ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14044 and ASTM PCR for:

100% Solids Reactive Products

Water-Resistive & Air Barriers

from Carlisle Coatings & Waterproofing Inc.

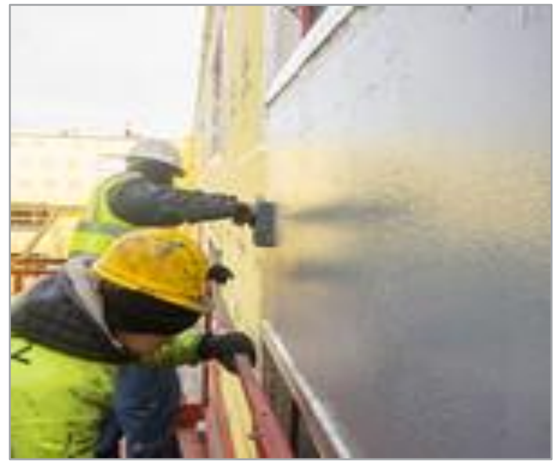
EPD DETAILS

Program Operator	NSF Certification, LLC 789 N Dixboro Road Ann Arbor, MI 48105, USA www.nsf.org
General Program instructions and Version Number	NSF Program Operator Rules, January 14, 2020
Manufacturer Name and Address	Carlisle Coatings & Waterproofing Inc. 900 Hensley Lane Wylie, Texas, USA 75098
Product Identification	100% Solids Reactive Products (Barrithane VP, MiraSEAL & MiraTITE)
Declared Product and Functional Unit	(1) m^2 of product following the ASTM Waster-Resistive & Air Barrier
Declaration Number	EPD10568
Reference PCR and Version Number	ASTM International: Water-Resistive and Air Barriers Valid: Sept. 2022 [1]. (UNCPC 54530 and/or CSI Master Format Designations 072500, 072600 and 072700)
Markets of applicability	North America
Date of Issue	June 30, 2021
Period of Validity	5 Years
EPD Type	Product Specific
EPD Scope	Cradle to Gate
Year of reported manufacturer primary data	2020
LCA Software and Version Number	Simapro v9.01
LCI database and version Number	Ecoinvent 3.6 [1] and Industry 2.0 [2]
LCIA Methodology and Version Number	TRACI 2.1 [2]
The PCR review conducted by;	Thomas P. Gloria, Industrial Ecology Consultants (chairperson) Graham Finch, RDH Building Science, Inc. Paul H. Shipp, USG Corporation
This declaration was independently verified in accordance with ISO 14025:2006 [5]. ASTM International "Water-Resistive and Air Barriers), based on ISO 21930:2007 [6], serves as the core PCR. ☒INTERNAL ☒EXTERNAL	Tony Favilla, NSF International

This life cycle assessment was independently verified in accordance with ISO 14044 [7] and the reference PCR by:	Jack Geibig, Ecoform
This life cycle assessment was conducted in accordance with ISO 14044 [7] and the reference PCR by:	Intertek Health Sciences Inc. 2233 Argentia Road, Suite 201 Mississauga, Ontario, Canada L5N 2X7 www.intertek.com

GENERAL INFORMATION

Company Information



This cradle to gate environmental product declaration is for produced for Water-Resistive & Air Barriers products Barrithane VP, MiraSEAL, MiraTITE from the location fully owned and operated by Carlisle Coatings & Waterproofing Inc. in USA, as follows:

For more than 45 years, CCW solutions have led the way in providing watertight, reliable waterproofing solutions to suit a variety of building sites. They provide time-tested and innovative solutions that incorporate the latest waterproofing technologies. Their complete waterproofing systems offer a single source warranty to streamline your next project from specification to delivery.

Further information regarding Carlisle Coatings & Waterproofing Inc. *can be accessed at:* *https://www.carlisleccw.com*

Product Information

Air barriers are essential for a high-performing building envelope. They dramatically improve building energy efficiency, indoor comfort, and longevity. CCW provides three types of water-resistive and air barrier products: self-adhered sheet, fluid-applied, and fluid-applied vapor-permeable. All have been evaluated by the Air Barrier Association of America (ABAA) and meet the most stringent energy codes including: 2012 & 2015 IECC; 2010 & 2013 ASHRAE 90.1; Massachusetts Energy Code 780 CMR; and the Canadian National Building Code.

Fluid applied, vapor-permeable membrane for use as an air and water resistive barrier in above-grade wall assemblies. The product is a one part, moisture curing silane-terminated polyether (STPE). Barrithane VP is a high-solids, low VOC product. It is highly moisture resistant after cure and can be applied over damp substrates. Barrithane VP will not freeze, can be installed at sub-freezing temperatures and resists rain wash-off immediately after installation. The formulation is also fire-resistant, which allows for its use in many NFPA 285 wall assemblies. Barrithane VP is applied in single or multiple coats by roller or brush at 15-25 wet mils over exterior sheathing and 30-50 wet mils over masonry and concrete. Upon cure, Barrithane VP provides a monolithic, fully adhered membrane.

100%-solids, fluid-applied, single-component, moisture-reacted, elastomeric, coal-tar and solvent-free, modified polymer that cures to form a flexible, monolithic, waterproof membrane on vertical and horizontal surfaces. Due to the moisture-reactive and non-gassing properties of the membrane, it provides tenacious adhesion to concrete substrates above- and below-grade, preventing lateral water migration, even with moisture present in the concrete. The inherent toughness and resilience of MiraSEAL and MiraTITE enables it to bridge structural or shrinkage cracks that may develop in the substrate.

MiraSEAL and MiraTITE can be applied wet on wet in a horizontal application resulting in reduced installation time. MiraSEAL and MiraTITE are available in a single viscosity for both horizontal and vertical surfaces. Typical applications are between structural slab and wearing course on parking garages, plaza decks, balconies, roof decks, terraces, mechanical equipment rooms, wet rooms, malls, kitchens, and shower stalls. MiraSEAL and MiraTITE are ideally suited for waterproofing on below-grade foundation walls, tunnels, planters, and other areas where a seamless, elastomeric waterproofing is required. The mass of fluid applied material required per m^2 was determined by dividing the product density (Kg/L) by the manufacture's specified dry product thickness coverage rate (m^2/L)- excluding waste.

TABLE 1. PRODUCT CHARACTERISTICS AND PRODUCTION INFORMATION

Product	Product Density (kg/L)	Dry Product Thickness (m^2/L)	Dry Product Thickness (m^2/kg)
Barrithane VP	1.318	1.96	1.498
MiraSEAL	1.318	0.638	0.484
MiraTITE	1.318	0.638	0.484

The EPDs for fluid applied products shall note that environmental impact results will be proportional to dry product thickness if applied for a specific application to a thickness other than as specified in the EPD.

