 3.55 | kg |
| | Incineration | 0 | kg |
| | Incineration with energy recovery | 0 | kg |
| | Energy conversion efficiency rate | 84-94 | % |
| Disposal | Product or material for final deposition | 3.55 | kg |
| *Includes weight of product and adhesive. | | | |

**Table 17: Reuse, recovery and/or recycling potentials (D), relevant scenario information**

| NAME | VALUE | UNIT |
|---|---|---|
| Module Not Declared | | |

## 4. Life Cycle Assessment Results

**Table 18: 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 | B7 | C1 | C2 | C3 | C4 | D |
| | Raw material supply | Transport | Manufacturing | Transport from gate | Assembly/ Install | Use | Maintenance | Repair | Replacement | Refurbishment | Building Operational Energy Use | Building Operational Water Use | Deconstruction | Transport | Waste processing | Disposal | Reuse, Recovery, Recycling Potential |
| EPD Type | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | MND |

Note: Modules B1, B5-B7 and C1 and C3 are included in the scope of this study; however, as illustrated in Section 3 these modules do not have any inputs or outputs in this product system. As such, their environmental impacts are 0.00 and to conserve space, they have been excluded from the results tables presented below.

The product family covered in this EPD is produced using electricity sourced from Renewable Energy Certificates (RECs); however, per the PCR guiding this study, results are presented separately including and excluding RECs (i.e., with REC-sourced electricity and with grid electricity). Results without RECs are reported in Sections 4.1 and 4.3 while results with RECs are reported in Sections 4.2 and 4.4. The latter most accurately reflect Milliken's current production pathway while the former are presented for compliance with the PCR.

## 4.1. Life Cycle Impact Assessment Results without Renewable Energy Certificates

**Table 19: North American Impact Assessment Results without RECs***

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | *1.37E+01* | *2.29E-01* | *5.85E-01* | *3.83E+01* | *5.86E+01* | *2.72E-02* | *7.86E-02* |
| GWPi 100 [kg $CO_2$ eq] | *1.30E+01* | *2.28E-01* | *6.36E-01* | *3.83E+01* | *5.60E+01* | *2.72E-02* | *7.83E-02* |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | *8.43E-07* | *6.65E-16* | *1.69E-08* | *4.13E-12* | *3.44E-06* | *7.95E-17* | *3.67E-15* |
| AP [kg $SO_2$ eq] | *2.08E-02* | *1.12E-03* | *1.61E-03* | *4.69E-02* | *9.59E-02* | *8.18E-05* | *3.97E-04* |
| EP [kg N eq] | *2.72E-03* | *9.79E-05* | *3.23E-04* | *5.38E-03* | *1.38E-02* | *8.35E-06* | *3.00E-04* |
| Resources [MJ, LHV] | *2.91E+01* | *4.24E-01* | *8.68E-01* | *4.23E+01* | *1.22E+02* | *5.07E-02* | *1.51E-01* |
| POCP [kg $O_3$ eq] | *3.82E-01* | *2.58E-02* | *1.36E-02* | *6.91E-01* | *1.72E+00* | *1.85E-03* | *7.11E-03* |

**Table 20: EU Impact Assessment Results without RECs**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| CML 2001 (v4.2) Impacts | | | | | | | |
| GWP 100 [kg CO2 eq] | *1.26E+01* | *2.24E-01* | *5.73E-01* | *3.72E+01* | *5.39E+01* | *2.68E-02* | *7.57E-02* |
| ODP [kg CFC-11 eq] | *8.42E-07* | *3.91E-14* | *1.68E-08* | *2.44E-10* | *3.44E-06* | *4.68E-15* | *2.17E-13* |
| AP [kg SO2 eq] | *1.82E-02* | *8.18E-04* | *9.59E-04* | *4.44E-02* | *8.18E-02* | *6.05E-05* | *3.74E-04* |
| EP [kg PO4-3 eq] | *3.86E-03* | *2.16E-04* | *4.73E-04* | *5.76E-03* | *1.98E-02* | *1.60E-05* | *3.89E-04* |
| POCP [kg ethene eq] | *2.39E-03* | *-3.22E-04* | *1.84E-04* | *4.37E-03* | *9.03E-03* | *-2.20E-05* | *2.93E-05* |
| ADPelement [kg Sb-eq] | *2.07E-05* | *3.14E-08* | *5.02E-07* | *5.38E-06* | *8.51E-05* | *3.76E-09* | *2.47E-08* |
| ADPfossil [MJ, LHV] | *2.17E+02* | *2.96E+00* | *6.37E+00* | *4.61E+02* | *9.12E+02* | *3.53E-01* | *1.13E+00* |

*These 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.

## 4.2. Life Cycle Inventory Results without Renewable Energy Certificates

**Table 21: Resource Use without RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 1.81E+01 | 1.32E-01 | 8.26E-01 | 1.55E+02 | 7.70E+01 | 1.58E-02 | 1.44E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 1.81E+01 | 1.32E-01 | 8.26E-01 | 1.55E+02 | 7.70E+01 | 1.58E-02 | 1.44E-01 |
| NRPRE [MJ, LHV] | 2.04E+02 | 2.98E+00 | 6.17E+00 | 6.29E+02 | 8.59E+02 | 3.56E-01 | 1.16E+00 |
| NRPRM [MJ, LHV] | 2.92E+01 | 0.00E+00 | 5.83E-01 | 0.00E+00 | 1.19E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 2.33E+02 | 2.98E+00 | 6.76E+00 | 6.29E+02 | 9.78E+02 | 3.56E-01 | 1.16E+00 |
| SM [kg] | 5.95E-01 | 0.00E+00 | 1.19E-02 | 0.00E+00 | 2.43E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 5.26E-21 | 0.00E+00 | 1.05E-22 | 0.00E+00 | 2.15E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 6.18E-20 | 0.00E+00 | 1.24E-21 | 0.00E+00 | 2.52E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 6.93E-02 | 4.38E-04 | 1.80E-03 | 2.31E-01 | 2.87E-01 | 5.24E-05 | 1.50E-04 |

