Environmental Product Declaration

AtlasMasland - Modular Carpet Family

Certified Environmental Product Declaration
www.nsf.org

Environmental Product Declaration Program Operator
NSF Certification, LLC
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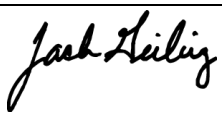
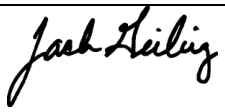
Date of Issue: 06/02/2020
Period of Validity: 5 years
Declaration#: EPD 10349

EPD Information			
Program Operator		NSF Certification, LLC	
Declaration Holder		AtlasMasland	
Product Modular Carpet Family	Date of Issue June 2, 2020	Period of Validity 5 Years	Declaration Number EPD 10349
This EPD was independently verified by NSF International in accordance with ISO 14025: ☐ Internal ☒ External		 Jenny Oorbeck joorbeck@nsf.org	
This life cycle assessment was independently verified by in accordance with ISO 14044 and the reference PCR:		 Jack Geibig, Ecoform jgeibig@ecoform.com	
LCA Information			
Basis LCA		Lifecycle Analysis of AtlasMasland Carpets April 6, 2020	
LCA Preparer		Michael Overcash & Evan Griffing Environmental Clarity, Inc. www.environmentalclarity.com	
This life cycle assessment was critically reviewed in accordance with ISO 14044 by:		 Jack Geibig, Ecoform	
PCR Information			
Program Operator		NSF International	
Reference PCR		Flooring: Carpet, Resilient, Laminate, Ceramic, Wood Version 2	
Date of Issue		June 2014	
PCR review was conducted by:		Michael Overcash Environmental Clarity mrovercash@earthlink.net	

All products are manufactured in the United States in facilities owned by the manufacturer. There are no ISO certifications for these facilities.

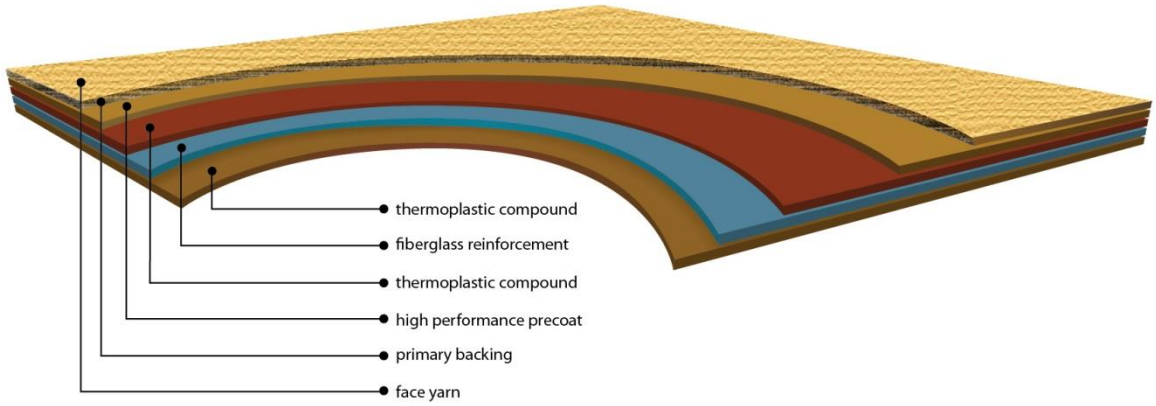
ENVIRONMENTAL PRODUCT DECLARATION: DETAILED VERSION

Product Description

Product classification and description

This report is an update to a previous Environmental Product Declaration (EPD) to account for improvements to the carpet architecture and the merger of Atlas and Masland manufacturing facilities. Products covered in this EPD are a broad variety of modular carpets manufactured by AtlasMasland and backed with our thermoplastic backing and made with a type 6,6 nylon. The thermoplastic backing is comprised of a polyvinyl chloride and filler. The backing recycled content is 57% post-industrial and 9% post-consumer material. The nylon 6,6 face fiber is either beck or solution dyed, and the recycled content of the fiber is 20% pre-consumer and 10% post-consumer. The products are covered by AtlasMasland's Lifetime Limited Commercial Warranty. The products all pass the Carpet & Rugs Institute's Green Label Plus and are third party to the NSF/ANSI 140 Sustainable Carpet Assessment Standard at the Gold level.

