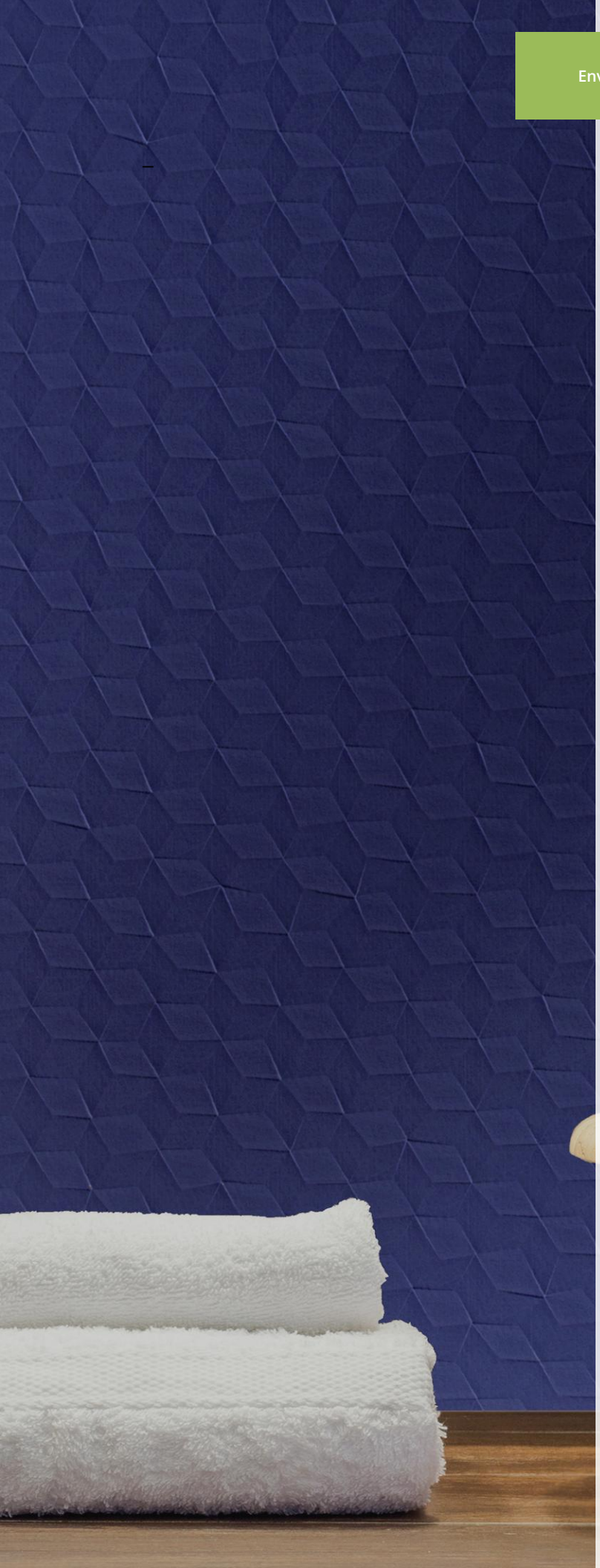

Environmental Product Declaration

Len-Tex | Clean Vinyl Technology® (CVT) Wallcovering with Bio-Based Content and Non-Woven Backing

LEN-TEX WALLCOVERINGS

VERIFIED by SCS Global Services
ENVIRONMENTAL PRODUCT DECLARATION
BASED ON LCA

Declaration Owner

Len-Tex Corporation
18 Len-Tex Lane
North Walpole, NH 03609
https://lentexwallcoverings.com
603.445.2342

Products:

Clean Vinyl Technology® (CVT) Wallcovering with Bio-Based Content and Non-Woven Backing

Declared Unit

The declared unit is one square meter of vinyl wallcovering with a non-woven backing.

EPD Number and Period of Validity

SCS-EPD-10016
EPD Valid March 18, 2024 through March 17, 2029
Version date: December 10, 2024

Product Category Rule

PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0. UL Environment. March 2022

UL Part B: Wall and Door Protection EPD Requirements

Program Operator

SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608
+1.510.452.8000 | www.SCSglobalServices.com

SCSglobal SERVICES

MDC INTERIOR SOLUTIONS

Declaration owner:	Len-Tex Corporation
Address:	18 Len-Tex Lane, North Walpole, NH 03609
Declaration Number:	SCS-EPD-10016
Declaration Validity Period:	EPD Valid March 18, 2024 through March 17, 2029
Version Date:	December 10, 2024
Program Operator:	SCS Global Services
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
LCA Practitioner:	Conor Skurky, SCS Global Services, Abby Martell, SCS Global Services
LCA Software and LCI database:	OpenLCA 1.11.0 software and the Ecoinvent v3.9.1 database
Product's Intended Application:	Decorative wall covering
Markets of Applicability:	Domestic and International
EPD Type:	Product-Specific
EPD Scope:	Cradle-to-Gate
LCIA Method and Version:	TRACI 2.1 and CML-IA Baseline
Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071	☒ internal ☐ external
LCA Reviewer:	 Urvi Talaty, SCS Global Services
Part A Product Category Rule:	PCR Guidance for Building-Related Products and Services Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0. UL Environment. March 2022
Part A PCR Review conducted by:	Lindita Bushi, PhD (Chair); Hugues Imbeault-Tétreault, ing., M.Sc.A.; Jack Geibig
Part B Product Category Rule:	UL Part B: Wall and Door Protection EPD Requirements. Version 1.0. UL Environment. May 2019.
PCR Review conducted by:	Dr. Lindita Bushi, Lisa Lauren, and Jim Mellentine
Independent verification of the declaration and data, according to ISO 21930, ISO 14025 and the PCR	☐ internal ☒ external
EPD Verifier:	 Thomas Gloria, Ph.D., Industrial Ecology Consultants
Declaration Contents:	

Disclaimers: *This EPD conforms to ISO 14025, 14040, 14044, ISO 21930, Building-Related Products and Services - Part A: LCA Calculation Rules and Report Requirements UL v.3.2, and PCR Guidance for Building-Related Products and Services, Part B: Wall and Door Protection EPD Requirements UL 10010-10.*

Scope of Results Reported: *The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.*

Accuracy of Results: *Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.*

Limitations: *Environmental declarations from different programs (ISO 14025) may not be comparable.*
Comparison of the environmental performance of Wall and Door Protection Products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the use phase as instructed under this PCR.
Full conformance with the PCR for Wall and Door Protection Products allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

1. Declaration Owner and Product Description

1.1 Len-Tex Corporation

Len-Tex is a manufacturer of contract wallcoverings, providing an extensive range of design options for the hospitality, healthcare, corporate, institutional, and retail markets.

