

ENVIRONMENTAL PRODUCT DECLARATION

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

SmartEPD-2024-031-0158-01

Illucent Linear - Integral



Date of Issue:
Aug 19, 2024

Expiration:
Aug 19, 2029

Last updated:
Aug 19, 2024

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General Information

LANTANA LED

300 Brannan St, Suite 608, San Francisco, CA 94107
415-814-8500
sales@lantanaled.com | lantanaled.com



Product Name:	Illucent Linear - Integral
Functional Unit:	1,000 lumens during a reference lifetime of 35,000 hours
Declaration Number:	SmartEPD-2024-031-0158-01
Date of Issue:	August 19, 2024
Expiration:	August 19, 2029
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EPD Scope:	Cradle to grave A1 - A3, A4, A5, B2, B4, B6, C1 - C4
Market(s) of Applicability:	North America

Reference Standards

Standard(s):	ISO 14025 and EN 15804:2012+A2:2019/AC:2021
Core PCR:	Association P.E.P PEP ecopassport Product Category Rules for Electrical, Electronic and HVAC-R Products v.4 Date of issue: September 06, 2021
Sub-category PCR:	Association P.E.P PEP ecopassport PSR Specific Rules for Luminaires v.2 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.1.0, November 2022

Verification Information

LCA Author/Creator:	Chris Carter chris.carter@truenorthcollective.net
EPD Program Operator:	Smart EPD info@smartepd.com www.smartepd.com 585 Grove St., Ste. 145 PMB 966, Herndon, VA 20170, USA

Verification:

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

External

🌐 Sarah Curpen | ✉ curpen1996@gmail.com

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

External

🌐 Sarah Curpen | ✉ curpen1996@gmail.com

Limitations, Liability, and Ownership

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 different results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Organization Information

LANTANA LED is a forward-thinking company committed to revolutionizing lighting solutions. They specialize in offering high-quality, energy-efficient light-emitting diodes (LED) lighting products and solutions suitable for various industries including commercial interiors, data centers, and educational institutions.

Further information can be found at: [LANTANALED.com](https://www.lantanaled.com)

Product Description

The original LANTANA LED architectural linear, now known as the Illucent Linear, is designed with cutting-edge technology, ensuring consistent illumination across its length. It features a sleek, linear design that provides superior light output and adds a touch of modern elegance to any space.

Further information can be found at: <https://www.lantanaled.com/product-page/illucent-linear>
<https://info.lantanaled.com/hubfs/2023%20LANTANA%20LED%20Performance%20Testing/Illucent%20Linear%20Performance.pdf>

Product Information

Functional Unit:	1,000 lumens during a reference lifetime of 35,000 hours
Mass:	0.212 kg
Product Specificity:	☒ Product Average ☒ Product Specific
Supply Chain Specific Data:	48.5 %

Plants

 Supplier A
Canada

Product Specifications

Product SKU(s):	Illucent Linear - Integral 4ft, L3, 80 CRI
Product Classification Codes:	EC3 -
Options:	✓ Light source included
Measured outgoing artificial luminous flux:	6,482 lumens
Light source color temperature:	4000 Kelvin
Light Source:	LED Module, integrated, semi-integrated, or non-integrated
Options:	✓ Control gear delivered with product
Control Gear Description:	Integrated electronic driver
Luminous efficiency:	162 lm/W
Electrical power:	40 watts
Assigned lifetime:	71,000 hours
Luminaire lifetime:	71,000 hours

Material Composition

Material/Component Category	Origin	% Mass
Aluminum	Canada	48.5
Acrylic	Canada	29.4
Electronics	Canada	12.6
LED	Canada	3.6
ABS	Canada	2.3
Steel	Canada	1.8
Copper	Canada	1.4
Glass Fiber Cloth	China	0.4

Packaging Material	Origin	kg Mass
Cardboard	None	100

Biogenic Carbon Content	kg C per lumens during a reference lifetime of 35,000 hours
Biogenic carbon content in product	None
Biogenic carbon content in accompanying packaging	0.0582

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

EPD Data Specificity

- Primary Data Year:2022
- Manufacturing Specificity:

✗

Industry Average

✗

Manufacturer Average

✓

Facility Specific

Software and LCI Data Sources

- LCA Software:

SimaPro v. 9.6
- LCI Foreground Database(s):

Ecoinvent v. 3.10
- LCI Background Database(s):

