



ENVIRONMENTAL PRODUCT DECLARATION

VDS LITE

VETROTECH – VDS® FRAMING SYSTEM

VDS® Lite offers a complete line of code-compliant, fire-rated assemblies from 20-90 minutes, including smoke barriers and fire-rated doors.



At Vetrotech, we believe that safety comes first. And that sustainability is a natural part of that effort.

That's why we have implemented verifiable footprint-minimizing practices throughout the organization, re-invigorated our innovation focus on sustainable products and processes, and publicly declared ambitious net zero carbon goals.

It's why we've embraced a leadership role in influencing healthy building policies in countries around the world. And why everything we do we do with full transparency—because true sustainability has nothing to hide.

Protecting people and property is what we do with care and pride, and with an acute sense of our social responsibilities. If we're going to build a sustainable future together, it has to start with integrity, ambition and the best of intentions—from people who care about each one of us, and the future of all.

For more information visit: <http://vetrotech.com/en-us>.

VDS® Lite Framing System

EPD Program and Program Operator Name, Address, Logo, and Website	UL Solutions 333 Pfingsten Rd., Northbrook, IL 600611 https://www.ul.com
General Program Instructions and Version Number	UL Environment Environmental Product Declaration Program, GENERAL PROGRAM INSTRUCTIONS, VERSION 2.7, MARCH 2022
Manufacturer Name and Address	Vetrotech Saint-Gobain 2108 B Street NW #110 Auburn 98001
Declaration Number	4791134773.102.1
Declared Product & Functional Unit or Declared Unit	VDS Lite– VDS by Forster Framing System One (1) metric ton of framing
Reference PCR and Version Number	Product Category Rule (PCR) Guidance for Building-Related Products and Services Part B: Designated Steel Construction Product EPD Requirements, UL 10010–34
Description of product application/use	VDS Lite by Forster Framing Systems are for commercial use. The products are used to hold or support glass panels, either as windows or doors.
Product RSL Description (if Appl.)	This study assumes a product service life of 75 years.
Markets of Applicability	Global/North America
Date of Issue	December 1, 2023
Period of Validity	5 Years
EPD Type	Product-specific
Range of Dataset Variability	N/A
EPD Scope	Cradle to gate
Year(s) of reported primary data	2021-2022
LCA Software & Version Number	LCA FE software v10.7
LCI Database(s) & Version Number	The Sphera GaBi 2022.2, US LCI, and Ecoinvent v3.8 databases
LCIA Methodology & Version Number	TRACI v2.1
The PCR review was conducted by:	Dr. Tom Gloria, Chair
	Brandie Sebastian
	James Littlefield
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	 Cooper McCollum, Solutions
This life cycle assessment was conducted in accordance with ISO 14044: 2006 and the reference PCR by:	Saint-Gobain North America
This life cycle assessment was independently verified in accordance with ISO 14044: 2006 and the reference PCR by:	Lindita Bushi, PhD, Athena Sustainable Materials Institute 
LIMITATIONS • Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. • Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any	

particular product line and reported impact.

- **Comparability:** EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

Product Definition and Information

Description of Company/Organization

Vetrotech Saint-Gobain North America is a member of the Saint-Gobain Group specializing in the development, production and distribution of sustainable fire-resistant safety and high-security glass for the building and marine sectors.

As a world leader and pioneer in glazed protective solutions for more than 40 years, people's safety comes first at Vetrotech: the company is an advocate of making living places more secure and accepts no compromise in compliance with regulations or standards.

To this end, Vetrotech produces fire-rated glass and framing products adapted to any architectural need, blending into the environment while providing the places where we live, work, learn or gather with the highest standard of safety and security for the peace of mind of all the stakeholders.

Product Description

- **Product Identification**

Engineered steel window or door frames to provide a fire-resistive or fire protective framing solution with complete design flexibility. Frames are custom sized according to building specifications, including a steel profile, coating, and gasket for the glazing. The VDS Lite by Forster Framing Systems have a mass of 4.66 kg/m. They are typically used with the Vetrotech Contraflam or Vetrotech Keralite Fire Rated Safety Glass, which also have separate EPDs.

VDS Lite by Forster Framing Systems are certified to UL 9, Standard for Fire Tests of Window Assemblies; NFPA 80, Standard for Fire Doors and Other Opening Protectives; NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies; and CAN/ULC S106, Standard Method for Fire Tests of Window and Glass Block Assemblies.



