CROSSFIELD PRODUCTS CORP.

Environmental Product Declaration

Environmental Product Declaration for resinous flooring products produced by Crossfield Products Corp at their Dex-O-Tex facility in Rancho Dominguez, California

ADMINISTRATIVE INFORMATION

International Certified Environmental Product Declaration

Declared Product:	This Environmental Product Declaration (EPD) covers resinous flooring products produced by Crossfield Products Corp. Declared unit: 1 m2 of covered and protected flooring surface for a period of 60 years.
Declaration Owner:	Crossfield Products Corp.
	3000E. Harcourt St.
	Rancho Dominguez, California
	www.dex-o-tex.com
Program Operator:	Labeling Sustainability
	Address, 11670 W Sunset Blvd.
	City, State, Los Angeles, CA
	www.labelingsustainability.com/
Product Category Rule:	ISO 21930:2017 Sustainability in buildings and civil engineering works Core rules for environmental product declarations of construction products and services and PCR for Resinous Floor Coatings.
	PCR Program Operator: NSF International
	PCR review was conducted by: Thomas P. Gloria, Ph. D., Bill Stough, Jack Geibig.
Independent LCA Reviewer and EPD Verifier:	This declaration was independently verified in accordance with ISO 14025:2006.
	Independent verification of the declaration, according to ISO 14025:2006
	Internal □ ; External □ X
	Third Party Verifier
	Geoffrey Guest, Certified 3rd Party Verifier under the Labeling Sustainability Program (www.labelingsustainability.com), CSA Group (www.csaregistries.ca),
Date of Issue:	27 October 2022
Period of Validity:	5 years; valid until 28 October 2027
EPD Number:	c18bf431-c032-442c-9ced-7fcda23f116e

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COMPANY DESCRIPTION

In the early 1930s, a British chemist named Crossfield developed a formulation for mixing natural rubber and cement (which are not compatible by nature) for ocean ships. In 1938, a group of investors purchased Crossfield's company, and Crossfield Products Corp. was born. When natural rubber was allocated during World War II, Crossfield adopted new synthetic rubber technologies and began using polymer-modified concrete on Navy ships and prominent vessels such as the Queen Mary, the SS America, and Queen Elizabeth. To identify this family of products, the name Dex-O-Tex, a contraction of the term "decks of latex," was coined. Although the marine business was the core business for Dex-O-Tex, it expanded after the 1960s to create a full suite of durable flooring and surfacing systems for various industries and applications. Today, Crossfield Products Corp. is the go-to company for flooring and surfacing solutions offering the most diversified product line of construction coatings. They pride themselves on a long history and expertise in developing state-of-the-art surfacing solutions, precise manufacturing capabilities, and product excellence.

STUDY GOAL

The intended application of this life cycle assessment (LCA) is to comply with the procedures for creating a Type III environmental product declaration (EPD) and publish the EPD for public review on the website, www.labelingsustainability.com. This level of study is in accordance with EPD Product Category Rule (PCR) for Resinous flooring published by NSF International, entitled 'Product Category Rule for Environmental Product declarations PCR for Resinous Floor Coatings'; International Standards Organization (ISO) 14025:2006 Environmental labels and declarations, Type III environmental declarations-Principles and procedures; ISO 14044:2006 Environmental management, Life cycle assessment- Requirements and guidelines; and ISO 14040:2006 Environmental management, Life cycle assessment-Principles and framework. The performance of this study and its subsequent publishing is in alignment with the business-to-business (B2B) communication requirements for the environmental assessment of building products. The study does not intend to support comparative assertions and is intended to be disclosed to the public.

This project report was commissioned to differentiate Crossfield Products Corp from their competition for the following reasons: generate an advantage for the organization; offer customers information to help them make informed product decisions; improve the environmental performance of Crossfield Products Corp by continuously measuring, controlling and reducing the environmental impacts of their products; help project facilitators working on Leadership in Energy and Environmental Design (LEED) projects achieve their credit goal; and to strengthen Crossfield Products Corp's license to operate in the community. The intended audience for this LCA report is Crossfield Products Corp's employees, their suppliers, project specifiers of their products, architects, and engineers. The EPD report is also available for policy makers, government officials interested in sustainability, academic professors, and LCA professionals. This LCA report does not include product comparisons from other facilities.

Resinous flooring products are often replaced before they technically fail; therefore, the PCR states the need to define these products by the estimated market service life (MSL) and the estimated technical service life (TSL). An additional consideration is that the products can be installed in a wide range of projects ranging from light commercial to industrial; therefore, the industrial scenario is a conservative estimate. The following are the defined MSL and TSL: 1). Thin-Mil- 5 year MSL, 5 year

TSL 2). Self-Leveling or Broadcast Slurry- 10 year MSL, 15 year TSL mortar/Monolithic/Terrazzo- 20 year MSL, 30 year TSL NSF International (2018).

DESCRIPTION OF PRODUCT AND SCOPE

Three (3) types of floor coatings are covered in this EPD: Epoxy, electrostatic, urethane, and moisture mitigation. Each coating type provides benefits to a commercial project. For example, epoxy systems are specially formulated to protect concrete in harsh conditions, provide an aesthetically pleasing surface, and improve safety for pedestrian traffic. More importantly, epoxy coatings can give flooring the enduring strength it needs to last for years. Electrostatic coatings by Dex-O-Tex provide two polar benefits. Electro CD is conducive to a spark-free work environment, and SD is electrostatic discharge for ESD-sensitive environments. Electrostatic floor coatings are used to protect the integrity of the flooring system and prevent hazards in the workplace. Conductive or non-conductive coatings can be used in pharmaceutical manufacturing plants, munitions and fine particle production plants, laser and optical facilities, hospitals and healthcare centers, electronics manufacturing, computer data centers, and server rooms. Next, polyurethane floor coatings perform well in commercial and industrial settings, delivering layers of protection over a flooring system while keeping it attractive and elegant. And lastly, VaporControl Primers are fluid-applied, epoxy moisture mitigation systems ideal for use under most non-breathing flooring surfaces, including epoxies, urethanes, rubber, adhesives, vinyl tiles, and more. The Dex-O-Tex Vapor Control 1P exceeds the Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings, designated ASTM F3010 – 13. It is designed for vapor suppression on above- and below-grade concrete and is placed on the negative side of the concrete substrate (between the concrete slab and the surfacing system).

The materials covered in this EPD do not contain substances of very high concern. The manufacturer has published a complete material ingredient inventory for the products via the HPD Collaborative. CAS numbers have not been published as part of this EPD; ingredients are listed by their common name or by the unit process used. Dex-O-Tex HPDs, by product, can be viewed at which identifies most CAS numbers for each ingredient and it's percent of composition to 100 ppm: https://hpdrepository.hpd-collaborative.org/Pages/Results.aspx#Default=%7B%22k%22%3A%22Dex%22%2C%22r%22%3A%5B%7B%22n%22%3A%22ManufacturerName%22%2C%22t%22%3A%5B%22%5C%22%C7%82%C7%8243726f73736669656c642050726f6475637473204 36f72702e%5C%22%22%5D%2C%22o%22%3A%22and%22%2C%22k%22%3Afalse%2C%22m%22%3Anull%7D%5D%7D

To determine the proper market and technical lifetimes, the PCR classifies the product by if it is a thin-mil, self-leveling or broadcast slurry, or mortar / monolithic mortar/terrazzo. Thin-Mil is a resin-rich coating system typically comprised of a primer, body coat(s), and topcoat installed less than 40 mils. Self-leveling or broadcast slurries are a high-build coating system using the addition of fillers and broadcast aggregates (quartz, flake, silica sand) installed in multiple layers to build thickness, typically from 40 to 180 mils. Mortars, monolithic mortars, and terrazzo are composite materials of marble, silica sand, granite, glass, or other suitable aggregates in a binder matrix of Portland cement mortar, epoxy, polyester resin, or vinyl ester resin. They are typically installed to build thicknesses greater than 180 mils.

Since resinous flooring products may be replaced before they technically fail, the reference service life of the products, as dictated by the PCR, is both an estimated market service life (MSL) and an estimated technical service life (TSL). The values used for both MSL and TSL are in the chart below. The number of replacements needed was calculated by dividing the building service Life (60 years) by the service life (MSL or TSL) and then subtracting the initial application.

Table 1: **The MSL and TSL of each product covered in this EPD based on the product's classifiation.**

...1	Product Classification	Environment	Market Service Life (MSL)	Technical Service Life
Décor-Flor	Thin-Mil/ Self-Leveling	Commercial	10 years	15 years
Posi-Tred O	Self Leveling	Commercial	20 years	30 years
Posi-Tred SL	Thin-Mil	Commercial	10 years	15 years
Posi-Tred CR	Thin-Mil	Commercial	10 years	15 years
VaporControl 1P	Thin-Mil	Commercial	10 years	15 years
Vapor Control FC	Thin-Mil	Commercial	10 years	15 years
Terracolor	Mortar	Commercial	30 years	60 years
Cheminert K	Mortar	Industrial	20 years	30 years
Cheminert HD	Mortar	Industrial	20 years	30 years
Cove Base Gel	Broadcast Slurry	Commercial	20 years	30 years
Electro Flor ESD	Thin-Mil	Commercial	10 years	15 years
Electro Flor CD	Thin-Mil	Commercial	10 years	15 years
ElastaFlake RFS	Broadcast Slurry	Commercial	20 years	30 years
Quik-Glaze	Thin-Mil	Commercial	10 years	15 years
Aero Flor	Thin-Mil	Commercial	10 years	15 years
HPT	Thin-Mil	Commercial	10 years	15 years

Expected lifetimes are based on the PCR given different application settings (commercial or industrial). For example, resinous floor coatings designed specifically for industrial settings rather than commercial environments shall have a lower estimated and technical service life. On the other hand, if the product type is applied indiscriminately between industrial and commercial settings, it

shall default to conservative industrial service lifetime values. The table below outlines the primary market for each product.

Table 2: **Number of repaints for each product in this EPD based on its application setting.**

...1	Repaints- MSL	Repaints- TSL
Décor-Flor	5	3
Posi-Tred O	2	1
Posi-Tred SL	5	3
Posi-Tred CR	5	3
VaporControl 1P	5	3
Vapor Control FC	5	3
Terracolor	1	0
Cheminert K	2	1
Cheminert HD	2	1
Cove Base Gel	2	1
Electro Flor ESD	5	3
Electro Flor CD	5	3
ElastaFlake RFS	2	1
Quik-Glaze	5	3
Aero Flor	5	3
HPT	5	3

This LCA assumes the impacts from products manufactured in accordance with the standards outlined in this report. This LCA is a cradle-to-grave study.

READY MIX CONCRETE DESIGN SUMMARY

The following tables provide a list of resinous flooring products considered in this EPD along with key performance parameters.