The modular carpet represented in this EPD had a weighted average weight of 129.7 oz./yd^2 (4.41 kg/m^2). The variation in weight in the modular products is due to the amount of yarn weight. The weighted average weight for the yarn used in the Life Cycle Assessment (LCA) was 20.0 oz./yd^2 (0.68 kg/m^2).



Applicability

AtlasMasland Modular Carpet is intended for installation in medium to high traffic commercial interior spaces. The specific product type determines the suitability for the traffic classification, as defined in the guidelines developed by the Carpet & Rug Institutes. For details on recommended commercial performance refer to: http://www.carpet-rug.org/commercial-customers/selecting-the-right-carpet/quality-and-performance/index.cfm

The referenced life span for AtlasMasland Modular Carpet is 15 years.

Product Characteristics

Table 1 – Product Characteristics of AtlasMasland Modular Carpet

Type of manufacture	Tufted patterned loop, Tufted patterned solid and cut pile, Tufted pattern solid and tip shear	
Yarn type	Nylon 6,6	
Additional characteristics according to NSF/ANSI 140	Sustainability Assessment to Carpet: Gold	
Sustainable certifications	Certified to NSF/ANSI 140	
VOC emissions test method	Carpet & Rug Institute's Green Label Plus: GLP 1922 & GLP 5300 Pre-Dyed GLP 7910 & GLP 9980 Post Dyed	
CRI- TARR rating	≥3	
Characteristics	**Nominal Value**	**Unit**
Total thickness	0.156-0.250	inch
Product weight	125-144	oz/yd^2
Surface pile thickness	0.100-0.1875	inch
Number of tufts or loops $/dm^2$	19,008-24,192	ft^2
Surface pile weight	16-24	oz/yd^2
Pile Fiber Composition	20	%
Secondary Backing Fabrics + Secondary Backing	80	%
Post-Consumer Recycled Content	5-9	%
Pre-Consumer Recycled Content	40-49	%

Product Standards			Results
CRI Green Label Plus			Pass
NSF 140			Gold
ASTM E648	Radiant Panel Flammability Test		Class I
ASTM E662	NBS Smoke Test (Flaming Mode)		≤ 450
AATCC 134	Electrostatic Propensity		≤ 3.0KV
AATCC 16	Colorfastness to Light		≥ 4 at 40 AFU's
ASTM D5252/D7330-11 Hexapod Tumble Drum Test (TARR)			≥3

Product Characteristics

Material Content

Table 2. AtlasMasland Modular Carpet material contents

Component	Material	Mass %	Availability			Origin of Raw Materials
			Renewable	Non-Renewable	Recycled	
Pile Material	Nylon 6,6	20.0%		Fossil resource, limited	20% Pre-consumer, 10% Post-consumer	Global
Primary Backing	PET (Polyester)	2.5%		Fossil resource, limited	41-87% post-consumer	Global
Back coating (Bonding Agent)	VAE & PVC	76.0%		Fossil resource, limited	0%	US
	Calcium Carbonate			Mineral, abundant		
Secondary Backing Fabric	Fiberglas	1.5%		Fossil resource, limited	0%	Global

The fiber content consists of 70% virgin fiber, 20% post-industrial (pre-consumer) content and 10% post-consumer content. Contents not listed were excluded due to the *de minimus* quantity of each.

None of the materials and substances used in the manufacture of AtlasMasland Modular Carpet is considered by any government regulation as adversely affecting human health or the environment. AtlasMasland Modular Carpet is not required to report an MSDS. The material and its chemical discharges are not considered critical air pollutants or hazardous air pollutants. Likewise, none of the materials or discharges are subject to any governmental regulation for water pollutants or to US EPA disclosure policies for hazardous substances. No material produced is listed as a persistent organic pollutant by the Stockholm Convention

Production of main materials

Nylon Face Fiber – Type 6,6 nylon that is solution dyed. Nylon 6,6 is produced through polycondensation of hexamethylene diamine and adipic acid.

Synthetic Primary Backing – The yarn is tufted into a woven polyester backing. The term "polyester" as a specific material most commonly refers to polyethylene terephthalate (PET). The material is categorized as containing core ester functional groups in their main chain.

