

ENVIRONMENTAL PRODUCT DECLARATION

POWERBOND® ETHOS® CUSHION

TARKETT / TANDUS CENTIVA
COMMERCIAL FLOOR COVERING



Powerbond® ethos® Cushion – Style: Literary / Color: Salt Lake



Tarkett is a global leader in innovative and sustainable solutions for flooring and sports surfaces serving customers in more than 100 countries worldwide. Tarkett has been involved in developing a collaborative circular economy, respectful of natural resources and people's health. With recycling centers worldwide, product development is focused on reuse and recycling at the end of use. Tarkett also continues to pursue its ambitious eco-innovation strategy by focusing on transparency and optimizing products for improved indoor air quality and material health based on Cradle to Cradle principals.

For more information visit
www.tarkett.com or
www.tarkettna.com



ENVIRONMENTAL PRODUCT DECLARATION



Tandus Centiva Powerbond® ethos® Cushion
Commercial Floor Covering




According to ISO 14025 and ISO 21930:2007

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. 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, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Tarkett/Tandus Centiva
DECLARATION NUMBER	4788046862.102.1
DECLARED PRODUCT	Tandus Centiva Powerbond® ethos® Cushion
REFERENCE PCR	NSF PCR for Flooring: Carpet, Resilient, Laminate, Ceramic, Wood, Version 2
DATE OF ISSUE	August 30, 2017
PERIOD OF VALIDITY	5 Years

CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications
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The PCR review was conducted by:	NSF International
	Accepted by PCR Review Panel
	ncss@nsf.org
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	 Wade Stout, UL Environment
	 Thomas Gloria, Industrial Ecology Consultants
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	 Thomas Gloria, Industrial Ecology Consultants

This EPD conforms with ISO 21930:2007



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Product Definition

Product Classification & Description

The Powerbond® ethos® Cushion product line consists of a full range of styles made with a nylon wear layer and ethos recycled content, closed cell cushion backing. The nylon and closed cell cushion are fused together to form an integral and inseparable construction that provides excellent performance and durability. The product's molecularly bonded seams provide a monolithic, moisture impermeable floor that allows for innovative design capabilities with easy installation of inlays and borders.

The product line consists of a full range of styles composed of either nylon 6 or nylon 6,6 yarn which is solution dyed, yarn dyed or a combination of solution and yarn dyed. The Powerbond ethos Cushion backing is produced from recycled Polyvinyl Butyral (PVB) film recovered from automotive and safety glass recycling operations. This product group was assessed for an average yarn weight of 20 osy, with the maximum (30 osy) and minimum (14 osy) yarn weights assessed for sensitivity. Unless otherwise noted, data is presented for an average product with 18.1 osy yarn weight.

All styles in the Powerbond and modular ethos product lines are Cradle to Cradle Certified™ v3.1 at the Silver level. Additionally, the products are certified at the Platinum level to the NSF/ANSI 140 Sustainability Assessment for Carpet standard and are fully recyclable in Tarkett's Restart® recycling program for flooring.

Accreditations

- Cradle to Cradle Certified™ v3.1 / Silver Level (ethos)
- ANSI/NSF 140 Carpet Standard / Platinum Level
- DeclareSM Product Label
- Recycled Content Certification
- Recycling Program Certification
- Carpet and Rug Institute (CRI) Green Label Plus (GLP)
- MAS Certified Green® Program (Adhesive VOC Content)
- Cradle to Cradle Certified™ v3.1 (Adhesive)
- Carbonfund.org CarbonFree® Certification (optional)



Recovered Windshields – the feedstock for ethos flooring





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Range of Applications

Powerbond ethos Cushion flooring is intended for heavy or severe traffic use in commercial buildings.

Product Standards and Approvals

Flammability Radiant Panel ASTM E-648	Class 1 (Mean Avg. CRF \geq 0.45 watts/cm ²)
Smoke Density ASTM E-662	Maximum Specific Optical Density \leq 450
Surface Flammability FF 1-70	Pass
Electrostatic Propensity AATCC 134	<3.0kV
Colorfastness to Light AATCC 16E	\geq 4.0 @ 60 AFUs
ISO 2551/ASTM D7570 Dimensional Stability	< 0.149% change
Delamination Strength ASTM D-3936	No Delamination
Tuft Bind ASTM D-1335	\geq 8 pounds
CRI Green Label Plus	Meets criteria GLP ID# 8320
California Specification 01350	Meets criteria (CDPH v1.1 and 1.2)