Thin-Mil

Table 3: **Declared products with Thin-Mil considered in this environmental product declaration.**

Prod #	Unique name/ID	Short description	Product type	Unit	Density, dry kg/Unit	Density, wet kg/Unit	Bio-carbon content, kgC/FU dry basis	productGroup	Thickness(mil)
1	Décor-Flor (MSL)	Decor-Flor is a two component, 100% solids, epoxy resin that can be applied as a Primer, Coating, High-Build, Slurry or Mortar in most Dex-O-Tex composite floors.	Resinous flooring	m2	0.82	8.18E-01	0.00	Thin-Mil	10.00
3	Posi-Tred SL (MSL)	Posi-Tred SL is a high solids two component pigmented epoxy body coat	Resinous flooring	m2	1.37	1.37E+00	0.00	Thin-Mil	10.00
4	Posi-Tred CR (MSL)	Posi-Tred CR is a chemical, heat and skid resistant novolac epoxy coating for application over primed concrete or as a grout coat and topcoat for other Dex-O-Tex systems.	Resinous flooring	m2	1.01	1.01E+00	0.00	Thin-Mil	7.00
5	VaporControl 1P (MSL)	VaporControl 1p is a uniquely modified fluid-applied epoxy moisture mitigation system.	Resinous flooring	m2	1.30	1.30E+00	0.00	Thin-Mil	16.00
6	Vapor Control FC (MSL)	Vapor Control FC is a uniquely modified fluid-applied epoxy moisture mitigation system with a faster cure time and shorter recoat window.	Resinous flooring	m2	1.56	1.56E+00	0.00	Thin-Mil	16.00
11	Electro Flor ESD (MSL)	Electro Flor ESD is a fluid applied, water based, monolithic flooring system, It is electrically active within resistance range of one million (1E6) to one billion (1E9) ohms, as tested in accordance with ESD	Resinous flooring	m2	0.73	7.27E-01	0.00	Thin-Mil	10.00

		Association Standard 7.1.							
12	Electro Flor CD (MSL)	Electro Flor CD is a fluid applied, water based, monolithic flooring system. It is electrically active within resistance range of Conductivity is within range of 250,000 (250 E4) to one million (1E6) ohms, as tested in accordance with ESD Association Standard 7.1.	Resinous flooring	m2	0.74	7.37E-01	0.00	Thin-Mil	10.00
14	Quik-Glaze (MSL)	Quik-Glaze is a state of the art, high solids, Low Odor, and UV stable aliphatic polyaspartic topcoat.	Resinous flooring	m2	0.68	6.77E-01	0.00	Thin-Mil	8.00
15	Aero Flor (MSL)	Aero-Flor 100 is an aliphatic polyester urethane formula, which is ultraviolet light stable, and provides high chemical, abrasion, and stain resistance.	Resinous flooring	m2	0.23	2.32E-01	0.00	Thin-Mil	4.00
16	HPT (MSL)	HPT is a uniquely versatile High-Performance Polyurethane topcoat using the latest technology of polyurethane resin systems.	Resinous flooring	m2	0.08	8.08E-02	0.00	Thin-Mil	3.00
17	Décor-Flor (TSL)	Decor-Flor is a two component, 100% solids, epoxy resin that can be applied as a Primer, Coating, High-Build, Slurry or Mortar in most Dex-O-Tex composite floors.	Resinous flooring	m2	0.82	8.18E-01	0.00	Thin-Mil	10.00
19	Posi-Tred SL (TSL)	Posi-Tred SL is a high solids two component pigmented epoxy body coat	Resinous flooring	m2	1.37	1.37E+00	0.00	Thin-Mil	10.00
20	Posi-Tred CR (TSL)	Posi-Tred CR is a chemical, heat and skid resistant novolac	Resinous flooring	m2	1.01	1.01E+00	0.00	Thin-Mil	7.00

		epoxy coating for application over primed concrete or as a grout coat and topcoat for other Dex-O-Tex systems.							
21	VaporControl 1P (TSL)	VaporControl 1p is a uniquely modified fluid-applied epoxy moisture mitigation system.	Resinous flooring	m2	1.30	1.30E+00	0.00	Thin-Mil	16.00
22	Vapor Control FC (TSL)	Vapor Control FC is a uniquely modified fluid-applied epoxy moisture mitigation system with a faster cure time and shorter recoat window.	Resinous flooring	m2	1.56	1.56E+00	0.00	Thin-Mil	16.00
27	Electro Flor ESD (TSL)	Electro Flor ESD is a fluid applied, water based, monolithic flooring system, It is electrically active within resistance range of one million (1E6) to one billion (1E9) ohms, as tested in accordance with ESD Association Standard 7.1.	Resinous flooring	m2	0.73	7.27E-01	0.00	Thin-Mil	10.00
28	Electro Flor CD (TSL)	Electro Flor CD is a fluid applied, water based, monolithic flooring system. It is electrically active within resistance range of Conductivity is within range of 250,000 (250 E4) to one million (1E6) ohms, as tested in accordance with ESD Association Standard 7.1.	Resinous flooring	m2	0.74	7.37E-01	0.00	Thin-Mil	10.00
30	Quik-Glaze (TSL)	Quik-Glaze is a state of the art, high solids, Low Odor, and UV stable aliphatic polyaspartic topcoat.	Resinous flooring	m2	0.68	6.77E-01	0.00	Thin-Mil	8.00
31	Aero Flor (TSL)	Aero-Flor 100 is an aliphatic polyester urethane formula, which is ultraviolet	Resinous flooring	m2	0.23	2.32E-01	0.00	Thin-Mil	4.00

		light stable, and provides high chemical, abrasion, and stain resistance.							
32	HPT (TSL)	HPT is a uniquely versatile High-Performance Polyurethane topcoat using the latest technology of polyurethane resin systems.	Resinous flooring	m2	0.08	8.08E-02	0.00	Thin-Mil	3.00

Self Leveling

Table 4: **Declared products with Self Leveling considered in this environmental product declaration.**

Prod #	Unique name/ID	Short description	Product type	Unit	Density, dry kg/Unit	Density, wet kg/Unit	Bio-carbon content, kgC/FU dry basis	productGroup	Thickness(mil)
2	Posi-Tred O (MSL)	Posi-Tred O is a 100% solids two component, state of the art, pigmented epoxy coating.	Resinous flooring	m2	0.85	8.50E-01	0.00	Self Leveling	10.00
18	Posi-Tred O (TSL)	Posi-Tred O is a 100% solids two component, state of the art, pigmented epoxy coating.	Resinous flooring	m2	0.85	8.50E-01	0.00	Self Leveling	10.00

Mortar

Table 5: **Declared products with Mortar considered in this environmental product declaration.**

Prod #	Unique name/ID	Short description	Product type	Unit	Density, dry kg/Unit	Density, wet kg/Unit	Bio-carbon content, kgC/FU dry basis	productGroup	Thickness(mil)
7	Terracolor (MSL)	Terracolor is a thin-section, trowel applied, decorative flooring system, designed to produce a seamless floor and cove base.	Resinous flooring	m2	33.74	3.37E+01	0.00	Mortar	182

8	Cheminert K (MSL)	Cheminert K is a troweled seamless epoxy industrial flooring system comprised of a specially formulated two-component epoxy resin, specialty engineered aggregates, and epoxy top coat	Resinous flooring	m2	27.35	2.74E+01	0.00	Mortar	182
9	Cheminert HD (MSL)	Cheminert HD Cheminert HD is a troweled slurry epoxy industrial flooring system comprised of a specially formulated two-component epoxy resin, specialty engineered aggregates, and epoxy top coat.	Resinous flooring	m2	9.21	9.21E+00	0.00	Mortar	182
23	Terracolor (TSL)	Terracolor is a thin-section, trowel applied, decorative flooring system, designed to produce a seamless floor and cove base.	Resinous flooring	m2	33.74	3.37E+01	0.00	Mortar	182
24	Cheminert K (TSL)	Cheminert K is a troweled seamless epoxy industrial flooring system comprised of a specially formulated two-component epoxy resin, specialty engineered aggregates, and epoxy top coat	Resinous flooring	m2	27.35	2.74E+01	0.00	Mortar	182
25	Cheminert HD (TSL)	Cheminert HD Cheminert HD is a troweled slurry epoxy industrial flooring system comprised of a specially formulated two-component epoxy resin, specialty engineered aggregates, and epoxy top coat.	Resinous flooring	m2	9.21	9.21E+00	0.00	Mortar	182

Broadcast Slurry

Table 6: **Declared products with Broadcast Slurry considered in this environmental product declaration.**

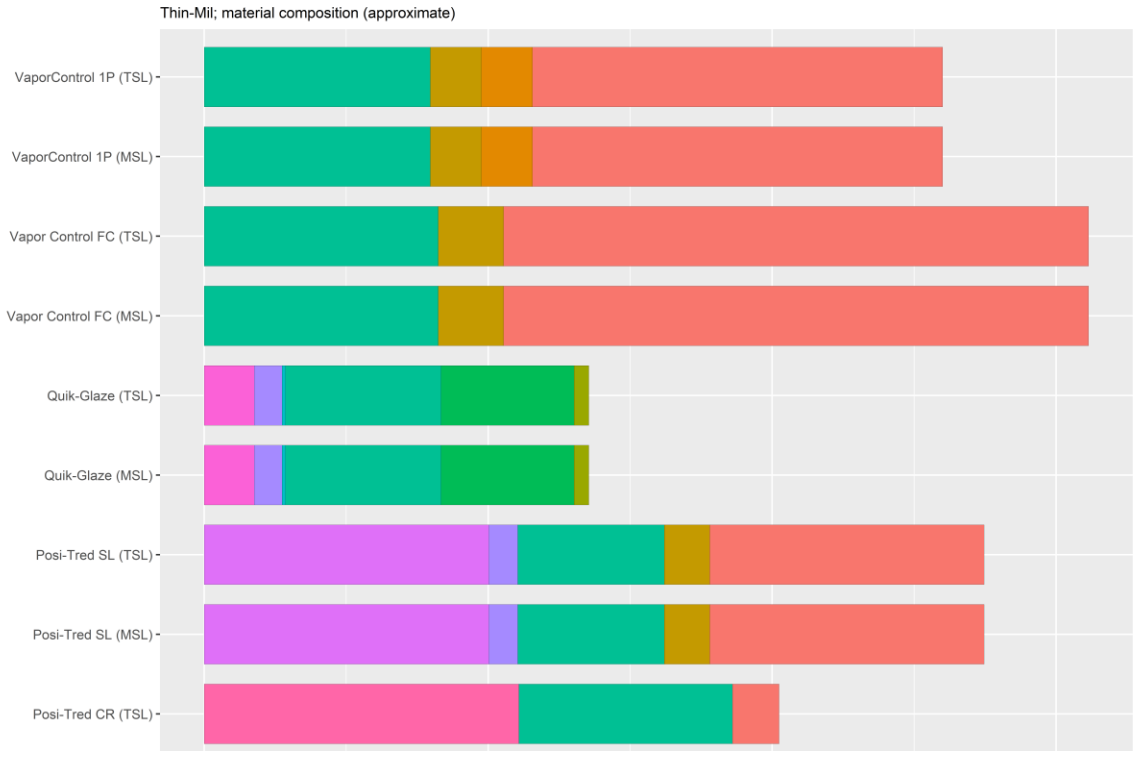
Prod #	Unique name/ID	Short description	Product type	Unit	Density, dry kg/Unit	Density, wet kg/Unit	Bio-carbon content, kgC/FU dry basis	productGroup	Thickness(mil)
10	Cove Base Gel (MSL)	Cove Base Gel is a three-component kit with a 2-part sag resistant thixotropic epoxy gel, which is designed to be mixed with a separate aggregate. Cove Base Gel is designed as a resin binder for vertical mortar applications. When mixed with selected aggregates, its thixotropic viscosity produces a mortar compound suitable to install cove bases, wainscots and other vertical applications	Resinous flooring	m2	8.25	8.25E+00	0.00	Broadcast Slurry	Varies
13	ElastaFlake RFS (MSL)	ElastaFlake RFS is a fluid applied composite flooring system including a primer, elastomeric polyurethane cushion coat, decorative color chips, and high performance stain resistant Quik-Glaze polyaspartic top coats.	Resinous flooring	m2	4.32	4.32E+00	0.00	Broadcast Slurry	80.00
26	Cove Base Gel (TSL)	Cove Base Gel is a three-component kit with a 2-part sag resistant thixotropic epoxy gel, which is designed to be mixed with a separate aggregate. Cove Base Gel is designed as a resin binder for vertical mortar applications. When mixed with	Resinous flooring	m2	8.25	8.25E+00	0.00	Broadcast Slurry	Varies

		selected aggregates, its thixotropic viscosity produces a mortar compound suitable to install cove bases, wainscots and other vertical applications							
29	ElastaFlake RFS (TSL)	ElastaFlake RFS is a fluid applied composite flooring system including a primer, elastomeric polyurethane cushion coat, decorative color chips, and high performance stain resistant Quik-Glaze polyaspartic top coats.	Resinous flooring	m2	4.32	4.32E+00	0.00	Broadcast Slurry	80.00

RESINOUS FLOORING DESIGN COMPOSITION

The following figures provide mass breakdown (kg per functional unit) of the material composition of each resinous flooring design considered.