Thermoplastic Layers -- Two layers of polyvinyl chloride material and a precoat of ethylene vinyl acetate copolymer are utilized to bond the tufted carpet to the primary backing giving the product stability and long-term performance. The backing layers contain both post-consumer and pre-consumer recycled content. Polyvinyl chloride is produced by polymerization of the monomer vinyl chloride. It can be made softer and more flexible by the addition of plasticizers such as dioctyl terephthalate (DOTP).

Reinforcement Layer – A fiberglass fabric is embedded in backing layers to provide dimensional stability. Fiberglass is the common name for glass-reinforced plastic or alternatively glass-fiber reinforced plastic. Fiberglass is a fiber reinforced polymer made of plastic reinforced by glass fibers, commonly woven into a mat.

Calcium Carbonate – an abundant mineral found in all parts of the world as the chief substance in marble and limestone. It can be ground to varying particle sizes and is widely used as filler in formulated flooring systems.

Life Cycle Assessment Stages and Reported EPD Information

Sourcing/extraction (raw material acquisition) stage

The life cycle assessment stage for sourcing and material extraction begins at the point of the raw materials extraction from its source and ends at the receipt of the raw material at the carpet manufacturing facility. All raw materials are evaluated for quality, availability, consistency, performance, and value before acceptance into the manufacturing process. Once the material and source have passed the initial evaluation process, on-going evaluation is made using the suppliers' certificate of analysis.

Manufacturing stage

The production process is designed for efficiency, utilizing the strengths of AtlasMasland's technology and expertise. It begins with the use of undyed or solution dyed fibers. The determination of the dyeing process lies in the intended purpose and aesthetics of the product. The fiber is then converted into yarn in the spinning process. These processes utilize water, electricity, and natural gas.

The tufting process incorporates tufting machines that utilize needles to insert the yarn into a synthetic backing material. The needles are controlled to determine the myriad of aesthetics that the marketplace desires. This process primarily utilizes electricity.

After tufting, the beck dyed carpets are transported to the dyeing facility, dyed, and transported back to the coating facility. The solution dyed carpets sent directly to coating. After coating, the carpets are cut and packaged.

Delivery and installation stage

Delivery

Delivery to the customer is typically using diesel-powered trucks. Truck transportation is optimized by load size and geographical logistics. This life cycle analysis has modeled truck transportation with an average distance of 500 miles.

Installation

The recommend adhesive for AtlasMasland Modular Carpet is AtlasMasland Modular Tile Adhesive using a full spread of adhesive. The life cycle assessment modeled the installation stage with AtlasMasland Contract Modular Adhesive at a spread rate of 0.15 kg adhesive/sm carpet.

Complete installation instructions are available at:

http://www.atlasmasland.com/documents/InstallationOfPatternedCarpet.pdf

Health, safety, and environmental aspects during installation

All MSDS sheets for adhesive may be viewed at http://www.atlasmasland.com/all-products/accessories. AtlasMasland Modular Adhesive is CRI Green Label Plus certified and meets the requirements of California South Coast Air Quality Management District Rule #1168.

Waste

AtlasMasland Modular Carpet is designed with the end in mind. Manufacturing waste is recycled, and an aggressive resource stewardship program is in place. Waste materials from installation may be recycled into new carpet or other new products utilizing CARE recyclers and other local recyclers. Other post installation carpet waste may be thermally recycled in a waste incineration plant and materially recycled in the cement industry. The packaging materials may be recycled utilizing local recyclers.

AtlasMasland Modular Carpet may also be reconditioned by cleaning and reused in less critical areas of a facility or in lower category spaces.

Packaging

Table 3– Packaging Materials for AtlasMasland Modular Carpet

Category	Material
Pallet	Wood
Tray Caps	Cardboard
Shrink Wrap	Plastic
Labelling and Instructions	Paper

These materials are below the cut-off and are not considered in the LCA review.

Use stage

Use of the floor covering

The service life for AtlasMasland Broadloom Carpet will vary depending on the amount of floor traffic, level of maintenance and the desired appearance of the floor covering. The reference service life for AtlasMasland Broadloom Carpet is 15 years. The use phase is defined by the cleaning and maintenance activities.