**Table 22: Output Flows and Waste Categories without RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.12E-06 | 4.02E-10 | 6.57E-07 | 3.53E-07 | 1.91E-05 | 4.80E-11 | 2.87E-10 |
| NHWD [kg] | 3.97E-01 | 2.97E-04 | 2.10E-01 | 3.88E-01 | 1.66E+01 | 3.55E-05 | 3.54E+00 |
| HLRW [kg] or [m3] | 6.78E-06 | 1.07E-08 | 1.58E-07 | 7.17E-05 | 2.78E-05 | 1.27E-09 | 1.38E-08 |
| ILLRW [kg] or [m3] | 5.77E-03 | 8.98E-06 | 1.38E-04 | 5.99E-02 | 2.37E-02 | 1.07E-06 | 1.23E-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] | 1.82E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.20E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.68E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 23: Carbon Emissions and Removals without RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## 4.3. Life Cycle Impact Assessment Results using Renewable Energy Certificates

**Table 24: North American Impact Assessment Results with RECs***

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.23E+01 | 2.29E-01 | 5.56E-01 | 3.83E+01 | 5.27E+01 | 2.72E-02 | 7.86E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.16E+01 | 2.28E-01 | 6.07E-01 | 3.83E+01 | 5.02E+01 | 2.72E-02 | 7.83E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.43E-07 | 6.65E-16 | 1.69E-08 | 4.13E-12 | 3.44E-06 | 7.95E-17 | 3.67E-15 |
| AP [kg $SO_2$ eq] | 2.00E-02 | 1.12E-03 | 1.60E-03 | 4.69E-02 | 9.27E-02 | 8.18E-05 | 3.97E-04 |
| EP [kg N eq] | 2.60E-03 | 9.79E-05 | 3.21E-04 | 5.38E-03 | 1.33E-02 | 8.35E-06 | 3.00E-04 |
| Resources [MJ, LHV] | 2.72E+01 | 4.24E-01 | 8.31E-01 | 4.23E+01 | 1.15E+02 | 5.07E-02 | 1.51E-01 |
| POCP [kg $O_3$ eq] | 3.65E-01 | 2.58E-02 | 1.32E-02 | 6.91E-01 | 1.65E+00 | 1.85E-03 | 7.11E-03 |

**Table 25: EU Impact Assessment Results with RECs**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| CML 2001 (v4.2) Impacts | | | | | | | |
| GWP 100 [kg CO2 eq] | *1.12E+01* | *2.24E-01* | *5.46E-01* | *3.72E+01* | *4.83E+01* | *2.68E-02* | *7.57E-02* |
| ODP [kg CFC-11 eq] | *8.42E-07* | *3.91E-14* | *1.68E-08* | *2.44E-10* | *3.44E-06* | *4.68E-15* | *2.17E-13* |
| AP [kg SO2 eq] | *1.76E-02* | *8.18E-04* | *9.46E-04* | *4.44E-02* | *7.91E-02* | *6.05E-05* | *3.74E-04* |
| EP [kg PO4-3 eq] | *3.73E-03* | *2.16E-04* | *4.70E-04* | *5.76E-03* | *1.93E-02* | *1.60E-05* | *3.89E-04* |
| POCP [kg ethene eq] | *2.28E-03* | *-3.22E-04* | *1.82E-04* | *4.37E-03* | *8.59E-03* | *-2.20E-05* | *2.93E-05* |
| ADPelement [kg Sb-eq] | *2.17E-05* | *3.14E-08* | *5.21E-07* | *5.38E-06* | *8.91E-05* | *3.76E-09* | *2.47E-08* |
| ADPfossil [MJ, LHV] | *2.00E+02* | *2.96E+00* | *6.03E+00* | *4.61E+02* | *8.41E+02* | *3.53E-01* | *1.13E+00* |

*These 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.

## 4.4. Life Cycle Inventory Results using Renewable Energy Certificates

**Table 26: Resource Use with RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | *7.55E+01* | *1.32E-01* | *1.97E+00* | *1.55E+02* | *3.11E+02* | *1.58E-02* | *1.44E-01* |
| RPRM [MJ, LHV] | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| RPRT [MJ,LHV] | *7.55E+01* | *1.32E-01* | *1.97E+00* | *1.55E+02* | *3.11E+02* | *1.58E-02* | *1.44E-01* |
| NRPRE [MJ, LHV] | *1.80E+02* | *2.98E+00* | *5.68E+00* | *6.29E+02* | *7.59E+02* | *3.56E-01* | *1.16E+00* |
| NRPRM [MJ, LHV] | *2.92E+01* | *0.00E+00* | *5.83E-01* | *0.00E+00* | *1.19E+02* | *0.00E+00* | *0.00E+00* |
| NRPRT [MJ, LHV] | *2.09E+02* | *2.98E+00* | *6.27E+00* | *6.29E+02* | *8.78E+02* | *3.56E-01* | *1.16E+00* |
| SM [kg] | *5.95E-01* | *0.00E+00* | *1.19E-02* | *0.00E+00* | *2.43E+00* | *0.00E+00* | *0.00E+00* |
| RSF [MJ, LHV] | *5.26E-21* | *0.00E+00* | *1.05E-22* | *0.00E+00* | *2.15E-20* | *0.00E+00* | *0.00E+00* |
| NRSF [MJ, LHV] | *6.18E-20* | *0.00E+00* | *1.24E-21* | *0.00E+00* | *2.52E-19* | *0.00E+00* | *0.00E+00* |
| RE [MJ, LHV] | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| FW [m3] | *6.30E-02* | *4.38E-04* | *1.68E-03* | *2.31E-01* | *2.61E-01* | *5.24E-05* | *1.50E-04* |