- **Product Specification**

- Fire ratings of 20-90 minutes
- Easy to assemble
- UL Certified in US and Canada
- Fabricated in the US

- **Flow Diagram**

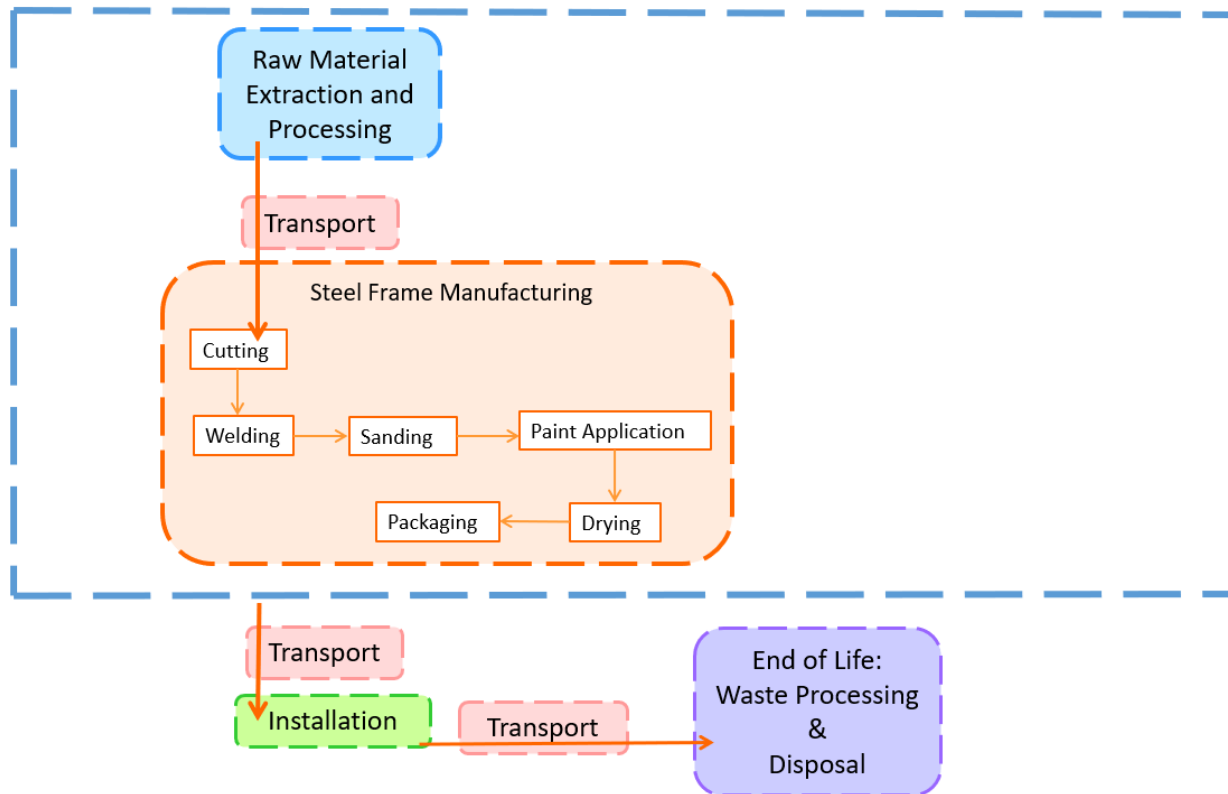


Figure 1. Flow Diagram

• Product Average

This is a site-specific and product-specific LCA.

Application

VDS Lite by Forster Framing Systems are for commercial use. The products are used to hold or support glass panels, either as windows or doors.

Declaration of Methodological Framework

The nature of life cycle assessment is to include a wide range of inputs and outputs associated with the product being analyzed. Constraining the LCA scope is an essential part of the study. The following section describes the various information included in the framework of this LCA study in order to appropriately define the goal, scope, and boundaries of the study. This LCA follows the attributional LCA approach. This declaration was independently verified in accordance with ISO 21930:2017, UL Part A and ISO 14025: 2006.