AtlasMasland Modular Carpet is guaranteed by AtlasMasland's warranted performance. These warranties may be found at http://www.maslandcontract.com/uploads/tmp/ModularWarranty16.pdf

Cleaning and maintenance

The level of cleaning and maintenance varies depending on the amount of floor traffic and the desired appearance of the floor that the end user is seeking. The Carpet and Rug Institute's publication titled *Carpet Maintenance Guidelines for Commercial Applications* offers guidance on how to maintain the carpet at various floor traffic levels.

AtlasMasland's maintenance guidelines may be found at:
http://www.atlasmasland.com/documents/AtlasMaslandCleaningMaintenanceGuide.pdf

Table 4 below is a guideline for the frequency of cleaning established by the IICRC. This is a very good guide for a maintenance schedule. However, each building and traffic patterns are different and modifications to the table may need to be implemented.

Table 4- Recommended Maintenance for AtlasMasland Modular Carpet

Traffic Soil Rating	Vacuuming	Spot Cleaning	Interim Maintenance (between restorative cleanings)	Restorative Cleanings
Light <500 Foot Traffics per day	1 to 2 per week	Daily or as soon as noticed	1 to 3 times annually	1 to 2 times annually
Medium 500-1000 foot traffics per day	Daily in traffic areas, overall 3 to 4 X per week	Daily or as soon as noticed	3 to 6 times annually	2 to 4 times annually
Heavy 1000-2500 foot traffics per day	Daily in traffic areas, overall 4 to 7 X per week	Daily in traffic areas, overall 4 to 7 X per week	6 to 12 times annually	3 to 6 times annually
Very Heavy >2500 foot traffics per day	1 to 2 X daily in traffic areas. Overall 7 X per week	1 to 2 X daily in traffic areas. Overall 7 X per week	12 to 52 times annually	6 to 12 times annually

End of life stage

Recycling, reuse, or repurpose

The AtlasMasland families of carpets are designed to achieve a commitment to enhance recycle and reuse. Reuse, repurpose, and recycling of carpet is the preferred method of disposal of carpet at the end of its useful life. AtlasMasland is a long-standing member of CARE and supports the efforts to divert carpet from landfills. We support the use of CARE Recycling Partners for the landfill diversion process.

Disposal

AtlasMasland Modular Carpet can be landfilled where local regulations allow. It can also be incinerated as part of a waste to energy program.

With the end-of-life, we have used energy for collection and transport to landfill as well as energy to operate the landfill. The total process energies (and natural resource energies) are:

48.5 MJ electricity/as is mt of solid waste (0.167 MJ nre/kg carpet)

335 MJ diesel/ as is mt of solid waste (0.385 MJ nre/kg carpet)

Life Cycle Assessment (LCA)

General

The Life Cycle Inventory (LCI) and Life Cycle Impact Assessment (LCIA) were undertaken with guidelines from ISO 14040/ISO 14044 with respect to *Product Category Rule for Environmental Product Declarations Flooring: Carpet, Resilient, Laminate, Ceramic, Wood* (NSF International, 2014).

Based on the stated goals, there are no significant limitations in the study.

Description of the functional unit

The functional unit has been defined as one square meter as defined in section 6.2 of the PCR. The reference service life for this product group is 15 years while the reference service life for a building is 60 years. Additionally, use phase data are accumulated on a 1-year basis.

Cut-off criteria

The PCR requires that each material or energy flow excluded must be less than 1% of the total mass or energy flow. The cumulative amount of excluded mass or energy must be less than 5% of the total. Several additives were excluded from the LCA calculations based on the PCR cutoff criteria for amount used. The total mass of excluded materials is less than 1% of the carpet mass. No excluded materials were found to have unique environmental relevance in the context of this functional unit, and the impact on results is estimated to be small. All known energy inputs were included. Therefore, this study complies with the PCR mass and energy cutoff rules.

All materials and substances used in the manufacture of AtlasMasland modular carpets are void of any chemicals considered to adversely affect human health and the environment as declared by government regulations. All processes and materials omitted from the inventory analyses are less than 1% of the total mass or total environmental impacts used to manufacture the product.