**Table 27: Output Flows and Waste Categories with RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.14E-06 | 4.02E-10 | 6.57E-07 | 3.53E-07 | 1.92E-05 | 4.80E-11 | 2.87E-10 |
| NHWD [kg] | 4.20E-01 | 2.97E-04 | 2.11E-01 | 3.88E-01 | 1.67E+01 | 3.55E-05 | 3.54E+00 |
| HLRW [kg] or [m3] | 3.79E-06 | 1.07E-08 | 9.79E-08 | 7.17E-05 | 1.57E-05 | 1.27E-09 | 1.38E-08 |
| ILLRW [kg] or [m3] | 3.28E-03 | 8.98E-06 | 8.85E-05 | 5.99E-02 | 1.36E-02 | 1.07E-06 | 1.23E-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] | 1.82E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.20E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.68E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 28: Carbon Emissions and Removals with RECs**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## 4.5. Global Warming Potential (GWP) stage A1-A3 for additional product yarn weights and M/PACT™

Today, all Milliken carpet, resilient flooring and entryway carpet tile products are part of M/PACT™, our carbon neutral program. Milliken offests the raw materials and manufacturing carbon footprint (cradle-to-gate) of these products using third-party Verified Carbon Standard Credits that support renewable energy and carbon reduction technologies to help fight climate change.

Milliken Flooring produces the reference product with a variety of different yarn weights. Table 29 and Table 30 show the embodied carbon values for the different variations of this product (e.g. the embodied carbon of the reference product with different face weights as produced by Milliken Flooring) with and without RECs. Embodied carbon in this EPD refers to A1-A3 (cradle-to-gate) GWP impacts. This value reflects the GWP associated with upstream material extraction and processing, material transportation to Milliken Flooring facilities, and the Milliken Flooring production process. Embodied carbon here is presented both including and excluding biogenic carbon.

**Table 29: Embodied Carbon with Face Weights without RECs**

| Yarn Weight (oz/yd2) | Yarn Weight (g/m2) | Embodied Carbon (kg/m2 co2e Excluding biogenic carbon) | Embodied Carbon (kg/m2 co2e Including biogenic carbon) | GWP After M/PACT™ (kg/m2 co2) |
|---|---|---|---|---|
| 12 | 407 | 11.6 | 11.0 | 0.00 |
| 13 | 441 | 11.9 | 11.3 | 0.00 |
| 14 | 475 | 12.2 | 11.6 | 0.00 |
| 15 | 509 | 12.5 | 11.8 | 0.00 |
| 16 | 542 | 12.8 | 12.1 | 0.00 |
| 17 | 576 | 13.1 | 12.4 | 0.00 |
| 18 | 610 | 13.4 | 12.7 | 0.00 |
| 19 | 644 | 13.7 | 13.0 | 0.00 |
| 20 | 678 | 14.0 | 13.3 | 0.00 |
| 21 | 712 | 14.3 | 13.6 | 0.00 |
| 22 | 746 | 14.6 | 13.9 | 0.00 |
| 23 | 780 | 14.9 | 14.2 | 0.00 |
| 24 | 814 | 15.2 | 14.5 | 0.00 |
| 25 | 848 | 15.5 | 14.8 | 0.00 |
| 26 | 882 | 15.9 | 15.1 | 0.00 |
| 27 | 915 | 16.2 | 15.4 | 0.00 |
| 28 | 949 | 16.5 | 15.7 | 0.00 |
| 29 | 983 | 16.8 | 16.0 | 0.00 |
| 30 | 1017 | 17.1 | 16.3 | 0.00 |

Table 30: Embodied Carbon with Face Weights using RECs

| Yarn Weight (oz/yd2) | Yarn Weight (g/m2) | Embodied Carbon (kg/m2 co2e Excluding biogenic carbon) | Embodied Carbon (kg/m2 co2e Including biogenic carbon) | GWP After M/PACT™ (kg/m2 co2) |
|---|---|---|---|---|
| 12 | 407 | 10.1 | 9.53 | 0.00 |
| 13 | 441 | 10.5 | 9.82 | 0.00 |
| 14 | 475 | 10.8 | 10.1 | 0.00 |
| 15 | 509 | 11.1 | 10.4 | 0.00 |
| 16 | 542 | 11.4 | 10.7 | 0.00 |
| 17 | 576 | 11.7 | 11.0 | 0.00 |
| 18 | 610 | 12.0 | 11.3 | 0.00 |
| 19 | 644 | 12.3 | 11.6 | 0.00 |
| 20 | 678 | 12.6 | 11.9 | 0.00 |
| 21 | 712 | 12.9 | 12.2 | 0.00 |
| 22 | 746 | 13.2 | 12.5 | 0.00 |
| 23 | 780 | 13.5 | 12.8 | 0.00 |
| 24 | 814 | 13.8 | 13.1 | 0.00 |
| 25 | 848 | 14.1 | 13.4 | 0.00 |
| 26 | 882 | 14.4 | 13.7 | 0.00 |
| 27 | 915 | 14.7 | 14.0 | 0.00 |
| 28 | 949 | 15.0 | 14.2 | 0.00 |
| 29 | 983 | 15.3 | 14.5 | 0.00 |
| 30 | 1017 | 15.6 | 14.8 | 0.00 |