TABLE 2. TECHINCAL DATA FOR PRODUCTS

Product	Product Type and Performance	Physical Properties
Barrithane VP	Air and Vapour Barrier	Colour: Dark Gray % solids: 88% VOC: 166 g/L Water Vapour Permeance: 11.1 perms @ 40 mils, 29.6 perms @ 20 mils (ASTM E96B) 5.1 perms @ 40 mils, 16.5 perms @ 20 mils (ASTM E96A) Air Permeance: 0.013 L/s*m^2 @ 75 Pa (0.0026 CFM/ft^2 @ 1.57 PSF)
MiraSEAL, MiraTITE	Waterproofing	Colour: Black % solids: 100% Composition: Modified Polymer Water Vapour Transmission Rate: 0.06 perms Inches (ASTM E96) Low Temp. Flexibility: No Cracking (ASTM C836)

TABLE 3. ADDITONAL SYSTEM PERFORMACE INFORMATION

Product	ASTM
Barrithane VP	ASTM E 84-18, 96, 2178, & 2357
MiraSEAL, MiraTITE	ASTM C 836, 1305, & 1522 ASTM D2240

Some of the material ingredients used in the 100% solid reactive products are identified as hazardous or toxic. The substances which are identified are antimony trioxide, lead, arsenic, crystalline silica, limestone, calcium carbonate.

Product Application

MiraSEAL and MiraTITE typical applications are between structural slab and wearing course on parking garages, plaza decks, balconies, roof decks, terraces, mechanical equipment rooms, wet rooms, malls, kitchens, and shower stalls. MiraSEAL and MiraTITE are ideally suited for waterproofing on below-grade foundation walls, tunnels, planters, and other areas where a seamless, elastomeric waterproofing is required.

Barrithane VP is a fluid applied, vapor-permeable membrane for use as an air and water resistive barrier in above-grade wall assemblies. The product is a one part, moisture curing silane-terminated polyether (STPE). Barrithane VP is a high-solids, low VOC product. It is highly moisture resistant after cure and can be applied over damp substrates. Barrithane VP will not freeze, can be installed at sub-freezing temperatures and resists rain wash-off immediately after installation. The formulation is also fire-resistant, which allows for its use in many NFPA 285 wall assemblies. Barrithane VP is applied in single or multiple coats by roller or brush at 15-25 wet mils over exterior sheathing and 30-50 wet mils over masonry and concrete. Upon cure, Barrithane VP provides a monolithic, fully adhered membrane.

Study Application

This study was conducted to provide CCW with the cradle-to-gate environmental impacts associated with the Barrithane VP, MiraSEAL, MiraTITE and to create the EPD for the products. The LCA study evaluates the environmental impacts at various stages of the lifecycle of 100% Solids Reactive Products. The results are intended to inform the creation of this EPD. This assessment is not intended to be used for comparative assertion. The intended audience of this study is both internal to CCW and external (Business-to-Business and Business-to-Consumer) to CCW *via* an EPD document.

Manufacturing Process

The 100% Solid reactive products are manufactured by Carlisle at their Wylie, Texas Facility. The Manufacturing of the formulated product is mixed from its raw materials in a batch process. The product is then pressed out of the mixer and packaged in 5-gallon pails for shipment. In this process, quality, environmental, and any other regulatory standards are observed.

Period Under Review

The period of review is calendar year 2020.

Comparability & Benchmarking

This EPD should not be used for comparative assertions as the scope of the study is cradle-to-gate and does not include the use and end-of-life phase. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the results, due to and not limited to, the practitioner’s assumptions, the source of the data used in the study, and the specifics of the product modelled.

Declaration of Methodological Framework

This EPD is considered a Cradle-to-Gate study. A summary of the life cycle stages included in this EPD is presented in Table 4. The Allocation and Cut-off rules applied to this study have been discussed in detail further in the report. The LCA Study followed an attributional approach and no known flows are deliberately excluded from this EPD.

Flow Diagram

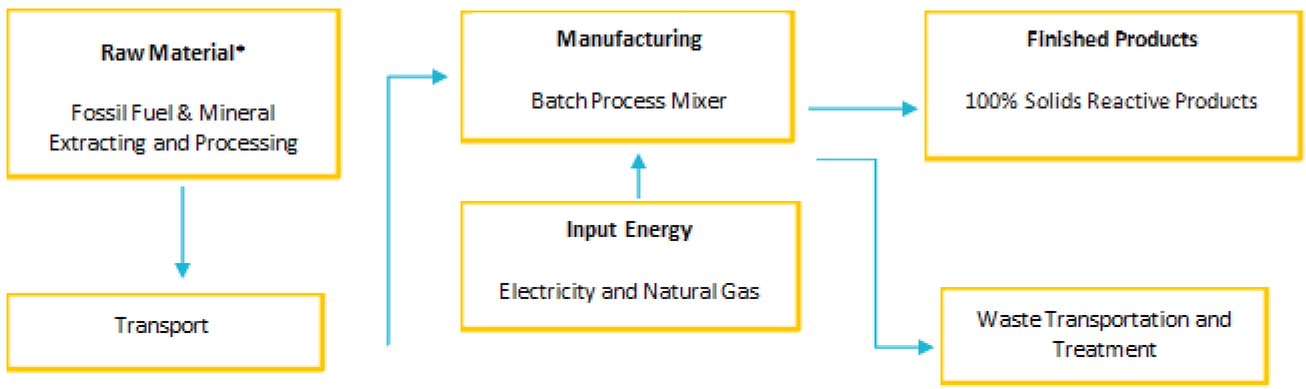


FIGURE 1. UNIT FLOW DIAGRAM FOR 100% SOLID REACTIVE PRODUCTS

LCA CALCULATION RULES

Declared Unit

The declared unit is defined as (1) m^2 of product following the ASTM International Waster-Resistive & Air Barrier PCR [1].

System Boundary

The LCA system boundary for all of the water-resistive and air barrier products includes cradle-to-gate life cycle stages. This boundary considers product stages such as: raw material extraction and processing, transport to the manufacturer, packaging, and manufacturing activities.

Construction, use, end-of-life, and the benefits and loads beyond the system boundary for reuse, recovery, and recycling potential, are not included in this study. The cradle-to-gate system boundary includes all unit processes contributing measurably to the category indicator results. As per the sensitivity analysis performed the system boundary does not need any refining and all the stages included in the initial system boundary stay the same.
Other Elements that are excluded from the system boundary are the manufacture, maintenance and decommissioning of capital equipment (e.g., buildings, machines, and vehicles), as well as the background infrastructure in both primary and secondary data. The deletion of these processes and inputs is permitted since it is not expected to significantly change the overall conclusions of the study. A description of each life cycle stage, in accordance with the PCR, is provided below

The study avoids the value choices such as normalization or grouping of indicator results and the LCA study is conducted with the best of the practitioner's knowledge.

TABLE 4. THE LIFE CYCLE STAGES INCLUDED IN THE SYSTEM BOUNDARY FOR ALL PRODUCTS

Upstream		Core	Downstream													Other
Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads Beyond
Raw Material Supply	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Future reuse, recycling, or energy recovery potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	**X**	**X**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = included in the study, ND = module not declared

A1-A3: Production Stage information modules

Extraction and Upstream Production (A1) includes the extraction of all raw materials, including the transport to the raw material processing site. Resource use and emissions associated with extraction of the raw materials and product component manufacturing is included. It also includes the generation of energy from the primary resources used during extraction and processing.

Transport to manufacturing facility (A2) includes the impacts associated with the transport of the processed raw materials to the manufacturing facility.

Manufacturing (A3) includes all the relevant manufacturing processes and flows, including the impacts from energy use and emissions at the facility. It also includes the transportation to landfill of all processing waste, including the empty back hauls. Production of capital goods, infrastructure, manufacturing equipment, and personnel-related activities are not included. This stage also includes the packaging of finished product.