Delivery Status

Type of Manufacture/Tufting Construction	Textured Loop, Stratatec® Patterned Loop, Accuweave® Patterned Loop, Level Loop, Stratatec® Patterned Symtex®, Accuweave® Patterned Symtex® or Symtex®			
Wear Layer Composition	Nylon 6 or Nylon 6,6 yarn			
Primary Backing	Polyester, Non-woven			
Secondary Backing	Powerbond ethos Cushion is made from postconsumer recycled PVB polymer			
Recycled Content	Dependent on style; 46 to 73% overall recycled content; min. 37% postconsumer			
Installation Options	Custom design options; various design inlays and borders;			
Cushion Thickness	0.10 inch		2.5 mm	
Cushion Density	32 lbs/ft ³		513 kg/m ³	
Compression Set ASTM D-3574	Max 10%			
Compression Deflection ASTM D-3574	29 lbs/in ² at 25%		2,039 g/cm ² at 25%	
Product Roll Width (ft)/(m)	6 feet		1.83 meters	
	Range	Unit	Range	Unit
Wear Layer/Yarn Weight	10 to 30	osy	339 to 1,017	gsm
Total Product Weight (+/- 5%)	87.9 to 107.9	osy	2,980 to 3,658	gsm

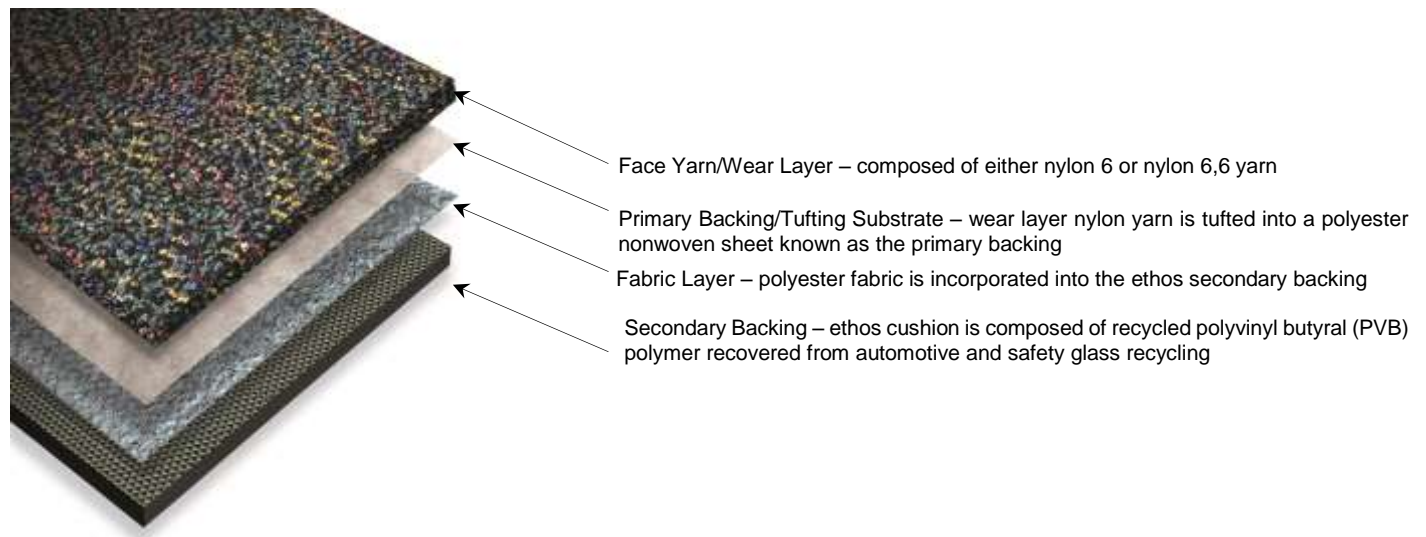




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Material Content



Material Content of the Product

Component	Material	Mass %	Availability		Origin
Wear Layer/Pile Yarn	Nylon 6 or Nylon 6,6	20.3	Non- Renewable	Limited	Global
Primary Backing/Tufting Substrate	Polyester	3.6	Non- Renewable	Limited	Global
Fabric Layer	Polyester	1.6	Non- Renewable	Limited	Global
RS Adhesive	Pre-applied acrylic adhesive	2.7	Non- Renewable	Limited	Global
Structural Backing	PVB polymer	71.7	Recycled	Limited	Global
	Calcium carbonate		Non- Renewable	Abundant	Global
	Aluminum trihydrate		Non- Renewable	Abundant	Global
	Misc. Additives		Non- Renewable	Abundant	Global