## 5. LCA Interpretation

Overall for Milliken's Solution Dyed Nylon 6.6 on WellBAC Comfort carpet tile, Global Warming and Abiotic Depletion of fossil fuels are seen to be the largest impact categories. Within these impact categories, the vast majority of impacts are aggregated in the B4 phase of the life cycle of the product which encompasses the replacement of the prodcut over the estimated service life (ESL) of the building in which is is istalled. The B4 module contributes 52% of GWPe impacts and 60% of ADPf impacts. The second largest life cycle stage is B2 which is the maintenance of the product.

In the sourcing, extraction and manufacturing stage, yarn contributes the majority of GWP impacts. The second highest contributor is manufacturing energy (both electricity and thermal energy). Following yarn, polyurethane contained in the cushion layer and the primary backing layer have the highest impacts.

# 6. Additional Environmental Information

## 6.1. Environment and Health During Manufacturing

Information on Milliken's sustainability programs, "No Carpet to Landfill" pledge and other sustainability resources can be found Milliken Floor Covering's sustainability website.

## 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

Milliken has published third-party verified Red List Free Declare labels for all Milliken Carpet products. Additionally, Milliken Carpet products globally are Cradle to Cradle Certified® Silver. All environmental certifications can be found on Milliken Floor Covering's sustainability website. Select certifications are also presented on mindful Materials. Milliken & Company is the first flooring company and one of the first 50 companies in the world to have our net-zero targets verified by Science Based Targets initiative (SBTi).

## 7. Supporting Documentation

The full text of the acronyms found in Section 4.1 are found in Table 31.

**Table 31: 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 | CRU | Components for reuse |
| PERM | Use of 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) |
| PERT | Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) | SM | Use of secondary materials |
| PENRE | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | RSF | Use of renewable secondary fuels |
| PENRM | Use of non-renewable primary energy resources used as raw materials | NRSF | Use of non-renewable secondary fuels |
| HWD | Disposed-of-hazardous waste | FW | Net use of fresh water |
| NHWD | Disposed-of non-hazardous waste | MR | Materials for recycling |
| HLRW | Disposed-of High-Level Radioactive waste | MER | Materials for energy recovery |
| ILLRW | Disposed-of Intermediate and Low Level Radioactive waste | EE | Exported energy |

## 8. Appendix

To adhere to Sections 2.5.2 Part A: Life Cycle Assessment Calculation Rules and Report Requirements from UL Environment, additional results for face weights of 16, 26, and 36oz/yd$^2$ are provided in the following appendix. These additional results ensure all values in Section 4 differ by no more than +/-10% from at least one of the full results tables in this EPD. Similarly to the results presented in Section 4, modules with zero environmental impact have been excluded from these tables but were accounted for in the scope of this study. Section 8.1 contains results without RECs while Section 8.2 contains results including RECs.

## 8.1. Additional Results without Renewable Energy Certificates

### Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 16 oz Face Weight Results without RECs

**Table 32: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | *1.28E+01* | *2.22E-01* | *5.67E-01* | *3.83E+01* | *5.48E+01* | *2.65E-02* | *7.64E-02* |
| GWPi 100 [kg $CO_2$ eq] | *1.21E+01* | *2.22E-01* | *6.18E-01* | *3.83E+01* | *5.23E+01* | *2.64E-02* | *7.60E-02* |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | *8.45E-07* | *6.47E-16* | *1.69E-08* | *4.13E-12* | *3.45E-06* | *7.72E-17* | *3.57E-15* |
| AP [kg $SO_2$ eq] | *1.88E-02* | *1.09E-03* | *1.57E-03* | *4.69E-02* | *8.79E-02* | *7.95E-05* | *3.86E-04* |
| EP [kg N eq] | *2.55E-03* | *9.52E-05* | *3.19E-04* | *5.38E-03* | *1.30E-02* | *8.11E-06* | *2.82E-04* |
| Resources [MJ, LHV] | *2.71E+01* | *4.12E-01* | *8.29E-01* | *4.23E+01* | *1.14E+02* | *4.92E-02* | *1.46E-01* |
| POCP [kg $O_3$ eq] | *3.47E-01* | *2.51E-02* | *1.29E-02* | *6.91E-01* | *1.58E+00* | *1.80E-03* | *6.90E-03* |