Allocation

Based on the information provided by CCW a physical allocation by mass was applied. The primary data for resource use (electricity, natural gas, water, etc.) and waste are allocated on a mass basis as a fraction of total annual production (October 2019 to September 2020).

Additionally, ISO 14044 [7] addresses allocation procedures for reuse and recycling situations. Several allocation scenarios and procedures are addressed by the standard, including consideration of both closed-loop and open-loop recovery systems. For this LCA study there are no closed or open loop system.

Assumptions

The Ecoinvent 3.6 database is one of the most comprehensive and reliable resources for LCA data available globally. The inputs for manufacturing, packaging, and transporting the air & water barrier products w provided by CCW.

While raw material and sub-component data sets within the Ecoinvent 3.6 database typically include raw material extraction, transport, infrastructure, emissions, waste and energy use, they do not include any packaging and/or palletizing that is applied to sub-components in their transport to the finished product manufacturer.

- The dimensions of the pallets were provided by CCW. However, desktop research was required to determine the pallet weights, using the given dimensions.
- The Cardboard box dimension and weights were calculated using values determined through desktop research and images provided by CCW.
- All input information is assumed to be as accurate as possible at the time of the study (2019/2020).
- Inventory data for packaging, and ancillary materials were modelled with unit process data taken from Ecoinvent.

Cut-Off Rules

The following cut-off criteria was considered.

- The mass and energy flow that consist of less than 1% may be omitted from the inventory analysis and the total omitted mass or energy flows shall not exceed 5%.
- The cut-off criteria was not applied to any substance which are identified as hazardous or toxic and all such substances are included in the inventory.

A sensitivity analysis was performed to determine the environmental significance of this cut-off criteria, which showed no significant impact to the outcome of the study.

Data Quality

TABLE 5. DATA QUALITY ASSESSMENT

Requirement	Assessment
Time Related Coverage: age of data and the minimum length of time over which data should be collected	The material and energy inputs provided by CCW are from the manufacturer based on measured primary data in 2019-20 for their products. Data for the Life Cycle Inventory (LCI) was obtained primarily from Ecoinvent 3.6 datasets and in some cases from Industry 2.0 datasets, the most up-to-date version available at the time of the study. Many of the parameters included in the study, reference data from 2020 are used. Thus, it is considered high quality data.
Geographical Coverage: geographical area from which data for unit processes should be collected to satisfy the goal of the study	The Ecoinvent 3.6 database, typically base their research and measurement on specific producers, usually in Europe and adjust for global energy and transport considerations. The electricity grid selected for the production phase was specific to the USA, where the manufacturers are located. Thus, the data is considered high quality.
Technology Coverage: specific technology or technology mix	CCW provided the primary material and energy input data, based on their sales data and composition of the air and water barrier products and its transport packaging. CCW production and materials do not evolve quickly and thus analysis is based on current technologies for the product. Technology, materials, and processes used in the Ecoinvent 3.6 and Industry

Requirement	Assessment
	Data 2.0 are mostly current and typically reference data from 2020. Thus, it is considered medium quality.
Precision: measure of the variability of the data values for each data expressed	CCW provided the primary material and energy input data, based on sales data and composition and density. Given the simplicity of this data, it is anticipated that there are few opportunities for variability in data. Thus, the data is considered high quality Additionally, an uncertainty analysis was performed and reported in the uncertainty section of the report.
Completeness: percentage of flow that is measured or estimated	CCW provided the primary material and energy input data, based on sales data and composition. All materials reported in the data were included in the raw materials phase of the LCA. Energy data was provided by the manufacturer and was measured in a current year on for the product; thus, this is considered 100% measured. Background or secondary data provided by the Ecoinvent 3.6 database, are globally regarded as high quality and researched data. At the time of the study, version 3.6 is the most up-to-date dataset available in Ecoinvent. Thus, it is considered medium quality.
Representativeness: qualitative assessment of the degree to which the data set reflects the true population of interest	CCW provided the primary material and energy input data, based on sales data, material composition and measured energy consumption. Given CCW expertise and in-depth knowledge of their products, it is anticipated that primary data is representative of actual data. Thus, considered high quality.
Consistency: qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The same methodology was applied consistently to all the studies. Thus, considered high quality.
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	Provided the practitioner has access to the same data sources described in the report, the results would be reproducible. It is considered high quality.
Data Sources: Description of data sources	CCW provided the primary material and energy input data, based on sales data, material composition and measured energy consumption. Thus, the data is considered high quality. Secondary data was derived from open sources, such as Ecoinvent 3.6, research and literature review.
Uncertainty: Description of known sources of potential uncertainty	Key uncertainty assumptions are stated in the report and evaluated by the pedigree matrix method.

Material Inputs

Raw material inputs are entered into the LCA model in kg per 1 m2 product. The bill of materials and material input information is shown for each product below. Primary data was provided by CCW for each product and its packaging. The sources of secondary LCI data is Ecoinvent v3.6 (2020). The tables below also summarize the data sources for materials and flows used in this LCA study.

TABLE 6. MATERIAL CONTRIBUTION USED TO MODEL BARRITHANE VP

Flow	Contribution (%)
Product	
FR Additive	14.8%
Plasticizer	19.7%
Polymer	20.0%
Stabilizer	2.1%
Rheology Modifier	0.1%
Rheology Modifier	0.5%
Pigment	1.0%
Pigment	4.1%
Flame Retardant Additive	0.3%
Flame Retardant Additive	2.5%
Filler	10.1%
Filler	18.1%
Odorless Mineral Spirits	5.2%
Process Aid	0.2%
Adhesion Promoter	1.0%
Anti-Degradant	0.1%
Anti-Degradant	0.1%
Anti-Degradant	0.1%
Catalyst	0.1%
Packaging	
Pails (5 gallon)	72.98%
Pallets	26.71%
Film	0.32%

TABLE 7. MATERIAL CONTRIBUTION USED TO MODEL MIRASEAL

Flow	Contribution (%)
Product	
Plasticizer	37.70%
Polymer	13.10%
Polymer	1.97%

Flow	Contribution (%)
Rheology Modifier	1.97%
Rheology Modifier	0.21%
Pigment	0.51%
Filler	10.33%
Filler	17.22%
Adhesion Promoter	0.39%
Plasticizer	9.92%
Stabilizer	3.59%
Stabilizer	2.07%
Anti-Degradant	0.51%
Adhesion Promoter	0.30%
Catalyst	0.21%
Packaging	
Pails (5 gallon)	65.14%
Pallets	34.58%
Film	0.28%

TABLE 8. MATERIAL CONTRIBUTION USED TO MODEL MIRATITE

Flow	**Contribution (%)**
Product	
Plasticizer	37.70%
Polymer	13.10%
Polymer	1.97%
Rheology Modifier	1.97%
Rheology Modifier	0.21%
Pigment	0.51%
Filler	10.33%
Filler	17.22%
Adhesion Promoter	0.39%
Plasticizer	9.92%
Stabilizer	3.59%
Stabilizer	2.07%
Anti-Degradant	0.51%
Adhesion Promoter	0.30%
Catalyst	0.21%
Packaging	
Pails (5 gallon)	65.14%
Pallets	34.58%
Film	0.28%

ENVIRONMENTAL PERFORMANCE

Life Cycle Impact Assessment

The purpose of conducting an impact assessment is to determine the actual impacts from the material and energy inputs calculated in the LCI. This is accomplished through assigning the LCI mass and energy inputs into flows that are then classified by the environmental impact categories to which they contribute. To compare emissions from various pollutants on the same scale, the impact assessment methodology characterizes emissions from various substances to enable comparison in common equivalence units. The impact categories are based on TRACI 2.1 [2] as per the PCR [1]. Further details of each impact category are provided in Appendix B. Additionally, the PCR specifies that other measures are declared as per ISO 14044 representing Primary Energy Consumption and Material Resource Consumption [6]. All cradle-to-gate LCIA results are provided for modules A1-A3 in the results section below for all products.