1.2 Product Description

Len-Tex | Clean Vinyl Technology® (CVT) Wallcovering with Bio-Based Content and Non-Woven Backing

Len-Tex designs and manufactures vinyl wallcoverings at its facilities. The manufacturing process begins with the incoming raw materials that are made to Len-Tex's specifications. The PVC film with bio-based content is typically printed and combined with non-woven backing (polyethylene terephthalate and cellulose fiber) through laminating and embossing. The procedure varies based on the design. Once the wallcoverings are trimmed to width and inspected, they are cut to length and packaged for shipment to the customer.

1.3 FURTHER INFORMATION

Further information on the product can be found on the manufacturer's website at https://lentexwallcoverings.com/.

2. Scope of the Study

2.1 FUNCTIONS OF THE PRODUCT SYSTEM

The non-woven backed vinyl wallcovering serves the primary function as a decorative wallcovering. Based on the PCR [1][2], a declared unit (DU) of one square meter product at the factory gate is used. The reference flow for the modeling of this system is also 1 square meter of wallcovering product. The DU properties and reference flow are shown in **Table 1**. **Table 2** contains the technical characteristics of the product.

Table 1. *The declared unit properties and reference flow used within this EPD.*

Parameter	Value	Unit
Declared Unit*	1	Square meter
Reference Flow	1	Square meter
One roll of final product	37.6	Square meter
Mass per square meter: 15 oz thickness	0.339	kg
Mass per square meter: 20 oz thickness	0.452	kg
Mass per square meter: 24 oz thickness	0.542	kg
Mass per square meter: 28 oz thickness	0.633	kg
Mass per square meter: 30 oz thickness	0.678	kg
Mass per square meter: 32 oz thickness	0.723	kg
Mass of packaging per declared unit (domestic)	0.042	kg
Mass of packaging per declared unit (international)	0.048	kg

* The calculations for this study were developed per square meter. Wallcovering is sold by linear yard at a width of 54 inches and at a variety of weights (15 oz, 20 oz, etc.). These weights are per linear yard and are used to differentiate the different thicknesses of wallcovering in this study.

Table 2. *The product technical characteristics for the non-woven backed vinyl wallcovering.*

Property	Test Method	Test Results
Building Code Classification	2015 Intl. Building Code Sec. 803.1.1	Class A
Flame Spread Index	ASTM E84	10
Smoke Developed Index	ASTM E84	10
Heat Release	NFPA 286	<288 kW
Smoke Release	NFPA 286	<1,000 m2
UNSPSC	Flexible Protective Wall Covering	10 26 23

2.2 PRODUCT MATERIAL COMPOSITION

The wallcovering is composed of a combination of PVC film, adhesive, different pigments, a non-woven backing made of polyester and cellulose, and a mixture of coating and extenders (**Table 3**).

Table 3. *The percent material composition of the wallcovering product.*

Raw Material	Percent Composition
PVC Film with Bio-Based Content	76%
Backing – Non-Woven	14%
Adhesive	9.5%
Pigments	0.27%
Coating	0.08%
Extender	0.08%
Top Coat	0.08%
Total	**100%**

2.3 SYSTEM BOUNDARY

The system boundary includes the cradle-to-gate life cycle of the wallcovering product, which includes all inputs required and outputs generated from each life cycle module. The modules are described in **Table 4** and a flow diagram illustrating the processes involved within each life cycle module is shown below in **Figure 1**. Some modules have been excluded from this study (**Table 4**) since they aren't relevant to the life cycle of this wallcovering product.

Table 4. *A description of the life cycle phases included in this wallcovering product's system boundary.*

Module	Module description from the PCR	Included in System Boundary
A1	Raw Material extraction and upstream production: Includes raw material extraction and processing, as well as processing of secondary material inputs (e.g., recycled or reused materials).	**x**
A2	Transport to factory: Covers transport of raw materials and other inputs to the factory and internal transport.	**x**
A3	Manufacturing: Includes all fuels, electricity, and water used in manufacturing the product; the extraction and upstream production, transport to factory, and manufacturing of product packaging; transport and treatment of all waste generated at the manufacturing facility.	**x**