Technical Requirements

The performance of Vetrotech VDS Lite is listed below:

Table 1. Technical Data

Items in this EPD	Performance Attributes
 Vetrotech VDS Lite	Fire-protective/resistive and tested to UL 9, NFPA 80 and 257, and CAN/ULC-S106. Welded/Clipped Certified by Underwriters Laboratories Fabricated in the US Glazing with KERALITE Glass Ceramic 20-90, PYROSWISS specialty tempered glazing 20 or 45, CONTRAFLAM 45 or 90 Single/double door compatible Weight 2 lbs/lin ft (does not include glass.)

Properties of Declared Product as Delivered

The product is packaged and delivered using cardboard with foam backing, wood, and shrink wrap.

Material Composition

A thorough analysis of the material inputs was completed for the inventory of this study. The steel framing systems' component percentages for the finished product are listed below.

Table 2. Materials Composition

Raw Material	Final Product Mass Percentage
Steel Profile	56.2%
Gasket	22.6%
Steel Bead	16.0%
Paint	5.0%
Putty	0.2%

Manufacturing

VDS Lite Framing Systems are fabricated at the Auburn, WA facility; and this is the only Saint-Gobain facility to produce the VDS Lite by Forster products.

The steel profile portion of the product is manufactured by the Forster company in Arbon, Switzerland; where large rolls of steel sheets are processed through various forming operations to create the steel profiles. The profiles are then cut into 6-meter lengths and shipped to the Vetrotech Saint-Gobain Auburn, WA, facility for fabrication.

After the steel profiles from Forster arrive at the Vetrotech facility, they are cut and welded according to the order or builder specifications for the frame size. The welded frame is then prepped for paint and sanded with sandpaper to allow better adhering of the paint to the steel surface. Paint is then applied and dried in a natural gas heated oven. Gaskets necessary for the installation of the glass panels is applied before the product is packaged for shipping to the construction site.

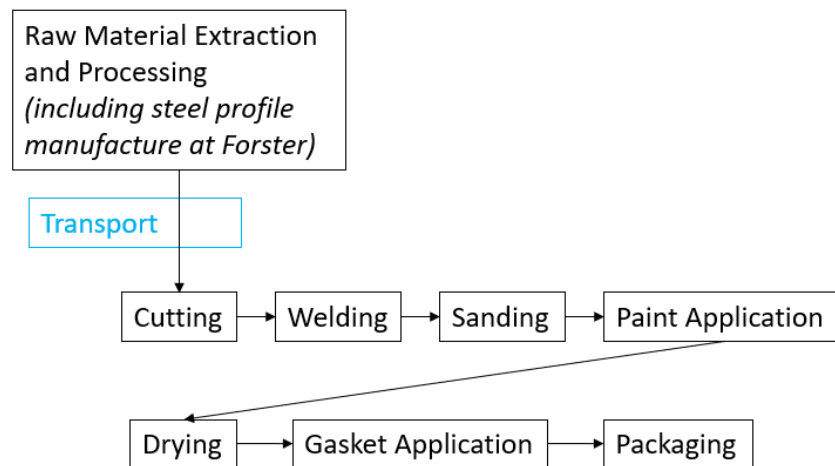


Figure 2. Manufacturing Overview

Packaging

Packaging of the final product after production is included in the life cycle assessment. The product is packaged using cardboard with foam backing, wood, and shrink wrap. The average weight of the packaging material was assumed to be the same for each of the products included in this study.

Transportation

Raw materials are transported to the manufacturing sites by standard freight truck, train, or air. Unless otherwise noted, transport vehicles are fueled with diesel fuel. The final product transportation phase is excluded from the study.

Product Installation

The installation phase is excluded from the study.

Use

The use phase is excluded from the study.

The PCR requires products with indoor applications to report on the VOC emissions as determined in accordance with the "Standard Method for the Testing and Evaluation of Volatile Organic Chemical

Emissions from Indoor Sources Using Environmental Chambers Version 1.2.” All the product families included in this study have been tested and certified in compliance with the VOC emissions standard for individual VOCs of concern and formaldehyde.

Reference Service Life and Estimated Building Service Life

This study assumes a product service life of 75 years.

Reuse, Recycling, and Energy Recovery

There is no reuse, recycling, or energy recovery reported.

Disposal

The end-of-life treatment is outside the scope of the study. The steel framing could be recycled at final disposal.

Life Cycle Assessment Background Information

Declared Unit

The declared unit for the study is one (1) metric ton of framing. The product weight is 4.6 kg/m.

