ENVIRONMENTAL PRODUCT DECLARATION

PALISADES S90

COMMERCIAL GLASS BI-FOLDING DOOR

Palisades S90 is a bi-folding door.

CRL is the leading, full-service provider of architectural metals, glass fittings, and professional-grade glazing supplies. The company leverages more than 50 years of experience and a track record of industry firsts to offer a one-stop shop with a breadth of innovative product choices. From design to installation, CRL focuses on expanding opportunities for customers to turn bold architectural visions into real-world experiences. For more information go to www.crlaurence.com

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ENVIRONMENTAL PRODUCT DECLARATION
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CRL

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COMMERCIAL GLASS BI-FOLDING DOOR

According to ISO 14025, EN 15804, and ISO21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Solutions www.ul.com 333 Pfingsten Rd, Northbrook IL, 60062 www.spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Rules v 2.7 2022
MANUFACTURER NAME AND ADDRESS	C.R. Laurence 2200 E. 55th St, Vernon, CA, 90058
DECLARATION NUMBER	4791924172.103.1
DECLARED UNIT	1 m^2 of product
REFERENCE PCR AND VERSION NUMBER	NSF 1102-23 PCR For Fenestration Assemblies December 2023 (V2.0)
DESCRIPTION OF PRODUCT APPLICATION/USE	Palisades S90 are used as bi-folding doors.
PRODUCT RSL DESCRIPTION (IF APPL.)	N/A
MARKETS OF APPLICABILITY	Commercial Buildings
DATE OF ISSUE	March 23rd, 2026
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	2024
LCA SOFTWARE & VERSION NUMBER	Sphera LCA for Experts (fka GaBi) 10.9.1.19
LCI DATABASE(S) & VERSION NUMBER	Sphera MLC 2025.1
LCIA METHODOLOGY & VERSION NUMBER	IPCC AR6, TRACI 2.1, TRACI 2.2

The PCR review was conducted by:	NSF PCR Review Panel ncss@nsf.org
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Cooper McCollum, UL Solutions
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	WAP Sustainability
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Lucas Pedro Berman, Senda Consultorias

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.

1. Product Definition and Information

1.1. Description of Company/Organization

CRL is the leading, full-service provider of architectural metals, glass fittings, and professional-grade glazing supplies. The company leverages more than 50 years of experience and a track record of industry firsts to offer a one-stop shop with a breadth of innovative product choices. From design to installation, CRL focuses on expanding opportunities for customers to turn bold architectural visions into real-world experiences.

1.2. Product Description

Product Identification

The CRL Palisades S90 Bi-Folding Door represents the next generation of movable wall systems, offering the most desirable features in looks and performance. A distinctly slim 4-3/4" vertical sightline and 1-7/16" panel rails reduce visible hardware to produce a minimal aesthetic that maximizes views. When closed, door hinges are completely concealed to deliver an elegant and streamlined look. Compared to similar bi-folding doors in the market, the Palisades S90 provides superior thermal and structural performance using a 3-1/2" system depth. Its distinguishing CW40 Performance Grade rating makes the system ideal for exterior applications where larger sizes, higher loading requirements, limits on deflection, and heavy use are expected.

Figure 1: Palisades S90

1.3. Application

Palisades S90 doors are used for exterior doors where high loads, limits on deflection, and heavy use are likely.

1.4. Declaration of Methodological Framework

This LCA follows an attributional approach.

1.5. Technical Requirements

Table 1: Technical Details

NAME	VALUE	UNIT
Max door height	12 (3.66)	ft (m)
Max door width	4 (1.22)	ft (m)
Max system height with optional transom	12 (3.66)	ft (m)
Thermal Performance: U-factor	<0.36	Btu/hr.ft2.°F
Design Pressure Differential: Meets AAMA 101L/175 Deflection Criteria	40	Psf
Air infiltration: Exceeds ASHRAE 90.1-2022 Air Infiltration Requirements	0.14 @ 1.57 psf	cfm/ft2
Water Penetration: Tested to AAMA 101 in accordance with ASTM E331	No uncontrolled water entry at 10 psf (440 Pa)	-
Thermal Performance: Tested in accordance with ANSI/NFRC 100-200-CMA	As low as 0.36	U-Factor
Acoustic Performance: ASTM E90 and E1425	STC Rating: 32-36	-
Life Cycle Performance: Tested to 1,000,000 cycles	Tested to 250,000 cycles. Meets AAMA 920 Criteria	-
Forced Entry Resistance: AAMA-1304 @ 300lbf with no entry	Pass	-

2.1. Properties of Declared Product as Delivered

The product is purchased based on the required dimensions and delivered to site as components. The finished system is assembled on site.

2.2. Material Composition

The raw materials for the framing were obtained from Asia and the United States. The general compositions of the product is shown in Table 2.

Table 2: Material Composition

NAME	COMPOSITION PERCENTAGE*
ABS - 3D Printed	<1%
Acrylic Adhesive	<1%
Aluminum Extrusion	35%
Aluminum Sheet	<1%
Anodized Aluminum	<1%
Coating Powder	<1%
Composite Aluminum Plastic	<1%
EPDM Gasket	1.4%
Fasteners	<1%
Nylon	<1%
PE/PP foam	<1%
Thermoplastic Rubber	<1%
304 Stainless Steel	11%
Glass	52%
Polycarbonate	<1%

The materials are delivered to the manufacturing facility via ship and truck and are accounted for in the model. The distances were modeled by material and were calculated using the supplier location and the location of manufacturing.

2.3. Manufacturing

Manufacturing a Palisades S90 door system begins with cutting, fabricating and assembling raw materials to the sizes indicated on a set of fabrication drawings. Trained operators use fabrication drawings, templates and quality standards to glaze and assemble a complete door with hardware. Each door is then packaged securely with protective materials, labeled, and approved by the quality team before shipping to the customer.

2.4. Packaging

Palisades S90 is packaged and sent to customers using several materials, primarily a wooden crate. Packaging details are shown in Table 3.

Table 3: Packaging Details

MATERIAL	VALUE	UNIT
Cardboard	9.61 (21.2)	kg/m^2 (lb/m^2)
Plastic Foam	2.71 (5.97)	kg/m^2 (lb/m^2)
Wood	9.66 (21.3)	kg/m^2 (lb/m^2)

2. Life Cycle Assessment Background Information

3.1. Declared Unit

The declared unit according to the PCR is 1 square meter of door assembly. The reference flow is 129 kg (284.4 lb) of product unit without packaging with a frame to glazing ratio of 47% to 53% by mass.

3.2. System Boundary

This LCA is a Cradle-to-Gate study. An overview of the system boundary is shown in Figure 2 and a summary of the life cycle stages included in this LCA is presented in Table 3.

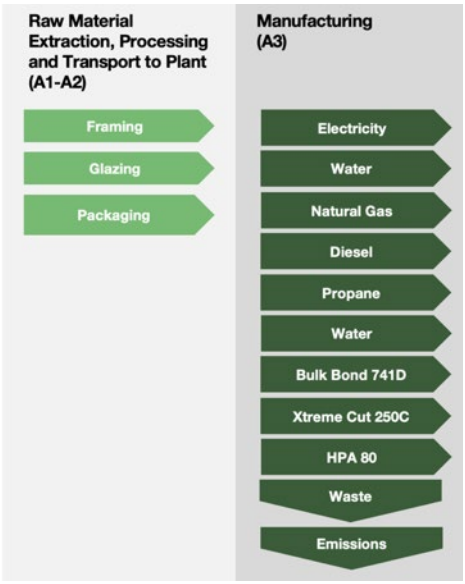

Figure 2: System Boundary Diagram

Table 4: Life Cycle Stages Included in the Study

	PRODUCT STAGE			CONSTRUCT-ION 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	Building Operational Water Use During Product	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

X = Module Included in LCA Report, MND = Module not Declared

3.3. Estimates and Assumptions

All estimates and assumptions are within the requirements of ISO 14040/44. The majority of the estimations are within the primary data. The primary data were collected as annual totals including all utility usage and production information. For the LCA, the data were divided by labor hours to create an energy and water use per unit. This was then normalized by area to determine requirements per square meter.

This study follows the modularity and polluter pays principles.

3.4. Cut-off Criteria

Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the declared unit.

The list of excluded inputs include:

- Items like labels, inks, stickers, adhesives, etc. may have been excluded from the product and packaging BOMs due to their small mass compared to the total product and packaging.
- Some material and energy inputs may have been excluded within the MLC datasets used for this project. All MLC datasets have been critically reviewed and conform to the exclusion requirements of the PCR.

3.5. Data Sources

Primary data were collected by facility personnel and from utility bills and was used for all manufacturing processes. Whenever available, supplier data were used for raw materials used in the production process. When primary data did not exist, secondary data for raw material production were utilized from the Sphera MLC Database.

3.6. Data Quality

Inventory data quality is judged by its precision (measured, calculated or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied on a study serving as a data source) and representativeness (geographical, temporal, and technological). To cover these requirements industry data were used in combination with consistent background LCA information from the Sphera MLC database. Primary data were used where available, including supplier data for raw materials used in the production process. When primary data did not exist, secondary data for raw material production were obtained from the MLC database.

3.7. Period under Review

The period under review was calendar year 2024.

3.8. Allocation

General principles of allocation were based on ISO 14040/44. There are no products other than the product under study that are produced as part of the specific manufacturing processes under study. There are, however, other products produced at the manufacturing facility. To derive a per-unit value for manufacturing inputs such as electricity, thermal energy, waste, ancillary materials, and water, allocation based on total labor hours was adopted due to the lack of annual production data. Labor hours were used for allocation of inputs and outputs at CRL's manufacturing

facility because of the availability of product-specific data available on time taken to manufacture Palisades S90. Though the data on manufacturing time includes activities that are directly correlated with energy use and some that aren't, the data is product-specific and accounts for the differences in manufacturing activities and how energy inputs vary for different CRL products.

As a default, secondary MLC datasets use a physical basis for allocation.

Of relevance to the defined system boundary is the method in which recycled materials were handled. Although there is no known recycled content in this product, background datasets may contain recycled material. Recycled materials in background datasets are accounted for via the cut-off method. Under this method, impacts and benefits associated with the previous life of a raw material from recycled stock are excluded from the system boundary. Additionally, impacts and benefits associated with secondary functions of materials at end of life are also excluded (i.e., production into a third life or energy generation from the incineration plant). Under this methodology, the study would include the impacts associated with reprocessing and preparation of recycled materials that are part of the bill of materials of the products under study.

3. Life Cycle Assessment Scenarios

This is a cradle-to-gate study. As such, there are no additional life cycle assessment scenarios to be reported.

4. Life Cycle Assessment Results

All results are given per declared unit. Each product under study is reported separately by life cycle stage. Per the PCR, section 7.1.3, results for the framing and glazing must be reported separately. Here, framing and glazing include impacts associated with the raw material extraction and processing before being received at CRL's facility. Manufacturing impacts and transportations impacts were not separated into these columns based on the LCA practitioner's interpretation of the standard and an inability to allocate manufacturing between framing and glazing. This why values in framing and glazing are lower than the A1-A3 total.

Table 5: LCIA Results

Impact	Unit	A1-A3	Framing	Glazing
		IPCC AR6		
GWPe	kg CO2 eq	6.39E+02	3.19E+02	2.66E+02
GWPi	kg CO2 eq	6.05E+02	3.16E+02	2.66E+02
		TRACI 2.1		
AP	kg SO2 eq.	2.18E+00	1.32E+00	6.80E-01
EP	kg N eq.	1.22E-01	4.14E-02	4.61E-02
ODP	kg CFC 11 eq.	5.48E-10	2.70E-10	1.92E-10
SFP	kg O3 eq.	3.26E+01	1.39E+01	1.56E+01
		TRACI 2.2		
EPf	kg P eq.	1.17E-03	8.05E-05	1.03E-04
EPm	kg N eq.	9.15E-01	3.83E-01	4.40E-01

Table 6: Resource Use

PARAMETER	UNIT	A1-A3	FRAMING	GLAZING
RPRE	MJ	4.57E+03	1.36E+03	2.86E+03
RPRM	MJ	2.69E+02	0.00E+00	1.46E+00
RPRT	MJ	4.84E+03	1.36E+03	2.86E+03
NRPRE	MJ	8.75E+03	3.85E+03	4.06E+03
NRPRM	MJ	5.33E+01	5.14E+01	1.50E-01
NRPRT	MJ	8.80E+03	3.90E+03	4.06E+03
RSF	MJ	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00
RE	MJ	0.00E+00	0.00E+00	0.00E+00
SM	MJ	3.23E+01	3.23E+01	0.00E+00
FW	m3	6.89E+00	3.82E+00	2.74E+00

Table 7: Output Flows and Waste Categories

PARAMETER	UNIT	A1-A3	FRAMING	GLAZING
HWD	kg	1.16E-04	1.11E-04	4.28E-06
NHWD	kg	8.20E+01	6.55E+01	8.91E+00
HLRW	kg	3.70E-04	1.00E-04	2.42E-04
ILLRW	kg	3.25E-01	9.91E-02	2.03E-01
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MR	kg	3.57E+00	0.00E+00	-1.72E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00

5. LCA Interpretation

Breakdown of key impact categories are shown in representing TRACI 2.1 impact categories and IPCC AR6 for GWP. Both framing and glazing drive impacts for Palisades S90 depending on the impact category. Framing drives impacts for GWPe (50%), AP (61%) and ODP (49%) while glazing drives impacts for EP (38%) and SFP (48%). Framing includes all materials that are not packaging or glazing (i.e., glass panel from OBE). Aluminum components within framing drives impact at about 50% followed by stainless steel at around 38%. Following framing is glazing components of A1-A3 impacts. Here, glass components within the glazing drives impacts.

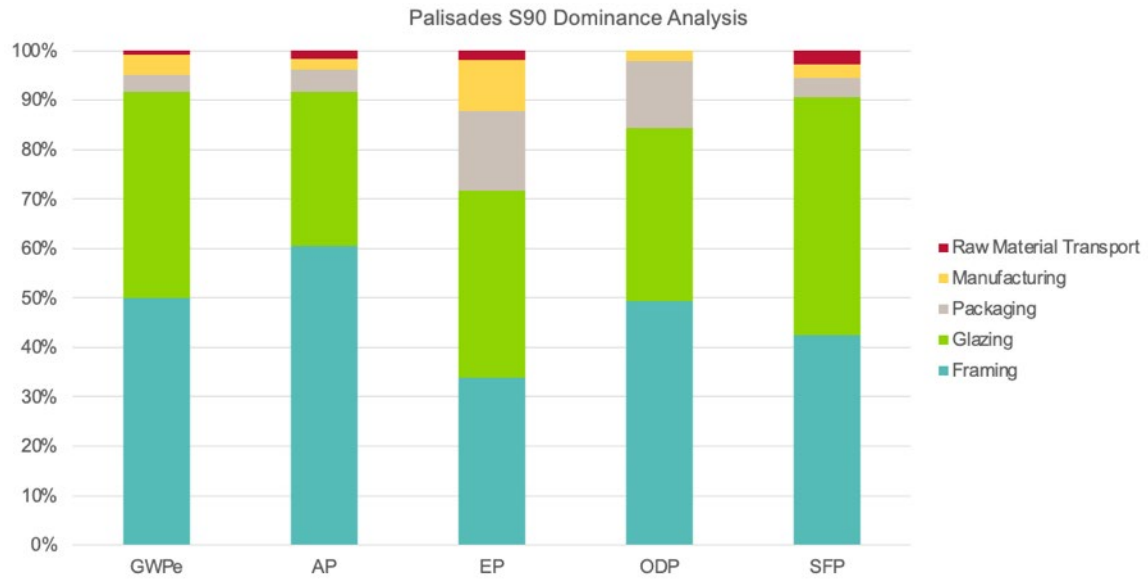

Figure 3: IPCC AR6 and TRACI 2.1 Summary

(GWP = Global warming potential (IPCC AR6); AP = Acidification potential; EP = Eutrophication potential; ODP = Stratospheric ozone layer depletion potential; FF = Resources, Fossil fuels; SFP = Smog formation potential)

6. Additional Environmental Information

Palisades S90 has an HPD. For additional product information refer to the C.R Laurence Technical Specifications sheet.

7. References

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