There are no reportable compounds in the AtlasMasland modular carpets that are required to be reported due to air pollution, water pollution, EPA guidelines such as EPCRA Section 313, RCRA guidelines, or Stockholm Convention POP lists. All materials are certified to CRI Green Label Plus for Indoor Air Quality, NSF 140, and have Health Product Declarations available.

Allocation

In cases where products and byproducts are made in a life cycle inventory gate-to-gate, mass allocation is used. In keeping with standard life cycle practice, the life cycle impacts of materials leaving the boundaries that are recycled (such as most carpet packaging), are assigned to the replacement use and not to the current floor covering.

Background data

The Carpet and Rug Institute database (2010) as well as that of Environmental Clarity (Overcash and Griffing, 2020) were utilized for the supply chain, delivery and installation, use, and end of life stages of this life cycle. These gate-to-gate datasets were combined with USLCI energy modules throughout the life cycle. The life cycle inventory data include all relevant process steps and technologies found in the supply chain, manufacturing, use, and end-of-life stages. Energy background data for cradle through combustion of energy use were based on data from USLCI (2019). For the manufacturing, use, and end-of-life stages the geographical aspects are relevant and therefore reasonable. The data on chemical manufacturing found for the commodity chemicals in the supply chain are also felt to be reasonable for the U.S. as global competition and manufacturing technologies are prevalent.

Relevant data concerning energy modules in the LCA and LCIA are included in Table 5. The process LCI data have some energy types that are not available in the USLCI database. Therefore, conversions were used to calculate the appropriate amount of energy in the USLCI database. Several gtgs in the background data have unusual energy types. For example, several gtgs have undefined energy inputs or have refrigeration as a service. Undefined energy was modeled as if it were process diesel. Refrigeration uses electricity, and the amount is a function of the temperatures of the cooled stream and the secondary cooling water circuit. In our heuristic, cooling a process stream to 2 ^{o}C requires about 1/3 MJ electricity per MJ of refrigeration. Undefined and refrigeration comprise less than 1% of the total ctg energy. When streams are cooled within processes, a portion of energy that is removed is considered recoverable. This portion is estimated based on the temperature of the cooled stream, and the energy is referred to as potential energy recovery. This represents opportunities for heat integration in chemical processes.

Table 5. Energy modules used in the life cycle impact assessment.

	SimaPro name	Library	Conversions and notes
Electricity	Used customized grid based on 2015 data from EIA and USLCI for electricity by fuel types.	USLCI	The US average electricity mix and Alabama electricity mix are very similar to 2015 US average. Therefore, US average was deemed appropriate.
Natural gas	Natural gas combusted in industrial boiler/US	USLCI	0.027027 m3 / MJ
Dowtherm	Natural gas combusted in industrial boiler/US	USLCI	1 MJ natural gas / 0.8 MJ Dowtherm to process
Steam	Natural gas combusted in industrial boiler/US	USLCI	1 MJ natural gas / (0.8 * 0.92) MJ steam to process
Direct fuel	Natural gas combusted in industrial boiler/US	USLCI	1 MJ natural gas / MJ direct fuel
Coal	Bituminous coal combusted in industrial boiler/US	USLCI	1 kg coal = 25 MJ
Diesel (process)	Diesel combusted in industrial boiler/US	USLCI	0.85 kg/L & 45 MJ/kg
Diesel (transport)	Transport, combination truck, average fuel mix/US	USLCI	0.027224 L/tkm (USLCI), 45 MJ/kg, 0.85 kg/L
Undefined	Same as diesel (process)		
Heavy oil: refinery	Same as diesel (process)		
Hydro power: refinery	Same as electricity		
Nuclear power: refinery	Same as electricity		
Refrigeration	1/3 of Electricity value		Most industrial refrigeration temperatures use approximately this much electricity
Potential recovery	Same as steam, but negative values		Potential recovery is assumed to off-set steam use