System Boundary

The life cycle analysis performed for this EPD includes “cradle-to-gate” life cycle stages. The system boundary includes raw material supply, raw material transport, and manufacture; the VDS Lite fabrication at the Auburn, WA facility; packaging.

Table 3. System Boundary

Description of the System Boundary (X=included in LCA: MND=module not declared)																
Product Stage			Construction Process Stage		Use Stage						End of Life Stage				Benefits & Loads Beyond System Boundaries	
Raw Material Supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste Processing	Disposal	Reuse-Recover-Recycling Potential
A 1	A 2	A 3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Estimates and Assumptions

Life cycle analysis requires that assumptions are made to constrain the project boundary or model processes when little to no data is available. Key assumptions made for this study of the VDS Lite by Forster Framing System include the paint mixture of primer, top coat, and catalyst; and pallet weight.

Cut-off Criteria

All inputs and outputs to a process shall be included in the calculation of results, for which data are available. Any data gaps are filled by conservative assumptions with average, generic, or proxy data. Any such assumptions are documented in Estimates and Assumptions.

For hazardous substances, as defined by the U.S. Resource Conservation and Recovery Act (RCRA), the following requirements apply:

- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided.

This LCA is in compliance with the cut-off criteria since no known processes were neglected or excluded from this analysis outside of the specific items outside the system boundary listed under “Excluded” in the LCA report. The uptake and emissions of CO₂ are not included in the quantification of the GWP-100.

Data Sources

LCA FE software v10.7 with the Sphera LCA for Experts (formerly GaBi) software system was used for modeling the life cycle of the Vetrotech VDS Lite. The Sphera GaBi, US LCI, and Ecoinvent v3.8 databases were used for raw materials, transportation, and energy inputs.

Data Quality

Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty. Since the inventory flows for the utilized databases are very often accompanied by a series of data quality ratings, a general indication of precision can be inferred. Using these ratings, the data sets used generally have medium-to-high precision. The Saint-Gobain North American ESG Department collected specific data on energy and material inputs, wastes, water use, emissions, and transportation impacts for the Auburn, WA manufacturing plant.

Period under Review

For this life cycle assessment, the Saint-Gobain North American ESG Department collected specific data on energy and material inputs, wastes, water use, emissions, and transportation impacts for the Auburn, WA manufacturing plant. The data used spanned between July 1, 2021 to June 30, 2022.

Allocation

The Auburn, WA facility is the only location that produces the Vetrotech VDS Lite product line in North America for Saint-Gobain North America. However, there are additional products produced at this location that were excluded from the study. Allocation was conducted based on the production mass data provided by the facility as a percentage of the overall production mass at each facility.

Life Cycle Assessment Scenarios

Life cycle stages A4-A5 and B1-B7 are excluded from the study. These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceedance of thresholds, safety margins or risks. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

Life Cycle Assessment Results

• Table 4. Description of the system boundary modules

	Product stage			Construction process Stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, recycling Potential
EPD Type	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Life Cycle Impact Assessment Results

• Table 5. North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.15E+03	-	-	-	-	-	-	-
ODP [kg CFC-11 eq]	5.39E-05	-	-	-	-	-	-	-
AP [kg SO ₂ eq]	1.47E+01	-	-	-	-	-	-	-
EP [kg N eq]	5.82E+00	-	-	-	-	-	-	-
POCP [kg O ₃ eq]	2.92E+02	-	-	-	-	-	-	-
ADP_{fossil} [MJ, LHV]	5.22E+03	-	-	-	-	-	-	-

Life Cycle Inventory Results

• Table 6. Resource Use

Parameter	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
RPRE [MJ, LHV]	2.63E+04	-	-	-	-	-	-	-
RPRM [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-
RPRT [MJ, LHV]	2.63E+04	-	-	-	-	-	-	-
NRPRE [MJ, LHV]	5.58E+04	-	-	-	-	-	-	-
NRPRM [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-
NRPRT [MJ, LHV]	5.58E+04	-	-	-	-	-	-	-
SM [kg]	0.00E+00	-	-	-	-	-	-	-
RSF [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-
NRSF [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-
RE [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-

FW [m³]	3.45E-02	-	-	-	-	-	-	-
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• **Table 7. Output Flows and Waste Categories**

Parameter	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
HWD [kg]	5.04E-07	-	-	-	-	-	-	-
NHWD [kg]	6.31E+01	-	-	-	-	-	-	-
HLRW [kg] or [m³]	9.79E-04	-	-	-	-	-	-	-
ILLRW [kg] or [m³]	8.70E-01	-	-	-	-	-	-	-
CRU [kg]	0.00E+00	-	-	-	-	-	-	-
MR [kg]	0.00E+00	-	-	-	-	-	-	-
MER [kg]	0.00E+00	-	-	-	-	-	-	-
EE [MJ, LHV]	0.00E+00	-	-	-	-	-	-	-

• **Table 8. Carbon Emissions and Removals**

Parameter	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
BCRP [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
BCEP [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
BCRK [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
BCEK [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
BCEW [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
CCE [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
CCR [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-
CWNR [kg, CO ₂]	0.00E+00	-	-	-	-	-	-	-

LCA Interpretation

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

Any comparison of EPDs shall be subject to the requirements of ISO 21930. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Based on the results from the life cycle assessment, the life cycle impacts are strongly driven by the raw materials and manufacturing processes.

Additional Environmental Information

Environment and Health During Manufacturing

Vetrotech Saint-Gobain has well-established Environmental, Health, and Safety (EHS) and product stewardship programs which help to enforce proper evaluation and monitoring of chemicals that are chosen to manufacture products. These programs ensure that all environmental and OSHA requirements are met or exceeded to ensure the health and safety of all employees and contractors.

Environment and Health During Installation

The installation stage was excluded from this study.

Extraordinary Effects

- **Fire**

ASTM E119 – Standard Test Methods for Fire Tests of Building Construction & Materials 2022

NFPA 257 – Standard on Fire Test for Window and Glass Block Assemblies 2022

UL 9 – Standard for Fire Tests of Window Assemblies Current Edition, Including All Revisions

- **Water**

Test installed exterior wall for water leakage in accordance with AAMA 501.2 host test.

Test installed exterior wall for water leakage in accordance with ASTM E1105.

- **Mechanical Destruction**

This product is intended for commercial applications. No danger to the environment can be anticipated during mechanical destruction.

Renewable Energy

Saint-Gobain is committed to achieving Carbon Neutrality by 2050. In January 2021, Saint-Gobain North America started receiving renewable energy certificates (RECs) from a 12-year virtual power purchase agreement (vPPA) with the Blooming Grove Wind Farm in McLean County, Illinois. Each year within the agreement, the company receives and retires these RECs, effectively reduced approximately 34.1% of CO₂ emissions from electricity usage in 2021-2022 in the United States and Canada. Updated results reflecting the RECs in the electricity input in manufacturing (A3) are shown below.

• **Table 9. Renewable Energy North American Impact Assessment Results**

TRACI v2.1	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	3.32E+03	-	-	-	-	-	-	-
ODP [kg CFC-11 eq]	5.26E-05	-	-	-	-	-	-	-
AP [kg SO ₂ eq]	1.15E+01	-	-	-	-	-	-	-
EP [kg N eq]	5.60E+00	-	-	-	-	-	-	-
POCP [kg O ₃ eq]	2.07E+02	-	-	-	-	-	-	-
ADP_{fossil} [MJ, LHV]	4.37E+03	-	-	-	-	-	-	-

Delayed Emissions

No delayed emissions are reported for this study.

Environmental Activities and Certifications

Visit www.vetrotech.com/en-us to find Vetrotech Saint-Gobain North America's full complement of Environmental Product Declarations and Health Product Declarations.

Further Information

Learn more about all VDS products at www.vetrotech.com/en-us.

Supporting Documentation

This product is intended for commercial applications. The product should be installed according to Vetrotech installation instructions.

References

Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Requirements. Version 3. 2018. UL Environment.

Product Category Rule Guidance for Building-Related Products and Services Part B: Designated Steel Construction Product EPD Requirements, Version 2.0 2020. UL Environment.

ISO 14040 (2006). ISO 14040:2006/Amd.1:2020: Environmental management - Life cycle assessment - principles and frameworks.

ISO 14044. (2006). ISO 14044:2006/Amd 1:2017/Amd 2:2020 -- Environmental management - Life cycle assessment - Requirements and guidelines.

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

LCA FE Databases. <https://LCA.FE.sphera.com/america/>

US LCI Database. <https://www.nrel.gov/lci/>

Ecoinvent v3.8 Database. <http://ecoinvent.org/>

Vetrotech Website. <https://www.vetrotech.com/>