

## ENVIRONMENTAL PRODUCT DECLARATION

# FLEX-AIRE® CUSHION MODULAR

COMMERCIAL FLOOR COVERING



Flex-Aire® Cushion Modular, Style HalfTone Transition, Color Litho/Mineral Ore



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](http://www.tarkett.com) or [www.tarkettna.com](http://www.tarkettna.com)



# ENVIRONMENTAL PRODUCT DECLARATION



THE ULTIMATE  
FLOORING EXPERIENCE

Tandus Centiva Flex-Aire® Cushion Modular  
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	4788046862.106.1
DECLARED PRODUCT	Tandus Centiva Flex-Aire® Cushion modular
REFERENCE PCR	NSF PCR for Flooring: Carpet, Resilient, Laminate, Ceramic, Wood, Version 2
DATE OF ISSUE	October 27, 2017
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	<ul style="list-style-type: none"> <li>Product definition and information about building physics</li> <li>Information about basic material and the material's origin</li> <li>Description of the product's manufacture</li> <li>Indication of product processing</li> <li>Information about the in-use conditions</li> <li>Life cycle assessment results</li> <li>Testing results and verifications</li> </ul>
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
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



Tandus Centiva Flex-Aire® Cushion Modular  
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According to ISO 14025

## Product Definition

### Product Classification & Description



The Flex-Aire® Cushion modular product line consists of a full range of styles that combine a nylon wear layer and closed cell cushion in a heterogeneous construction. The nylon and closed cell cushion are fused together through heat and pressure to form an integral and inseparable construction that provides excellent performance, durability and comfort underfoot. The closed cell nature of the cushion layer provides softness underfoot as well as structural support. The enhanced cushion layer increases the acoustical and insulation properties of the product and gives longer wear life to the face yarns. Innovative patterns and an extensive offering of color palettes, allows Flex-Aire Cushion modular products to work in tandem with other Tandus Centiva products.

Flex-Aire Cushion is an ergonomic modular product that is fully recyclable in Tandus Centiva's third party certified, closed loop carpet recycling process. It is also certified at the Gold level to the ANSI/ NSF 140 standard. The product is composed of either nylon 6 or nylon 6,6 which is solution dyed, yarn dyed or a combination of solution and yarn dyed. These product groups were assessed for an average face weight of 18.1 ounces per square yard (osy), with the maximum (30 osy) and minimum (10 osy) yarn weights assessed for sensitivity. Unless otherwise noted, data is presented for an average product with 18.1 osy yarn weight.

### Accreditation

- ISO 14001 Environmental Management System
- Gold ANSI/NSF 140 Sustainability Standard
- Recycling Program Certification
- Recycled Content Certification
- Carpet and Rug Institute (CRI) Green Label Plus
- Carbonfund.org Carbonfree® Certification (optional)
- MAS Certified Green® Program (Adhesives)
- Cradle to Cradle Certified™ v3.1 Adhesives





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**Range of Applications**

Flex-Aire® Cushion Modular 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 <sup>2</sup> )
Smoke Density ASTM E-662	Maximum Specific Optical Density $\leq$ 450
Surface Flammability FF 1-70	Meets criteria
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# 6558
California Specification 01350	Meets criteria (CDPH v1.1 and v1.2)