x = Module Included

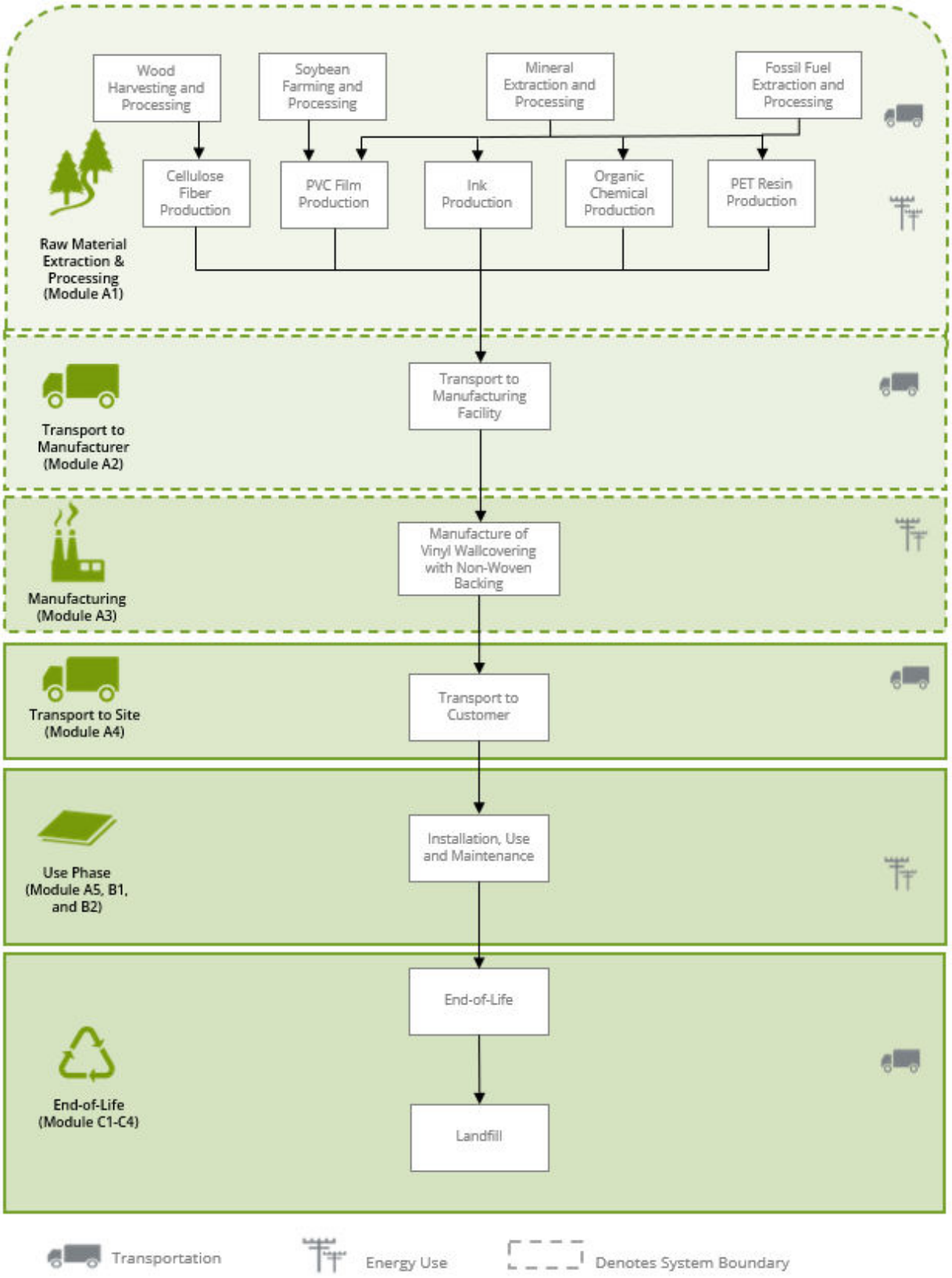

Figure 1. *Flow Diagram for the life cycle of this wallcovering product.*

3. Technical Information and Scenarios

3.1 LIFE CYCLE MODULES

(A1- A3) Raw Material Extraction, Transport, & Manufacturing

These three modules include all of the inputs and outputs necessary to produce the raw materials, transport these raw materials to the manufacturing facilities (located in North Walpole, New Hampshire), and then process the raw materials into the wallcovering product. The manufacturing module also includes the production of the product packaging. The A2 module transport parameters are shown in **Table 6.**

Manufacturing of the wallcovering product includes the following steps:

- Pigments are mixed into extender and printed onto film
- Backing is laminated to film using adhesive and heat
- Embossing and cooling
- Product is packaged

These processing steps require electricity, water, propane, and packaging (polyethylene plastic bag, paper core, stretch wrap, polyester strapping, packing tape, kraft paper and wood pallets). The cellulose in the backing and PVC film with bio-based content used within the product contain biogenic carbon, which is shown in **Table 5**. Biogenic carbon enters the product system as raw material in A1. Some leaves the system in A3 as scrap. Biogenic carbon also enters the system as packaging in A3. While modules A5 (Installation) and C4 (Waste Disposal) are not declared, the biogenic carbon being emitted by the disposed packaging in A5 and disposed product in C4 are also reported below. Electricity is modeled using the NERC SERC regional grid mix [3]. Transport of waste is based on the EPA WARM model [4], which assumes a distance of 20 miles (~32km) from point of generation of waste to a disposal facility (e.g., landfill, recycling or incineration); transport is assumed to be done by diesel truck and utilizes the same transport parameters shown in **Table 6.** No substances required to be reported as hazardous are associated with the production of this product.

The type, mass, mode of transport, and distance raw materials were transported were provided by Len-Tex. The quantity of manufacturing facility inputs and outputs were also provided by Len-Tex.

Table 5. *The biogenic carbon inputs and outputs from the product system in kg CO_2eq*

Wallcovering Thickness	A1 (raw material)	A3 (scrap)	A3 (packaging material)	A5 (packaging disposal)	C4 (product disposal)	Net biogenic carbon sequestration
15 oz	-0.172	$3.34x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.169	0.00
20 oz	-0.229	$4.55x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.225	0.00
24 oz	-0.275	$5.82x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.269	0.00
28 oz	-0.321	$6.49x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.314	0.00
30 oz	-0.344	$7.12x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.337	0.00
32 oz	-0.367	$7.39x10^{-3}$	$-6.84x10^{-2}$	$6.84x10^{-2}$	0.359	0.00

Table 6. *The type, fuel utilization, and capacity utilization of truck transport used in all modules.*

Transport Specifications	Value
Truck - EURO 4, 16-32 MT Freight Lorry	
Diesel Fuel Utilization (kg/tkm)	$3.67x10^{-2}$
Capacity Utilization (%)	37%

Table 7. *Raw material transported to Len-Tex facilities for each product type reported in ton-kilometers.*

Type of Transport	15 oz	20 oz	24 oz	28 oz	30 oz	32 oz
Truck (tkm)	0.316	0.422	0.506	0.591	0.633	0.675

3.2 DATA SOURCES

Modeling of this LCA was conducted in openLCA v1.11.0 [5] and all datasets used were from the Ecoinvent 3.9.1 database [6]. **Table 8** below lists the individual datasets used.

Table 8. *The LCI datasets from the Ecoinvent v3.9.1 (2022) database used to model the product system.*

Flow	Dataset
Raw Materials	
PVC Film with Bio-Based Plasticizer	market for aluminium hydroxide | aluminium hydroxide | Cutoff, U - GLO market for calcium carbonate, precipitated | calcium carbonate, precipitated | Cutoff, U - RoW extrusion, plastic film | extrusion, plastic film | Cutoff, U - RoW polyvinylchloride production, suspension polymerisation | polyvinylchloride, suspension polymerised | Cutoff, U – RoW market for titanium dioxide | titanium dioxide | Cutoff, U - RoW Epoxidized Sucrose Soyate (see below)
Epoxidized Sucrose Soyate**	market for acetic acid, without water, in 98% solution state | acetic acid, without water, in 98% solution state | Cutoff, U – GLO market for hydrogen peroxide, without water, in 50% solution state | hydrogen peroxide, without water, in 50% solution state | Cutoff, U - RoW market for water, deionised | water, deionised | Cutoff, U - Europe without Switzerland market for hexane | hexane | Cutoff, U - GLO market for soda ash, light | soda ash, light | Cutoff, U - GLO market for magnesium sulfate | magnesium sulfate | Cutoff, U - GLO market for electricity, medium voltage | electricity, medium voltage | Cutoff, U - US-RFC esterification of soybean oil | fatty acid methyl ester | Cutoff, U - US market for potassium carbonate | potassium carbonate | Cutoff, U - GLO market for sugar, from sugar beet | sugar, from sugar beet | Cutoff, U - GLO market for soap | soap | Cutoff, U - GLO heat production, natural gas, at industrial furnace >100kW | heat, district or industrial, natural gas | Cutoff, U - CA-QC market for hazardous waste, for incineration | hazardous waste, for incineration | Cutoff, U - Europe without Switzerland
Adhesive	market for citric acid | citric acid | Cutoff, U - GLO market for polyvinylchloride, bulk polymerised | polyvinylchloride, bulk polymerised | Cutoff, U - GLO
Non-Woven Backing	market for cellulose fibre | cellulose fibre | Cutoff, U - RoW market for chemical, organic | chemical, organic | Cutoff, U - GLO market for polyethylene terephthalate, granulate, amorphous | polyethylene terephthalate, granulate, amorphous | Cutoff, U - GLO market for polyethylene terephthalate, granulate, amorphous, recycled | polyethylene terephthalate, granulate, amorphous, recycled | Cutoff, U - RoW
Top Coat	market for chemical, organic | chemical, organic | Cutoff, U - GLO market for water, deionised | water, deionised | Cutoff, U - RoW
Coating	market for chemical, organic | chemical, organic | Cutoff, U - GLO market for water, deionised | water, deionised | Cutoff, U - RoW
Extender	market for chemical, organic | chemical, organic | Cutoff, U - GLO market for water, deionised | water, deionised | Cutoff, U - RoW
Pigments	market for chemical, organic | chemical, organic | Cutoff, U - GLO market for water, deionised | water, deionised | Cutoff, U - RoW market for aluminium oxide, metallurgical | aluminium oxide, metallurgical | Cutoff, U - RoW market for titanium dioxide | titanium dioxide | Cutoff, U - RoW market for carbon black | carbon black | Cutoff, U - GLO
Transport of Materials to Manufacturing Facility	
Truck Transport	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U - RoW
Manufacturing	
Electricity	Electricity, medium voltage, at grid/NEWE eGRID 2021*

Flow	Dataset
Propane	market for propane, burned in building machine | propane, burned in building machine | Cutoff, U - GLO
Water	tap water production, conventional treatment | tap water | Cutoff, U - CA-QC
Waste	treatment of municipal solid waste, sanitary landfill | municipal solid waste | Cutoff, U - RoW
Transport to Waste Facility	municipal waste collection service by 21 metric ton lorry | municipal waste collection service by 21 metric ton lorry | Cutoff, U - RoW
Product Packaging	
Paper Core	market for core board | core board | Cutoff, U - GLO
Stretch Wrap	market for polyethylene, high density, granulate | polyethylene, high density, granulate | Cutoff, U - GLO extrusion, plastic film | extrusion, plastic film | Cutoff, U - RoW
Wood Pallet	market for EUR-flat pallet | EUR-flat pallet | Cutoff, U - RoW
Polyester Strapping	market for polyester resin, unsaturated | polyester resin, unsaturated | Cutoff, U - RoW extrusion, plastic film | extrusion, plastic film | Cutoff, U - RoW
Packing Tape	market for polyurethane adhesive | polyurethane adhesive | Cutoff, U - GLO
Kraft Sheet	market for kraft paper | kraft paper | Cutoff, U - RoW
Protective Bag	market for packaging film, low density polyethylene | packaging film, low density polyethylene | Cutoff, U - GLO extrusion, plastic film | extrusion, plastic film | Cutoff, U - RoW

*Utilizes a custom process built using Ecoinvent 3.9.1 [6] background datasets that is based on the 2021 grid mix for the NEWE subregion using data from eGRID [3] outlining the energy resource mix in New Hampshire.
**A custom process based on Ghasemi et al. [7]. Material included in PVC film.

3.3 DATA QUALITY

The data quality assessment is discussed in **Table 9** below for each of the data quality parameters. No data gaps were allowed which were expected to significantly affect the outcome of the impact indicator or LCI resource results.

Table 9. *Data quality assessment of the Len Tex wallcovering product system.*

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	Manufacturing data are based on 2022 annual production. Representative datasets (secondary data) used for upstream and background processes are generally less than 10 years old. All primary data used represented an average of at least one year's worth of data collection.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Representative data used in the assessment are representative of US, Global, or "Rest-of-World" (average for all countries in the world with uncertainty adjusted). Datasets chosen are considered sufficiently similar to actual geographical coverage of processes. Furthermore, eGRID information allowed for specific energy mixes for electricity use for the NEWE subregion to be modeled.
Technology Coverage: Specific technology or technology mix	Data are predominantly representative of the actual technologies used for processing, transportation, and manufacturing operations.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one year and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	Except where noted, the LCA model included all known mass and energy flows. In some instances, surrogate data used to represent upstream operations may be missing some data which is propagated in the model. No known processes or activities were excluded; in total, these missing data represent less than 5% of the cumulative omitted mass or energy flows.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represent typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Some proxy datasets are used for creating the composition of extenders and coatings. A dataset for cellulose fibers for insulation application was used as a proxy for the cellulose fibers in non-woven backed wallcovering products. A custom

Data Quality Parameter	Data Quality Discussion
	epoxidized sucrose soyate process was created to serve as a proxy for the octo epoxy soyate ingredient in the PVC film with bio-based plasticizer.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used, which are taken from Ecoinvent v3.9.1. Different portions of the product life cycle are equally considered.
Reproducibility: Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	All assumptions, models, and data sources are documented. However, this product uses ingredient recipes which are proprietary, including the PVC film with bio-based content. The epoxidized soyate included in the PVC film can be reproduced based on the referenced LCI used, but the specific weights of other ingredients in the PVC film are not included in this report. This study is only reproducible by a practitioner with access to all of the primary data.
Sources of the Data: Description of all primary and secondary data sources	The following primary data were provided: 1) Material types and amounts required for manufacturing and packaging of the final product, including scrap rate; 2) material composition for several material inputs used for manufacturing of final product; 3) Upstream transport of materials for manufacturing and packaging of final product; specifically, modes and distances; 4) Annual production, resource use (e.g., electricity, natural gas), waste, and emissions released at the manufacturing facility. Where primary upstream data were unavailable, secondary data were taken from Ecoinvent v3.9.1.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed primary data collection throughout the supply chain back to resource extraction. Some proxy datasets are used to represent material ingredients due to the lack of specific datasets available. These proxies are believed to have negligible effects on the results.

3.4 ALLOCATION

This study follows the allocation guidelines of ISO 14044 [8] and allocation rules specified in the PCR [1][2] and minimized the use of allocation wherever possible.

For the manufacturing stage, mass allocation was deemed the most accurate and reproducible way of calculating resource use, emissions, and wastes. Primary data for resource use (e.g., electricity, natural gas, water, etc.), waste, and emissions released at the facility were allocated to the product on a mass-basis as a fraction of total annual production.

The product system includes some amount of recycled content, (50% of PET used in the non-woven backing) which are modeled using the recycled content allocation method, also known as the 100-0 cut off method. Using the recycled content allocation approach, system inputs with recycled content do not receive any burden from the previous life cycle other than reprocessing of the waste material.

Transportation was allocated based on the mass and distance the material transported.

3.5 CUT-OFF RULES

The cut-off criteria for including or excluding materials, energy, and emissions data from the study are in accordance with the PCR and are listed below.

- All inputs and outputs to a unit process are included in the LCA calculation for which data are available. Any data gaps are filled with representative data. Assumptions used for filling data gaps are documented in the LCA report.

- Where there is a data gap or insufficient data, criteria for exclusion of inputs and outputs is 1% of primary energy usage (renewable and non-renewable energy) and 1% on a mass basis for the specific unit process. The maximum criteria for exclusion of inputs and outputs is 5% of primary energy usage and mass across all modules included in the LCA.
- If a flow meets the above criteria for exclusion but is considered to have a significant potential environmental impact, it is included.
- No excluded processes were thought to have any significant impact on the total life cycle impact of this product.

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No data gaps were allowed which were expected to significantly affect the outcome of the indicator results. No known flows are deliberately excluded from this EPD.

3.6 SUMMARY OF ASSUMPTIONS

The assessment relied on several assumptions, described below:

- The transport distance of all waste from the point of generation to a treatment facility is based on the EPA WARM model [4] assumption of 20 miles (~32 km).
- Representative inventory data were used to reflect the energy mix for electricity use at the manufacturing facilities. Ecoinvent datasets were modified to reflect the eGRID energy mix and transmission in order to estimate resource use and emissions from electricity use. The 2021 NEWE eGRID subregion resource mix was used to represent electricity use at the Len-Tex manufacturing facility.
- Proxies were used in place for the extenders that are mixed with the pigments, and coatings which serve as a protective layer. A generic dataset for organic chemicals and deionized water was used to model the extender and coating as outlined in Table 8. The effects of this proxy on the impacts assessed in this report are negligible as the extenders and coating make up less than 0.27% of the products total mass. Additionally, a cellulose fiber for insulation production process from the Ecoinvent v3.9.1 database was used as a proxy for the cellulose fiber used in the non-woven backed wallcovering products. The proxy cellulose fiber dataset contributed less than 2% to all environmental impact categories assessed, and is therefore determined not to have a noticeable effect on the results.
- A custom PVC film with bio-based plasticizer process was created based on a material recipe provided by the PVC supplier. Quantity ranges were provided for each material. For materials with higher impacts, a conservative choice of the high end of the range was chosen. For those with lower impacts, the mid value of the range was chosen. The lowest impact material was modeled with slightly less than a midpoint value to create a recipe that equaled 100%. Other included materials were cut-off according to the cut-off criteria detailed in Section 3.5.
- A custom process for the plasticizer contained in the PCV, octo epoxy soyate, was created based on an LCA of epoxidized sucrose soyate by Ghasemi et al. [7]. The datasets used to create the custom epoxidize soyate process are included in Table 8.
- Len-Tex has two different packaging options, depending on whether final product is transported domestically or internationally. For international shipments, the final product uses the same packaging as domestic shipments but includes the use of protective bags. The amount of packaging material used for the final product is based on a weighted average of domestic and international shipments (80% and 20%, respectively).
- All inert waste is assumed to be landfilled.

3.7 PERIOD UNDER REVIEW

The period of review is January 1, 2022 through December 31, 2022.

3.8 COMPARABILITY

The PCR this EPD was based on was not written to support comparative assertions. Comparison of the environmental performance of construction works and construction products using EPD information shall be based on the product's use and impacts at the construction works level. In general, EPDs may not be used for comparability purposes when not considered in a construction works context. Given this PCR ensures products meet the same functional requirements, comparability is permissible provided the information given for such comparison is transparent and the limitations of comparability explained. When comparing EPDs created using this PCR, variations and deviations are possible. Example of variations: different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.

4. LCA Results

The LCIA results are presented in **Table 10a – 10f** below using the TRACI 2.1 [9] and CML-IA [10] characterization methodologies, as required by the PCR for North American and European markets: global warming (TRACI 2.1 IPCC AR4 and CML-IA baseline IPCC AR5), acidification, eutrophication, ozone depletion, smog formation, and fossil fuel depletion. These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes. It should be noted that the indicators prescribed by the PCR do not represent all categories of potential environmental and human health impact associated with the life cycle of the product, and this represents a general limitation of the LCA study. Additionally, these indicators have no "environmental relevance," as defined in the ISO-14044 §4.4.2.2.2, 4.4.2.2.4, and 4.4.5, with the exception of the "Global Warming Potential" indicator, which has low environmental relevance. That is, these "potential" results may or may not have any relationship to actual impacts occurring.

Any comparison of EPDs shall be subject to the requirements of the PCR [1][2]. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate and could lead to erroneous selection of materials or products which are higher impact, at least in some impact categories.

The PCR requires the calculation of biogenic carbon emissions and removals. While the product packaging and cellulose within the non-woven backing of the product include a small amount biogenic carbon, this carbon is assumed to be released at EOL or after landfilling. In addition, neither the TRACI 2.1 [9] nor the CML-IA [10] baseline characterization methodologies account for biogenic carbon uptake or biomass CO_2 emissions.

Table 10a. *The life cycle impact indicator category results for one square meter of 15 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

15 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	1.10	$5.95x10^{-2}$	0.365	**1.53**
	72%	4%	24%	**100%**
Smog Formation – (kg O_3 eq)	$6.20x10^{-2}$	$5.99x10^{-3}$	$3.01x10^{-2}$	**$9.81x10^{-2}$**
	63%	6%	31%	**100%**
Acidification – (kg SO_2 eq)	$4.96x10^{-3}$	$2.37x10^{-4}$	$1.50x10^{-3}$	**$6.70x10^{-3}$**
	74%	4%	22%	**100%**
Eutrophication – (kg N eq)	$5.23x10^{-3}$	$5.59x10^{-5}$	$1.00x10^{-3}$	**$6.29x10^{-3}$**
	83%	1%	16%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$3.42x10^{-7}$	$1.05x10^{-9}$	$7.25x10^{-9}$	**$3.50x10^{-7}$**
	98%	0%	2%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	1.83	0.120	0.668	**2.62**
	70%	5%	25%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	1.11	$6.00x10^{-2}$	0.372	**1.54**
	72%	4%	24%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$3.39x10^{-4}$	$9.58x10^{-6}$	$1.53x10^{-4}$	**$5.02x10^{-4}$**
	68%	2%	31%	**100%**
Acidification – (kg SO_2 eq)	$4.81x10^{-3}$	$1.99x10^{-4}$	$1.34x10^{-3}$	**$6.36x10^{-3}$**
	76%	3%	21%	**100%**
Eutrophication – (kg PO_4 eq)	$2.43x10^{-3}$	$5.00x10^{-5}$	$5.50x10^{-4}$	**$3.03x10^{-3}$**
	80%	2%	18%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$2.99x10^{-7}$	$7.96x10^{-10}$	$5.69x10^{-9}$	**$3.05x10^{-7}$**
	98%	0%	2%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	15.6	0.842	4.98	**21.4**
	73%	4%	23%	**100%**

Table 10b. *The life cycle impact indicator category results for one square meter of 20 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

20 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	1.47	$7.94x10^{-2}$	0.418	**1.97**
	75%	4%	21%	**100%**
Smog Formation – (kg O_3 eq)	$8.27x10^{-2}$	$7.99x10^{-3}$	$3.21x10^{-2}$	**0.123**
	67%	7%	26%	**100%**
Acidification – (kg SO_2 eq)	$6.62x10^{-3}$	$3.17x10^{-4}$	$1.59x10^{-3}$	**$8.52x10^{-3}$**
	78%	4%	19%	**100%**
Eutrophication – (kg N eq)	$6.98x10^{-3}$	$7.45x10^{-5}$	$1.09x10^{-3}$	**$8.15x10^{-3}$**
	86%	1%	13%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$4.56x10^{-7}$	$1.40x10^{-9}$	$8.19x10^{-9}$	**$4.66x10^{-7}$**
	98%	0%	2%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	2.44	0.160	0.773	**3.38**
	72%	5%	23%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	1.48	$8.00x10^{-2}$	0.426	**1.99**
	75%	4%	21%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$4.52x10^{-4}$	$1.28x10^{-5}$	$1.64x10^{-4}$	**$6.29x10^{-4}$**
	72%	2%	26%	**100%**
Acidification – (kg SO_2 eq)	$6.42x10^{-3}$	$2.65x10^{-4}$	$1.42x10^{-3}$	**$8.10x10^{-3}$**
	79%	3%	18%	**100%**
Eutrophication – (kg PO_4 eq)	$3.24x10^{-3}$	$6.67x10^{-5}$	$5.95x10^{-4}$	**$3.90x10^{-3}$**
	83%	2%	15%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$3.98x10^{-7}$	$1.06x10^{-9}$	$6.42x10^{-9}$	**$4.06x10^{-7}$**
	98%	0%	2%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	20.8	1.12	5.66	**27.6**
	75%	4%	21%	**100%**

Table 10c. *The life cycle impact indicator category results for one square meter of 24 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

24 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	1.76	$9.52x10^{-2}$	0.460	**2.32**
	76%	4%	20%	**100%**
Smog Formation – (kg O_3 eq)	$9.92x10^{-2}$	$9.59x10^{-3}$	$3.37x10^{-2}$	**0.143**
	70%	7%	24%	**100%**
Acidification – (kg SO_2 eq)	$7.94x10^{-3}$	$3.80x10^{-4}$	$1.66x10^{-3}$	**$9.98x10^{-3}$**
	80%	4%	17%	**100%**
Eutrophication – (kg N eq)	$8.37x10^{-3}$	$8.95x10^{-5}$	$1.17x10^{-3}$	**$9.63x10^{-3}$**
	87%	1%	12%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$5.48x10^{-7}$	$1.68x10^{-9}$	$8.93x10^{-9}$	**$5.58x10^{-7}$**
	98%	0%	2%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	2.93	0.192	0.857	**3.98**
	74%	5%	22%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	1.78	$9.60x10^{-2}$	0.469	**2.34**
	76%	4%	20%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$5.42x10^{-4}$	$1.53x10^{-5}$	$1.73x10^{-4}$	**$7.31x10^{-4}$**
	74%	2%	24%	**100%**
Acidification – (kg SO_2 eq)	$7.70x10^{-3}$	$3.18x10^{-4}$	$1.48x10^{-3}$	**$9.50x10^{-3}$**
	81%	3%	16%	**100%**
Eutrophication – (kg PO_4 eq)	$3.88x10^{-3}$	$8.01x10^{-5}$	$6.30x10^{-4}$	**$4.59x10^{-3}$**
	85%	2%	14%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$4.78x10^{-7}$	$1.27x10^{-9}$	$7.00x10^{-9}$	**$4.86x10^{-7}$**
	98%	0%	1%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	24.9	1.35	6.20	**32.5**
	77%	4%	19%	**100%**

Table 10d. *The life cycle impact indicator category results for one square meter of 28 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

28 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	2.06	0.111	0.503	**2.67**
	77%	4%	19%	**100%**
Smog Formation – (kg O_3 eq)	0.116	$1.12x10^{-2}$	$3.54x10^{-2}$	**0.162**
	71%	7%	22%	**100%**
Acidification – (kg SO_2 eq)	$9.27x10^{-3}$	$4.43x10^{-4}$	$1.73x10^{-3}$	**$1.14x10^{-2}$**
	81%	4%	15%	**100%**
Eutrophication – (kg N eq)	$9.77x10^{-3}$	$1.04x10^{-4}$	$1.24x10^{-3}$	**$1.11x10^{-2}$**
	88%	1%	11%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$6.39x10^{-7}$	$1.96x10^{-9}$	$9.69x10^{-9}$	**$6.51x10^{-7}$**
	98%	0%	1%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	3.42	0.223	0.943	**4.59**
	75%	5%	21%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	2.08	0.112	0.513	**2.70**
	77%	4%	19%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$6.33x10^{-4}$	$1.79x10^{-5}$	$1.82x10^{-4}$	**$8.33x10^{-4}$**
	76%	2%	22%	**100%**
Acidification – (kg SO_2 eq)	$8.99x10^{-3}$	$3.71x10^{-4}$	$1.54x10^{-3}$	**$1.09x10^{-2}$**
	82%	3%	14%	**100%**
Eutrophication – (kg PO_4 eq)	$4.53x10^{-3}$	$9.34x10^{-5}$	$6.66x10^{-4}$	**$5.29x10^{-3}$**
	86%	2%	13%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$5.58x10^{-7}$	$1.48x10^{-9}$	$7.59x10^{-9}$	**$5.67x10^{-7}$**
	98%	0%	1%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	29.1	1.57	6.74	**37.4**
	78%	4%	18%	**100%**

Table 10e. *The life cycle impact indicator category results for one square meter of 30 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

30 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	2.21	0.119	0.524	**2.85**
	77%	4%	18%	**100%**
Smog Formation – (kg O_3 eq)	0.124	$1.20x10^{-2}$	$3.62x10^{-2}$	**0.172**
	72%	7%	21%	**100%**
Acidification – (kg SO_2 eq)	$9.93x10^{-3}$	$4.75x10^{-4}$	$1.77x10^{-3}$	**$1.22x10^{-2}$**
	82%	4%	15%	**100%**
Eutrophication – (kg N eq)	$1.05x10^{-2}$	$1.12x10^{-4}$	$1.27x10^{-3}$	**$1.19x10^{-2}$**
	88%	1%	11%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$6.85x10^{-7}$	$2.10x10^{-9}$	$1.01x10^{-8}$	**$6.97x10^{-7}$**
	98%	0%	1%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	3.67	0.239	0.984	**4.89**
	75%	5%	20%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	2.23	0.120	0.535	**2.88**
	77%	4%	19%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$6.78x10^{-4}$	$1.92x10^{-5}$	$1.86x10^{-4}$	**$8.84x10^{-4}$**
	77%	2%	21%	**100%**
Acidification – (kg SO_2 eq)	$9.63x10^{-3}$	$3.97x10^{-4}$	$1.57x10^{-3}$	**$1.16x10^{-2}$**
	83%	3%	14%	**100%**
Eutrophication – (kg PO_4 eq)	$4.86x10^{-3}$	$1.00x10^{-4}$	$6.84x10^{-4}$	**$5.64x10^{-3}$**
	86%	2%	12%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$5.97x10^{-7}$	$1.59x10^{-9}$	$7.88x10^{-9}$	**$6.07x10^{-7}$**
	98%	0%	1%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	31.2	1.68	7.01	**39.9**
	78%	4%	18%	**100%**

Table 10f. *The life cycle impact indicator category results for one square meter of 32 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category. Percentages may not add up to 100 due to rounding.*

32 oz Non-Woven Backing				
Impact Category (units)	**A1**	**A2**	**A3**	**Total**
TRACI 2.1				
Global Climate Change – (kg CO_2 eq)	2.35	0.127	0.545	**3.03**
	78%	4%	18%	**100%**
Smog Formation – (kg O_3 eq)	0.132	$1.28x10^{-2}$	$3.70x10^{-2}$	**0.182**
	73%	7%	20%	**100%**
Acidification – (kg SO_2 eq)	$1.06x10^{-2}$	$5.06x10^{-4}$	$1.80x10^{-3}$	**$1.29x10^{-2}$**
	82%	4%	14%	**100%**
Eutrophication – (kg N eq)	$1.12x10^{-2}$	$1.19x10^{-4}$	$1.31x10^{-3}$	**$1.26x10^{-2}$**
	89%	1%	10%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$7.30x10^{-7}$	$2.24x10^{-9}$	$1.04x10^{-8}$	**$7.43x10^{-7}$**
	98%	0%	1%	**100%**
Fossil Fuel Depletion – (MJ surplus, LHV)	3.91	0.255	1.03	**5.19**
	75%	5%	20%	**100%**
CML-IA Baseline				
Climate Change – (kg CO_2 eq)	2.37	0.128	0.557	**3.06**
	78%	4%	18%	**100%**
Photochemical Oxidation – (kg C_2H_4 eq)	$7.24x10^{-4}$	$2.04x10^{-5}$	$1.91x10^{-4}$	**$9.35x10^{-4}$**
	77%	2%	20%	**100%**
Acidification – (kg SO_2 eq)	$1.03x10^{-2}$	$4.24x10^{-4}$	$1.61x10^{-3}$	**$1.23x10^{-2}$**
	84%	3%	13%	**100%**
Eutrophication – (kg PO_4 eq)	$5.18x10^{-3}$	$1.07x10^{-4}$	$7.02x10^{-4}$	**$5.99x10^{-3}$**
	87%	2%	12%	**100%**
Ozone Depletion – (kg CFC-11 eq)	$6.37x10^{-7}$	$1.70x10^{-9}$	$8.18x10^{-9}$	**$6.47x10^{-7}$**
	98%	0%	1%	**100%**
Depletion of Abiotic Resources, Fossil Fuel – (MJ, LHV)	33.3	1.80	7.29	**42.4**
	79%	4%	17%	**100%**

5. LCI Results

The following life cycle inventory (LCI) parameters specified by the PCR, shown in **Table 11** below, are reported in **Table 12a – 12f**. These indicators were calculated using the ACLCA Guidance [11] and are in accordance with ISO 21930:2017 [12].

Table 11. *The full name, abbreviation, and unit of additional LCI indicators required by the PCR. All energy indicators use the lower heating value (LHV).*

Indicator Category	Abbreviation	Units
Resource use		
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	RPRe	MJ, LHV
Use of renewable primary energy resources used as raw materials	RPRm	MJ, LHV
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	NRPRe	MJ, LHV
Use of non-renewable primary energy resources used as raw materials	NRPRm	MJ, LHV
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ, LHV
Use of non-renewable secondary fuels	NRSF	MJ, LHV
Use of net fresh water	FW	m^3
Waste and outflows		
Non-hazardous waste disposed	NHWD	kg
Hazardous waste disposed	HWD	kg
High-level Radioactive waste disposed	HLRW	kg
Intermediate Low Level Radioactive waste disposed	ILLRW	kg
Components for re-use	CRU	kg
Materials for recycling	MR	kg
Materials for energy recovery	MER	MJ, LHV
Recovered energy	RE	MJ, LHV

Table 12a. *Resource use and wastes results for one square meter of 15 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

15 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	18.5	4.61	$1.07x10^{-2}$	13.9
	100%	25%	<1%	75%
RPRm (MJ, NCV)	1.73	0.967	N/A	0.759
	100%	56%	N/A	44%
NRPRe (MJ, NCV)	24.6	17.8	0.907	5.92
	100%	72%	4%	24%
NRPRm (MJ, NCV)	4.75	4.64	N/A	0.11
	100%	98%	N/A	2%
SM (kg)	$1.13x10^{-2}$	$1.13x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.189	0.137	$9.21x10^{-4}$	$5.15x10^{-2}$
	100%	72%	<1%	27%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$7.38x10^{-5}$	N/A	N/A	$7.38x10^{-5}$
	100%	N/A	N/A	100%
HLRW (kg)	$5.84x10^{-6}$	$4.03x10^{-6}$	$5.1019x10^{-8}$	$1.76x10^{-6}$
	100%	69%	1%	30%
ILLRW (kg)	$1.54x10^{-5}$	$9.66x10^{-6}$	$1.21x10^{-7}$	$5.63x10^{-6}$
	100%	63%	1%	37%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

Table 12b. *Resource use and wastes results for one square meter of 20 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

20 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	20.1	6.14	$1.43x10^{-2}$	14.0
	100%	31%	<1%	69%
RPRm (MJ, NCV)	2.05	1.29	0	0.759
	100%	63%	0	37%
NRPRe (MJ, NCV)	31.7	23.7	1.21	6.78
	100%	75%	4%	21%
NRPRm (MJ, NCV)	6.3	6.19	0	0.11
	100%	98%	0	2%
SM (kg)	$1.50x10^{-2}$	$1.50x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.245	0.182	$1.23x10^{-3}$	$6.14x10^{-2}$
	100%	74%	1%	25%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$9.84x10^{-5}$	N/A	N/A	$9.84x10^{-5}$
	100%	N/A	N/A	100%
HLRW (kg)	$7.54x10^{-6}$	$5.37x10^{-6}$	$6.80x10^{-8}$	$2.10x10^{-6}$
	100%	71%	1%	28%
ILLRW (kg)	$2.00x10^{-5}$	$1.29x10^{-5}$	$1.62x10^{-7}$	$6.93x10^{-6}$
	100%	64%	1%	35%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

Table 12c. *Resource use and wastes results for one square meter of 24 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

24 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	21.4	7.37	$1.72x10^{-2}$	14.0
	100%	34%	<1%	65%
RPRm (MJ, NCV)	2.31	1.55	N/A	0.759
	100%	67%	N/A	33%
NRPRe (MJ, NCV)	37.4	28.5	1.45	7.46
	100%	76%	4%	20%
NRPRm (MJ, NCV)	7.53	7.42	N/A	0.11
	100%	99%	N/A	1%
SM (kg)	$1.80x10^{-2}$	$1.80x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.289	0.219	$1.47x10^{-3}$	$6.92x10^{-2}$
	100%	76%	1%	24%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$1.18x10^{-4}$	N/A	N/A	$1.18x10^{-4}$
	100%	N/A	N/A	100%
HLRW (kg)	$8.91x10^{-6}$	$6.45x10^{-6}$	$8.16x10^{-8}$	$2.39x10^{-6}$
	100%	72%	1%	27%
ILLRW (kg)	$2.36x10^{-5}$	$1.55x10^{-5}$	$1.94x10^{-7}$	$7.99x10^{-6}$
	100%	65%	1%	34%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

Table 12d. *Resource use and wastes results for one square meter of 28 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

28 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	22.7	8.60	$2.01x10^{-2}$	14.0
	100%	38%	<1%	62%
RPRm (MJ, NCV)	2.57	1.81	N/A	0.759
	100%	70%	N/A	30%
NRPRe (MJ, NCV)	43.1	33.2	1.69	8.16
	100%	77%	4%	19%
NRPRm (MJ, NCV)	8.77	8.66	N/A	0.11
	100%	99%	N/A	1%
SM (kg)	$2.10x10^{-2}$	$2.10x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.334	0.255	$1.72x10^{-3}$	$7.72x10^{-2}$
	100%	76%	1%	23%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$1.38x10^{-4}$	N/A	N/A	$1.38x10^{-4}$
	100%	N/A	N/A	100%
HLRW (kg)	$1.03x10^{-5}$	$7.53x10^{-6}$	$9.52x10^{-8}$	$2.67x10^{-6}$
	100%	73%	1%	26%
ILLRW (kg)	$2.73x10^{-5}$	$1.80x10^{-5}$	$2.27x10^{-7}$	$9.07x10^{-6}$
	100%	66%	1%	33%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

Table 12e. *Resource use and wastes results for one square meter of 30 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

30 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	23.3	9.22	$2.15x10^{-2}$	14.0
	100%	40%	<1%	60%
RPRm (MJ, NCV)	2.7	1.94	N/A	0.759
	100%	72%	N/A	28%
NRPRe (MJ, NCV)	45.9	35.6	1.81	8.51
	100%	78%	4%	19%
NRPRm (MJ, NCV)	9.38	9.27	N/A	0.11
	100%	99%	N/A	1%
SM (kg)	$2.25x10^{-2}$	$2.25x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.356	0.273	$1.84x10^{-3}$	$8.11x10^{-2}$
	100%	77%	1%	23%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$1.48x10^{-4}$	N/A	N/A	$1.48x10^{-4}$
	100%	N/A	N/A	100%
HLRW (kg)	$1.10x10^{-5}$	$8.06x10^{-6}$	$1.02x10^{-7}$	$2.81x10^{-6}$
	100%	73%	1%	26%
ILLRW (kg)	$2.92x10^{-5}$	$1.93x10^{-5}$	$2.43x10^{-7}$	$9.60x10^{-6}$
	100%	66%	1%	33%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

Table 12f. *Resource use and wastes results for one square meter of 32 oz non-woven backed vinyl wallcovering product. All values are rounded to three significant digits. Results representing energy flows are calculated using lower heating (i.e., net calorific) values. Percentages in the second row of each impact category show the percent contribution of each life cycle module to the total of each impact category.*

32 oz Non-Woven Backing				
Impact Category (units)	**Total (A1-A3)**	**A1**	**A2**	**A3**
RPRe (MJ, NCV)	23.9	9.83	$2.29x10^{-2}$	14.1
	100%	41%	<1%	59%
RPRm (MJ, NCV)	2.82	2.06	N/A	0.759
	100%	73%	N/A	27%
NRPRe (MJ, NCV)	48.8	38.0	1.94	8.86
	100%	78%	4%	18%
NRPRm (MJ, NCV)	10	9.9	N/A	0.11
	100%	99%	N/A	1%
SM (kg)	$2.40x10^{-2}$	$2.40x10^{-2}$	N/A	N/A
	100%	100%	N/A	N/A
RSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NRSF (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
RE (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
FW (m3)	0.379	0.292	$1.97x10^{-3}$	$8.51x10^{-2}$
	100%	77%	1%	22%
HWD (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
NWHD (kg)	$1.57x10^{-4}$	N/A	N/A	$1.57x10^{-4}$
	100%	N/A	N/A	100%
HLRW (kg)	$1.17x10^{-5}$	$8.60x10^{-6}$	$1.09x10^{-7}$	$2.95x10^{-6}$
	100%	74%	1%	25%
ILLRW (kg)	$3.10x10^{-5}$	$2.06x10^{-5}$	$2.59x10^{-7}$	$1.01x10^{-5}$
	100%	66%	1%	33%
CRU (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MR (kg)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
MER (MJ, NCV)	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A

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