Production of Main Materials

Aluminum trihydrate - a mineral filler derived from bauxite that is mined from natural surface deposits

Calcium carbonate - also known as limestone, a mineral filler that is mined from natural surface deposits

Nylon 6,6 - manufactured by combining adipic acid and hexamethylenediamine, both having six carbon atoms, and polymerizing the resultant monomer by condensation polymerization

Polyester - most commonly referred to as polyethylene terephthalate, produced by the polymerization of ethylene glycol and terephthalic acid or its derivatives

Polyvinyl Butyral (PVB) - postconsumer PVB polymer is obtained from recycled windshields and safety glass recycling operations

RS Adhesive – pressure sensitive, water based, acrylic adhesive is applied to secondary backing for product installation





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Production

In the manufacturing process, nylon yarn is tufted into a polyester, nonwoven primary backing. The Powerbond ethos cushion secondary backing is adhered to the tufted primary backing composite. RS adhesive is applied.

Health, Safety, and Environmental Aspects During Production

- ISO 14001 certification and an Environmental Management System (EMS) is employed.
- Tandus Centiva is in compliance with all applicable local, state and federal environmental regulations.
- The company has a successful supply chain and raw material management program.
- World Class Manufacturing (WCM) – is a comprehensive Environment, Health and Safety (EHS) program focused on continual improvement in industrial performance, safety, quality, customer service and the environment.

Production Waste

All trimmings and carpet manufacturing waste, along with postconsumer carpet, is recycled into new flooring in Tandus Centiva's third party certified closed-loop carpet recycling process. Non-carpet waste is also recycled in various programs.

Delivery and Installation

Delivery

For the life cycle assessment, the weighted average transportation distance from Dalton manufacturing facility to its customers amounts to 1,900 km by truck and 300 km by boat.

Installation



Powerbond ethos Cushion can be installed using preapplied RS "peel and stick" adhesive or a Tandus Centiva's water-based, acrylic adhesive. A water-based acrylic sealer, such as, Tandus Centiva's C-XL Universal Seam Sealer, is used to molecularly bond seams to provide a monolithic, moisture impermeable floor. Detailed installation instructions can be found at www.tarkettna.com.

Installation Waste

Packaging and flooring installation waste can be recycled in a local recycling program or returned to Tandus Centiva for recycling. Although installation waste is often recycled, to remain conservative, the recycled portion was not taken into account. Thus, product waste and packaging was modeled as disposed of in a landfill.



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Packaging

Powerbond ethos cushion is placed on a recycled content, cardboard core and wrapped in plastic. Tandus Centiva encourages installers to recycle packaging materials in local recycling programs.

Health, Safety and Environmental Aspects during Installation

Tandus Centiva floorcoverings and adhesives meet VOC emission requirements in accordance with the California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, version 1.1 (Feb 2010) and version 1.2 (Jan 2017). These are also known as the California 01350 Specification, or referenced as CRI Green Label Plus. Additionally, adhesives have been tested for VOC content, are third party certified in the MAS Certified Green® program and meet the VOC emission requirements of the South Coast Air Quality Management District - Rule 1168. Many adhesives are also Cradle to Cradle Certified™. Installation Instructions and Material Safety Data Sheets (MSDS) are available at www.tarkettna.com.

Use

The use stage takes into account environmental impacts during product use. A reference service life (RSL) of 25 years has been applied. It should be noted that floor coverings may be replaced before the end of their useful life and they may also last much longer than the stated RSL.

Cleaning and Maintenance

Product selection, construction, color, use of entry mats, traffic wear patterns, vacuuming, extraction cleaning and spot removal all play a part in product maintenance. Tandus Centiva’s recommended cleaning and maintenance guidelines are available at www.tarkettna.com. Cleaning and maintenance was modelled as shown below.

Level of Use	Cleaning Process	Cleaning Frequency	Consumption of Energy and Resources
Commercial Heavy Traffic	Vacuuming	4 times per week	Electrical Energy
	Extraction Cleaning	2 times per year	Electrical Energy
			Water
			Cleaning Agent

Prevention of Structural Damage

Floor coverings should be installed on dry, structurally sound and adequately prepared floors. Subfloor requirements and installation instructions are available at www.tarkettna.com.





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End-of-Life

Customers are encouraged to return and recycle end-of-life carpet in the company's ReStart® program. Tandus Centiva's third party certified, closed-loop carpet recycling process is located in Dalton, Georgia. Alternative product types returned for recycling are recycled in other locations or in affiliate recycling programs.

Tandus Centiva's Carpet Recycling Process





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Disposal

Tandus Centiva's Dalton facility annually recycles an average of 10 million pounds of postconsumer carpet, at a rate of 12.8%. This recycled portion is accounted for as being diverted from the landfill but no credit is given to the recycled products in the LCA model or results. The non-recycled portion of the products is modeled as disposed of in a landfill. A diesel-powered truck is assumed to transport the products 30 miles to the landfill.

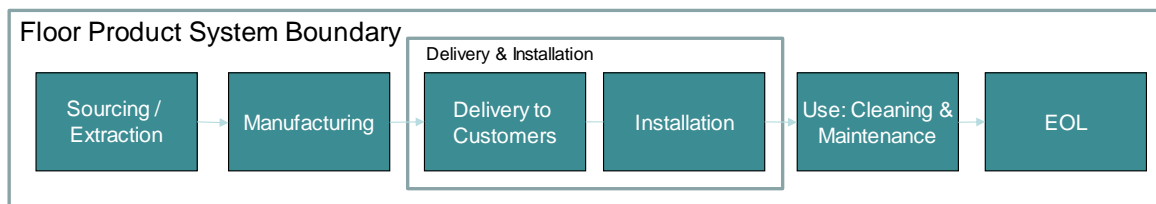
Life Cycle Assessment

A cradle-to-grave Life Cycle Assessment (LCA) was completed on this product in accordance with ISO 14040/ISO 14044, and the study was reviewed for conformance with ISO 14044 and the NSF flooring PCR v2.

System Boundaries

The life cycle stages included in the system boundaries are:

1. Sourcing and extraction: This includes production of the materials in the flooring products. Extraction of materials from the earth and/or extraction from postconsumer sources are quantified. Transportation of materials to the Tandus Centiva facilities as well as production of packaging materials are included.
2. Manufacturing, which accounts for the operations at Tandus Centiva facilities.
3. Delivery and Installation, which includes delivery of the finished product to the end user and installation of the product.
4. Use, which takes into account the use of the flooring product in a building, including cleaning and maintenance.
5. End of life, includes the fate of the flooring product at the end of its life.



The Declared or Functional Unit

The functional unit, or reference flow, has been defined as one square meter of floor product used in a commercial building with a reference service life of 60 years. As such, replacements of the product every 25 years are taken into account.

Background Data

The SimaPro LCA software was used to model the life cycle of the product. Tandus Centiva supplied primary data on the product's bill of materials and manufacturing operations. Background data came from databases appropriate for the geography and with the highest data quality in mind: nylon 6 came from PlasticsEurope (2012); nylon 6,6 came from a manufacturer-specific LCA (2014); polyester came from US LCI Database (2011); and the remaining materials came from ecoinvent (2013).





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Cut-off Criteria

For mass and energy, a cut-off goal of 99% of energy inputs and total mass inputs was defined. However, an attempt was made to collect all materials and energy involved in the materials systems – despite the defined energy and mass criteria – in order to capture any aspect that may be environmentally relevant.

Allocation

Allocation of the production data for this product was based on a total facility mass basis.

Data Quality

The data applied to this study represent current products and practices. Data from 2016 for the Dalton, GA, manufacturing facility were used. Data for manufacturing includes all processes to manufacture the carpet, (including facility heating and lighting) and represents the average energy use based on total production. The product formulation is current. Energy and transportation data are based on the 2010’s, and production data for materials are based on mid 2000’s to 2010’s. Data for energy and transportation are North American-based. Data for materials and processes are based on a combination of North American and European sources; EcolInvent 2.2-US was used in order to comprehensively capture some upstream North American data. Technological coverage for Tandus Centiva operations is current. Technological coverage for the materials and processes upstream and downstream of Tandus Centiva are in most cases industry average, and in some instances, typical.

Results & Interpretation

Statement of Comparison

Users of EPDs should avoid comparing results for products from different companies. Assumptions, data sources, databases, and assessment tools may all impact the uncertainty of final results and make comparisons misleading. As a general rule, comparisons of different products should not be made unless similar background data, calculation methods, building context, service life and assumptions for use are utilized.

Life Cycle Impact Assessment Results

The life cycle impact assessment (LCIA) results were calculated using the CML (required) and TRACI v.2.1 (optional) methodologies. Energy results are based on the Cumulative Energy Demand (CED) methodology.

		Powerbond ethos Cushion - 1 Installation, no Use				
CML Impact Categories	Unit	Sourcing & Extraction	Manuf.	Delivery & Installation	End of Life	Total
Abiotic Depletion Potential (ADP)	kg Sb eq	2.2 E-06	1.0 E-08	6.4 E-08	2.1 E-08	2.3 E-06
Acidification Potential (AP)	kg SO2 eq	2.6 E-02	2.4 E-02	7.9 E-03	3.3 E-04	0.06
Eutrophication Potential (EP)	kg PO4--- eq	3.7 E-03	7.5 E-04	1.2 E-03	5.5 E-05	0.01
Global Warming Potential (GWP) (100a)	kg CO2 eq	7.1 E+00	2.6 E+00	1.6 E+00	5.1 E-02	11.3





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Ozone Depletion Potential (ODP)	kg CFC-11 eq	5.3 E-08	3.3 E-10	1.3 E-07	5.7 E-09	1.9 E-07
Photochem. Oxidant Form'n Pot'l (POCP)	kg C2H4 eq	1.5 E-03	1.4 E-03	3.4 E-04	1.4 E-05	3.2 E-03
Energy Categories						
Primary Energy - Non Renewable	MJ	1.3 E+02	3.8 E+01	2.4 E+01	1.0 E+00	188
Primary Energy - Renewable	MJ	1.1 E+00	1.2 E-02	8.3 E-02	4.9 E-03	1.2
TRACI Impact Categories (Optional)						
Acidification Potential (AP)	kg SO2 eq	2.8 E-02	2.2 E-02	8.8 E-03	3.8 E-04	0.06
Eutrophication Potential (EP)	kg N eq	3.1 E-03	3.9 E-04	9.8 E-04	3.5 E-05	4.5 E-03
Global Warming Potential (GWP) (100a)	kg CO2 eq	7.1 E+00	2.6 E+00	1.6 E+00	5.1 E-02	11.3
Ozone Depletion Potential (ODP)	kg CFC-11 eq	6.8 E-08	4.6 E-10	1.7 E-07	7.6 E-09	2.5 E-07
Smog Formation (POCP)	kg O3 eq	3.1 E-01	1.4 E-01	2.0 E-01	9.3 E-03	0.66

Table 1 Powerbond ethos Cushion – 1 m2 of 1 production cycle of floor product (without use phase)

CML Impact Categories	Unit	1 Yr Use & Maintenance
Abiotic Depletion Potential (ADP)	kg Sb eq	2.8 E-08
Acidification Potential (AP)	kg SO2 eq	0.01
Eutrophication Potential (EP)	kg PO4--- eq	2.1 E-04
Global Warming Potential (GWP) (100a)	kg CO2 eq	0.70
Ozone Depletion Potential (ODP)	kg CFC-11 eq	2.8 E-10
Photochemical Oxidant Formation Potential (POCP)	kg C2H4 eq	6.3 E-04
Energy Categories		
Primary Energy - Non Renewable	MJ	10.5
Primary Energy - Renewable	MJ	0.08
TRACI Impact Categories (Optional)		
Acidification Potential (AP)	kg SO2 eq	0.01
Eutrophication Potential (EP)	kg N eq	1.0 E-04
Global Warming Potential (GWP) (100a)	kg CO2 eq	0.70
Ozone Depletion Potential (ODP)	kg CFC-11 eq	4.0 E-10
Smog Formation (POCP)	kg O3 eq	0.04

Table 2 1-year use phase impacts for 1 m2 of flooring product





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Powerbond ethos Cushion - 60 years
RSL of Product (yr) = 25
Replacements in 60 yrs = 2.4

CML Impact Categories	Unit	Sourcing & Extraction	Manuf.	Delivery & Installation	Use	EOL	Total
Abiotic Depletion Potential (ADP)	kg Sb eq	5.3 E-06	2.4 E-08	1.5 E-07	1.7 E-06	5.0 E-08	7.2 E-06
Acidification Potential (AP)	kg SO2 eq	6.3 E-02	5.7 E-02	1.9 E-02	4.0 E-01	8.0 E-04	0.54
Eutrophication Potential (EP)	kg PO4---eq	8.8 E-03	1.8 E-03	2.9 E-03	1.3 E-02	1.3 E-04	0.03
Global Warming Potential (GWP) (100a)	kg CO2 eq	1.7 E+01	6.1 E+00	3.8 E+00	4.2 E+01	1.2 E-01	69.5
Ozone Depletion Potential (ODP)	kg CFC-11 eq	1.3 E-07	8.0 E-10	3.1 E-07	1.7 E-08	1.4 E-08	4.6 E-07
Photochem. Oxidant Form'n Pot'l (POCP)	kg C2H4 eq	3.6 E-03	3.3 E-03	8.2 E-04	3.8 E-02	3.3 E-05	0.05
Energy Categories							
Primary Energy - Non Renewable	MJ	3.0 E+02	9.0 E+01	5.9 E+01	6.3 E+02	2.5 E+00	1079
Primary Energy - Renewable	MJ	2.7 E+00	2.8 E-02	2.0 E-01	4.5 E+00	1.2 E-02	7.4
TRACI Impact Categories (Optional)							
Acidification Potential (AP)	kg SO2 eq	6.7 E-02	5.2 E-02	2.1 E-02	3.6 E-01	9.2 E-04	0.51
Eutrophication Potential (EP)	kg N eq	7.3 E-03	9.4 E-04	2.3 E-03	6.1 E-03	8.4 E-05	0.02
Global Warming Potential (GWP) (100a)	kg CO2 eq	1.7 E+01	6.1 E+00	3.8 E+00	4.2 E+01	1.2 E-01	69.5
Ozone Depletion Potential (ODP)	kg CFC-11 eq	1.6 E-07	1.1 E-09	4.1 E-07	2.4 E-08	1.8 E-08	6.16 E-07
Smog Formation (POCP)	kg O3 eq	7.5 E-01	3.2 E-01	4.8 E-01	2.5 E+00	2.2 E-02	4.0

Table 3 Powerbond ethos Cushion – 1 m2 over the 60-year life of the building

Interpretation

When evaluating 1 m2 of flooring without the use phase, most of the environmental impacts occur during production of the flooring (raw materials production and manufacturing). An exception is ODP; its value in the full life cycle is very small; ODP during production is even smaller relative to delivery. When the product is evaluated in terms of its 60-year use in a building, the relative impacts of the use phase become more prominent in the life cycle, and the relative impacts of the flooring production decrease. When the yarn weight is lower or higher, the impacts slightly decrease or increase, respectively.





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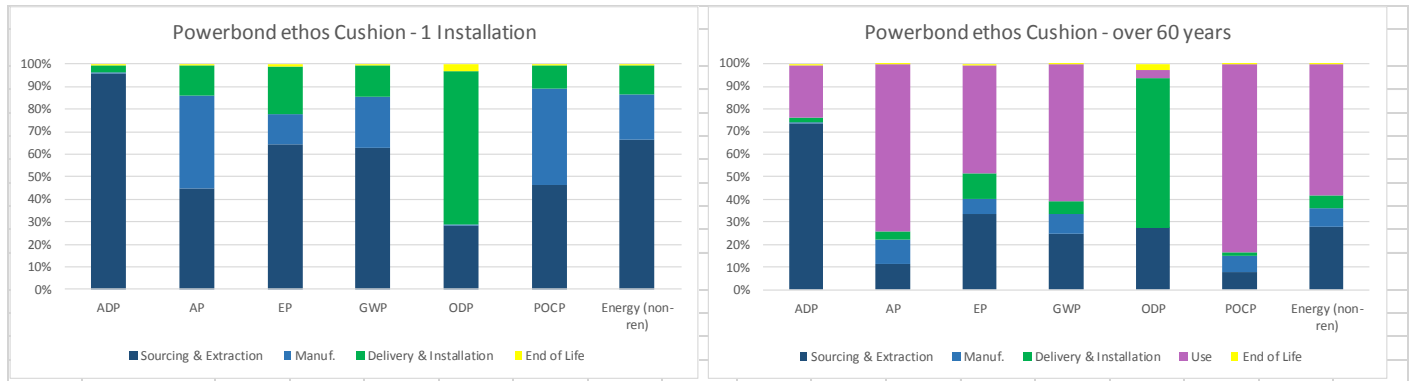


Figure 1 Relative impacts of the life cycle stages

Cradle to grave results using low (14 osy), average (18.1 osy) and high (30 osy) yarn weights:

CML Impact Categories	Unit	Powerbond ethos Cushion - 60 yrs		
		Low	Average	High
Abiotic Depletion Potential (ADP)	kg Sb eq	5.2 E-05	7.2 E-06	1.1 E-04
Acidification Potential (AP)	kg SO2 eq	0.56	0.54	0.60
Eutrophication Potential (EP)	kg PO4--- eq	0.03	0.03	0.04
Global Warming Potential (GWP) (100a)	kg CO2 eq	67	69	79
Ozone Depletion Potential (ODP)	kg CFC-11 eq	4.5 E-07	4.6 E-07	5.1 E-07
Photochemical Oxidant Formation Potential	kg C2H4 eq	0.05	0.05	0.05
Energy Categories				
Primary Energy - Non Renewable	MJ	1018	1079	1198
Primary Energy – Renewable	MJ	7.1	7.4	8.3

Table 4 Powerbond ethos Cushion face weight analysis

Additional Information, Evidence, and Test Results

Carbon footprinting enables Tandus Centiva to offer its customers the option to purchase products that are “carbon free” or “climate neutral” through the Carbonfund.org, a leading, nonprofit organization dedicated to combating climate change. Claiming a product is carbon free means that the greenhouse gas emissions related to the entire life cycle of the product have been offset. For a nominal cost, Tandus Centiva customers can purchase carbonfree Powerbond or modular flooring products through a registered and credible program.

Powerbond ethos Cushion has a Class I fire rating and meets flammability requirements of the 2012 NFPA 101 Life Safety Code and the 2012 International Fire Code.





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Emissions

Product and adhesives have low VOC emissions and are tested per the criteria defined in CRI's Green Label Plus program (CDPH v1.1 and v1.2). Additionally, adhesive VOC content is tested by Materials Analytical Services, LLC and certified in the MAS Certified Green® Program. Adhesives meet the requirements the South Coast Air Quality Management District - Rule 1168.

References

- /1/ Product Category Rule: NSF Sustainability, Product Category Rule (PCR) on Flooring: Carpet, Resilient, Textile, Laminate, Ceramic, Wood, version 2, Valid through June 23, 2019.
- /2/ ISO 14025:2006, the International Organization for Standardization, Environmental Labels and Declarations - Type III Environmental Declarations - Principals and Procedures, Edition 1.
- /3/ ISO 14040:2006, the International Standard of the International Standardization Organization, Environmental Management - Life Cycle Assessment - Principles and Framework.
- /4/ ISO 14044:2006, the International Standard of the International Standardization Organization, Environmental Management - Life Cycle Assessment – Requirements and guidelines.
- /5/ ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA <http://www.astm.org/Standard/index.shtml>
- /6/ 16 CFR 1631 - STANDARD FOR THE SURFACE FLAMMABILITY OF SMALL CARPETS AND RUGS (FF 2-70); Code of Federal Regulations; 40 FR 59935
- /7/ American Association of Textile Chemists and Colorists (AATCC), Research Triangle Park, NC., USA, Test Methods and Evaluation Procedures <http://www.aatcc.org/>
- /8/ Carpet and Rug Institute, Green Label Plus Program, Carpet and Adhesives, <http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/carpet-and-adhesive.cfm>
- /9/ Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers 1.1 (February 2010) and Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers 1.2 (January 2017), Indoor Air Quality Section, Environmental Health Laboratory Branch, Division of Environmental and Occupational Disease Control, California Department of Public Health (also known as California Specification 01350) AND http://www.cal-iaq.org/phocadownload/cdph-iaq_standardmethod_v1_1_2010%20new1110.pdf.
- /10/ South Coast Air Quality Management District, Rule 1168, Adhesives and Sealant Applications; <http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf>
- /11/ International Organization for Standardization (ISO) ISO 14001:2015, Environmental Management Systems – Requirements with Guidance for Use <http://www.iso.org/iso/home.html>.
- /12/ NSF/ANSI 140 Sustainability Assessment for Carpet, NSF International, <http://www.nsf.org>.
- /13/ Materials Analytical Services (MAS), Inc. MAS Certified Green® program, <http://www.mascertifiedgreen.com/>.
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