Thin-Mil



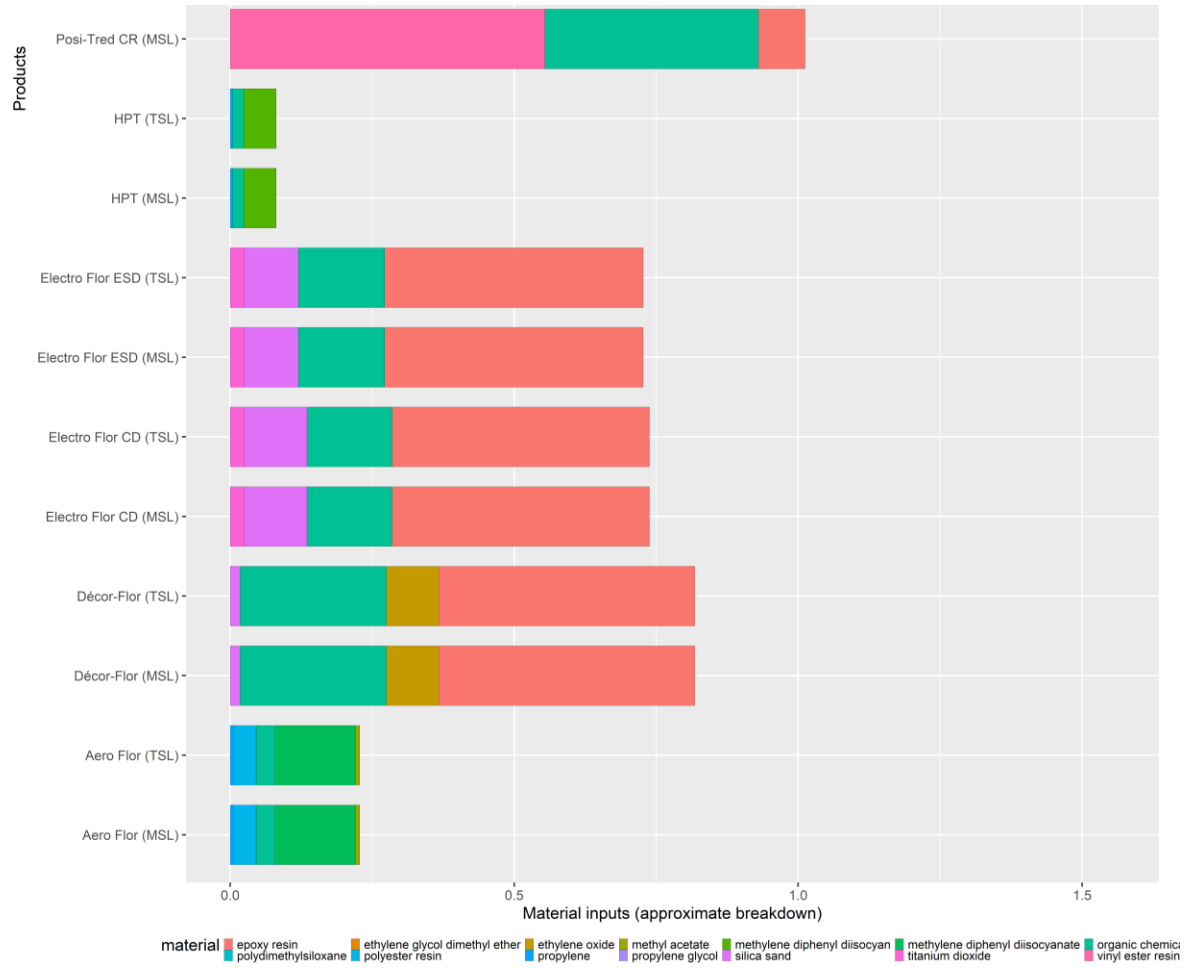


Figure 1: **Material composition - Thin-Mil per 1 m2 of covered and protected flooring surface for a period of 60 years.**

Self-Leveling

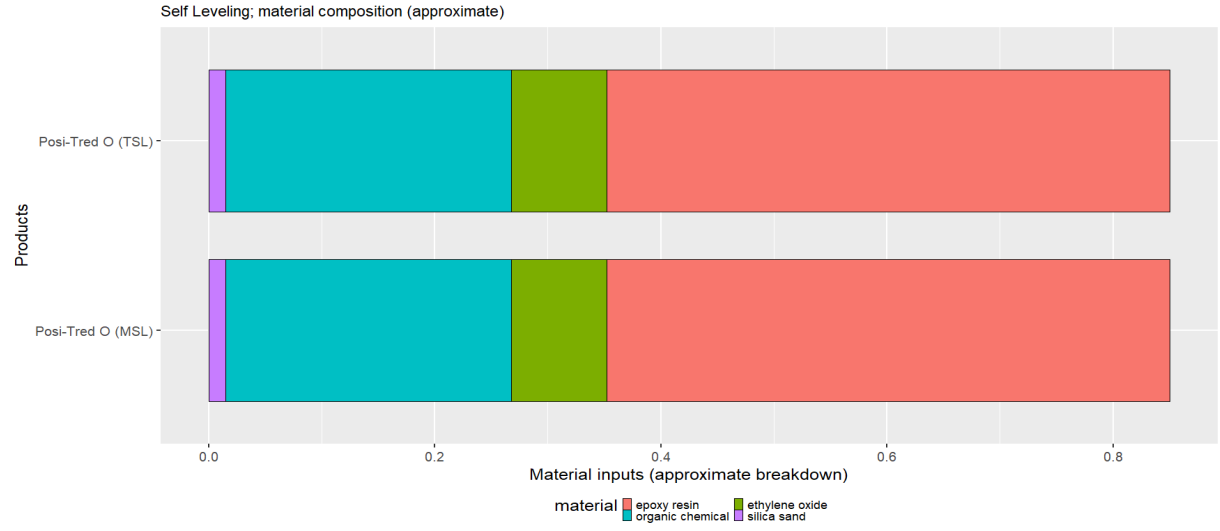


Figure 2: **Material composition - Self Leveling per 1 m2 of covered and protected flooring surface for a period of 60 years.**

Mortar

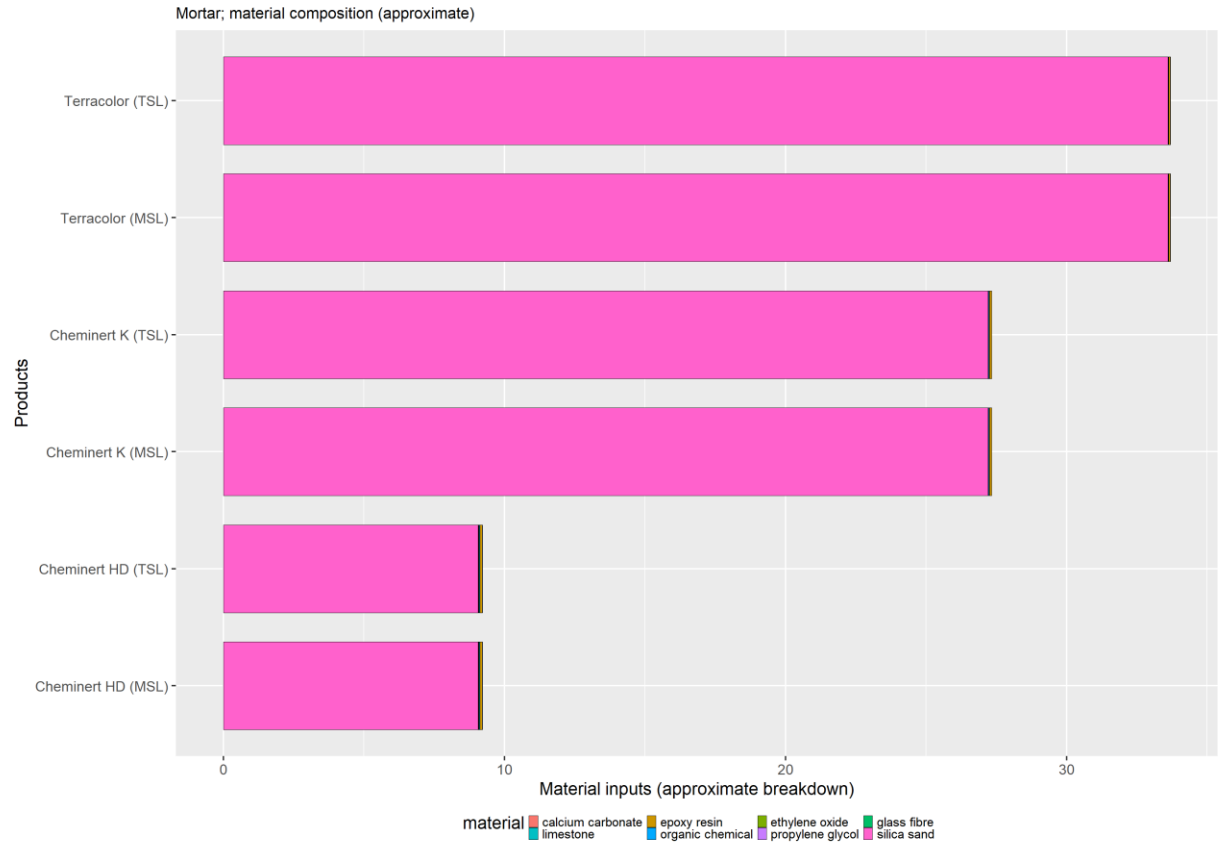


Figure 3: **Material composition - Mortar per 1 m2 of covered and protected flooring surface for a period of 60 years.**