**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	Innovative Closed Cell Cushion Layer			
Recycled Content	Dependent on style; 21 to 41% overall recycled content; min. 4% postconsumer			
Installation Options	Random, Quarter Turned, Unidirectional, Horizontal Ashlar, Vertical Ashlar (18 x 36), Herring Bone (18 x 36), Unidirectional (18 x 36); Dependent upon style.			
Cushion Thickness ASTM D-3574	0.156 inch	4.0 mm		
Cushion Density ASTM D-3574	18.5 lbs/ft <sup>3</sup>	296 kg/m <sup>3</sup>		
Compression Set ASTM D-3574	Max 10%			
Compression Deflection ASTM D-3574	min. 5 and 25 lbs/in <sup>2</sup> max at 25%		min.352 and 1758 g/cm <sup>2</sup> max at 25%	
Flex-Aire Cushion modular				
Product Size Availability (inches)	24 x 24	18 x 18	36 x 36	18 x 36
Product Size Availability (centimeters)	60.9 x 60.9	45.7 x 45.7	91.4 x 91.4	45.7 x 91.4
	<b>Range</b>	<b>Unit</b>	<b>Range</b>	<b>Unit</b>
Wear Layer/Yarn Weight	10 to 30	osy	339 to 1,017	gsm
Total Product Weight (+/- 5%)	113.1 to 133.1	osy	3,835 to 4,513	gsm

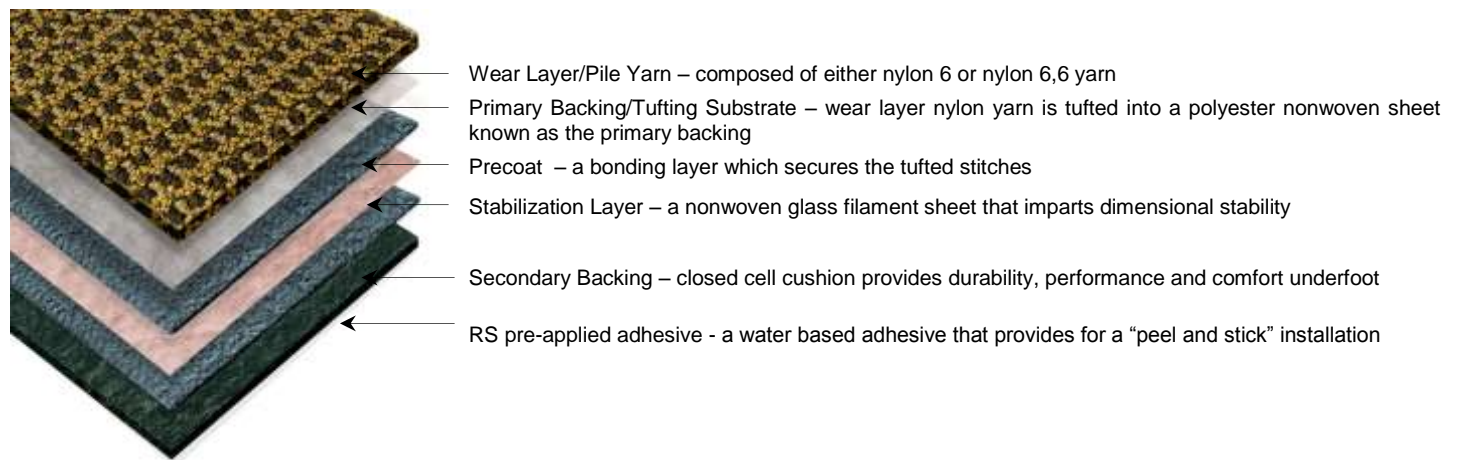




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**Material Content**



**Material Content of the Product**

Component	Material	Mass %	Availability		Origin
Wear Layer/Pile Yarn	Nylon 6 or Nylon 6,6	15.5	Non- Renewable	Limited	Global
Primary Backing	Polyester	2.8	Non- Renewable	Limited	Global
Precoat	Ethylene vinyl acetate copolymer	17.3	Non- Renewable	Limited	Global
	Calcium carbonate		Non- Renewable	Abundant	Global
	Aluminum trihydrate		Non- Renewable	Abundant	Global
Stabilization Layer	Glass filament non-woven	1.7	Non- Renewable	Limited	Global
Secondary Backing	Postconsumer calcium carbonate	61.5	Recycled	Limited	U.S.
	Preconsumer calcium alumina glass spheres		Recycled	Limited	U.S.
	Polyvinyl chloride polymer		Non- Renewable	Limited	Global
	Diocetyl terephthalate/Diisononyl adipate		Non- Renewable	Limited	Global
RS Adhesive	Pre-applied acrylic adhesive	1.2	Non- Renewable	Limited	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