Data quality and data quality assessment

AtlasMasland data were collected for one year at each facility. The energy data were allocated between products using energy models provided by AtlasMasland for each operation. The data for these operations are very good. The Carpet and Rug Institute database (2010) as well as that of Environmental Clarity (Overcash and Griffing, 2020) data were utilized for other stages in this life cycle. The life cycle inventory data include all relevant process steps and technologies found in the supply chain, manufacturing, use, and end-of-life stages For the manufacturing, delivery and installation, use, and end-of-life stages the geographical aspects are relevant and therefore reasonable. The use of data on chemical manufacturing found for the commodity chemicals in the supply chain are also felt to be reasonable for the U.S. as global competition and manufacturing technologies are prevalent. Overall the data quality is in the good to high categories, which meets the requirements of the product category rules. (NSF International, 2014)

Time related coverage – The process data were based on one year of data between 2018 and 2019. The background data sources are based on data less than 10 years old. All the background data sources are modeled using 2010 or newer North American energies. The time related coverage is good.

Geographical coverage – The process data were based on North America. The geographical coverage is good.

Technology coverage – Process data were collected from the actual processes and thus the technology coverage is very good. The background data was selected for technology relevance to ensure the best fit of the life cycle inventory to the real world. The technology coverage is very good.

System boundaries

The life cycle assessment for the AtlasMasland Modular Carpet family was a cradle to grave study. System boundaries for this study are as follows:

- Source/Extraction Stage – This stage begins with the end in mind for the selection and sourcing of materials, evaluation of viable alternatives, and the results of the design parameters through the extraction of raw materials. This may include the growth, manufacture, extraction of all raw materials and the delivery to the production facilities. Packaging materials are considered in this study.
- Manufacturing Stage – All relevant manufacturing processes indicated by the design concepts are included in this stage. Energy data were based on metered usage and include all metered energy. Production of capital equipment is excluded. All metered energy consumptions were included. Packaging is included.
- Delivery and Installation Stage – This stage includes the transportation of material from the production facility to the point of use. Adhesive materials used for installation and site preparation are included.
- Use Stage – This stage includes cleaning and maintenance of the AtlasMasland Broadloom Carpet during the useful life as well as the extraction, manufacturing, and transport of all supporting materials, if relevant for the maintenance.
- End of Life Stage – The End of Life Stage includes the transportation of the used carpet to end of life processes. All the relevant end of life processes is included in the report.

Impact declaration and use stage normalization

The life cycle impact assessments (LCIA) were calculated for the market average of solution and beck dyed AtlasMasland Carpets. The results are specified in three Tables as specified in the PCR (NSF International, 2014).

Table A: Specifies the impacts for sourcing/extraction, manufacturing, delivery and installation, and end-of-life stages for one square meter.

Table B: Specifies the impacts for the use stage for one square meter for one year.

Table C: Specifies the impacts over the reference service life of a building (60 years).

Life Cycle Impact Assessment

The life cycle inventory data were converted to life cycle impact assessment (LCIA) results for the impact categories specified in the NSF International flooring product category rules (PCR) (NSF International, 2014). Six impact assessment categories from the CML 2 baseline 2000 version 3.01 method (CML, 2013) were used. Non-renewable and renewable primary energy usage was calculated using the cumulative energy demand method version 1.08 from ecoinvent (Wernet et al., 2016). This method was modified to include raw materials from the Environmental Clarity database. The inventory was calculated by combining Environmental Clarity gate-to-gate data with energy modules from the USLCI database supplemented with EIA 2015 electricity data. LCIA results relevant to the NSF flooring PCR are shown in Tables 6, 7, and 8. These results are expressed per square meter of carpet. Most of the environmental impacts are derived from energy consumption throughout the life cycle.

Table 6 (PCR Table A). Impact assessment and primary energy results for a market weighted average of PVC tile carpets from cradle to disposal omitting use phase. All results are per square meter of carpet.

Impact category *PVC, solution dyeing*	Units	Sourcing/ Extraction	Manufacturing	Delivery and installation	End of life	Total
Abiotic depletion, non-energy	kg Sb eq	1.13E-05	0	1.58E-07	0	1.14E-05
Acidification	kg SO2 eq	0.0896	0.0416	3.20E-03	4.30E-04	0.135
Eutrophication	kg PO4--- eq	0.0103	1.02E-03	4.06E-04	1.19E-05	0.0117
Global warming (GWP100)	kg CO2 eq	8.48	4.39	0.557	0.161	13.6
Ozone layer depletion (ODP)	kg CFC-11 eq	5.01E-11	1.99E-11	2.89E-11	2.51E-13	9.92E-11
Photochemical oxidation	kg C2H4 eq	0.0326	3.07E-03	9.54E-04	5.24E-05	0.0367
Primary energy, non-renewable	MJ	206	68.2	10.8	2.22	287
Primary energy, renewable	MJ	5.98	7.72	0.0338	0.100	13.8