Broadcast Slurry

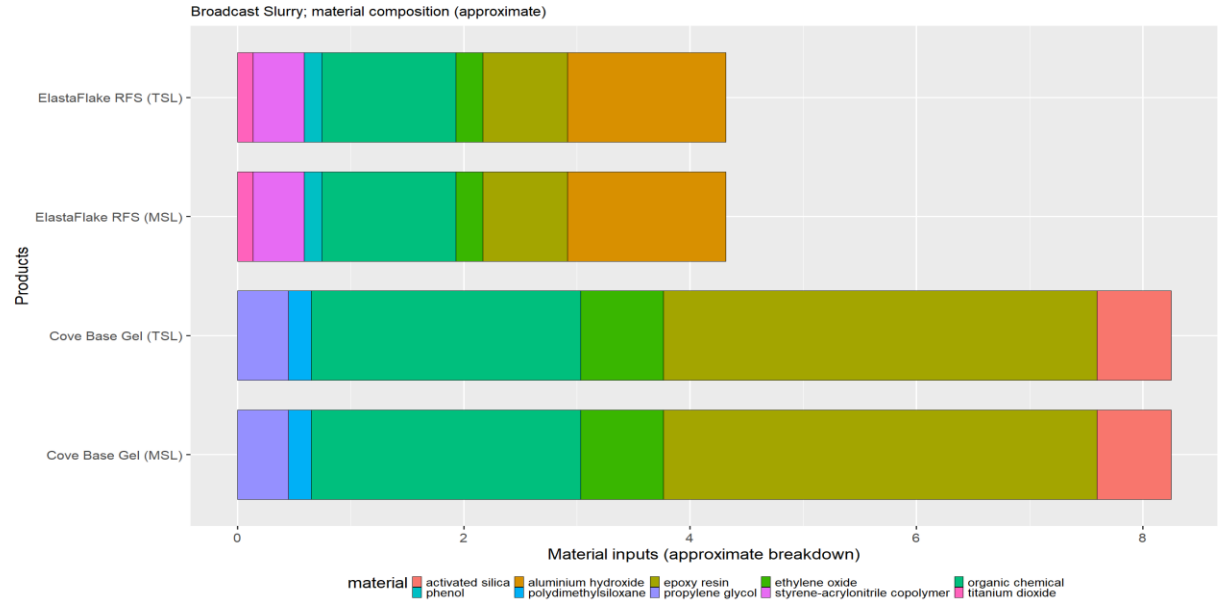


Figure 4: **Material composition - Broadcast Slurry per 1 m2 of covered and protected flooring surface for a period of 60 years.**

A1 RAW MATERIAL RECYCLED CONTENT AND MATERIAL LOSSES –

The following table provides a list of the raw material inputs (module A1) across all products considered, their recyclability content and assumed material losses.

Table 7: **Module A1 raw material inputs, the recyclability content and assumed material losses (dry basis)**

product.name	mix.category	primary.content	post.industrial. content	post.consumer. content	material. losses
epoxy resin production, liquid	epoxy resin, liquid	100%	0%	0%	2%
ethylene oxide production	ethylene oxide	100%	0%	0%	2%
silica sand production	silica sand	100%	0%	0%	22%
market for chemical, organic	chemical, organic	100%	0%	0%	2%
epoxy resin production, liquid	epoxy resin, liquid	100%	0%	0%	2%
silica sand	silica sand	100%	0%	0%	2%
propylene glycol production, liquid	propylene glycol, liquid	100%	0%	0%	2%
epoxy resin production, liquid	epoxy resin, liquid	100%	0%	0%	2%
market for bisphenol A epoxy based vinyl ester resin	bisphenol A epoxy based vinyl ester resin	100%	0%	0%	2%
market for chemical, organic	chemical, organic	100%	0%	0%	2%
ethylene glycol dimethyl ether production	ethylene glycol dimethyl ether	100%	0%	0%	2%
REC2800	chemical, organic	100%	0%	0%	2%
market for chemical, organic	chemical, organic	100%	0%	0%	2%
glass fibre production	glass fibre	100%	0%	0%	2%
market for calcium	calcium carbonate, precipitated	100%	0%	0%	2%

carbonate, precipitated					
market for chemical, organic	chemical, organic	100%	0%	0.00%	2%
propylene glycol production, liquid	propylene glycol, liquid	100%	0%	0%	2%
market for activated silica	activated silica	100%	0%	0%	2%
epoxy resin production, liquid	epoxy resin, liquid	100%	0%	0%	2%
polydimethyl siloxane	polydimethylsiloxane	100%	0%	0%	2%
market for titanium dioxide	titanium dioxide	100%	0%	0%	2%
RT0033	tap water	100%	0%	0%	2%
epoxy resin production, liquid	epoxy resin, liquid	100%	0%	0%	2%
silica sand production	silica sand	100%	0%	0%	2%
market for chemical, organic	chemical, organic	100%	0%	0%	2%
market for aluminium hydroxide	aluminium hydroxide	100%	0%	0%	2%
market for titanium dioxide	titanium dioxide	100%	0%	0%	2%
market for styrene-acrylonitrile copolymer	styrene-acrylonitrile copolymer	100%	0%	0%	2%
organic chemical	chemical, organic	100%	0%	0%	2%
market for phenol production	phenol	100%	0%	0%	2%
market for phenol production	phenol	100%	0%	0%	2%
polydimethyl siloxane	polydimethylsiloxane	100%	0%	0%	2%
organic chemical	chemical, organic	100%	0%	0%	2%

Market for titanium dioxide	titanium dioxide	100%	0%	0%	2%
methyl acetate to generic market for solvent, organic	methyl acetate	100%	0%	0%	2%
organic chemical	chemical, organic	100%	0%	0%	2%
organic chemical	chemical, organic	100%	0%	0%	2%
market for methylene diphenyl diisocyan	methylene diphenyl diisocyanate	100%	0%	0%	2%
market for polydimethyl siloxane	polydimethylsiloxane	100%	0%	0%	2%
organic	chemical, organic	100%	0%	0%	2%
market for methylene diphenyl diisocyanate	methylene diphenyl diisocyanate	100%	0%	0%	2%
market for polyester resin, unsaturated	polyester resin, unsaturated	100%	0%	0%	2%
propylene production	propylene	100%	0%	0%	2%
market for methylene diphenyl diisocyanate	methylene diphenyl diisocyanate	100%	0%	0%	2%
organic chemical	chemical, organic	100%	0%	0%	2%
RECINCLV	chemical, organic	100%	0%	0%	2%
RT0030	propylene glycol, liquid	100%	0%	0%	2%
limestone	limestone, crushed, for mill	100%	0%	0%	2%
Propane burned	propane, burned in building machine	100%	0%	0%	2%
HDPE for Pail	polyethylene, high density, granulate	100%	0%	0%	2%
Tin Processing	tin	100%	0%	0%	0
Steel Processing	metal working, average for steel	100%	0%	0%	0%

	product manufacturing				
HDPE Processing	extrusion of plastic sheets and thermoforming, inline	100%	0%	0%	0%
Pallet	EUR-flat pallet	75%	0%	25%	0%
Plastic wrap	packaging film, low density polyethylene	100%	0%	0%	1%

SYSTEM BOUNDARIES

The following figure depicts the cradle-to-gate system boundary considered in this study:

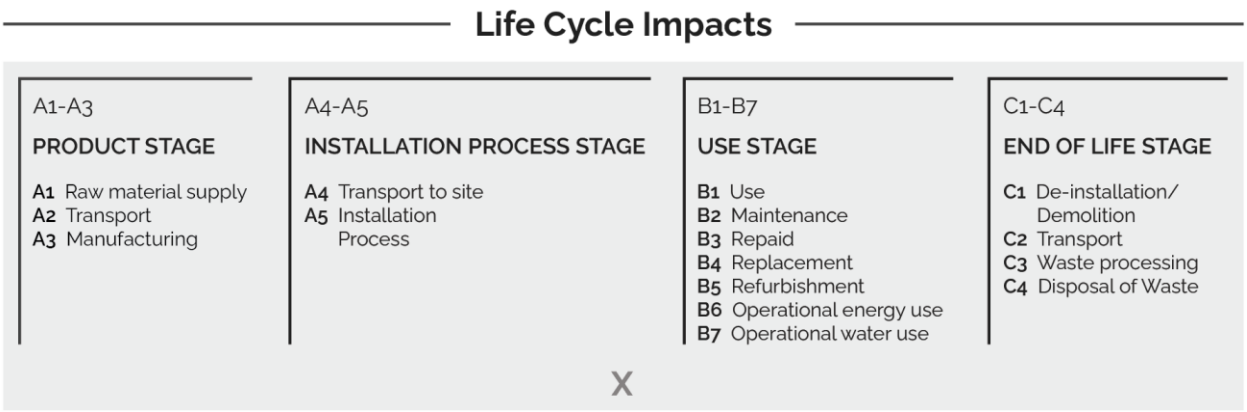


Figure 5: **General life cycle phases for consideration in a construction works system**

This is a Cradle-to-gate life cycle assessment and the following life cycle stages are included in the study:

- A1: Raw material supply (upstream processes) - Extraction, handling, and processing of the materials used in manufacturing the declared products in this LCA.
- A2: Transportation - Transportation of A1 materials from the supplier to the "gate" of the manufacturing facility (i.e. A3).
- A3: Manufacturing (core processes)- The energy and other utility inputs used to store, move, and manufacturer the declared products and to operate the facility.
- A4: Product plant gate-to-site of use logistics
- A5: Product at-site installation requirements
- B: Product use phase requirements and direct emissions (if applicable)
- C: Product end-of-life requirements

As according to the PCR, the following figure illustrates the general activities and input requirements for producing ready mix concrete products and is not necessarily exhaustive.

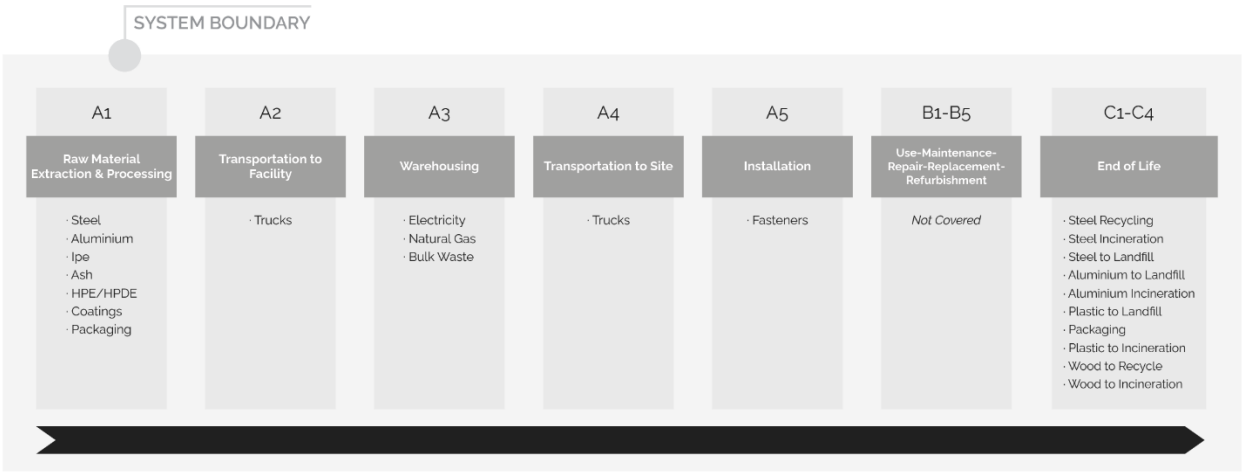


Figure 6: **General system inputs considered in the product system and categorized by modules in scope**

In addition, as according to the relevant PCR, the following requirements are excluded from this study:

- Production, manufacture and construction of A3 building/capital goods and infrastructure;
- Production and manufacture of steel production equipment, steel delivery vehicles, earth-moving equipment, and laboratory equipment;
- Personnel-related activities (travel, furniture, office supplies);
- Energy use related to company management and sales activities.