**Diisononyl adipate (DINA)** - a non ortho-phthalate plasticizer, an ester used to soften rigid polyvinyl chloride (PVC) and help to improve low temperature flexibility

**Diocetyl terephthalate (DOTP)** - a non ortho-phthalate plasticizer, a diester of terephthalic acid and the branched-chain 2-ethylhexanol

**Ethylene vinyl acetate** - a copolymerization product of ethylene and vinyl acetate

**Glass stabilization layer** - a nonwoven sheet consisting of glass fibers used for dimensional stability





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**Nylon 6** - a polymer of caprolactam formed by ring opening polymerization

**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 Chloride (PVC)** - a thermoplastic polymer made by combining ethylene (derived from petroleum, natural gas or coal) and chlorine from common salt

**RS “peel and stick” adhesive** - a water based, pressure sensitive, acrylic adhesive derived from acrylate based polymers

## Production

In the manufacturing process, nylon yarn is tufted into a polyester, nonwoven primary backing and coated with a precoat. The closed cell cushion structural backing, containing an embedded non-woven glass sheet, is then adhered to the tufted primary backing composite through heat and pressure. RS adhesive is applied.

### Health, Safety, and Environmental Aspects During Production

- ISO 14001 and an Environmental Management System (EMS)
- Tandus Centiva is in compliance with all applicable local, state and federal environmental regulations.
- A comprehensive health and safety program focused on continual improvement in worker safety is employed.
- The company has a successful supply chain and raw material management program.
- World Class Manufacturing (WCM) is a comprehensive Environment, Health and Safety 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, 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 the Dalton manufacturing facility to customers amounts to 1,900 km by truck and 300 km by boat.



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## Installation



Flex-Aire Cushion Modular can be installed using TarkettTape®, RS “peel and stick” pre-applied adhesive or a water-based, acrylic adhesive. Installation with TarkettTape™ allows flooring installation to be unaffected by pH or moisture as long as there are no free standing liquids present. TarkettTape applied to the corners of the product provides adhesion during use and ease of removal upon de-installation. Detailed installation instructions can be found at [www.tarkettna.com](http://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 in the LCA model, the recycled portion was not taken into account. Thus, product waste and packaging was modeled as disposed of in a landfill.

## Packaging

Modular flooring is packaged in recycled content, cardboard boxes, stacked on wooden pallets and secured with stretch wrap. Tandus Centiva encourages installers to recycle packaging materials in local recycling programs.

## Health, Safety and Environmental Aspects during Installation

Tandus Centiva floor coverings 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, v1.1 (Feb 2010) and v1.2 (Jan 2017). These test methods 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. Installation Instructions and Material Safety Data Sheets (MSDS) are available at [www.tarkettna.com](http://www.tarkettna.com).

## Use

The use stage takes into account environmental impacts during product use. A reference service life (RSL) of 15 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.



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**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](http://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**

Floorcoverings should be installed on dry, structurally sound and adequately prepared floors. Subfloor requirements and installation instructions are available at [www.tarkettna.com](http://www.tarkettna.com).

**End-of-Life**

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







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Tandus Centiva's Carpet Recycling Process



Disposal

Tandus Centiva's Dalton facility annually recycles over 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.





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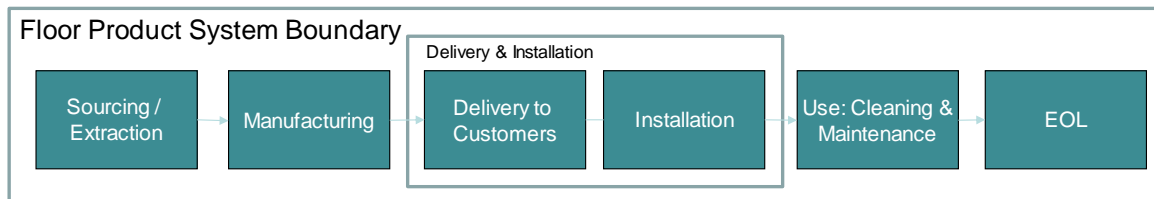
## Life Cycle Assessment

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 15 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).