**Table 33: Resource Use per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | *1.73E+01* | *1.28E-01* | *8.10E-01* | *1.55E+02* | *7.37E+01* | *1.53E-02* | *1.40E-01* |
| RPRM [MJ, LHV] | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| RPRT [MJ,LHV] | *1.73E+01* | *1.28E-01* | *8.10E-01* | *1.55E+02* | *7.37E+01* | *1.53E-02* | *1.40E-01* |
| NRPRE [MJ, LHV] | *1.89E+02* | *2.90E+00* | *5.88E+00* | *6.29E+02* | *7.98E+02* | *3.46E-01* | *1.13E+00* |
| NRPRM [MJ, LHV] | *2.87E+01* | *0.00E+00* | *5.73E-01* | *0.00E+00* | *1.17E+02* | *0.00E+00* | *0.00E+00* |
| NRPRT [MJ, LHV] | *2.18E+02* | *2.90E+00* | *6.45E+00* | *6.29E+02* | *9.15E+02* | *3.46E-01* | *1.13E+00* |
| SM [kg] | *5.75E-01* | *0.00E+00* | *1.15E-02* | *0.00E+00* | *2.35E+00* | *0.00E+00* | *0.00E+00* |
| RSF [MJ, LHV] | *4.46E-21* | *0.00E+00* | *8.92E-23* | *0.00E+00* | *1.82E-20* | *0.00E+00* | *0.00E+00* |
| NRSF [MJ, LHV] | *5.24E-20* | *0.00E+00* | *1.05E-21* | *0.00E+00* | *2.14E-19* | *0.00E+00* | *0.00E+00* |
| RE [MJ, LHV] | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| FW [m3] | *6.59E-02* | *4.26E-04* | *1.73E-03* | *2.31E-01* | *2.73E-01* | *5.09E-05* | *1.46E-04* |

**Table 34: Output Flows and Waste Categories per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.13E-06 | 3.91E-10 | 6.57E-07 | 3.53E-07 | 1.91E-05 | 4.67E-11 | 2.79E-10 |
| NHWD [kg] | 3.68E-01 | 2.89E-04 | 2.08E-01 | 3.88E-01 | 1.61E+01 | 3.45E-05 | 3.44E+00 |
| HLRW [kg] or [m3] | 6.52E-06 | 1.04E-08 | 1.52E-07 | 7.17E-05 | 2.68E-05 | 1.24E-09 | 1.34E-08 |
| ILLRW [kg] or [m3] | 5.56E-03 | 8.73E-06 | 1.34E-04 | 5.99E-02 | 2.29E-02 | 1.04E-06 | 1.20E-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] | 1.80E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.19E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.68E-03 | 0.00E+00 | 8.07E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 35: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 26 oz Face Weight Results without RECs

**Table 36: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.59E+01 | 2.43E-01 | 6.28E-01 | 3.83E+01 | 6.73E+01 | 2.91E-02 | 8.39E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.51E+01 | 2.43E-01 | 6.77E-01 | 3.83E+01 | 6.45E+01 | 2.90E-02 | 8.35E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.39E-07 | 7.07E-16 | 1.68E-08 | 4.13E-12 | 3.42E-06 | 8.48E-17 | 3.92E-15 |
| AP [kg $SO_2$ eq] | 2.52E-02 | 1.20E-03 | 1.70E-03 | 4.69E-02 | 1.14E-01 | 8.73E-05 | 4.24E-04 |
| EP [kg N eq] | 3.12E-03 | 1.04E-04 | 3.32E-04 | 5.38E-03 | 1.56E-02 | 8.91E-06 | 3.43E-04 |
| Resources [MJ, LHV] | 3.35E+01 | 4.51E-01 | 9.58E-01 | 4.23E+01 | 1.41E+02 | 5.41E-02 | 1.61E-01 |
| POCP [kg $O_3$ eq] | 4.61E-01 | 2.75E-02 | 1.52E-02 | 6.91E-01 | 2.05E+00 | 1.98E-03 | 7.58E-03 |

**Table 37: Resource Use per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 2.00E+01 | 1.40E-01 | 8.63E-01 | 1.55E+02 | 8.46E+01 | 1.68E-02 | 1.54E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 2.00E+01 | 1.40E-01 | 8.63E-01 | 1.55E+02 | 8.46E+01 | 1.68E-02 | 1.54E-01 |
| NRPRE [MJ, LHV] | 2.38E+02 | 3.17E+00 | 6.86E+00 | 6.29E+02 | 9.98E+02 | 3.80E-01 | 1.24E+00 |
| NRPRM [MJ, LHV] | 3.03E+01 | 0.00E+00 | 6.06E-01 | 0.00E+00 | 1.24E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 2.68E+02 | 3.17E+00 | 7.46E+00 | 6.29E+02 | 1.12E+03 | 3.80E-01 | 1.24E+00 |
| SM [kg] | 6.39E-01 | 0.00E+00 | 1.28E-02 | 0.00E+00 | 2.61E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 7.09E-21 | 0.00E+00 | 1.42E-22 | 0.00E+00 | 2.89E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 8.33E-20 | 0.00E+00 | 1.67E-21 | 0.00E+00 | 3.40E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 7.72E-02 | 4.66E-04 | 1.96E-03 | 2.31E-01 | 3.20E-01 | 5.59E-05 | 1.60E-04 |

**Table 38: Output Flows and Waste Categories per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.11E-06 | 4.27E-10 | 6.57E-07 | 3.53E-07 | 1.91E-05 | 5.12E-11 | 3.06E-10 |
| NHWD [kg] | 4.63E-01 | 3.16E-04 | 2.16E-01 | 3.88E-01 | 1.78E+01 | 3.79E-05 | 3.78E+00 |
| HLRW [kg] or [m3] | 7.36E-06 | 1.13E-08 | 1.69E-07 | 7.17E-05 | 3.02E-05 | 1.36E-09 | 1.47E-08 |
| ILLRW [kg] or [m3] | 6.26E-03 | 9.55E-06 | 1.48E-04 | 5.99E-02 | 2.57E-02 | 1.14E-06 | 1.32E-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] | 1.86E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.22E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.67E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 39: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 36 oz Face Weight Results without RECs