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. The LCIA indicators prescribed by the PCR do not represent all categories of potential environmental impacts, such as impacts to terrestrial ecosystem.

TABLE 9. LIST OF CRADLE-TO-GATE MODULE NUMBERS FOR REPORTING THE RESULTS

Module Number	Module Name
A1	Raw Material Supply
A2	Transport
A3	Manufacturing

LCIA Results: TRACI Method

TABLE 10. CRADLE-TO-GATE LCIA RESULT FOR BARRITHANE VP PER DECLARED UNIT

Impact Category	Unit	Total	A1	A2	A3
Ozone Depletion	kg CFC-11 eq.	1.77E-03	1.77E-03	4.32E-08	1.60E-08
Global Warming	kg CO2 eq.	5.18E+00	3.95E+00	1.81E-01	1.05E+00
Smog	kg O3 eq.	3.02E-01	2.53E-01	2.35E-02	2.53E-02
Acidification	kg SO2 eq.	2.11E-02	1.83E-02	1.00E-03	1.74E-03
Eutrophication	kg N eq.	3.16E-03	2.22E-03	1.01E-04	8.39E-04
Non-Renewable Fossil	MJ (HHV)	7.92E+01	7.41E+01	2.71E+00	2.39E+00
Non-Renewable Nuclear	MJ (HHV)	5.29E+00	4.78E+00	3.14E-03	5.10E-01
Renewable	MJ (HHV)	7.51E-01	5.73E-01	2.65E-04	1.78E-01
Renewable (Biomass)	MJ (HHV)	1.87E+00	1.86E+00	9.49E-04	8.94E-03
Non-Renewable Material Resources	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Material Resources	kg	1.02E+00	1.01E+00	6.65E-04	6.35E-03
Net Fresh Water	L	3.68E+01	3.68E+01	5.30E-02	-4.77E-02
Non-Hazardous Waste Generated	kg	9.50E-01	9.42E-01	6.29E-04	7.45E-03
Hazardous Waste Generated	kg	4.36E-05	3.66E-05	6.60E-06	3.45E-07

TABLE 11. CRADLE-TO-GATE LCIA RESULT FOR MIRASEAL PER DECLARED UNIT

Impact Category	Unit	Total	A1	A2	A3
Ozone Depletion	kg CFC-11 eq.	1.05E-06	8.48E-07	1.58E-07	4.64E-08
Global Warming	kg CO2 eq.	8.37E+00	6.49E+00	6.61E-01	1.22E+00
Smog	kg O3 eq.	4.90E-01	3.83E-01	8.04E-02	2.63E-02
Acidification	kg SO2 eq.	3.29E-02	2.72E-02	3.36E-03	2.33E-03
Eutrophication	kg N eq.	1.48E-02	1.34E-02	3.57E-04	1.09E-03
Non-Renewable Fossil	MJ (HHV)	1.84E+02	1.67E+02	9.88E+00	7.12E+00
Non-Renewable Nuclear	MJ (HHV)	7.78E+00	6.21E+00	1.14E-02	1.56E+00
Renewable	MJ (HHV)	1.37E+00	8.23E-01	9.63E-04	5.44E-01
Renewable (Biomass)	MJ (HHV)	4.63E+00	4.60E+00	3.45E-03	2.69E-02
Non-Renewable Material Resources	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Material Resources	kg	1.25E+00	1.23E+00	2.42E-03	1.92E-02
Net Fresh Water	L	9.69E+01	9.62E+01	1.96E-01	5.11E-01
Non-Hazardous Waste Generated	kg	3.65E-01	3.48E-01	2.33E-03	1.49E-02
Hazardous Waste Generated	kg	2.41E-04	2.16E-04	2.44E-05	5.08E-07

TABLE 12. CRADLE-TO-GATE LCIA RESULT FOR MIRATITE PER DECLARED UNIT

Impact Category	Unit	Total	A1	A2	A3
Ozone Depletion	kg CFC-11 eq.	1.05E-06	8.48E-07	1.58E-07	4.64E-08
Global Warming	kg CO2 eq.	8.37E+00	6.49E+00	6.61E-01	1.22E+00
Smog	kg O3 eq.	4.90E-01	3.83E-01	8.04E-02	2.63E-02
Acidification	kg SO2 eq.	3.29E-02	2.72E-02	3.36E-03	2.33E-03
Eutrophication	kg N eq.	1.48E-02	1.34E-02	3.57E-04	1.09E-03
Non-Renewable Fossil	MJ (HHV)	1.84E+02	1.67E+02	9.88E+00	7.12E+00
Non-Renewable Nuclear	MJ (HHV)	7.78E+00	6.21E+00	1.14E-02	1.56E+00
Renewable	MJ (HHV)	1.37E+00	8.23E-01	9.63E-04	5.44E-01
Renewable (Biomass)	MJ (HHV)	4.63E+00	4.60E+00	3.45E-03	2.69E-02
Non-Renewable Material Resources	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable Material Resources	kg	1.25E+00	1.23E+00	2.42E-03	1.92E-02
Net Fresh Water	L	9.69E+01	9.62E+01	1.96E-01	5.11E-01
Non-Hazardous Waste Generated	kg	3.65E-01	3.48E-01	2.33E-03	1.49E-02
Hazardous Waste Generated	kg	2.41E-04	2.16E-04	2.44E-05	5.08E-07

Sensitivity

The sensitivity analysis included the following four scenarios and the tables below show the results and the percent change from the baseline model.

- **Scenario 1:** Use of ReCiPe midpoint method instead of TRACI midpoint method.
- **Scenario 2:** Change in material weight by 5%.
- **Scenario 3:** Change in assembly energy by 5%.

- **Scenario 4:** Change in eGrid.
- **Scenario 5:** Change in natural gas usage at the manufacturing facility and the transport of raw material by truck varied by 10% to account for the unavailability of US datasets.

Barrithane VP

Scenario 1

The sensitivity analysis scenario was modelled by running the LCA model using the ReCiPe Midpoint (H) method [13] rather than the TRACI midpoint method. When the TRACI midpoint method was used to model the LCA, it was observed that the raw materials had the highest environmental impact in all products followed by upstream transportation.

All the observations made while using the ReCiPe midpoint method are the same as when the TRACI method was used for calculation of the environmental impacts.