For this LCA the manufacturing plant, owned and operated by Crossfield Products Corp, is located at their Dex-O-Tex-CA facility in California. All operating data is formulated using the actual data from Crossfield Products Corp's plant at the above location, including water, energy consumption and waste generation. All inputs for this system boundary are calculated for the plant.

This life cycle inventory was organized in a spreadsheet and was then input into an RStudio environment where pre-calculated LCIA results for relevant products/activies stemming from the ecoinvent ecoinvent v3.8 database and a local EPD database in combination with primary data from Crossfield Products Corp were utilized. Explanations of the contribution of each data source to this study are outlined in the section 'Data Sources and Quality'. Further LCI details for each declared product are provided in the sections 'Detailed LCI tables' and 'Transport tables' of the detailed LCA report. A parameter uncertainty analysis was also performed where key statistical results (e.g. min/mean/max etc.) are provided in the detailed LCA report.

No known flows are deliberately excluded from this EPD.

CUT-OFF CRITERIA

ISO 14044:2006 and the focus PCR requires the LCA model to contain a minimum of 95% of the total inflows (mass and energy) to the upstream and core modules be included in this study. The cut-off criteria were applied to all other processes unless otherwise noted above as follows. A 1% cut-off is considered for all renewable and non-renewable primary energy consumption and the total mass of inputs within a unit process where the total of the neglected inputs does not exceed 5%.

DATA SOURCES AND DATA QUALITY ASSESSMENT

No recovered on-site energy occurs at this facility.

No re-used or recycled material for utilization on-site or off-site was reported at this facility.

The following statements explain how the above facility requirements/generation were derived:

Raw material transport: Raw material transport is based on the actual distance from the manufacturer. All distances are calculated based on Crossfield primary data. Materials arrive at the Crossfield facility by tanker truck or freight truck. Only one product originates at a manufacturer outside the United States in England and travels by truck/boat/truck.

The PCR states, "Instances will likely occur where products are made at multiple manufacturing locations or travel to different distribution or retail centers. For situations such as this, a weighted average of production volume at each facility and/or site shall be utilized for calculation purposes." but this EPD only covers exact calculations related to the Dex-O-Tex facility. However, the PCR allows for an average, the industry norm for EPDs in leaning towards facility-specific EPD. Since an EPD is valid for five years, the decision was made to make all Dex-O-Tex EPDs facility specific; therefore, all transportation requirements are for the California facility only.

Electricity: Primary electricity consumption was calculated for the Crossfield/Dex-O-Tex facility from electricity bills. Crossfield's fiscal year starts in June; twelve consecutive months were used, from June 2021 through May 2022. Crossfield's utility providers' monthly usage was in kilowatt-hours (kWh), so no conversions were performed. To calculate the amount of utility allotted to each product, the total used was multiplied by the percentage of sales by dollar amount and then divided by the number of each product manufactured.

Process/space heating: Natural gas usage was calculated by using Dex-O-Tex's utility bills for the fiscal year from June 2021 to May 2022.

Fuel required for machinery: On-site machinery for moving materials uses propane and was recorded in this study under Module A3.The conversion factor used for m3 to MJ to represent the burning of the natural gas was 1 m3 of natural gas= 38.3 MJ of energy.

Waste generation: All Waste was calculated using primary information from Dex-O-Tex utility bills. Transportation defaults were used because the driver's route and ultimate final destination are

unknown. Therefore, the waste hauler could not confirm the exact mileage. The types of Waste included are as follows 1). Recycling: cardboard boxes, paper bags, plastic bagging, or pails; 2). Bulk Waste: trash bins from standard Waste streams from the warehouse, food, drinks, single-use plastics, and samples such as 2" x 4" tiles with cured material on top; 3). Hazardous/Regulated Waste: expired resins and products in pails/drums/ cans. Regulated waste is picked up on an "as needed" basis.

Recovered energy: No on-site energy is recovered on site.

Recycled/reused material/components: According to the Advancing Sustainable Materials Management: 2018 Fact Sheet (US EPA), only 4% of the total plastic packaging is recycled in the USA. Similarly, 4.47% of Plastic waste from pallets were assumed to be recycled off-site at the end of their service life. These numbers are in alignment with the PCR for Resinous Floor Coverings. The PCR also states the transportation distance to the disposal point is 11 km plus the default value in the WARRM Model which is 20 miles (32 km). A total value of 43 km was used per the PCR.

Module A1 material losses: Default material losses were used unless otherwise specified in the PCR. For instance, per the PCR, "It shall be assumed that there is a loss of 2% of the wet mass of the coating remains unused and is properly disposed as solid waste. This value was determined via industry consensus during the PCR development process and represents a conservative estimate."

Direct A3 emissions accounting: Direct emissions were modeled with best available ecoinvent processes (see LCI list).

A4 Product transport requirements: The average customer or project was calculated based on Dex-O-Tex records for shipping. On average, the customer for the California factory was within 100 miles or (160.9 km) from the factory. In addition, 25% of the orders were picked up by the project installer and not shipped. Dex-O-Tex sells direct to installers and therefore no distribution was calculated as part of this module per the PCR guidelines.

A5 product installation: In accordance with the requirements of ISO 21930:2017, the impact from the activities normally considered in Module A1-A3 (production stage) and in Module A4 (transport to site) for the mass of product wasted during application are included in the Module A5 and not Modules A1 to A4. Additionally, waste processing of the packaging system shall also be accounted in module A5.

B product use phase: Maintenance is thoroughly explained in the PCR for Resinous Floor Coverings. Per the PCR, "It shall be assumed that a cleaning event (1 gallon of mop water with an added ½ cup of cleaning solution) can accommodate 100 m2. Therefore, to satisfy the 60-year time frame functional unit, a total of 21,840 cleaning events will take place, corresponding to 218.4 events for the smaller surface area considered by the functional unit (1 m2 vs. 100 m2). Another 1.6 cleaning events shall also be added to account for any spot cleaning events that may occur. The total impact of these 220 cleaning events shall be reported." This means that 886 liters of tap water are used per m2 of the installed floor.

The process "market for cleaning consumables, without water, in 13.6% solution state, Global" was used to represent a cleaning solution for the floors in use. This is the best available Ecoinvent process. The formula assumes a product density of 100 fl oz. per 2.5 L cleaner. The market process was used due to the level of uncertainty as to where the origin of the cleaner is and how many levels of warehousing and distribution are present.

C product end-of-life: Per the PCR, the following guidelines were followed. "In the United States, the 2012 EPA Waste Reduction Model (WARM model) gives an average transport end of life distance as 32 km. This value shall be used for manufacturing facilities located in the US when primary data or other representative data are not available, and waste transports are not included in the secondary dataset."

The following tables depict a list of assumed life cycle inventory utilized in the LCA modeling to generate the impact results across the life cycle modules in scope. An assessment of the quality of each LCI activities utilized from various sources is also provided.

Table 8: **LCI inputs assumed for module A1 (i.e. raw material supply)**

Input	LCI.activity	Data.source	Geo	Year	Technology	Time	Geography	Reliability	Completeness
methyl acetate to generic market for solvent, organic	oxidation of butane/methyl acetate/RoW/kg	ecoinvent v3.8	Texas	v3.8 in 2021	2	3	2	3	3
Pallet	market for EUR-flat pallet/EUR-flat pallet/RoW/unit	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
market for polyester resin, unsaturated	polyester resin production, unsaturated/polyester resin, unsaturated/RoW/kg	ecoinvent v3.8	Pennsylvania	v3.8 in 2021	2	3	2	3	3
propylene production	propylene production/propylene /RoW/kg	ecoinvent v3.8	Pennsylvania	v3.8 in 2021	2	3	2	3	3
polydimethylsiloxane	polydimethylsiloxane production/polydimethylsiloxane/GLO/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3
market for aluminium hydroxide	aluminium hydroxide production/aluminium hydroxide/RoW/kg	ecoinvent v3.8	Georgia	v3.8 in 2021	2	3	2	3	3
silica sand production	silica sand production/silica sand/RoW/kg	ecoinvent v3.8	Georgia	v3.8 in 2021	2	3	2	3	3
market for bisphenol A epoxy based vinyl ester resin	bisphenol A epoxy based vinyl ester resin production/bisphenol A epoxy based vinyl ester resin/RoW/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3

Plastic wrap	packaging film production, low density polyethylene/packaging film, low density polyethylene/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
epoxy resin production, liquid	epoxy resin production, liquid/epoxy resin, liquid/RoW/kg	ecoinvent v3.8	Missouri	v3.8 in 2021	2	3	2	3	3
ethylene glycol dimethyl ether production	ethylene glycol dimethyl ether production/ethylene glycol dimethyl ether/RoW/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3
RT0033	tap water production, ultrafiltration treatment/tap water/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Propane burned	propane, burned in building machine/propane, burned in building machine/GLO/MJ	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
HDPE Processing	extrusion of plastic sheets and thermoforming, inline/extrusion of plastic sheets and thermoforming, inline/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
ropylene glycol production, liquid	propylene glycol production, liquid/propylene glycol, liquid/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Steel Processing	metal working, average for steel product manufacturing/metal working, average for steel product manufacturing/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
market for chemical, organic	chemical production, organic/chemical, organic/GLO/kg	ecoinvent v3.8	Missouri	v3.8 in 2021	2	3	2	3	3
Tin Processing	tin production/tin/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3

ethylene oxide production	ethylene oxide production/ethylene oxide/RoW/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3
market for styrene-acrylonitrile copolymer	styrene-acrylonitrile copolymer production/styrene-acrylonitrile copolymer/RoW/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3
limestone	limestone production, crushed, for mill/limestone, crushed, for mill/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
market for methylene diphenyl diisocyanate	market for methylene diphenyl diisocyanate/methylene diphenyl diisocyanate/RoW/kg	ecoinvent v3.8	Missiouri	v3.8 in 2021	2	3	2	3	3
market for phenol production	phenol production/phenol/RoW/kg	ecoinvent v3.8	New Jersey	v3.8 in 2021	2	3	2	3	3
market for titanium dioxide	titanium dioxide production, sulfate process/titanium dioxide/RoW/kg	ecoinvent v3.8	Missiouri	v3.8 in 2021	2	3	2	3	3
market for activated silica	activated silica production/activated silica/GLO/kg	ecoinvent v3.8	Pennsylvania	v3.8 in 2021	2	3	2	3	3
HDPE for Pail	polyethylene production, high density, granulate/polyethylene, high density, granulate/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
market for calcium carbonate, precipitated	calcium carbonate production, precipitated/calcium carbonate, precipitated/RoW/kg	ecoinvent v3.8	Missiouri	v3.8 in 2021	2	3	2	3	3
glass fibre production	glass fibre production/glass fibre/RoW/kg	ecoinvent v3.8	Missiouri	v3.8 in 2021	2	3	2	3	3
market for methylene diphenyl diisocyanate	methylene diphenyl diisocyanate production/methylene diphenyl diisocyanate/RoW/kg	ecoinvent v3.8	Missiouri	v3.8 in 2021	2	3	2	3	3