Table 7 (Table B in PCR). Impacts over the use stage of one square meter of carpet for one year

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Impact category	Units	Use (one year)
Abiotic depletion, non-energy	kg Sb eq	0
Acidification	kg SO2 eq	1.68E-03
Eutrophication	kg PO4--- eq	4.91E-05
Global warming (GWP100)	kg CO2 eq	0.178
Ozone layer depletion (ODP)	kg CFC-11 eq	1.07E-12
Photochemical oxidation	kg C2H4 eq	1.43E-04
Primary energy, non-renewable	MJ	2.64
Primary energy, renewable	MJ	0.429

Table 8 (Table C in PCR). Impact assessment and primary energy results over a reference service life of 60 years for a market weighted average of PVC tile carpets. The user defined reference service life of the product is 15 years. The number of installations over 60 years is 4. All results are per square meter of carpet.

	Life Cycle Stages User defined reference service life of product = 15 years Number of installations over 60 years = 4						
Impact category	Units	Sourcing/ Extraction	Manufacturing	Delivery and installation	Use (60 years)	End of life	Total
Abiotic depletion, non-energy	kg Sb eq	4.50E-05	0	6.30E-07	0	0	4.57E-05
Acidification	kg SO2 eq	0.359	0.166	0.0128	0.101	1.72E-03	0.640
Eutrophication	kg PO4--- eq	0.0411	4.09E-03	1.62E-03	2.95E-03	4.77E-05	0.0499
Global warming (GWP100)	kg CO2 eq	33.9	17.6	2.23	10.7	0.644	65.1
Ozone layer depletion (ODP)	kg CFC-11 eq	2.00E-10	7.96E-11	1.16E-10	6.42E-11	1.01E-12	4.61E-10
Photochemical oxidation	kg C2H4 eq	0.131	0.0123	3.82E-03	8.56E-03	2.10E-04	0.155
Primary energy, non-renewable	MJ	824	273	43.4	159	8.90	1,308
Primary energy, renewable	MJ	23.9	30.9	0.135	25.7	0.400	81.1

Interpretation

Interpretations gleaned from the AtlasMasland Modular Carpet family reinforces that the Sourcing/Extraction stage is the largest contributor of the studied impact categories. The second largest contributor to environmental impact is the manufacturing step, and the dyeing method contributes a large portion of this energy. AtlasMasland has made a big effort to use solution dyeing whenever possible to achieve better environmental performance. When these studies are reviewed over the useful life of the product, it is apparent that the Use stage, namely maintenance, is an area that requires development of less impactful processes.

Most of the environmental impacts included in this study were driven by energy consumption. Abiotic depletion was based solely on mostly on raw material use in the sourcing and extraction of raw materials. Eutrophication and photochemical oxidation had significant contributions from process (non-energy related) emissions in the raw material extraction phase. A more detailed description of these emissions is given in the accompanying LCA.

There were improvements to the materials within the carpet supporting AtlasMasland's efforts to utilize more environmentally friendly components when feasible.

Future modular product developments should consider wastewater conservation and contaminant clean-up for manufacturing and maintenance. Additional innovations around maintenance are important for overall product impact improvements.

Additional Environmental Information

Health, safety, and environmental aspects during production

AtlasMasland has a long-term policy of providing its associates with modern, clean, safe, and pleasant working conditions. In recent years, there have been investments in modernizing all facilities. AtlasMasland stresses that a safe and clean operation is essential for the accident-free production of products.

AtlasMasland continues emphasis on these efforts to be accident free by on-going Safety Training through Safe Start, an awareness and culture of being mindful of associates' surroundings and the production processes around them. There are daily stand up safety meetings, monthly safety inspections of all plants and operations, and annual OSHA training and corporate audits.

Structural damage

Subfloor preparation instructions can be found at:
http://www.atlasmasland.com/documents/InstallationofPatternedCarpet.pdf

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