TABLE 13. CRADLE-TO-GATE LCIA RESULTS WITH RECIPE METHOD – BARRITHANE VP

Impact category	Unit	Total	A1	AA	A3
Global warming	kg CO2 eq	5.77E+00	4.15E+00	1.82E-01	1.44E+00
Stratospheric ozone depletion	kg CFC11 eq	2.01E-04	2.01E-04	8.67E-08	3.15E-07
Ionizing radiation	kBq Co-60 eq	3.96E-02	3.60E-02	1.27E-03	2.34E-03
Ozone formation, Human health	kg NOx eq	1.26E-02	1.07E-02	9.58E-04	1.03E-03
Fine particulate matter formation	kg PM2.5 eq	8.53E-03	6.71E-03	2.43E-04	1.58E-03
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.32E-02	1.12E-02	9.65E-04	1.06E-03
Terrestrial acidification	kg SO2 eq	1.60E-02	1.45E-02	6.76E-04	8.02E-04
Freshwater eutrophication	kg P eq	2.08E-04	1.55E-04	4.13E-07	5.28E-05
Marine eutrophication	kg N eq	4.21E-04	4.77E-05	4.64E-08	3.74E-04
Terrestrial ecotoxicity	kg 1,4-DCB	7.77E+00	4.29E+00	2.85E+00	6.27E-01
Freshwater ecotoxicity	kg 1,4-DCB	8.69E-03	4.81E-03	4.33E-04	3.44E-03
Marine ecotoxicity	kg 1,4-DCB	1.49E-02	8.82E-03	2.04E-03	4.01E-03
Human carcinogenic toxicity	kg 1,4-DCB	5.48E-02	4.23E-02	1.61E-04	1.23E-02
Human non-carcinogenic toxicity	kg 1,4-DCB	8.99E-01	6.95E-01	4.15E-02	1.63E-01
Land use	m2a crop eq	1.13E-01	1.10E-01	8.10E-05	2.42E-03
Mineral resource scarcity	kg Cu eq	5.61E-02	5.60E-02	2.50E-05	6.41E-05
Fossil resource scarcity	kg oil eq	1.71E+00	1.59E+00	5.91E-02	5.26E-02
Water consumption	m3	4.73E-02	4.66E-02	5.64E-05	6.27E-04

Scenarios 2, 3, 4 and 5

CCW's Barrithane VP product was tested by increasing and decreasing the overall weight of the product (*i.e.*, bill of materials) by 5%, increasing and decreasing the energy consumption by 5%, and replacing the energy dataset used in the LCA to reflect a national (US only) eGrid. The results show the greatest change to environmental impacts occurred when the bill of materials was increased and decreased by 5%. The results also show that the non-renewable nuclear impact for each product increased by 8% when a national (US only) average electrical grid was used. Additionally, when the datasets for natural gas and truck transport were varied by 10% to see the environmental impacts associated with not using the US based datasets, we see a small change in some of the environmental impact's categories.

TABLE 14. PERCENTAGE CHANGE BILL OF MATERIALS, ASSEMBLY ENERGY, AND ENERGY DATASET – BARRITHANE VP

	Scenario 2		Scenario 3		Scenario 4	Scenario 5
Impact category	**Increase**	**Decrease**	**Increase**	**± Change**	**Change**	**± Change**
Global Warming (kg CO2 eq)	5%	-2%	0%	0%	0%	0%
Acidification (kg SO2 eq)	5%	-2%	0%	0%	0%	0%
Eutrophication (kg N eq)	4%	-3%	0%	0%	-2%	0%
Smog (kg O3 eq)	5%	-2%	0%	0%	1%	1%
Ozone Depletion (kg CFC-11 eq)	8%	0%	0%	0%	0%	0%
Non-Renewable Fossil (MJ)	5%	-3%	0%	0%	0%	0%
Non-Renewable Nuclear (MJ)	6%	-2%	0%	0%	8%	0%
Renewable (MJ)	4%	-2%	1%	-1%	-13%	0%
Renewable (Biomass) (MJ)	5%	-1%	0%	0%	3%	0%
Non-Renewable Material Resources (kg)	0%	0%	0%	0%	0%	0%
Renewable Material Resources (kg)	6%	-1%	0%	0%	4%	0%
Net Fresh Water (L)	5%	-4%	0%	0%	2%	0%
Hazardous Waste Generated (kg)	3%	-3%	0%	0%	0%	1%
Non-Hazardous Waste Generated (kg)	7%	-1%	0%	0%	0%	1%

Miraseal

Scenario 1

The sensitivity analysis scenario was modelled by running the LCA model using the ReCiPe Midpoint (H) method [13] rather than the TRACI midpoint method. When the TRACI midpoint method was used to model the LCA, it was observed that the raw materials had the highest environmental impact in all products followed by upstream transportation. All the observations made while using the ReCiPe midpoint method are the same as when the TRACI method was used for calculation of the environmental impacts.

TABLE 15. CRADLE-TO-GATE LCIA RESULTS WITH RECIPE METHOD – MIRASEAL

Impact category	Unit	Total	A1	AA	A3
Global warming	kg CO2 eq	8.99E+00	6.80E+00	6.64E-01	1.53E+00
Stratospheric ozone depletion	kg CFC11 eq	9.23E-06	8.53E-06	3.13E-07	3.87E-07
Ionizing radiation	kBq Co-60 eq	6.53E-02	5.35E-02	4.64E-03	7.09E-03
Ozone formation, Human health	kg NOx eq	2.07E-02	1.63E-02	3.28E-03	1.07E-03
Fine particulate matter formation	kg PM2.5 eq	1.42E-02	1.01E-02	8.18E-04	3.28E-03
Ozone formation, Terrestrial ecosystems	kg NOx eq	2.19E-02	1.75E-02	3.31E-03	1.10E-03
Terrestrial acidification	kg SO2 eq	2.55E-02	2.17E-02	2.24E-03	1.50E-03
Freshwater eutrophication	kg P eq	1.29E-03	1.19E-03	1.52E-06	9.97E-05
Marine eutrophication	kg N eq	5.86E-04	2.99E-04	1.71E-07	2.87E-04
Terrestrial ecotoxicity	kg 1,4-DCB	2.08E+01	9.71E+00	1.05E+01	5.67E-01
Freshwater ecotoxicity	kg 1,4-DCB	1.20E-02	7.48E-03	1.60E-03	2.90E-03
Marine ecotoxicity	kg 1,4-DCB	2.53E-02	1.43E-02	7.54E-03	3.43E-03
Human carcinogenic toxicity	kg 1,4-DCB	1.18E-01	1.06E-01	5.55E-04	1.14E-02
Human non-carcinogenic toxicity	kg 1,4-DCB	1.11E+00	7.86E-01	1.54E-01	1.74E-01
Land use	m2a crop eq	4.12E-01	4.09E-01	2.97E-04	2.97E-03
Mineral resource scarcity	kg Cu eq	4.87E-02	4.84E-02	9.25E-05	1.73E-04
Fossil resource scarcity	kg oil eq	3.99E+00	3.61E+00	2.16E-01	1.57E-01
Water consumption	m3	1.19E-01	1.17E-01	2.09E-04	2.57E-03

Scenarios 2, 3, 4 and 5

CCW's Miraseal product was tested by increasing and decreasing the overall weight of the product (*i.e.*, bill of materials) by 5%, increasing and decreasing the energy consumption by 5%, and replacing the energy dataset used in the LCA to reflect a national (US only) eGrid. The results show the greatest change to environmental impacts occurred when the bill of material was increased and decreased by 5%. The results also show that the non-renewable nuclear impact for each product increased by 16% when a national (US only) average electrical grid was used. Additionally, when the datasets for natural gas and truck transport were varied by 10% to see the environmental impacts associated with not using the US based datasets, we see a small change in some of the environmental impact's categories.