### 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.





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**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.

		Flex-Aire Cushion Modular - 1 Installation, no Use				
CML Impact Categories	Unit	Sourcing & Extraction	Manuf.	Delivery & Installation	End of Life	Total
Abiotic Depletion Potential (ADP)	kg Sb eq	3.9 E-06	1.0 E-08	8.4 E-08	2.7 E-08	<b>4.1 E-06</b>
Acidification Potential (AP)	kg SO2 eq	7.6 E-02	2.4 E-02	1.0 E-02	4.4 E-04	<b>0.11</b>
Eutrophication Potential (EP)	kg PO4--- eq	5.4 E-03	7.5 E-04	1.6 E-03	7.3 E-05	<b>0.01</b>
Global Warming Potential (GWP) (100a)	kg CO2 eq	1.0 E+01	2.6 E+00	2.1 E+00	6.7 E-02	<b>15.2</b>
Ozone Depletion Potential (ODP)	kg CFC-11 eq	5.5 E-06	3.3 E-10	1.7 E-07	7.5 E-09	<b>5.6 E-06</b>
Photochem. Oxidant Form'n Pot'l (POCP)	kg C2H4 eq	3.8 E-03	1.4 E-03	4.5 E-04	1.8 E-05	<b>5.7 E-03</b>

Energy Categories





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<b>Primary Energy - Non Renewable</b>	MJ	2.4 E+02	3.8 E+01	3.2 E+01	1.4 E+00	<b>307</b>
<b>Primary Energy - Renewable</b>	MJ	2.5 E+00	1.2 E-02	1.1 E-01	6.4 E-03	<b>2.7</b>
<b>TRACI Impact Categories (Optional)</b>						
<b>Acidification Potential (AP)</b>	kg SO2 eq	7.1 E-02	2.2 E-02	1.2 E-02	5.0 E-04	<b>0.11</b>
<b>Eutrophication Potential (EP)</b>	kg N eq	5.8 E-03	3.9 E-04	1.3 E-03	4.6 E-05	<b>0.01</b>
<b>Global Warming Potential (GWP) (100a)</b>	kg CO2 eq	1.0 E+01	2.6 E+00	2.1 E+00	6.7 E-02	<b>15.2</b>
<b>Ozone Depletion Potential (ODP)</b>	kg CFC-11 eq	5.5 E-06	4.6 E-10	2.3 E-07	1.0 E-08	<b>5.7 E-06</b>
<b>Smog Formation (POCP)</b>	kg O3 eq	4.4 E-01	1.4 E-01	2.6 E-01	1.2 E-02	<b>0.85</b>

Table 1 Flex-Aire Cushion Modular – 1 m2 of 1 production cycle of floor product (without use phase)

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

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





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Flex-Aire Cushion Modular - 60 years  
RSL of Product (yr) = 15  
# Replacements in 60 yrs = 4