**Table 40: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.89E+01 | 2.64E-01 | 6.89E-01 | 3.83E+01 | 7.98E+01 | 3.17E-02 | 9.14E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.80E+01 | 2.64E-01 | 7.36E-01 | 3.83E+01 | 7.66E+01 | 3.16E-02 | 9.10E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.34E-07 | 7.68E-16 | 1.67E-08 | 4.13E-12 | 3.40E-06 | 9.24E-17 | 4.27E-15 |
| AP [kg $SO_2$ eq] | 3.14E-02 | 1.30E-03 | 1.83E-03 | 4.69E-02 | 1.40E-01 | 9.51E-05 | 4.62E-04 |
| EP [kg N eq] | 3.67E-03 | 1.13E-04 | 3.45E-04 | 5.38E-03 | 1.82E-02 | 9.70E-06 | 4.04E-04 |
| Resources [MJ, LHV] | 3.99E+01 | 4.90E-01 | 1.09E+00 | 4.23E+01 | 1.67E+02 | 5.89E-02 | 1.75E-01 |
| POCP [kg $O_3$ eq] | 5.73E-01 | 2.98E-02 | 1.75E-02 | 6.91E-01 | 2.52E+00 | 2.15E-03 | 8.26E-03 |

**Table 41: Resource Use per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 2.26E+01 | 1.52E-01 | 9.16E-01 | 1.55E+02 | 9.55E+01 | 1.83E-02 | 1.67E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 2.26E+01 | 1.52E-01 | 9.16E-01 | 1.55E+02 | 9.55E+01 | 1.83E-02 | 1.67E-01 |
| NRPRE [MJ, LHV] | 2.86E+02 | 3.44E+00 | 7.83E+00 | 6.29E+02 | 1.20E+03 | 4.14E-01 | 1.35E+00 |
| NRPRM [MJ, LHV] | 3.20E+01 | 0.00E+00 | 6.41E-01 | 0.00E+00 | 1.31E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 3.18E+02 | 3.44E+00 | 8.47E+00 | 6.29E+02 | 1.33E+03 | 4.14E-01 | 1.35E+00 |
| SM [kg] | 7.03E-01 | 0.00E+00 | 1.41E-02 | 0.00E+00 | 2.87E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 9.68E-21 | 0.00E+00 | 1.94E-22 | 0.00E+00 | 3.95E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 1.14E-19 | 0.00E+00 | 2.28E-21 | 0.00E+00 | 4.64E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 8.85E-02 | 5.06E-04 | 2.19E-03 | 2.31E-01 | 3.66E-01 | 6.09E-05 | 1.75E-04 |

**Table 42: Output Flows and Waste Categories per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.10E-06 | 4.64E-10 | 6.57E-07 | 3.53E-07 | 1.90E-05 | 5.58E-11 | 3.34E-10 |
| NHWD [kg] | 5.57E-01 | 3.43E-04 | 2.25E-01 | 3.88E-01 | 1.96E+01 | 4.13E-05 | 4.12E+00 |
| HLRW [kg] or [m3] | 8.20E-06 | 1.23E-08 | 1.86E-07 | 7.17E-05 | 3.36E-05 | 1.48E-09 | 1.61E-08 |
| ILLRW [kg] or [m3] | 6.96E-03 | 1.04E-05 | 1.62E-04 | 5.99E-02 | 2.86E-02 | 1.25E-06 | 1.43E-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] | 1.93E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.24E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.67E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 43: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## 8.2. Additional Results using Renewable Energy Certificates

### Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 16 oz Face Weight Results with RECs

**Table 44: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.14E+01 | 2.22E-01 | 5.38E-01 | 3.83E+01 | 4.89E+01 | 2.65E-02 | 7.64E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.07E+01 | 2.22E-01 | 5.89E-01 | 3.83E+01 | 4.65E+01 | 2.64E-02 | 7.60E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.45E-07 | 6.47E-16 | 1.69E-08 | 4.13E-12 | 3.45E-06 | 7.72E-17 | 3.57E-15 |
| AP [kg $SO_2$ eq] | 1.81E-02 | 1.09E-03 | 1.56E-03 | 4.69E-02 | 8.47E-02 | 7.95E-05 | 3.86E-04 |
| EP [kg N eq] | 2.43E-03 | 9.52E-05 | 3.17E-04 | 5.38E-03 | 1.25E-02 | 8.11E-06 | 2.82E-04 |
| Resources [MJ, LHV] | 2.53E+01 | 4.12E-01 | 7.92E-01 | 4.23E+01 | 1.07E+02 | 4.92E-02 | 1.46E-01 |
| POCP [kg $O_3$ eq] | 3.30E-01 | 2.51E-02 | 1.25E-02 | 6.91E-01 | 1.51E+00 | 1.80E-03 | 6.90E-03 |

**Table 45: Resource Use per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 7.47E+01 | 1.28E-01 | 1.96E+00 | 1.55E+02 | 3.08E+02 | 1.53E-02 | 1.40E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 7.47E+01 | 1.28E-01 | 1.96E+00 | 1.55E+02 | 3.08E+02 | 1.53E-02 | 1.40E-01 |
| NRPRE [MJ, LHV] | 1.65E+02 | 2.90E+00 | 5.39E+00 | 6.29E+02 | 6.98E+02 | 3.46E-01 | 1.13E+00 |
| NRPRM [MJ, LHV] | 2.87E+01 | 0.00E+00 | 5.73E-01 | 0.00E+00 | 1.17E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 1.93E+02 | 2.90E+00 | 5.96E+00 | 6.29E+02 | 8.15E+02 | 3.46E-01 | 1.13E+00 |
| SM [kg] | 5.75E-01 | 0.00E+00 | 1.15E-02 | 0.00E+00 | 2.35E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 4.46E-21 | 0.00E+00 | 8.92E-23 | 0.00E+00 | 1.82E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 5.24E-20 | 0.00E+00 | 1.05E-21 | 0.00E+00 | 2.14E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 5.95E-02 | 4.26E-04 | 1.61E-03 | 2.31E-01 | 2.47E-01 | 5.09E-05 | 1.46E-04 |

**Table 46: Output Flows and Waste Categories per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.15E-06 | 3.91E-10 | 6.58E-07 | 3.53E-07 | 1.92E-05 | 4.67E-11 | 2.79E-10 |
| NHWD [kg] | 3.92E-01 | 2.89E-04 | 2.08E-01 | 3.88E-01 | 1.62E+01 | 3.45E-05 | 3.44E+00 |
| HLRW [kg] or [m3] | 3.54E-06 | 1.04E-08 | 9.28E-08 | 7.17E-05 | 1.46E-05 | 1.24E-09 | 1.34E-08 |
| ILLRW [kg] or [m3] | 3.07E-03 | 8.73E-06 | 8.42E-05 | 5.99E-02 | 1.27E-02 | 1.04E-06 | 1.20E-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] | 1.80E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.19E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.68E-03 | 0.00E+00 | 8.07E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 47: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 26 oz Face Weight Results with RECs

**Table 48: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.44E+01 | 2.43E-01 | 5.99E-01 | 3.83E+01 | 6.15E+01 | 2.91E-02 | 8.39E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.37E+01 | 2.43E-01 | 6.49E-01 | 3.83E+01 | 5.87E+01 | 2.90E-02 | 8.35E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.39E-07 | 7.07E-16 | 1.68E-08 | 4.13E-12 | 3.42E-06 | 8.48E-17 | 3.92E-15 |
| AP [kg $SO_2$ eq] | 2.44E-02 | 1.20E-03 | 1.69E-03 | 4.69E-02 | 1.11E-01 | 8.73E-05 | 4.24E-04 |
| EP [kg N eq] | 2.99E-03 | 1.04E-04 | 3.30E-04 | 5.38E-03 | 1.51E-02 | 8.91E-06 | 3.43E-04 |
| Resources [MJ, LHV] | 3.17E+01 | 4.51E-01 | 9.21E-01 | 4.23E+01 | 1.33E+02 | 5.41E-02 | 1.61E-01 |
| POCP [kg $O_3$ eq] | 4.44E-01 | 2.75E-02 | 1.49E-02 | 6.91E-01 | 1.98E+00 | 1.98E-03 | 7.58E-03 |

**Table 49: Resource Use per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 7.74E+01 | 1.40E-01 | 2.01E+00 | 1.55E+02 | 3.19E+02 | 1.68E-02 | 1.54E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 7.74E+01 | 1.40E-01 | 2.01E+00 | 1.55E+02 | 3.19E+02 | 1.68E-02 | 1.54E-01 |
| NRPRE [MJ, LHV] | 2.14E+02 | 3.17E+00 | 6.37E+00 | 6.29E+02 | 8.99E+02 | 3.80E-01 | 1.24E+00 |
| NRPRM [MJ, LHV] | 3.03E+01 | 0.00E+00 | 6.06E-01 | 0.00E+00 | 1.24E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 2.44E+02 | 3.17E+00 | 6.98E+00 | 6.29E+02 | 1.02E+03 | 3.80E-01 | 1.24E+00 |
| SM [kg] | 6.39E-01 | 0.00E+00 | 1.28E-02 | 0.00E+00 | 2.61E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 7.09E-21 | 0.00E+00 | 1.42E-22 | 0.00E+00 | 2.89E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 8.33E-20 | 0.00E+00 | 1.67E-21 | 0.00E+00 | 3.40E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 7.08E-02 | 4.66E-04 | 1.84E-03 | 2.31E-01 | 2.93E-01 | 5.59E-05 | 1.60E-04 |

**Table 50: Output Flows and Waste Categories per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.13E-06 | 4.27E-10 | 6.57E-07 | 3.53E-07 | 1.91E-05 | 5.12E-11 | 3.06E-10 |
| NHWD [kg] | 4.87E-01 | 3.16E-04 | 2.17E-01 | 3.88E-01 | 1.79E+01 | 3.79E-05 | 3.78E+00 |
| HLRW [kg] or [m3] | 4.38E-06 | 1.13E-08 | 1.10E-07 | 7.17E-05 | 1.81E-05 | 1.36E-09 | 1.47E-08 |
| ILLRW [kg] or [m3] | 3.77E-03 | 9.55E-06 | 9.83E-05 | 5.99E-02 | 1.56E-02 | 1.14E-06 | 1.32E-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] | 1.86E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.22E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.67E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 51: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## Milliken SDN Nylon 6.6 on WellBAC® Comfort Backing: 36 oz Face Weight Results with RECs

**Table 52: North American Impact Assessment Results per 1 $m^2$ of installed flooring**

| | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| IPCC AR5 Impacts | | | | | | | |
| GWPe 100 [kg $CO_2$ eq] | 1.74E+01 | 2.64E-01 | 6.60E-01 | 3.83E+01 | 7.39E+01 | 3.17E-02 | 9.14E-02 |
| GWPi 100 [kg $CO_2$ eq] | 1.66E+01 | 2.64E-01 | 7.08E-01 | 3.83E+01 | 7.07E+01 | 3.16E-02 | 9.10E-02 |
| TRACI 2.1 Impacts | | | | | | | |
| ODP [kg CFC-11 eq] | 8.34E-07 | 7.68E-16 | 1.67E-08 | 4.13E-12 | 3.40E-06 | 9.24E-17 | 4.27E-15 |
| AP [kg $SO_2$ eq] | 3.06E-02 | 1.30E-03 | 1.82E-03 | 4.69E-02 | 1.37E-01 | 9.51E-05 | 4.62E-04 |
| EP [kg N eq] | 3.55E-03 | 1.13E-04 | 3.42E-04 | 5.38E-03 | 1.77E-02 | 9.70E-06 | 4.04E-04 |
| Resources [MJ, LHV] | 3.80E+01 | 4.90E-01 | 1.05E+00 | 4.23E+01 | 1.59E+02 | 5.89E-02 | 1.75E-01 |
| POCP [kg $O_3$ eq] | 5.56E-01 | 2.98E-02 | 1.72E-02 | 6.91E-01 | 2.46E+00 | 2.15E-03 | 8.26E-03 |

**Table 53: Resource Use per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| RPRE [MJ, LHV] | 8.00E+01 | 1.52E-01 | 2.06E+00 | 1.55E+02 | 3.30E+02 | 1.83E-02 | 1.67E-01 |
| RPRM [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RPRT [MJ,LHV] | 8.00E+01 | 1.52E-01 | 2.06E+00 | 1.55E+02 | 3.30E+02 | 1.83E-02 | 1.67E-01 |
| NRPRE [MJ, LHV] | 2.62E+02 | 3.44E+00 | 7.34E+00 | 6.29E+02 | 1.10E+03 | 4.14E-01 | 1.35E+00 |
| NRPRM [MJ, LHV] | 3.20E+01 | 0.00E+00 | 6.41E-01 | 0.00E+00 | 1.31E+02 | 0.00E+00 | 0.00E+00 |
| NRPRT [MJ, LHV] | 2.94E+02 | 3.44E+00 | 7.98E+00 | 6.29E+02 | 1.23E+03 | 4.14E-01 | 1.35E+00 |
| SM [kg] | 7.03E-01 | 0.00E+00 | 1.41E-02 | 0.00E+00 | 2.87E+00 | 0.00E+00 | 0.00E+00 |
| RSF [MJ, LHV] | 9.68E-21 | 0.00E+00 | 1.94E-22 | 0.00E+00 | 3.95E-20 | 0.00E+00 | 0.00E+00 |
| NRSF [MJ, LHV] | 1.14E-19 | 0.00E+00 | 2.28E-21 | 0.00E+00 | 4.64E-19 | 0.00E+00 | 0.00E+00 |
| RE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW [m3] | 8.21E-02 | 5.06E-04 | 2.06E-03 | 2.31E-01 | 3.40E-01 | 6.09E-05 | 1.75E-04 |

**Table 54: Output Flows and Waste Categories per 1 m2 of installed flooring**

| Parameter | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| HWD [kg] | 4.12E-06 | 4.64E-10 | 6.57E-07 | 3.53E-07 | 1.91E-05 | 5.58E-11 | 3.34E-10 |
| NHWD [kg] | 5.81E-01 | 3.43E-04 | 2.25E-01 | 3.88E-01 | 1.97E+01 | 4.13E-05 | 4.12E+00 |
| HLRW [kg] or [m3] | 5.21E-06 | 1.23E-08 | 1.26E-07 | 7.17E-05 | 2.15E-05 | 1.48E-09 | 1.61E-08 |
| ILLRW [kg] or [m3] | 4.47E-03 | 1.04E-05 | 1.12E-04 | 5.99E-02 | 1.84E-02 | 1.25E-06 | 1.43E-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] | 1.93E-01 | 0.00E+00 | 1.18E-01 | 0.00E+00 | 1.24E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 1.94E-01 | 0.00E+00 | 7.67E-03 | 0.00E+00 | 8.06E-01 | 0.00E+00 | 0.00E+00 |
| EE [MJ, LHV] | 0.00E+00 | 0.00E+00 | 8.92E-03 | 0.00E+00 | 3.57E-02 | 0.00E+00 | 0.00E+00 |
| EET [MJ, LHV] | 0.00E+00 | 0.00E+00 | 2.35E-03 | 0.00E+00 | 9.40E-03 | 0.00E+00 | 0.00E+00 |

**Table 55: Carbon emissions and removals per 1 m2 of installed flooring**

| PARAMETER | A1-A3 | A4 | A5 | B2 | B4 | C2 | C4 |
|---|---|---|---|---|---|---|---|
| BCRP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK [kg $CO_2$] | 4.07E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEK [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 4.07E-01 | 0.00E+00 | 1.63E+00 | 0.00E+00 | 0.00E+00 |
| BCEW [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR [kg $CO_2$] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR [kg $CO_2$] | 4.37E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.75E+00 | 0.00E+00 | 0.00E+00 |

## 9. References

1. Life Cycle Assessment, LCA Report for Milliken & Company. WAP Sustainability Consulting. September 2024.
2. Product Category Rule (PCR) for Building-Related Products and Services, Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL 10010. Version 4.0, March, 2022.
3. Part B: Flooring EPD Requirements. UL Environment V2.0, 2018.
4. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
5. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.
6. ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.