TABLE 16. PERCENTAGE CHANGE BILL OF MATERIALS, ASSEMBLY ENERGY, AND ENERGY DATASET – MIRASEAL

	Scenario 2		Scenario 3		Scenario 4	Scenario 5
Impact category	**Increase**	**Decrease**	**Increase**	**± Change**	**Change**	**± Change**
Global Warming (kg CO2 eq)	1%	-6%	0%	1%	0%	1%
Acidification (kg SO2 eq)	2%	-6%	0%	1%	1%	1%
Eutrophication (kg N eq)	-23%	-30%	0%	0%	-1%	0%
Smog (kg O3 eq)	2%	-5%	0%	1%	1%	1%
Ozone Depletion (kg CFC-11 eq)	2%	-5%	0%	2%	1%	2%
Non-Renewable Fossil (MJ)	2%	-6%	0%	1%	0%	1%
Non-Renewable Nuclear (MJ)	2%	-5%	1%	0%	16%	0%
Renewable (MJ)	2%	-3%	2%	0%	-21%	0%
Renewable (Biomass) (MJ)	-10%	-15%	0%	0%	4%	0%
Non-Renewable Material Resources (kg)	0%	0%	0%	0%	0%	0%
Renewable Material Resources (kg)	2%	-2%	0%	0%	10%	0%

Net Fresh Water (L)	1%	-8%	0%	0%	2%	0%
Hazardous Waste Generated (kg)	-20%	-26%	0%	1%	0%	1%
Non-Hazardous Waste Generated (kg)	1%	-5%	0%	4%	0%	4%

Miratite

Scenario 1

The sensitivity analysis scenario was modelled by running the LCA model using the ReCiPe Midpoint (H) method [13] rather than the TRACI midpoint method. When the TRACI midpoint method was used to model the LCA, it was observed that the raw materials had the highest environmental impact in all products followed by upstream transportation. All the observations made while using the ReCiPe midpoint method are the same as when the TRACI method was used for calculation of the environmental impacts.

TABLE 17. CRADLE-TO-GATE LCIA RESULTS WITH RECIPE METHOD – MIRATITE

Impact category	Unit	Total	A1	AA	A3
Global warming	kg CO2 eq	8.99E+00	6.80E+00	6.64E-01	1.53E+00
Stratospheric ozone depletion	kg CFC11 eq	9.23E-06	8.53E-06	3.13E-07	3.87E-07
Ionizing radiation	kBq Co-60 eq	6.53E-02	5.35E-02	4.64E-03	7.09E-03
Ozone formation, Human health	kg NOx eq	2.07E-02	1.63E-02	3.28E-03	1.07E-03
Fine particulate matter formation	kg PM2.5 eq	1.42E-02	1.01E-02	8.18E-04	3.28E-03
Ozone formation, Terrestrial ecosystems	kg NOx eq	2.19E-02	1.75E-02	3.31E-03	1.10E-03
Terrestrial acidification	kg SO2 eq	2.55E-02	2.17E-02	2.24E-03	1.50E-03
Freshwater eutrophication	kg P eq	1.29E-03	1.19E-03	1.52E-06	9.97E-05
Marine eutrophication	kg N eq	5.86E-04	2.99E-04	1.71E-07	2.87E-04
Terrestrial ecotoxicity	kg 1,4-DCB	2.08E+01	9.71E+00	1.05E+01	5.67E-01
Freshwater ecotoxicity	kg 1,4-DCB	1.20E-02	7.48E-03	1.60E-03	2.90E-03
Marine ecotoxicity	kg 1,4-DCB	2.53E-02	1.43E-02	7.54E-03	3.43E-03
Human carcinogenic toxicity	kg 1,4-DCB	1.18E-01	1.06E-01	5.55E-04	1.14E-02
Human non-carcinogenic toxicity	kg 1,4-DCB	1.11E+00	7.86E-01	1.54E-01	1.74E-01
Land use	m2a crop eq	4.12E-01	4.09E-01	2.97E-04	2.97E-03
Mineral resource scarcity	kg Cu eq	4.87E-02	4.84E-02	9.25E-05	1.73E-04
Fossil resource scarcity	kg oil eq	3.99E+00	3.61E+00	2.16E-01	1.57E-01
Water consumption	m3	1.19E-01	1.17E-01	2.09E-04	2.57E-03

Scenarios 2, 3, 4 and 5

CCW's Miratite product was tested by increasing and decreasing the overall weight of the product (*i.e.*, bill of materials) by 5%, increasing and decreasing the energy consumption by 5%, and replacing the energy dataset used in the LCA to reflect a national (US only) eGrid. The results show the greatest change to environmental impacts occurred when the bill of materials was increased and decreased by 5%. The results also show that the non-renewable nuclear impact for each product increased by 16% when a national (US only) average electrical grid was used. Additionally, when the datasets for natural gas and truck transport were varied by 10% to see the environmental impacts associated with not using the US based datasets, we see a small change in some of the environmental impact's categories.

TABLE 18. PERCENTAGE CHANGE BILL OF MATERIALS, ASSEMBLY ENERGY, AND ENERGY DATASET – MIRATITE

	Scenario 2		Scenario 3		Scenario 4	Scenario 5
Impact category	**Increase**	**Decrease**	**Increase**	**± Change**	**Change**	**± Change**
Global Warming (kg CO2 eq)	1%	-6%	0%	0%	0%	1%
Acidification (kg SO2 eq)	2%	-6%	0%	0%	1%	1%
Eutrophication (kg N eq)	-23%	-30%	0%	0%	-1%	0%
Smog (kg O3 eq)	2%	-5%	0%	0%	1%	1%
Ozone Depletion (kg CFC-11 eq)	2%	-5%	0%	0%	1%	2%
Non-Renewable Fossil (MJ)	2%	-6%	0%	0%	0%	1%
Non-Renewable Nuclear (MJ)	2%	-5%	1%	-1%	16%	0%
Renewable (MJ)	2%	-3%	2%	-2%	-21%	0%
Renewable (Biomass) (MJ)	-10%	-15%	0%	0%	4%	0%
Non-Renewable Material Resources (kg)	0%	0%	0%	0%	0%	0%
Renewable Material Resources (kg)	2%	-2%	0%	0%	10%	0%
Net Fresh Water (L)	1%	-8%	0%	0%	2%	0%
Hazardous Waste Generated (kg)	-20%	-26%	0%	0%	0%	1%
Non-Hazardous Waste Generated (kg)	1%	-5%	0%	0%	0%	4%

INTERPRETATION

The primary goals of the comprehensive LCA for each 100% solid reactive products were developed at the beginning of the project with CCW and are outlined in the Introduction of this report. The Interpretation section serves as a discussion of the results and their relationship to the initial goals of the study.

Barrithane VP

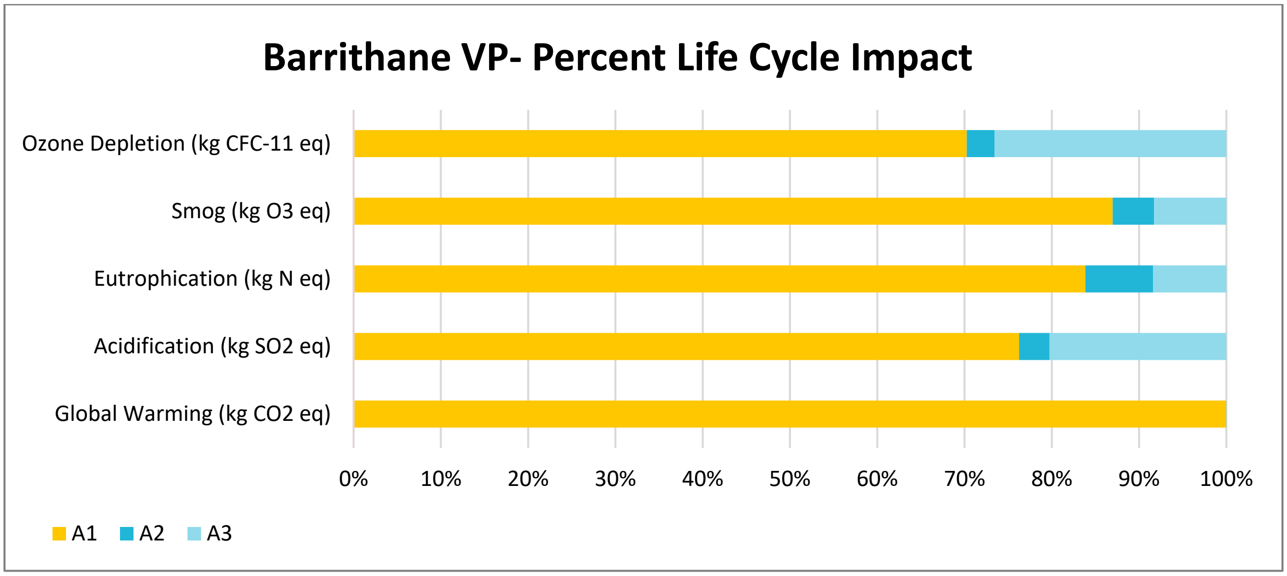


FIGURE 2. CRADLE-TO-GATE LCA PERCENTAGE CONTRIBUTION TO ENVIRONMENTAL IMPACTS – BARRITHANE VP

The cradle-to-gate LCA showed several intriguing results for interpretation as part of the study. While these are discussed in the Life Cycle Impact Assessment and Sensitivity sections of the report, they are further summarized here:

- The results of the cradle-to-gate LCA showed global warming impacts of 5.18 kg CO_2eq. for Barrithane VP as per the declared unit.
- The results show that the raw materials of the life cycle contribute most significantly to the environmental impacts, followed by manufacturing.
- The highest contributors of global warming potential are the process aids, plasticizers, and filler components at 34%, 12%, and 7% respectively. The extraction of minerals and the fossil fuel burned during processing and transporting of raw materials contributes towards the GWP.
- When the bill of materials for each solid reactive product was increased and decreased by 5%, the change in all environmental impacts generally increased and decreased by 5% as well.
- The eGrid Change sensitivity scenario where the location specific grid was replaced by a US national average grid, we could observe the Non – Renewable Energy (Nuclear) has increased for all the products.
- Eutrophication potential is largely driven again by the process aids, with other considerable portions coming from plasticizers and the filler components. Processing of raw materials, transportation and generation of heat and electricity can lead to release of agents that cause eutrophication in the water supply.
- The process aids contribute 99% towards ozone depletion. The energy used in manufacturing of Methylchloride which is used in manufacturing polydimethylsiloxane is the major contributor contributing towards Ozone Depletion.

- The process aids contribute 41%, and filler and Truck Transport contributes 10% and 6%, respectively towards smog formation potential. The fossil fuel burned during extraction and transportation by truck, is the major reason for Smog contribution.

Miraseal

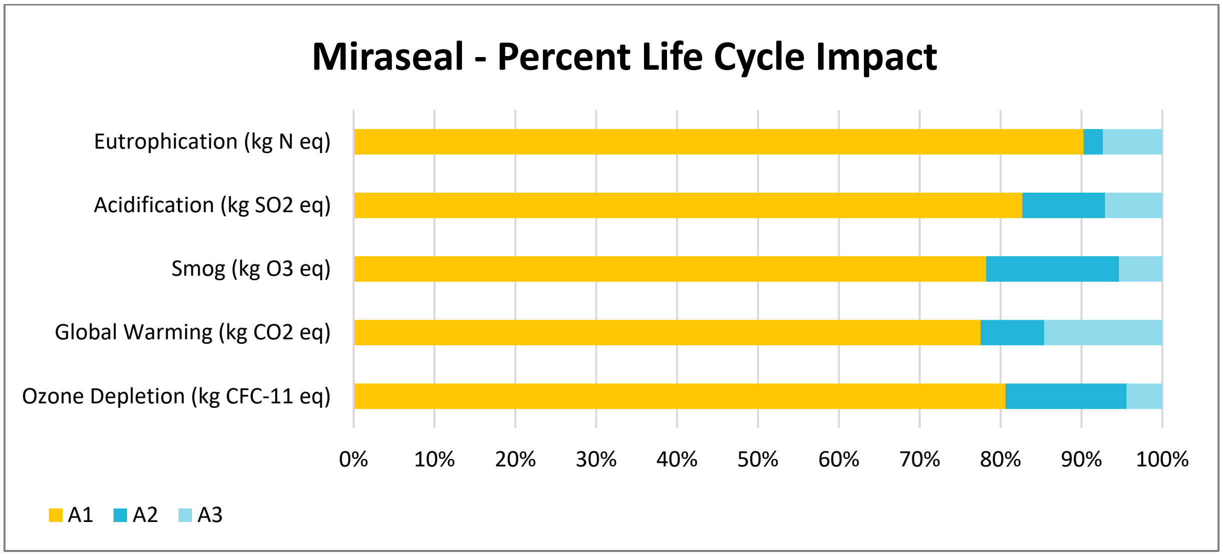


FIGURE 3. CRADLE-TO-GATE LCA PERCENTAGE CONTRIBUTION TO ENVIRONMENTAL IMPACTS – MIRASEAL

The cradle-to-gate LCA showed several intriguing results for interpretation as part of the study. While these are discussed in the Life Cycle Impact Assessment and Sensitivity sections of the report, they are further summarized here.

- The results of the cradle-to-gate LCA showed global warming impacts of 8.36 kgCO_2eq. for Miraseal as per the declared unit.
- The results show that the raw materials of the life cycle contribute most significantly to the environmental impacts, followed by the upstream transportation.
- The highest contributors of global warming potential are the plasticizer, filler, plasticizer, and the truck transport at 24%, 12%, 11% and 8% respectively. The transportation is primarily by truck and the burning of fuel (diesel) contributes to GWP. The extraction of minerals and the fossil fuel burned in production of the raw material contributes towards the GWP.
- Acidification potential was greatly influenced by the plasticizer and filler. The reasons are similar to those mentioned for GWP.
- Eutrophication potential is largely driven by the stabilizer, with other considerable portions coming from the rheology modifier, and plasticizer. Processing of raw materials, transportation and generation of heat and electricity can lead to release of agents that cause eutrophication in the water supply.
- The plasticizer contributes 38% towards ozone depletion, followed by truck transport which contributes 14%. Diesel fuel used in truck is the major contributor contributing towards Ozone Depletion.
- When the bill of materials for each solid reactive product was increased and decreased by 5%, the change in all environmental impacts generally increased and decreased by 5% as well.
- The eGrid Change sensitivity scenario where the location specific grid was replaced by a US national average grid, we could observe the Non – Renewable Energy (Nuclear) has increased for all the products.