Table 9: **LCI inputs assumed for module A2 (i.e. transport of A1 inputs)**

Input	LCI.activity	Data.source	Geo	Year	Technology	Time	Geography	Reliability	Completeness
Bulk Waste-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
epoxy resin production, liquid-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
ethylene glycol dimethyl ether production-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
ethylene oxide production-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
glass fibre production-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
HDPE Processing-freight transport via Truck	market group for transport, freight, light commercial vehicle/transport, freight, light commercial vehicle/GLO/tkm	ecoinvent v3.8	GLO	v3.8 in 2021	2	3	1	3	3

limestone-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for activated silica-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for aluminium hydroxide-freight transport via Truck	market for transport, freight, lorry 3.5-7.5 metric ton, EURO5/transport, freight, lorry 3.5-7.5 metric ton, EURO5/RER/tkm	ecoinvent v3.8	RER	v3.8 in 2021	2	3	1	3	3
market for bisphenol A epoxy based vinyl ester resin- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for calcium carbonate, precipitated - freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for chemical, organic-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for methylene diphenyl diisocyan-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for methylene	market for transport, freight, lorry 7.5-16	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3

diphenyl diisocyanate - freight transport via Truck	metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm								
market for phenol production- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for polydimethylsiloxane- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for polyester resin, unsaturated - freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for styrene-acrylonitrile copolymer- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
market for titanium dioxide- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
Market for titanium dioxide- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
methyl acetate to generic market for	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport,	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3

solvent, organic-freight transport via Truck	freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm								
organic-freight transport via Barge	market group for transport, freight, inland waterways, barge/transport, freight, inland waterways, barge/GLO/tkm	ecoinvent v3.8	GLO	v3.8 in 2021	2	3	1	3	3
organic-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
organic chemical-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
Plastic wrap-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
polydimethylsiloxane-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
propylene glycol production, liquid-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
propylene production-freight	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport,	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3

transport via Truck	freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm								
REC2800-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
RECINCLV-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
Recycling from Plant-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
Regulated Waste-freight transport via Truck	market for transport, freight, lorry 3.5-7.5 metric ton, EURO5/transport, freight, lorry 3.5-7.5 metric ton, EURO5/RER/tkm	ecoinvent v3.8	RER	v3.8 in 2021	2	3	1	3	3
RT0030-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
silica sand-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3
silica sand production-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16	ecoinvent v3.8	RoW	v3.8 in 2021	2	3	1	3	3

	metric ton, EURO6/RoW/tkm								
Steel Processing-freight transport via Truck	market group for transport, freight, light commercial vehicle/transport, freight, light commercial vehicle/GLO/tkm	ecoinvent v3.8	GLO	v3.8 in 2021	2	3	1	3	3
Tin Processing-freight transport via Truck	market group for transport, freight, light commercial vehicle/transport, freight, light commercial vehicle/GLO/tkm	ecoinvent v3.8	GLO	v3.8 in 2021	2	3	1	3	3

Table 10: **LCI inputs assumed for module A3**

Input	LCI.activity	Data.source	Geo	Year	Technology	Time	Geography	Reliability	Completeness
Bulk Waste	process-specific burdens, inert material landfill/process-specific burdens, inert material landfill/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Electricity	market for electricity, medium voltage/electricity, medium voltage/US-WECC/kWh	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Natual Gas	market for heat, district or industrial, natural gas/heat, district or industrial, natural gas/RoW/MJ	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Recycling from Plant	container production, for collection of post-consumer waste plastic for recycling/container, for collection of post-consumer waste plastic for recycling/Europe	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3

	without Switzerland/unit								
Regulated Waste	process-specific burdens, hazardous waste incineration plant/process-specific burdens, hazardous waste incineration plant/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
Water	market for tap water/tap water/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3

Table 11: **LCI inputs assumed across modules A4 to C4 (i.e. from plant gate-to-grave if applicable)**

Input	LCI.activity	Data.source	Geo	Year	Technology	Time	Geography	Reliability	Completeness
A5. 2% unused material loss	treatment of waste emulsion paint, municipal incineration/electricity, for reuse in municipal waste incineration only/RoW/kWh	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
A5. 2% unused material loss- freight transport via Truck	market group for transport, freight, light commercial vehicle/transport, freight, light commercial vehicle/GLO/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
B2. cleaning concentrate	market for cleaning consumables, without water, in 13.6% solution state/cleaning consumables, without water, in 13.6% solution state/GLO/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A4. Customer pick up	Product-to-site transport requirements	See A4 transport requirements	California	2021-06-01 to 2022-05-31	NA	NA	NA	NA	NA
A4. Customer pick up-	market group for transport, freight, light commercial	ecoinvent v3.8	see corrsp. product	v3.8 in 2021	2	3	1	3	3

freight transport via Truck	vehicle/transport, freight, light commercial vehicle/GLO/tkm		input above						
C3. End of Life	process-specific burdens, inert material landfill/process-specific burdens, inert material landfill/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	2	3	2	3	3
C2. End of Life- freight transport via Truck	market for transport, freight, lorry 3.5-7.5 metric ton, EURO5/transport, freight, lorry 3.5-7.5 metric ton, EURO5/RER/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
A5. Pallets to Landfill	treatment of waste wood, untreated, sanitary landfill/waste wood, untreated/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A5. Pallets to Landfill- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
A5. Pallets to Recycling	waste wood, post-consumer, Recycled Content cut-off/waste wood, post-consumer/GLO/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A5. Pallets to Recycling- freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
B4. per m2 A-module requirements for 60yr service life	A1-to-A5 replacement requirements for service life	See A3 inputs	See specific A-inputs	See A3 inputs	2	A3	2	A3	A3
A4. Product to Site	Product-to-site transport requirements	See A4 transport requirements	California	2021-06-01 to 2022-05-31	NA	NA	NA	NA	NA

A4. Product to Site-freight transport via Truck	market for transport, freight, lorry 3.5-7.5 metric ton, EURO5/transport, freight, lorry 3.5-7.5 metric ton, EURO5/RER/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
A5. Steel for can	iron scrap, sorted, pressed, Recycled Content cut-off/iron scrap, sorted, pressed/GLO/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
B2. Tap Water for Cleaning	market for tap water/tap water/RoW/kg	ecoinvent v3.8	California	v3.8 in 2021	2	3	2	3	3
A5. Tin for can	treatment of scrap tin sheet, municipal incineration/scrap tin sheet/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A5. Waste Plastic to landfill	treatment of waste plastic, mixture, sanitary landfill/waste plastic, mixture/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A5. Waste Plastic to landfill-freight transport via Truck	market group for transport, freight, light commercial vehicle/transport, freight, light commercial vehicle/GLO/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3
A5. Waste Plastic to Recycling	market for waste plastic, mixture/waste plastic, mixture/RoW/kg	ecoinvent v3.8	Multiple Regions	v3.8 in 2021	1	3	1	3	3
A5. Waste Plastic to Recycling-freight transport via Truck	market for transport, freight, lorry 7.5-16 metric ton, EURO6/transport, freight, lorry 7.5-16 metric ton, EURO6/RoW/tkm	ecoinvent v3.8	see corrsp. product input above	v3.8 in 2021	2	3	1	3	3

DATA QUALITY ASSESSMENT

Data quality/variability requirements, as specified in the PCR, are applied. This section describes the achieved data quality relative to the ISO 14044:2006 requirements. Data quality is judged based on its precision (measured, calculated or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied within a study serving as a data source) and representativeness (geographical, temporal, and technological).

Precision: Through measurement and calculation, the manufacturers collected and provided primary data on their annual production. For accuracy, the LCA practitioner and 3rd Party Verifier validated the plant gate-to-gate data.

Completeness: All relevant specific processes, including inputs (raw materials, energy and ancillary materials) and outputs (emissions and production volume) were considered and modeled to represent the specified and declared products. The majority of relevant background materials and processes were taken from ecoinvent ecoinvent v3.8 LCI datasets where relatively recent region-specific electricity inputs were utilized. The most relevant EPDs requiring key A1 inputs were also utilized where readily available.

Consistency: To ensure consistency, the same modeling structure across the respective product systems was utilized for all inputs, which consisted of raw material inputs and ancillary material, energy flows, water resource inputs, product and co-products outputs, returned and recovered Resinous flooring materials, emissions to air, water and soil, and waste recycling and treatment. The same background LCI datasets from the ecoinvent ecoinvent v3.8 database were used across all product systems. Crosschecks concerning the plausibility of mass and energy flows were continuously conducted. The LCA team conducted mass and energy balances at the plant and selected process level to maintain a high level of consistency.

Reproducibility: Internal reproducibility is possible since the data and the models are stored and available in a machine readable project file for all foreground and background processes, and in Labeling Sustainability's proprietary Resinous flooring LCA calculator* for all production facility and product-specific calculations. A considerable level of transparency is provided throughout the detailed LCA report as the specifications and material quantity make-up for the declared products are presented and key primary and secondary LCI data sources are summarized. The provision of more detailed publicly accessible data to allow full external reproducibility was not possible due to reasons of confidentiality.

*Labeling Sustainability has developed a proprietary tool that allows the calculation of PCR-compliant LCA results for Resinous flooring product designs. The tool auto-calculates results by scaling base-unit technosphere inputs (i.e. 1 kg sand, 1 kWh electricity, etc.) to replicate the reference flow conversions that take place in any typical LCA software like openLCA or SimaPro. The tool was tested against several LCAs performed in openLCA and the tool generated identical results to those realized in openLCA across every impact category and inventory metric (where comparisons could be readily made).

Representativeness: The representativeness of the data is summarized as follows.

- Time related coverage of the manufacturing processes' primary collected data from 2021-06-01 to 2022-05-31.
- Upstream (background) LCI data was either the PCR specified default (if applicable) or more appropriate LCI datasets as found in the country-adjusted ecoinvent ecoinvent v3.8 database.
- Geographical coverage for inputs required by the A3 facility(ies) is representative of its region of focus; other upstream and background processes are based on US, North

American, or global average data and adjusted to regional electricity mixes when relevant.
- Technological coverage is typical or average and specific to the participating facilities for all primary data.

ENVIRONMENTAL INDICATORS AND INVENTORY METRICS

Per the PCR, this EPD supports the life cycle impact assessment indicators and inventory metrics as listed in the tables below. As specified in the PCR, the most recent US EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), impact categories were utilized as they provide a North American context for the mandatory category indicators to be included in the EPD. Additionally, the PCR requires a set of inventory metrics to be reported with the LCIA indicators (see tables below).