CML Impact Categories	Unit	Sourcing & Extraction	Manuf.	Delivery & Installation	Use	EOL	Total
<b>Abiotic Depletion Potential (ADP)</b>	kg Sb eq	1.6 E-05	4.0 E-08	3.4 E-07	1.7 E-06	1.1 E-07	<b>1.8 E-05</b>
<b>Acidification Potential (AP)</b>	kg SO2 eq	3.1 E-01	9.6 E-02	4.2 E-02	4.0 E-01	1.7 E-03	<b>0.84</b>
<b>Eutrophication Potential (EP)</b>	kg PO4---eq	2.2 E-02	3.0 E-03	6.5 E-03	1.3 E-02	2.9 E-04	<b>0.04</b>
<b>Global Warming Potential (GWP) (100a)</b>	kg CO2 eq	4.2 E+01	1.0 E+01	8.5 E+00	4.2 E+01	2.7 E-01	<b>103</b>
<b>Ozone Depletion Potential (ODP)</b>	kg CFC-11 eq	2.2 E-05	1.3 E-09	6.8 E-07	1.7 E-08	3.0 E-08	<b>2.3 E-05</b>
<b>Photochem. Oxidant Form'n Pot'l (POCP)</b>	kg C2H4 eq	1.5 E-02	5.5 E-03	1.8 E-03	3.8 E-02	7.2 E-05	<b>0.06</b>
<b>Energy Categories</b>							
<b>Primary Energy - Non Renewable</b>	MJ	9.4 E+02	1.5 E+02	1.3 E+02	6.3 E+02	5.4 E+00	<b>1857</b>
<b>Primary Energy – Renewable</b>	MJ	1.0 E+01	4.7 E-02	4.4 E-01	4.5 E+00	2.5 E-02	<b>15.1</b>
<b>TRACI Impact Categories (Optional)</b>							
<b>Acidification Potential (AP)</b>	kg SO2 eq	2.8 E-01	8.7 E-02	4.7 E-02	3.6 E-01	2.0 E-03	<b>0.79</b>
<b>Eutrophication Potential (EP)</b>	kg N eq	2.3 E-02	1.6 E-03	5.2 E-03	6.1 E-03	1.8 E-04	<b>0.04</b>
<b>Global Warming Potential (GWP) (100a)</b>	kg CO2 eq	4.2 E+01	1.0 E+01	8.5 E+00	4.2 E+01	2.7 E-01	<b>103</b>
<b>Ozone Depletion Potential (ODP)</b>	kg CFC-11 eq	2.2 E-05	1.8 E-09	9.0 E-07	2.4 E-08	4.0 E-08	<b>2.29 E-05</b>
<b>Smog Formation (POCP)</b>	kg O3 eq	1.8 E+00	5.4 E-01	1.1 E+00	2.5 E+00	4.9 E-02	<b>5.9</b>

Table 3 Flex-Aire Cushion Modular – 1 m2 over the 60-year life of the building





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According to ISO 14025

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). 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.

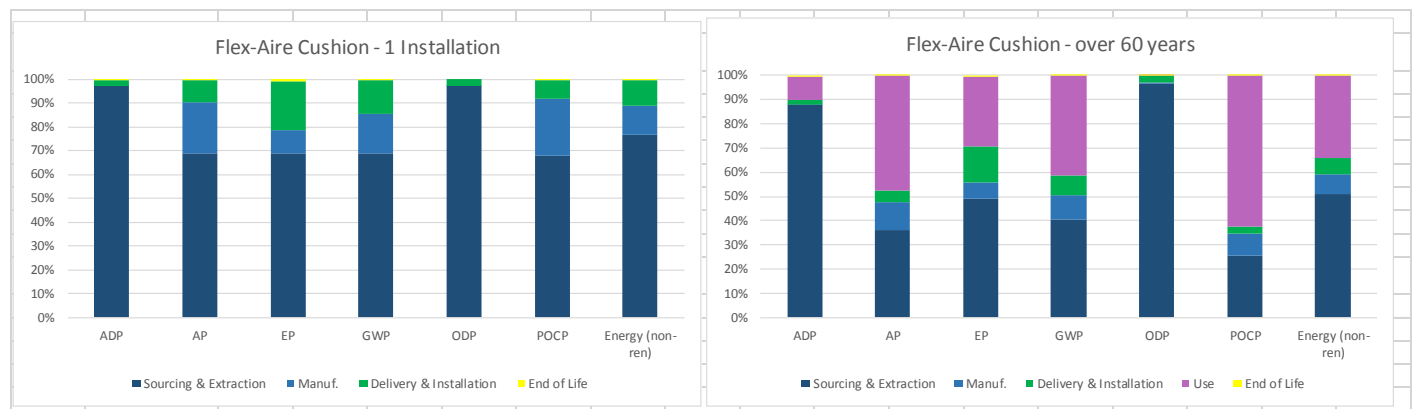


Figure 1 Relative impacts of the life cycle stages – Flex-Aire Cushion Modular

Cradle to grave results using low (10 osy), average (18.1 osy) and high (30 osy) yarn weights:

		Flex-Aire Cushion Modular - 60 yrs		
CML Impact Categories	Unit	Low	Average	High
Abiotic Depletion Potential (ADP)	kg Sb eq	7.0 E-05	1.8 E-05	1.8 E-04
Acidification Potential (AP)	kg SO2 eq	0.85	0.84	0.94
Eutrophication Potential (EP)	kg PO4--- eq	0.04	0.04	0.06
Global Warming Potential (GWP) (100a)	kg CO2 eq	94	103	120
Ozone Depletion Potential (ODP)	kg CFC-11 eq	2.3 E-05	2.3 E-05	2.3 E-05
Photochemical Oxidant Formation Potential	kg C2H4 eq	0.06	0.06	0.06
<b>Energy Categories</b>				
Primary Energy - Non Renewable	MJ	1681	1857	2055
Primary Energy – Renewable	MJ	14	15	17

Table 4 Flex-Aire Cushion Modular face weight analysis





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According to ISO 14025

## Additional Information, Evidence, and Test Results

Carbon foot printing 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 carbon free Powerbond or modular flooring products through a registered and credible program.

Flex-Aire Cushion modular has a Class I fire rating and meets flammability requirements of the 2012 NFPA 101 Life Safety Code and the 2012 International Fire Code.



### 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 third party certified in the MAS Certified Green® Program. Adhesives meet the requirements of 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 v1.2 (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](http://www.cal-iaq.org/phocadownload/cdph-iaq_standardmethod_v1_1_2010%20new1110.pdf).



Tandus Centiva Flex-Aire® Cushion Modular  
Commercial Floor Covering

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- /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/>.
- /14/ Carbonfund.org, CarbonFree Certification <http://www.carbonfund.org/offset/product-certification>.
- /15/ Tandus Centiva web site [www.tandus-centiva.com](http://www.tandus-centiva.com) and Tarkett web site [www.tarkettna.com](http://www.tarkettna.com)
- /16/ NFPA 101®: Life Safety Code®, 2012 Edition, <http://www.nfpa.org/catalog/product.asp?pid=10112>.
- /17/ 2012 International Fire Code®, International Code Council (ICC), <http://shop.iccsafe.org/2012-international-fire-code-1.html>
- /18/ Ecoinvent Database, Ecoinvent Centre, Ecoinvent data v2 (Dübendorf: Swiss Centre for Life Cycle Inventories, 2007), <http://www.ecoinvent.org/>.
- /19/ Care and Maintenance of Commercial Carpet Conventional and Next Generation Technology: Contents of Use Phase Gate to Gate; Life Cycle Inventory Summary, Di Lu, M. Overcash and M. Realff, February 2008 (CCACTI report).
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- /23/ Leiden University Institute of Environmental Sciences (CML), Life Cycle Impact Assessment methodology, version 4.2, released in April, 2013. More information can be found at <http://cml.leiden.edu/software/data-cmlia.html>.
- /24/ Cumulative Energy Demand (CED): see Frischknecht R., Jungbluth N., et.al. (2003). Implementation of Life Cycle Impact Assessment Methods. Final report ecoinvent 2000, Swiss Centre for LCI. Dübendorf, CH, [www.ecoinvent.ch](http://www.ecoinvent.ch). See also [www.pre.nl](http://www.pre.nl).