Miratite

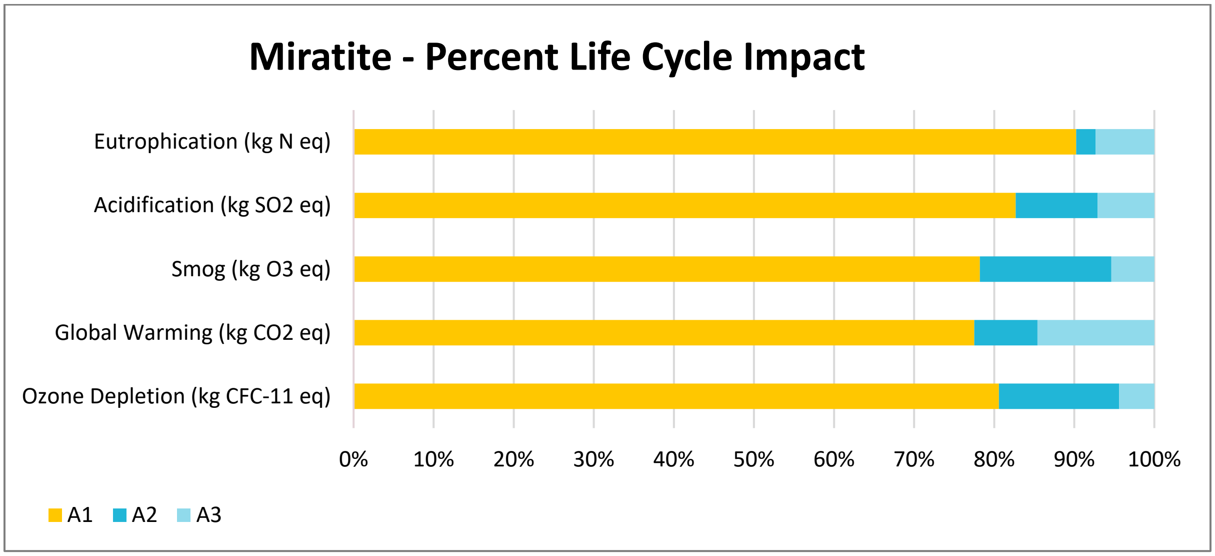


FIGURE 4. CRADLE-TO-GATE LCA PERCENTAGE CONTRIBUTION TO ENVIRONMENTAL IMPACTS – MIRATITE

The cradle-to-gate LCA showed several intriguing results for interpretation as part of the study. While these are discussed in the Life Cycle Impact Assessment and Sensitivity sections of the report, they are further summarized here.

- The results of the cradle-to-gate LCA showed global warming impacts of 8.37 $kgCO_2eq$. for Miratite as per the declared unit.
- The results show that the raw materials of the life cycle contribute most significantly to the environmental impacts, followed by the upstream transportation.
- The highest contributors of global warming potential are the plasticizer, filler, plasticizer, and the truck transport at 24%, 12%, 11% and 8% respectively. The transportation is primarily by truck and the burning of fuel (diesel) contributes to GWP. The extraction of minerals and the fossil fuel burned in production of the raw material contributes towards the GWP.
- The plasticizer contributes 38% towards ozone depletion, followed by truck transport which contributes 14%. Diesel fuel used in truck is the major contributor contributing towards Ozone Depletion.
- When the bill of materials for each solid reactive product was increased and decreased by 5%, the change in all environmental impacts generally increased and decreased by 5% as well.
- The eGrid Change sensitivity scenario where the location specific grid was replaced by a US national average grid, we could observe the Non – Renewable Energy (Nuclear) has increased for all the products.

Limitations of Study

The study limitations are as follows.

- Due to the inherent limitations of LCA methodology, this study should not be used as the sole source of environmental data on the materials and processes modelled. This LCA has been performed according to best practices in modelling and allocation.
- Resource use at the CCW facility were allocated to each product based on the mass of the product as a fraction of the total facility production (i.e., mass-based allocation).
- The Datasets used for representing the natural gas usage at the manufacturing facility and the transport of raw materials by truck within US are modelled in the study using global datasets. In the older ecoinvent version they

were available as part of the US LCI database, which due to errors during software update did not get transferred into the new ecoinvent 3.6 version. A sensitivity scenario was modelled to account for this data gap where the truck transport and the natural gas inputs were varied by 10%. Scenario 5 represents these changes, and the results shows a very small percentage change to overall environmental impacts.

ADDITIONAL INFORMATION

- Environment and Health during Installation or Use: No environmental or health impacts are expected from the 100% solid reactive products during its installation or use.
- Extraordinary Effects: No environmental or health impacts are expected due to extraordinary effects including fire and/or water damage and product destruction.

REFERENCES

[1] ASTM International PCR, "Water- Resistive and Air Barriers".

[2] B. e. a. Weidema, "Overview and Methodology: Data Quality Guidelines for the Ecoinvent Database version 3," Ecoinvent Centre, St. Gallen, 2013.

[3] Plastic Europe. [Online]. Available: https://www.plasticseurope.org/en.

[4] US EPA, "Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) version 2.1, User Guide," Office of Research Development 600/R-12/554, Cincinnati, Ohio, 2012.

[5] International Standards Organization (ISO), *Environmental management - Life Cycle Assessment - Requirements and guidelines,* Geneva: International Standards Organization (ISO), 2006.

[6] ISO, "ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services," 07 2017. [Online]. Available: https://www.iso.org/standard/61694.html.

[7] International Standards Organization (ISO), *ISO 14040 Environmental management - Life Cycle Assessment - Principles and Framework,* Geneva: International Standards Organization (ISO), 2006.

[8] US EPA, "Resource Conservation and Recovery Act (RCRA) laws and regulations," [Online]. Available: https://www.epa.gov/rcra.

[9] Intertek, "Life Cycle Assessment Report : Water-resistive & Air Barriers," 2021.

[10] RIVM, Radbound Nijmegan, Leiden University and Pre Sustainability, "ReCiPe Midpoint Method," 2017. [Online].Available:(http://www.rivm.nl/en/Topics/L/Life_Cycle_Assessment_LCA/Downloads/Documents_ReCiPe2017/Report_ReCiPe_Update_2017). [Accessed February 2020].

[11] The American Center for Life Cycle Assessment, "Guidance to Calculate non-LCIA inventory metrics in accordance with ISO 21930:2017," [Online]. Available: (https://aclca.org/aclca-iso-21930-guidance/). [Accessed February 2020].

[12] Pre, "SimaPro Database Manual - Methods," Pre, 1 02 2019. [Online]. Available: https://simapro.com/wp-content/uploads/2019/02/DatabaseManualMethods.pdf.

[13] Ecoinvent, "The ecoinvent database version 3 (part I): overview and methodology.," 2016. [Online]. Available: http://link.springer.com/10.1007/s11367-016-1087-8. [Accessed November 2020].

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