Table 12: **Life cycle impact categories and life cycle inventory metrics**

ID	LCIA.indicators	Abbreviations	Units
1	environmental impact: acidification	AP	moles of H+-Eq
2	environmental impact: eutrophication	EP	kg N
3	environmental impact: global warming	GWP	kg CO2-Eq
4	environmental impact: ozone depletion	ODP	kg CFC-11-Eq
5	environmental impact: photochemical oxidation	PCOP	kg NOx-Eq
6	material resources: metals/minerals: abiotic depletion potential (ADP): elements (ultimate reserves)	ADPe	kg Sb-Eq
7	energy resources: non-renewable: abiotic depletion potential (ADP): fossil fuels	ADPf	MJ, net calorific value
Inventory metrics			
8	Total primary energy	TPE	MJ-Eq
9	Renewable energy	RE	MJ-Eq
10	Non-renewable energy	NRE	MJ-Eq
11	Non-Renewable Resources	NRR	kg
12	Renewable Resources	RR	m3
13	water depletion: WDP	WDP	m3
14	land filling: bulk waste	LFW	kg waste
15	land filling: hazardous waste	LFHW	kg waste
16	resource: carbon, biogenic, fixed	bioC	kg

A summary description of each of the impact categories and inventory metrics is provided in the following table:

Table 13: **Definitions of life cycle impact categories and life cycle inventory metrics**

Midpoint impact categories	
Global Warming Potential (GWP) (units: kg CO2-eq)	Global Warming Potential or climate change can be defined as the change in global temperature caused by the greenhouse effect that the release of greenhouse gases by human activity creates. The Environmental Profiles characterization model is based on factors developed by the United Nations Intergovernmental Panel on Climate Change (IPCC). Factors are expressed as Global Warming Potential over the time horizon of different years, being the

	most common 100 years (GWP100), measured in the reference unit, kg CO2 equivalent.
Ozone Depletion Potential (ODP) (kg CFC-11-eq)	Ozone-depleting gases cause damage to stratospheric ozone or the ozone layer. CFCs, halons and HCFCs are the major causes of ozone depletion. The characterization model has been developed by the World Meteorological Organization (WMO) and defines the ozone depletion potential of different gases relative to the reference substance chlorofluorocarbon-11 (CFC-11), expressed in kg CFC-11 equivalent.
Acidification Potential (AP) (kg SO2-eq)	Acidic gases such as Sulphur dioxide (SO2) react with water in the atmosphere to form acid rain, a process known as acid deposition. Acidification potential is expressed using the reference unit, kg SO2 equivalent. The model does not take account of regional differences in terms of which areas are more or less susceptible to acidification. It accounts only for acidification caused by SO2 and NOx. This includes acidification due to fertilizer use, according to the method developed by the Intergovernmental Panel on Climate Change (IPCC). CML has based the characterization factor on the RAINS model developed by the University of Amsterdam.
Eutrophication Potential (EP) (PO4 3- -eq)	Eutrophication is the build-up of a concentration of chemical nutrients in an ecosystem which leads to abnormal productivity. This causes excessive plant growth like algae in rivers which causes severe reductions in water quality and animal populations. This category is based on the work of Heijungs, and is expressed using the reference unit, kg PO4 3- equivalents. Direct and indirect impacts of fertilizers are included in the method. The direct impacts are from production of the fertilizers and the indirect ones are calculated using the IPCC method to estimate emissions to water causing eutrophication.
Photochemical Ozone Creation/Smog Potential (POCP) (kg O3-eq)	Ozone is protective in the stratosphere, but on the ground-level, it is toxic to humans in high concentration. Photochemical ozone, also called ground-level ozone, is formed by the reaction of volatile organic compounds and nitrogen oxides in the presence of heat and sunlight. The impact category depends largely on the amounts of carbon monoxide (CO), Sulphur dioxide (SO2), nitrogen oxide (NO), ammonium and NMVOC (non-methane volatile organic compounds). Photochemical ozone creation potential (also known as summer smog) for emission of substances to air is calculated with the United Nations Economic Commission for 22 Europe (UNECE) trajectory model (including fate) and expressed using the reference unit, kg ethylene (C2H4) equivalent.
Abiotic Depletion Potential (ADPel and ADPff) (kg Sb-eq)	The main concern of this category is the health of humans and the ecosystem and how it is affected by the extraction of minerals and fossil fuels, which are inputs into the system. For each extraction of minerals and fossil fuels, the abiotic depletion factor is determined. This indicator is on a global scale and is based on the concentration reserves and rate of deaccumulation. The results are presented in units of the reference element strontium (i.e. Sb). For the purposes of this EPD, this impact category is split between mineral elements (i.e. ADPel) and fossil fuels (i.e. ADPff).
Inventory metrics	
Depletion of non-renewable material resources (NRM) (kg)	This indicator covers the cumulative life cycle consumption of non-renewable resources that are extracted from the ground but not including energy resources like coal, oil and natural gas. This indicator includes the consumption of metallic ores, aggregates, and other minerals. The units of measure are in terms of kilograms material extracted and utilzied/wasted in the life cycle system considered.

Use of renewable material resources (RM) (kg)	This indicator covers the cumulative life cycle consumption of renewable resources that are extracted from nature like sustainably harvested biomass. The units of measure are in terms of kilograms material extracted and utilzied/wasted in the life cycle system considered.
Depletion of non-renewable energy resources (NRE) (MJ HHV)	This indicator considers the cumulative life cycle consumption of non-renewable energy resources like oil, natural gas, and coal. The units of measure are in terms of Mega-Joules of energy resource extracted and utilzied/wasted in the life cycle system considered.
Use of renewable primary energy (RE) (MJ HHV)	This indicator considers the cumulative life cycle extraction of renewable energy resources from nature like solar and wind energy as well as biomass for energy purposes. The units of measure are in terms of Mega-Joules of energy resource extracted and utilzied/wasted in the life cycle system considered.
Total primary energy consumption (PEC) (MJ HHV)	This indicator is the summatation of non-renewable and renewable energy extracted from nature, where the units of measure are in terms of Mega-Joules of energy resource extracted/utilized/wasted in the life cycle system considered.
Concrete batching water consumption (CBWC) (m3)	This indicator is defined as the direct water used in concrete mix batches. The units of measure are in cubic meters of water consumed.
Concrete washing water consumption (CWWC) (m3)	This inidcator is defined as the direct washing water used at the facility. The units of measure are in cubic meters of wash water consumed.
Total water consumption (TWC) (m3)	This indicator considers the cumulative life cycle consumption of water required to produce the declared functional unit of a given product. The units of measure are in cubic meters of water consumed.
Concrete hazardous waste (CHW) (kg)	This indicator considers the amount of hazardous waste waste generated at the concrete facility. The units of measure are in kilograms of waste generated.
Concrete non-hazardous waste (CNHW) (kg)	This indicator considers the direct amount of non-hazardous waste generated at the concrete facility. The units of measure are in kilograms of waste generated.

It should be noted that emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in any of the following categories.

- Renewable primary energy resources as energy (fuel);
- Renewable primary resources as material;
- Non-renewable primary resources as energy (fuel);
- Non-renewable primary resources as material;
- Secondary Materials;
- Renewable secondary fuels;
- Non-renewable secondary fuels;
- Recovered energy;
- Abiotic depletion potential for non-fossil mineral resources.
- Land use related impacts, for example on biodiversity and/or soil fertility;
- Toxicological aspects;
- Emissions from land use change [GWP 100 (land-use change)];
- Hazardous waste disposed;
- Non-hazardous waste disposed;
- High-level radioactive waste;

- Intermediate and low-level radioactive waste;
- Components for reuse;
- Materials for recycling;
- Materials for energy recovery;
- Recovered energy exported from the product system.

TOTAL IMPACT SUMMARY

The following table reports the total LCA results for each product produced at the given resinous flooring facility on a per 1 m2 of covered and protected flooring surface for a period of 60 years.

Thin-Mil

Table 14: **Total life cycle (across modules in scope) impact results for Thin-Mil, assuming the geometric mean point values on a per 1 m2 of covered and protected flooring surface for a period of 60 years basis.**

a) Midpoint Impact Categories:

Indicator/LCI Metric	AP	EP	GWP	ODP	PCOP	ADPe	ADPf
Unit	**moles of H+-Eq**	**kg N**	**kg CO2-Eq**	**kg CFC-11-Eq**	**kg NOx-Eq**	**kg Sb-Eq**	**MJ, net calorific value**
Minimum	1.74	0.00375	8.15	6.69e-07	0.0219	0.000232	130
Maximum	11.1	0.0308	52.2	5.14e-06	0.135	0.002	1040
Mean	5.81	0.0145	25.9	2.67e-06	0.069	0.000855	475
Median	5.78	0.0146	26.6	2.67e-06	0.0662	0.000764	482
Décor-Flor (MSL)	6.06	0.0147	28.2	2.62e-06	0.0703	0.000783	519
Posi-Tred SL (MSL)	6.87	0.0196	30.4	3.49e-06	0.0803	0.000743	603
Posi-Tred CR (MSL)	7.57	0.0165	34.6	3.09e-06	0.0815	0.000305	672
VaporControl 1P (MSL)	8.79	0.0231	40	4e-06	0.108	0.002	792
Vapor Control FC (MSL)	11.1	0.0308	52.2	5.14e-06	0.135	0.00129	1040
Electro Flor ESD (MSL)	7.08	0.0151	29	3.03e-06	0.082	0.00117	497
Electro Flor CD (MSL)	6.99	0.0155	30.7	3.01e-06	0.0876	0.00117	507
Quik-Glaze (MSL)	7.21	0.0195	28.8	3.36e-06	0.0778	0.000744	481
Aero Flor (MSL)	3.69	0.00962	16.2	1.51e-06	0.0452	0.000616	272
HPT (MSL)	2.38	0.00504	10.9	8.44e-07	0.0313	0.000801	171
Décor-Flor (TSL)	4.26	0.0105	19.5	2e-06	0.0517	0.000623	379
Posi-Tred SL (TSL)	4.75	0.0138	22.2	2.53e-06	0.0619	6e-04	409
Posi-Tred CR (TSL)	5.32	0.0117	24.9	2.45e-06	0.0604	0.000232	484
VaporControl 1P (TSL)	6.31	0.0159	29.8	3.05e-06	0.0743	0.00147	545
Vapor Control FC (TSL)	8.08	0.0219	36.4	4.05e-06	0.0964	0.001	707
Electro Flor ESD (TSL)	5	0.0109	21.6	2.32e-06	0.0618	0.000924	358
Electro Flor CD (TSL)	4.87	0.0112	21.6	2.42e-06	0.0622	0.000934	370
Quik-Glaze (TSL)	5.49	0.0145	21	2.72e-06	0.0564	0.000592	363

Aero Flor (TSL)	2.67	0.00726	12	1.18e-06	0.033	0.000488	192
HPT (TSL)	1.74	0.00375	8.15	6.69e-07	0.0219	0.000618	130

b) Inventory Metrics:

Indicator/LCI Metric	**TPE**	**RE**	**NRE**	**NRR**	**RR**	**WDP**	**LFW**	**LFHW**	**bioC**
Unit	**MJ-Eq**	**MJ-Eq**	**MJ-Eq**	**kg**	**m3**	**m3**	**kg waste**	**kg waste**	**kg**
Minimum	74.5	25.4	47.4	1.54	0.0018	0.0525	3.48	0.000124	0
Maximum	285	33	246	6.89	0.00213	0.165	22.3	0.00143	0
Mean	173	28.8	141	4.08	0.00195	0.108	11.9	0.000738	0
Median	164	28.9	132	3.93	0.00196	0.107	12.6	0.00073	0
Décor-Flor (MSL)	167	28	135	3.86	0.00193	0.107	12.6	0.000646	0
Posi-Tred SL (MSL)	190	29.8	157	4.45	0.00201	0.125	17.2	0.000849	0
Posi-Tred CR (MSL)	202	29.3	169	4.73	0.00197	0.118	15.8	0.000823	0
VaporControl 1P (MSL)	230	30	198	5.57	0.00193	0.134	17.3	0.000927	0
Vapor Control FC (MSL)	285	33	246	6.89	0.00207	0.165	22.3	0.00118	0
Electro Flor ESD (MSL)	161	28.2	129	3.78	0.00197	0.124	13.4	0.0013	0
Electro Flor CD (MSL)	163	29.5	131	3.86	0.00199	0.127	13.5	0.00143	0
Quik-Glaze (MSL)	162	28.4	130	4.01	0.00193	0.165	14.3	0.000745	0
Aero Flor (MSL)	99.3	26.6	70.3	2.2	0.00186	0.0752	6.6	0.000298	0
HPT (MSL)	74.5	25.5	47.6	1.55	0.00185	0.061	4.46	0.000158	0
Décor-Flor (TSL)	166	28.8	134	3.85	0.00199	0.0843	9.39	0.000445	0
Posi-Tred SL (TSL)	189	29	155	4.43	0.00198	0.0995	12.7	0.000616	0
Posi-Tred CR (TSL)	200	28.5	169	4.69	0.00195	0.0929	11.2	0.00065	0
VaporControl 1P (TSL)	230	30.5	196	5.52	0.00199	0.107	12.9	0.000715	0
Vapor Control FC (TSL)	282	32.5	243	6.87	0.00213	0.128	16.4	0.000885	0
Electro Flor ESD (TSL)	161	29	129	3.78	0.00194	0.0993	10.1	0.00103	0
Electro Flor CD (TSL)	163	28.6	131	3.86	0.00196	0.101	10.4	0.00115	0

Quik-Glaze (TSL)	161	29	129	4	0.00194	0.126	9.9	0.000558	0
Aero Flor (TSL)	99.1	25.9	70.2	2.19	0.00188	0.061	4.67	0.000227	0
HPT (TSL)	75.2	25.4	47.4	1.54	0.0018	0.0525	3.48	0.000124	0

Self Leveling

Table 15: **Total life cycle (across modules in scope) impact results for Thin-Mil, assuming the geometric mean point values on a per 1 m2 of covered and protected flooring surface for a period of 60 years basis.**

a) Midpoint Impact Categories:

Indicator/LCI Metric	**AP**	**EP**	**GWP**	**ODP**	**PCOP**	**ADPe**	**ADPf**
Unit	**moles of H+-Eq**	**kg N**	**kg CO2-Eq**	**kg CFC-11-Eq**	**kg NOx-Eq**	**kg Sb-Eq**	**MJ, net calorific value**
Minimum	2.63	0.00672	12.2	1.41e-06	0.0328	0.000415	227
Maximum	3.54	0.00885	16.6	1.82e-06	0.0455	0.00056	308
Mean	3.08	0.00778	14.4	1.62e-06	0.0392	0.000488	268
Median	3.08	0.00778	14.4	1.62e-06	0.0392	0.000488	268
Posi-Tred O (MSL)	3.54	0.00885	16.6	1.82e-06	0.0455	0.00056	308
Posi-Tred O (TSL)	2.63	0.00672	12.2	1.41e-06	0.0328	0.000415	227

b) Inventory Metrics:

Indicator/LCI Metric	**TPE**	**RE**	**NRE**	**NRR**	**RR**	**WDP**	**LFW**	**LFHW**	**bioC**
Unit	**MJ-Eq**	**MJ-Eq**	**MJ-Eq**	**kg**	**m3**	**m3**	**kg waste**	**kg waste**	**kg**
Minimum	171	28	139	3.98	0.00189	0.0615	5.71	0.000303	0
Maximum	172	28.4	140	4	0.00195	0.075	7.46	0.000391	0
Mean	172	28.2	140	3.99	0.00192	0.0682	6.58	0.000347	0
Median	172	28.2	140	3.99	0.00192	0.0682	6.58	0.000347	0
Posi-Tred O (MSL)	171	28.4	140	4	0.00195	0.075	7.46	0.000391	0
Posi-Tred O (TSL)	172	28	139	3.98	0.00189	0.0615	5.71	0.000303	0

Mortar

Table 16: **Total life cycle (across modules in scope) impact results for Thin-Mil, assuming the geometric mean point values on a per 1 m2 of covered and protected flooring surface for a period of 60 years basis.**

a) Midpoint Impact Categories:

Indicator/LCI Metric	AP	EP	GWP	ODP	PCOP	ADPe	ADPf
Unit	moles of H+-Eq	kg N	kg CO2-Eq	kg CFC-11-Eq	kg NOx-Eq	kg Sb-Eq	MJ, net calorific value
Minimum	5.31	0.00969	26.8	4.06e-06	0.071	0.000594	393
Maximum	17.8	0.0337	93.4	1.47e-05	0.233	0.00122	1310
Mean	11.6	0.0213	58.7	9.7e-06	0.152	0.000867	853
Median	11.2	0.0206	57.8	1.02e-05	0.151	0.000866	832
Terracolor (MSL)	16.5	0.0299	80.8	1.38e-05	0.213	0.000919	1210
Cheminert K (MSL)	17.8	0.0337	93.4	1.47e-05	0.233	0.00122	1310
Cheminert HD (MSL)	7.34	0.0132	35.6	5.21e-06	0.0923	0.000813	543
Terracolor (TSL)	9.34	0.0173	46.7	8.94e-06	0.127	0.000594	688
Cheminert K (TSL)	13.1	0.0238	69	1.15e-05	0.175	0.000987	975
Cheminert HD (TSL)	5.31	0.00969	26.8	4.06e-06	0.071	0.000668	393

b) Inventory Metrics:

Indicator/LCI Metric	TPE	RE	NRE	NRR	RR	WDP	LFW	LFHW	bioC
Unit	MJ-Eq	MJ-Eq	MJ-Eq	kg	m3	m3	kg waste	kg waste	kg
Minimum	282	30.2	246	6.79	0.00201	0.158	33.5	0.0021	0
Maximum	792	41.1	745	19.8	0.00236	0.486	131	0.00756	0
Mean	577	36.6	535	14.4	0.0022	0.331	81.1	0.00496	0
Median	664	38.6	622	16.6	0.00225	0.334	79.4	0.00512	0
Terracolor (MSL)	792	41.1	745	19.8	0.00226	0.46	116	0.0072	0
Cheminert K (MSL)	668	38.6	629	16.8	0.00224	0.486	131	0.00756	0
Cheminert HD (MSL)	285	30.2	250	6.86	0.00202	0.213	47.5	0.00264	0
Terracolor (TSL)	777	40.2	728	19.6	0.0023	0.291	65.1	0.00449	0
Cheminert K (TSL)	660	38.6	614	16.5	0.00236	0.376	93.7	0.00574	0
Cheminert HD (TSL)	282	31.1	246	6.79	0.00201	0.158	33.5	0.0021	0

Broadcast Slurry

Table 17: **Total life cycle (across modules in scope) impact results for Thin-Mil, assuming the geometric mean point values on a per 1 m2 of covered and protected flooring surface for a period of 60 years basis.**

a) Midpoint Impact Categories:

Indicator/LCI Metric	AP	EP	GWP	ODP	PCOP	ADPe	ADPf
Unit	**moles of H+-Eq**	**kg N**	**kg CO2-Eq**	**kg CFC-11-Eq**	**kg NOx-Eq**	**kg Sb-Eq**	**MJ, net calorific value**
Minimum	8.8	0.0176	37.3	4.45e-06	0.103	0.00157	713
Maximum	29	0.0887	120	2.28e-05	0.337	0.00527	2360
Mean	18	0.0487	74.5	1.28e-05	0.207	0.00324	1440
Median	17	0.0442	70.4	1.2e-05	0.194	0.00306	1350
Cove Base Gel (MSL)	29	0.0887	120	2.28e-05	0.337	0.00527	2360
ElastaFlake RFS (MSL)	12.4	0.024	51.3	5.61e-06	0.136	0.00191	952
Cove Base Gel (TSL)	21.6	0.0644	89.5	1.84e-05	0.252	0.0042	1740
ElastaFlake RFS (TSL)	8.8	0.0176	37.3	4.45e-06	0.103	0.00157	713

b) Inventory Metrics:

Indicator/LCI Metric	TPE	RE	NRE	NRR	RR	WDP	LFW	LFHW	bioC
Unit	**MJ-Eq**	**MJ-Eq**	**MJ-Eq**	**kg**	**m3**	**m3**	**kg waste**	**kg waste**	**kg**
Minimum	480	36	441	12.6	0.00213	0.153	23.1	0.00137	0
Maximum	1110	66.2	1050	28.9	0.00312	0.367	58.6	0.00359	0
Mean	796	51.2	744	20.7	0.00264	0.25	39	0.00236	0
Median	796	51.2	742	20.7	0.00266	0.24	37	0.00224	0
Cove Base Gel (MSL)	1110	66.1	1050	28.9	0.00308	0.367	58.6	0.00359	0
ElastaFlake RFS (MSL)	482	36	443	12.6	0.00224	0.189	31	0.00172	0
Cove Base Gel (TSL)	1110	66.2	1040	28.8	0.00312	0.29	43.1	0.00276	0
ElastaFlake RFS (TSL)	480	36.4	441	12.6	0.00213	0.153	23.1	0.00137	0

ADDITIONAL ENVIRONMENTAL INFO

No regulated substances of very high concern are utilized on site.

REFERENCES

ISO Standards:

- ISO 6707-1: 2014 Buildings and Civil Engineering Works - Vocabulary - Part 1: General Terms
- ISO 14021:1999 Environmental Labels and Declarations - Self-declared Environmental Claims (Type II Environmental Labeling)
- ISO 14025:2006 Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures
- ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and Framework
- ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and Guidelines
- ISO 14067:2018 Greenhouse Gases – Carbon Footprint of Products – Requirements and Guidelines for Quantification
- ISO 14050:2009 Environmental Management - Vocabulary
- ISO 21930:2017 Sustainability in Building Construction - Environmental Declaration of Building Products

EN Standards:

- EN 16757 Sustainability of construction works - Environmental product declarations – Product Category Rules for concrete and concrete elements
- EN 15804 Sustainability of construction works - Environmental product declarations -Core rules for the product category of construction products

Other References:

- NSF International (2018). Product Category Rule for Environmental Product Declarations PCR for Resinous Floor Coatings
- USGBC LEED v4 for Building Design and Construction, 11 Jan 2019 available at https://www.usgbc.org/resources/pcr-committee-process-resources-part-b
- USGBC PCR Committee Process & Resources: Part B, USGBC, 7 July 2017 available at https://www.usgbc.org/resources/pcr-committee-process-resources-part-b.
- US EPA (2020) Advancing Sustainable Materials Management: 2018 Fact Sheet, https://www.epa.gov/sites/production/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf