



Environmental Product

Declaration

Program Operator: Smart EPD®

www.smartepd.com

IN ACCORDANCE WITH ISO 14025 AND EN 15804:2012+A2:2019/AC:2021



SmartEPD-2026-122-0779-01

Integral Edge Tri-flat and Tri-curve Linear Luminaires



Date of Issue

Mar 09, 2026

Expiration date

Mar 09, 2031

Last updated

Mar 09, 2026



Refer to the EPD Library at www.smartepd.com for the latest EPD listing information

General Information

Lantana LED

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Product Name:	Integral Edge Tri-flat and Tri-curve Linear Luminaires
Functional Unit:	1,000 lumens during a reference lifetime of 35,000 hours
Declaration Number:	SmartEPD-2026-122-0779-01
Date of Issue:	March 09, 2026
Expiration:	March 09, 2031
Last updated:	March 09, 2026
EPD Scope:	Cradle to grave A1 - A3, A4, A5, B2, B4, B6, C1 - C4
Market(s) of Applicability:	North America

General Organization Information

Lantana LED is an LED lighting solutions company based in San Francisco, California.

Further information can be found at: <https://www.lantanaled.com/about>

Limitations, Liability and Ownership

The EPD owner has sole ownership, liability, and responsibility for the EPD.

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible 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.

Reference Standards

Standard(s):	ISO 14025 and EN 15804:2012+A2:2019/AC:2021
Core PCR:	PEP PCR Electrical, Electronic and HVAC-R Products v.4 Date of issue: September 06, 2021
Sub-category PCR:	PEP ecopassport® PROGRAM PSR Specific Rules for Luminaires (PSR-0014-ed2.0-EN-2023 07 13) Date of issue: July 13, 2023

Valid until: July 13, 2028

Sub-category PCR review panel:

Contact Smart EPD for more information.

General Program Instructions:

Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

Sarah Curpen | curpen1996@gmail.com

External

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

Sarah Curpen | curpen1996@gmail.com

External

Product Information

Functional Unit:

1,000 lumens during a reference lifetime of 35,000 hours

Mass:

0.239 kg

Product Specificity:

Product Average
Product Specific

Variation in GWP Result (Products):

0% to %

Variation in GWP Result (Facilities):

0% to %

Product Description

The Integral Edge Tri-flat and Tri-curve Linear luminaires are used across commercial and industrial settings, offering flat or curved lens options to suit specific applications. These luminaires deliver high-efficacy illumination of up to ~12,380 lumens and have a lifespan of 71,000 hours. The luminaires come in 4 ft and 8 ft sizes with several different mounting options: surface, pendant, Unistrut, or 45° bracket mount. They are compatible with a wide range of sensors and may be integrated with advanced lighting control systems.

Further information can be found at: <https://www.lantanaled.com/category/edge-lighting>

Product Specifications

Product SKU(s):

L62

Product Classification Codes:	UNSPSC - 39111501 EC3 - Electrical -> Lighting -> LightingFixtures
Components and Accessories:	The commercial presentation includes 4 luminaires per box. The integral luminaire contains a control gear and LED lighting source, and the remote luminaire contains an LED lighting source. The remote luminaire does not contain a control gear and must be purchased separately. The products include a pendant with Aircraft Cable, Unistrut, and Integrated Surface Mount, which can be used for luminaire installation.
Options:	✓ Light source included
Measured outgoing artificial luminous flux:	6,267 lumens
Light source color temperature:	4000 Kelvin
Light Source:	LED Module, integrated, semi-integrated, or non-integrated
Extrapolated outgoing artificial luminous flux:	12,534 lumens
Options:	✓ Control gear delivered with product
Control Gear Description:	An LED driver is included with the luminaire. The LED driver is assumed to have a lifespan of 15,000 hours.
Operating Voltage:	36-48 volts
Luminous efficiency:	157 lm/W
Electrical power:	40 watts
Assigned lifetime:	71,000 hours
Reference use scenario description:	Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours.
Luminaire lifetime:	71,000 hours

Material Composition

Material/Component Category	Origin	% Mass
Steel	Canada, United States	45.1
Aluminum	Canada	22.8
10% PCR acrylic	Canada	14.3
LED driver	Mexico	10.3
LED board	United States	3.8
ABS plastic	Canada	1.7
Wires	Unknown	0.8
Glass fiber cloth	China	0.2
Polycarbonate	Unknown	0.4
Zinc-plated steel	Unknown	0.5
Nickel-plated steel	Unknown	0.1
Rubber	Unknown	0.4
Copper	Unknown	0.4

Packaging Material	Origin	kg Mass
Corrugated board	Unknown	0.135

Biogenic Carbon Content	kg C per 1000 lumens during a reference lifetime of 35,000 hours
Biogenic carbon content in product	None
Biogenic carbon content in accompanying packaging	0.00502

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specifity

- Primary Data Year:2024
- Manufacturing Specificity:

✗ Industry Average

✗ Manufacturer Average

✓ Facility Specific

Averaging:
Averaging was not conducted for this EPD.

System Boundary

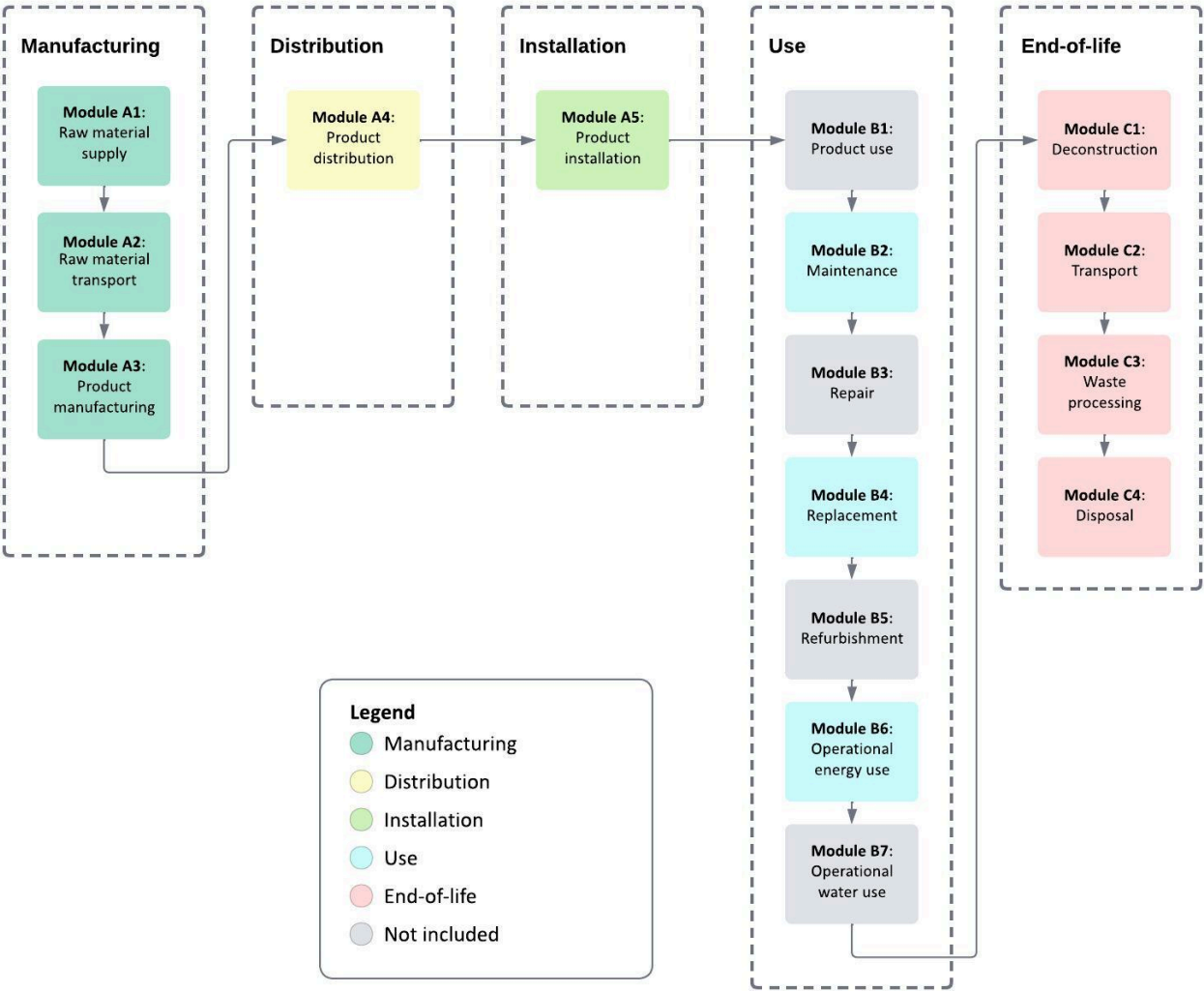
Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓

Use	B1	Use	ND
	B2	Maintenance	✓
	B3	Repair	ND
	B4	Replacement	✓
	B5	Refurbishment	ND
	B6	Operational Energy Use	✓
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Note:

ND = Module not declared

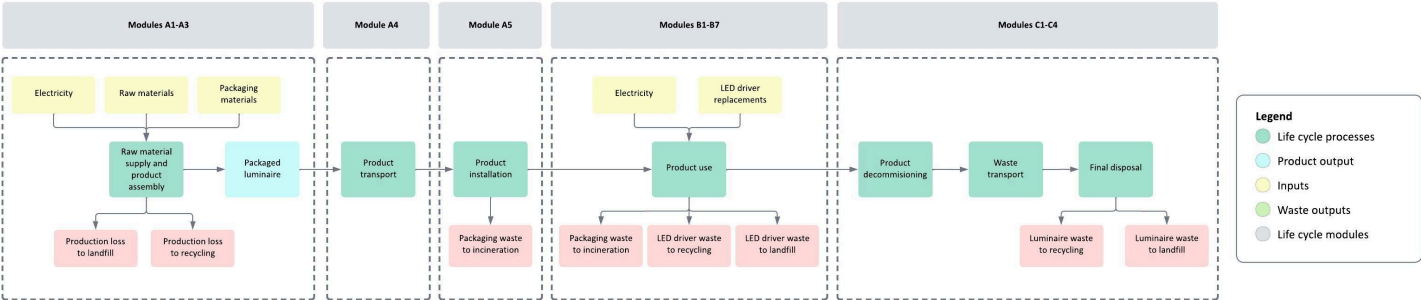
Product Composition Diagram



Plants

 Lantana LED Manufacturing Plant 234 Norseman St, Etobicoke, Toronto, ON M8Z 2R4, Canada

Product Flow Diagram



Software And Database

LCA Software:	SimaPro v. 10.2	
LCI Foreground Database(s):	Ecoinvent v. 3.11	CA, US, RoW, GLO
LCI Background Database(s):	Ecoinvent v. 3.11	CA, US, RoW, GLO

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

Time-related coverage: Primary data is based on 2024 operations and secondary data from ecoinvent 3.11 spans from 2010 to 2024. Ecoinvent updates its database annually; however, some datasets have not been revised in recent releases and have therefore not been classified as obsolete. In the absence of more recent data, this suggests that these datasets are still technologically representative of current-day processes, despite being over 10 years old. Accordingly, these datasets are considered the best available secondary data for this study, despite their low temporal representativeness.

Geographical coverage: The data used to model the inputs and outputs of manufacturing for the luminaires is from Canada and the U.S. When there was no data from Canada or the U.S., but there was from other regions, the electricity source was changed, to reflect Canadian or U.S. conditions. For background data, RoW and GLO data sets were used.

Technology coverage: The technology for manufacturing luminaires reflects the actual technology. For background data, Canadian, U.S., RoW, and GLO average data were used.

Accuracy: an uncertainty assessment (Monte Carlo analysis) was conducted on relevant datasets, including US grid electricity and the LED driver, which were modeled using secondary datasets from ecoinvent 3.11. For both US grid electricity and the LED driver, results of the Monte Carlo analysis reveal a high degree of uncertainty for the following impact categories: ecotoxicity - freshwater, human toxicity - cancer, human toxicity - non-cancer, and water use. The LED driver also shows a high degree of uncertainty for the ionizing radiation impact category. Findings for the highly uncertain indicators should be interpreted with caution, while the more stable categories can be considered more reliable.

Precision: The model is built using primary data for the BOM, manufacturing energy, and distribution inputs. Primary information provided by Lantana LED represents the foreground system for this product. If primary data was not available, assumptions were based on guidance from the PCR and PSR. Therefore, the inventory obtained and the datasets used were as precise as possible.

Completeness: Every effort was made to perform a comprehensive analysis and to include as much detail as possible; therefore, the analysis is considered to be complete.

Life Cycle Module Description

Module A1-A3:

The life cycle starts with the production of raw materials required for product manufacturing and packaging. The heaviest components of the luminaire include cardboard packaging, an aluminum extruded chassis, and a steel top integral box. Other notable raw materials include an LED driver and LED board, extruded acrylic lens, and smaller steel and plastic components. The production and transport of all material inputs to the manufacturing facility is included in the system boundary for this study.

The luminaires are assembled at a manufacturing facility in Etobicoke, Ontario, Canada. The electricity associated with product manufacturing is based on primary data and is included in the system boundaries.

The production losses are 5% based on primary data from Lantana LED. It is assumed that 55% of the production loss waste is recycled and the other 45% of the waste is landfilled. These waste treatments are based on default assumptions outlined in the PSR for luminaire EoL treatment.

Following production, the products are packaged with 4 luminaires in 1 carton and stored on-site prior to product distribution.

Module A4:

The luminaires are transported from the production facility to consumers via truck. The average distance from production facility to installation site is assumed to be 2446 km, based on estimations from Lantana LED.

Module A5:

Once the products are received by the consumer, the luminaire is installed according to the manufacturer's instructions. It is assumed that the luminaire is installed using the pendant mount option. Installation is done manually via hand tools; therefore, no additional energy is required for operation of power tools. Disposal of packaging waste is considered in the system boundary.

Module B2:

The luminaire contains an LED driver, with an assumed lifetime of 15,000 hours based on the default value outlined in the PSR. Over the lifetime of the luminaire (71,000 hours), the LED driver must be replaced 4.7 times. The system boundaries encompass the production of replacement LED drivers along with their associated packaging, as well as the disposal of waste LED drivers and packaging materials. Waste treatment is based on default values in the PSR for packaging and luminaires.

Module B4:

The luminaire is not assumed to require replacement to fulfill the functional unit. The control gear requires replacement; however, the impacts of the control gear replacement are considered under product maintenance (Module B2). Therefore, there are no replacement phase impacts assumed for the luminaire.

Module B6:

The baseline scenario for the luminaire is considered to have an active power consumption of 40 W/hour and a product lifespan of 71,000 hours. It is assumed that the average customer is located in the United States, so this life cycle phase is modeled using the average US electricity grid.

Module C1:

Deconstruction is assumed to be done manually via hand tools; therefore, no additional energy is required for the operation of power tools. There are no deconstruction phase impacts assumed.

Module C2:

This phase considers the transport of collected waste to treatment centers. The default distance is 100 km by truck, according to the PSR.

Module C3:

This phase considers the sorting, cleaning, and pre-processing of luminaires for recycling; however, no benefits beyond the system boundary are allocated. It is assumed there is no waste processing required for materials going to landfill.

Module C4:

This phase considers the final disposition of the luminaire. It is assumed that 55% of the luminaire is recycled and the other 45% of the luminaire is landfilled. These waste treatments are based on default assumptions outlined in the PSR.

LCA Discussion

Allocation Procedure

This study follows the allocation principles outlined in EN 15804 and ISO 14044 to ensure accurate and transparent environmental impact assessment.

- Allocation is avoided wherever possible. The system boundaries have been defined such that no multi-output or joint processes requiring allocation occur within the included processes.
- The allocation method is applied consistently across all relevant life cycle stages.
- The sum of inputs and outputs of each unit process is preserved before and after allocation, ensuring no losses or double counting occur. The product output is normalized to one 4 ft luminaire, and inputs are proportionally allocated to maintain balance.
- Since inputs are based on the life cycle of one 4 ft luminaire, environmental impacts are accurately assigned without double counting or omission.
- There is no use of secondary materials or secondary fuels as raw materials within the scope of this study. Therefore, no allocation related to secondary materials or secondary fuels is necessary.

Allocation within the Plant and Co-Products:

- During the manufacturing phase, electricity consumption was reported at the facility level. As both integral and remote Tri-Flat and Tri-Curve products are manufactured at the same facility, total facility electricity use was allocated on a per-unit basis across all luminaires produced. The facility's electricity consumption is reported as 30 kWh per day of operation, with a total production volume of 2,130 luminaires in 2024. Based on guidance from Lantana LED, the facility is assumed to operate 300 days per year, resulting in a total electricity consumption of 9,000 kWh for the study period. Table 2-3 summarizes the resulting electricity allocation per luminaire produced at the manufacturing facility during 2024.
- There are no co-products generated during the production processes. Consequently, no co-product allocation factors are required, and no allocation method beyond that described in the general allocation procedure is applied.
- Facility electricity consumption was allocated on a per-unit basis, as the manufactured products are similar in design and production requirements and no product-specific electricity data were available.
- Net benefits and loads (Module D) are not declared in this study.
- No multi-input processes (such as combined waste treatment, landfilling, or incineration with other waste streams) are included within the system boundaries. Therefore, no allocation is required or applied for multi-input processes.

Cut-off Procedure

Cut-off criteria are often used in LCA practice for the selection of processes or flows to be included in the system boundary. The processes or flows below these cut-offs or thresholds may be excluded from the study. Several criteria are used in LCA practice to decide which inputs are to be considered, including mass, energy, and environmental relevance.

For this study, every effort was made to include all foreground flows.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:

✗ No

Scenarios

Transport to the building/construction site (A4)

A4 Module

Transport Distance:	2446 km
Packaging Mass:	0.135 kg
Weight of products transported:	0.239 kg
Assumptions for scenario development:	Transport distance is based on primary data for average customer distance from Lantana LED.

Installation in to the building/construction site (A5)

A5 Module

Mass of Packaging Waste Specified by Type:	0.135 kg
Biogenic Carbon Contained in Packaging (kg C):	0.00502 kg
Assumptions for scenario development:	It is assumed that the luminaires are installed using the pendant mount option. Installation is done manually via hand tools; therefore, no additional energy is required for operation of power tools. Disposal of packaging waste is considered in the system boundary. There is no product waste generated during installation.

Maintenance (B2)

B2 Module

Maintenance Cycle:	4.7 Cycles/RSL
Ancillary Materials Specified by Type:	0.0795 kg
Waste Materials from Maintenance:	0.0795 kg
Maintenance Process Information:	The integral luminaire contains an LED driver, with an assumed lifetime of 15,000 hours based on the default value outlined in the PSR. Over the lifetime of the luminaire (71,000 hours), the LED driver must be replaced 4.7 times. The system boundaries encompass the production of replacement LED drivers along with their associated packaging, as well as the disposal of waste LED drivers and packaging materials. Amount of packaging is assumed based on guidance from the PSR. Waste treatment is based on default values in the PSR for packaging and luminaires.
Ancillary materials (LED driver replacements):	0.0758 kg
Ancillary materials (Cardboard packaging):	0.0015 kg
Ancillary materials (Plastic packaging):	0.0004 kg
Ancillary materials (Wood packaging):	0.0019 kg

Replacement (B4)

B4 Module

Further assumptions for scenario development:

The luminaires are not assumed to require replacement to fulfill the functional unit. The control gear requires replacement; however, the impacts of the control gear replacement are considered under product maintenance. Therefore, there are no replacement phase impacts assumed for luminaires.

Operational Energy Use (B6) & Operational Water Use (B7)

B6 & B7 Modules

Energy Input:

0.04 kWh

Further assumptions for scenario development:

The baseline scenario for the luminaire is considered to have an active power consumption of 40 W/hour. It is assumed that the average customer is located in the United States, so this life cycle phase is modeled using the average US electricity grid.

End of Life (C1 - C4)

C1 - C4 Modules

Recovery

Recycling:

0.131 kg

Landfill:

0.107 kg

Disposal

Product or Material for Final Disposal:

0.239 kg

Removals of Biogenic Carbon:

5.06E-03 kg CO2

Assumptions for scenario development:

Deconstruction is assumed to be done manually via hand tools; therefore, no additional energy is required for the operation of power tools. There are no deconstruction phase impacts assumed in this study. This phase considers the transport of collected waste to treatment centers. The default distance is 100 km by truck, according to the PSR. This phase considers the sorting, cleaning, and pre-processing of integral and remote luminaires for recycling. It is assumed there is no waste processing required for materials going to landfill. This phase considers the final disposition of the luminaire. It is assumed that 55% of the luminaire is recycled and the other 45% of the luminaire is landfilled. These waste treatments are based on default assumptions outlined in the PSR.

Results

Environmental Impact Assessment Results

EF 3.1

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Method	Indicator	A1 - A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
GWP-total	EF 3.1	ND	1.80e+0	1.64e-1	7.60e-2	1.84e+0	0	1.03e+2	0	4.08e-3	2.88e-2	9.91e-4
GWP-fossil	EF 3.1	ND	1.77e+0	1.64e-1	7.60e-2	1.83e+0	0	1.03e+2	0	4.08e-3	2.87e-2	9.88e-4
GWP-biogenic	EF 3.1	ND	1.93e-2	3.71e-5	3.06e-6	3.57e-3	0	3.27e-2	0	9.20e-7	1.49e-4	2.59e-6
GWP-luluc	EF 3.1	ND	8.09e-3	7.36e-5	2.53e-6	3.55e-3	0	4.87e-2	0	1.83e-6	2.80e-5	5.97e-7
ODP	EF 3.1	ND	3.09e-8	2.09e-9	1.48e-10	5.83e-8	0	3.81e-7	0	5.18e-11	1.66e-10	2.42e-11
AP	EF 3.1	ND	1.17e-2	5.61e-4	6.53e-5	1.50e-2	0	2.82e-1	0	1.39e-5	1.22e-4	1.07e-5
EP-freshwater	EF 3.1	ND	1.30e-3	1.80e-5	1.06e-5	1.49e-3	0	8.42e-2	0	4.47e-7	7.13e-6	1.57e-6
EP-marine	EF 3.1	ND	2.12e-3	1.78e-4	9.33e-5	2.37e-3	0	5.99e-2	0	4.41e-6	2.31e-5	2.65e-6
EP-terrestrial	EF 3.1	ND	2.14e-2	1.93e-3	3.03e-4	2.55e-2	0	4.71e-1	0	4.79e-5	2.54e-4	2.88e-5
POCP	EF 3.1	ND	7.68e-3	7.60e-4	8.19e-5	1.07e-2	0	1.94e-1	0	1.89e-5	8.04e-5	1.03e-5
ADP-minerals&metals	EF 3.1	ND	1.04e-4	5.39e-7	1.83e-8	2.73e-4	0	1.35e-4	0	1.34e-8	5.97e-7	1.84e-9
ADP-fossil	EF 3.1	ND	2.72e+1	2.27e+0	9.58e-2	2.49e+1	0	1.83e+3	0	5.64e-2	1.97e-1	-1.10e+0
WDP	EF 3.1	ND	6.32e-1	1.06e-2	1.36e-3	5.72e-1	0	1.65e+1	0	2.62e-4	2.72e-3	-1.44e-2

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

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 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. 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.

Resource Use Indicator

Indicator	Unit	A1 - A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
PERE	MJ, net calorific value	5.36e+0	3.04e-2	1.96e-3	3.34e+0	0	2.02e+2	0	2.48e-2	2.48e-2	2.75e-4
PERM	MJ, net calorific value	2.27e+0	0	-2.27e+0	0	0	0	0	0	0	0
PERT	MJ, net calorific value	7.63e+0	3.04e-2	-2.27e+0	3.34e+0	0	2.02e+2	0	7.53e-4	2.48e-2	2.75e-4
PENRE	MJ, net calorific value	2.61e+1	2.27e+0	9.58e-2	2.49e+1	0	1.83e+3	0	5.64e-2	2.45e-1	2.20e-2
PENRM	MJ, net calorific value	1.12e+0	0	0	0	0	0	0	0	0	-1.12e+0
PENRT	MJ, net calorific value	2.72e+1	2.27e+0	9.58e-2	2.49e+1	0	1.83e+3	0	5.64e-2	2.45e-1	-1.10e+0
SM	kg	1.35e-1	0	0	0	0	0	0	0	0	0
RSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
NRSF	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0	0	0	0
FW	m3	3.71e-2	2.92e-3	1.82e-4	2.92e-2	0	1.64e+0	0	7.23e-5	2.95e-4	3.36e-5

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

Indicator	Unit	A1 - A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
HWD	kg	0	0	0	0	0	0	0	0	0	0
NHWD	kg	4.77e-3	0	0	3.41e-2	0	0	0	0	0	9.08e-2
RWD	kg	0	0	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	5.84e-3	0	0	4.16e-2	0	0	0	0	0	1.11e-1
MER	kg	0	0	1.35e-1	3.78e-3	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

Indicator	Unit	A1 - A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
BCCPR	kg C	0	0	0	0	0	0	0	0	0	0
BCCPA	kg C	-5.02e-3	0	5.02e-3	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Scaling Factors

Product Name and/or Product Attribute	Product Specific Functional/Declared Unit Multiplier
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8 ft Integral luminaire

ND	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4
Scaling factors	3.02	1.89	1.67	3.02	2.00	2.03	2.03	2.03	2.03

- Modules A1-A3
- Rule applicable to the production of the luminaire structure: structure weight of concerned product (kg) / structure weight of reference product (kg)
- Rule applicable to the production of the packaging: packaging weight of concerned product (kg) / packaging weight of reference product (kg)
- Rule applicable to the production of the control gear: control gear weight of concerned product (kg) / control gear weight of reference product (kg)
- Rule applicable to the production of the light source: light source weight of concerned product (kg) / packaging weight of reference product (kg)
- Module A4
- Rule applicable to the distribution of the luminaire: (weight of the concerned product + packaging weight of concerned product (kg)) / (weight of reference product + packaging weight of reference product (kg)).
- Module A5
- Rule applicable to the installation of the luminaire: packaging weight of concerned product (kg) / packaging weight of reference product (kg).
- Module B2
- Rule applicable to the production of replacing light sources and the treatment of used light source: weight of concerned product light source (kg) / weight of replaced product light source (kg).
- Rule applicable to the production of replacing control gear and the treatment of used control gear: weight of concerned product control gear (kg) / weight of replaced product control gear (kg).
- Module B6
- Rule applicable to the electricity consumption: (power of concerned product (W) / power of reference product (W)) / (energy saving coefficient of concerned product / energy saving coefficient of reference product)
- There are no energy saving functions considered in this study for the integral and remote luminaires; therefore, these coefficients are considered to be 1.
- Modules C1-C4
- Based on the extrapolation rules outlined in the PSR, the extrapolation coefficient is considered to be the same for Modules C1, C2, C3 and C4.
- Rule applicable to end-of-life stages: weight of concerned product including its light source and control gear (kg)/weight of reference product including its light source and control gear (kg).

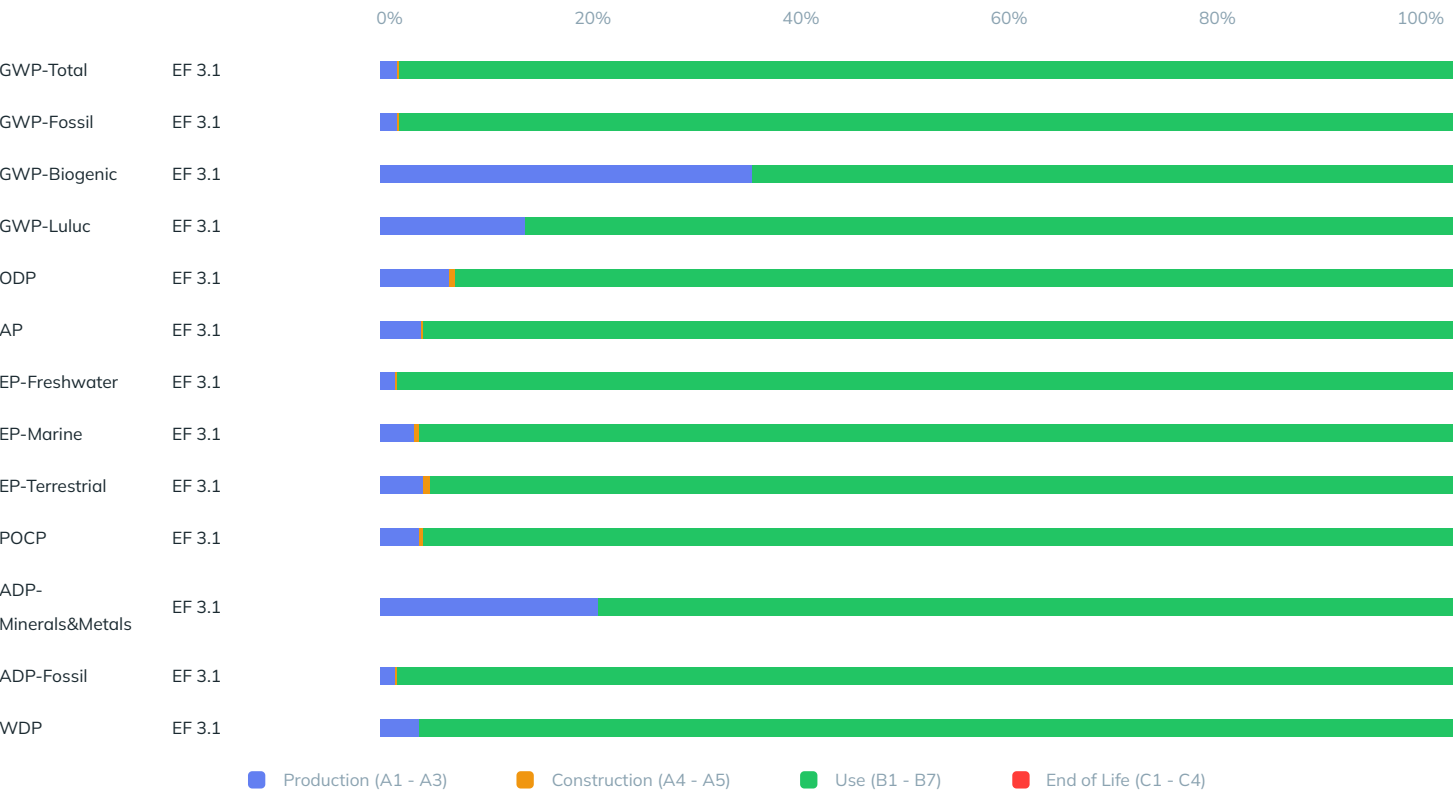
- The maximum value method is used as a conservative approach for establishing the extrapolation coefficient, meaning that the largest extrapolation coefficient is used to extrapolate impacts for each life cycle stage considered.

Interpretation

Module B6 (operational energy use) is the primary driver of impact for climate change (total), climate change (fossil fuels), climate change (land use and land use transformation), ozone depletion, acidification, freshwater eutrophication, marine aquatic eutrophication, terrestrial eutrophication, photochemical ozone formation, abiotic resource depletion (fossils), and water use, accounting for 80% to 97% of impacts across these indicators. These impacts are driven by US grid electricity consumption.

Module A1-A3 (raw material sourcing, transport, and production) is the main driver of climate change (biogenic), accounting for 50% of impacts across modules. This is due to the cardboard packaging, followed by the top integral box, and aluminum chassis.

Module B2 (maintenance) is the leading driver of abiotic resource depletion (metals and minerals), accounting for 53% of impact across modules for the integral luminaire. This is driven by the LED driver replacements throughout the luminaire lifespan. The PSR estimates a control gear lifetime of 15,000 hours, requiring 4.7 LED driver replacements over the luminaire lifespan.



Additional Environmental Information

The integral luminaires do not contain any hazardous substances, nor do they release any dangerous substances.

If the necessary sensors are applied for light management functions, the energy consumption during Module B6 (operational energy use) may be reduced as compared to the baseline scenario (based on guidance from the PSR):

- Variation of extinction system according to the brightness of day light – 25% reduction of energy consumption.
- Variation of extinction system according to the presence and absence – 25% reduction of energy consumption.
- Combination of presence detection function and luminosity function – 45% reduction of energy consumption.
- Luminaire capable of communicating with an external light management system – 50% reduction of energy consumption.

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