WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile

Modular Carpet Flooring

Life Cycle Impact Reduction Action Plan

Date of Issue: July 1, 2020

Date of Expiration: June 30, 2023

Product Category Rules

Part A: Life Cycle Assessment Calculation Rules and Report Requirements, (UL Environment, V3.2, 2018)

Part B: Flooring EPD Requirements. (UL Environment V2.0, 2018)

Functional Unit

1 m^2 of floor covering for 75 years

Life Cycle Impact Reduction Plan

WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile

Manufacturer Name and Address	Milliken Flooring 924 Milliken Rd. Spartanburg, SC 29303
Declared Product	WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile
Product Type	Floor Covering – Carpet
Product Description	Modular Floor Covering
Action Plan Number	MAPUS05
Functional Unit as Defined by PCR	1 m^2 of floor covering for 75 years
LCA/EPD Action Plan is Based On	EPD - WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile https://spot.ul.com/main-app/products/detail/5c58538455b0e81fc81f6d77 EPD Number: 4787801051.105.1
LCA/EPD Type	☐ Publicly available, critically reviewed LCA ☐ Internally verified LCA with a product specific EPD ☒ Externally-verified Product specific Type III EPD
LCA/EPD Reviewer	Grant R. Martin UL Environment
Reference PCR(s) for LCA/EPD	Part A: Life Cycle Assessment Calculation Rules and Report Requirements, (UL Environment, V3.2, 2018) Part B: Flooring EPD Requirements. (UL Environment V2.0, 2018)
LCA/EPD Scope	Cradle to Grave
Date of LCA/EPD Issue	Jan 1, 2019
Date of LCA/EPD Expiration	Jan 1, 2024
Markets of LCA/EPD Applicability	North/South America
LCA Software and Version Number	GaBi 8.7
LCI Database and Version Number	GaBi 8.7, Service Pack 35
LCIA Methodology and Version Number	TRACI 2.1
Action Plan Date of Issue	July 01, 2020
Action Plan Period of Validity	3 years from date of issue
Action Plan Type	Product Specific
Is the action plan applicable to all products listed in the corresponding LCA/EPD or only a subset?	All products
This Action Plan was prepared by an expert in product-specific LCAs/EPDs:	Matt Van Duinen, LCACP Sustainability Director WAP Sustainability 
This Action Plan was confirmed by an executive of the manufacturer:	Philip Ivey Floor Covering Strategic Sustainability Leader Milliken Flooring 

Life Cycle Impact Reduction Plan

WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile

Product Description

The EPD represents Milliken's WellBAC™ Comfort Solution Dyed Nylon 6 (SDN) Carpet Tile manufactured in the US. The face fiber used in the carpet is solution dyed nylon 6.

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.

Products covered by this action plan are: Archipelago, Heavy Meta, Inis Mor, Journal, Mainstreet, Monuments & Shrines, Obex Loop, Sepio, Sound & Fury, Southern Analog, Surface Study, Whale Song, Yarn Storm.

LCA Description

The cradle-to-grave, product-specific life cycle assessment and subsequent EPD were created according to the following standards: UL Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL Part B: Flooring EPD Requirements, and ISO 14025/40/44. The assessment was performed using the GaBi LCA software. Both the LCA report and EPD were externally reviewed and verified against the previous standards by UL Environment.

Milliken associates collected the bill of materials data for the product which was utilized in the model. Additionally, facility-level utility data was collected and allocated to each product to generate manufacturing impacts. Finally, transportation data was collected via supplier locations and utilized to generate these impacts.

LCA Results

The cradle-to-grave results for the product are shown below using TRACI v2.1 indicators. The vast majority of the impacts come from the cleaning of the product (B2) and the product replacements (B4), which are not directly controlled by Milliken. When taking into account the items that Milliken has direct control over (A1-A3), the majority of the impacts are from the raw materials. Within this life cycle stage, the relative impacts mostly align with the mass of the materials in the product, with face fiber being the largest contributor.

LCA Results From EPD								
Impact Category	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**
AP [kg SO_2 eq]	1.82E-02	1.52E-03	1.46E-03	0.00E+00	8.78E-02	0.00E+00	8.73E-02	0.00E+00
EP [kg N eq]	1.07E-03	1.24E-04	3.17E-04	0.00E+00	5.96E-03	0.00E+00	6.18E-03	0.00E+00
GWP [kg CO_2 eq]	8.12E+00	3.28E-01	3.32E-01	0.00E+00	4.19E+01	0.00E+00	3.57E+01	0.00E+00
ODP [kg CFC 11 eq]	7.22E-09	1.13E-14	5.43E-13	0.00E+00	6.89E-11	0.00E+00	2.89E-08	0.00E+00
Resources [MJ]	1.88E+01	6.21E-01	5.02E-01	0.00E+00	4.27E+01	0.00E+00	8.08E+01	0.00E+00
POCP [kg O_3 eq]	2.57E-01	5.02E-02	8.63E-03	0.00E+00	9.83E-01	0.00E+00	1.32E+00	0.00E+00

Impact Category	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
AP [kg SO_2 eq]	0.00E+00	0.00E+00	0.00E+00	7.30E-05	0.00E+00	5.78E-04	0.00E+00
EP [kg N eq]	0.00E+00	0.00E+00	0.00E+00	5.86E-06	0.00E+00	2.93E-05	0.00E+00
GWP [kg CO_2 eq]	0.00E+00	0.00E+00	0.00E+00	1.41E-02	0.00E+00	1.25E-01	0.00E+00
ODP [kg CFC 11 eq]	0.00E+00	0.00E+00	0.00E+00	4.84E-16	0.00E+00	2.30E-14	0.00E+00
Resources [MJ]	0.00E+00	0.00E+00	0.00E+00	2.67E-02	0.00E+00	2.51E-01	0.00E+00
POCP [kg O_3 eq]	0.00E+00	0.00E+00	0.00E+00	1.65E-03	0.00E+00	1.15E-02	0.00E+00

The results presented in the table above are equivalent to those presented in the EPD and are for a production weighted average product with a face weight of 20.4 oz. Additional results for different yarn weights are available upon request.

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Impact Reduction Action Plan

At an organizational level, Milliken has always had a culture of environmental stewardship. As early as 1900, Milliken was reusing packaging and textile materials in their operations and documented their first recycling policy. By the late 1900's Milliken developed a comprehensive plan to eliminate waste, increase product performance and preserve resources — years before the first clean air and water acts and the U.S. Environmental Protection Agency were formed. By 1960, We established a formal environmental policy to reduce our impact on the environment and installed water treatment facilities before it was required by the clean water act. This stewardship still guides our daily choices and influences innovations in product design, raw material selection, manufacturing operations and marketing and merchandising materials.

As indicated by the results on the previous page, the vast majority of the impacts across the life cycle are due to the materials chosen for use in the product. Since Milliken does not have direct control over the manufacturing of these materials, there are various challenges in determining which impact reduction steps to take. That being said, the following items have been identified as steps that Milliken will be taking over the next three years to reduce the impacts of our products, ordered in decreasing order of priority.

Impact Reduction Steps	Reduction Scope	Expected Outcomes	Responsible Team(s)	Due Date
Increase reference service life (RSL) of the product.	Formulation Change	RSL increase >10% and the impacts associated with replacements (B4) will decrease.	Engineering	Q4 2022
Request supplier specific life cycle assessments for all materials.	Supplier Cooperation	>10% of suppliers respond with completed LCAs, >40% of suppliers begin LCA work	Sustainability / Sourcing	Ongoing
Communicate request for additional recycled content to fiber suppliers	Formulation Change / Supplier Change	Average recycled content of fiber increases >20%	Sustainability / Sourcing	Q4 2021
Communicate request for additional recycled content to backing material suppliers	Formulation Change / Supplier Change	Average recycled content of backing materials increases >10%	Sustainability / Sourcing / Engineering	Q4 2021
Research low-carbon alternatives for existing materials and present to engineering team for consideration	Formulation Change	At least one suggestion gets trialed	Sustainability	Q2 2022
Work with engineering team to lightweight existing products	Formulation Change	At least one product decreases in weight during a redesign	Sustainability / Engineering	Q2 2022
Coordinate with other teams to ensure alignment between LCA optimization and material health optimization	Formulation Change	Decisions can be made ahead of changes to ensure no regrettable substitutes are chosen during the optimization process.	Sustainability	Ongoing

By taking the steps indicated above and continuously innovating for tomorrow, Milliken is working towards its goal to get to zero landfills, zero waste generation, and zero air emissions.