Ecoinvent v. 3.10

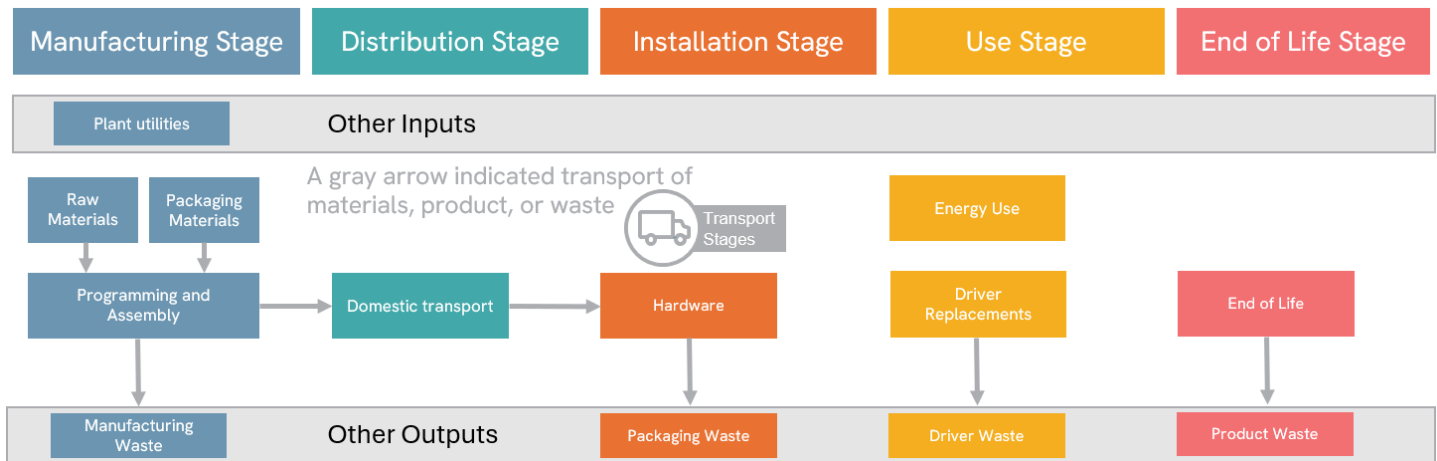
Renewable Electricity

- Renewable electricity is used:No

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

Product Flow Diagram



Life Cycle Module Descriptions

The Manufacturing stage (A1-A3) includes the following:

- Production of the materials and components that make up the reference product, including the transportation of raw materials from the supplier to the assembly site.
- Production of packaging raw materials and transportation of packaging from manufacturing to the product packaging site.
- Industrial processes used to assemble the reference product and packaging components.
- Transportation of the packaged product from the packaging site to the manufacturer's last logistics platform.
- Climate Change for electricity during Manufacturing is 8.23E-02 kg CO2 eq. per kWh.
- 48.5% of raw materials are geographically represented.

Distribution stage (A4)

Within the distribution stage, the transportation of the product in its packaging from the manufacturer's last logistics platform to the installation place is captured.

Installation stage (A5)

The reference products include an integrated light source, and installation includes mounting hardware found in the manufacturer's instructions. Installation is performed manually using hand tools, so it is assumed that no energy from power tools or other sources is consumed. Installation also includes the waste management treatment of packaging.

Use stage (B1 – B7)

The reference product operates for 71,000 hours while in active mode, and in active mode they operate at their declared power. Control gear replacement is captured in the Use stage with an assumed lifetime of 5,000 hours while all other components last as long as the luminaire. The geographical region for electricity consumption during the use phase is United States.

End-of-life stage (C1 – C4)

At the end of the reference product's life, deinstallation is performed using manual tools that do not require electricity or other energy use. A default distance of 100 km is used to represent the transport stage to the approved treatment center where 55% of the mass is recycled and 45% of the mass is landfilled.

LCA Discussion

Allocation Procedure

Utilizing the supplier data provided, plant inputs and outputs were assigned across total production volume using a 'per piece' allocation. Subdivision for product and packaging raw material inputs was made possible through product bills of materials (BOMs). A default scrap rate of 50% was applied to all components during manufacturing, and the manufacturing waste generated is assumed to travel 100 km to be incinerated.

This study uses the cut-off method for recycling, so the burdens from waste treatment are taken on by the next life of the product and not included in this study.

Cut-off Procedure

Input and output flows of mass and energy greater than 1% (based on total mass of final product and total energy usage of the product system) or greater than 1% of environmental impacts were included within the scope of the analysis. Flows less than 1% were included if sufficient data were available to warrant inclusion and/or the flow was thought to have significant environmental impact. Cumulative excluded flows and environmental impacts are less than 5% per module based on total mass, energy usage, and impacts of the product system. Where data gaps were identified, they are filled by conservative assumptions with average, generic, or proxy data and assumptions are documented. No known flows relevant to the product system are deliberately excluded from this EPD.

Allocation Cutoff EN 15804+A2.

Data Quality Discussion

The environmental impacts associated with the reference product were considered in order to understand relevancy for data quality rating (DQR), and datasets that contribute to over 80% of the following impacts were evaluated:

- Global warming
- Abiotic resource depletion – mineral
- Eutrophication
- Use of total non-renewable primary energy

All evaluated datasets were given a DQR based on PCR guidance around Time Representativeness, Technological Representativeness, and Geographical Representativeness. An average DQR for the relevant datasets was calculated, and with an average DQR of 1.56, the global evaluation of data quality is considered to be: Very good quality.

Results

Environmental Impact Assessment Results

EF3.1

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

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

Impact Category	Method	Unit	A1A2A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
GWP- total	EF3.1	kg CO2 eq	9.95e+0	6.83e-2	3.66e-1	0	9.23e+0	1.02e+2	0	4.15e-3	0	1.12e-2
GWP- fossil	EF3.1	kg CO2 eq	9.86e+0	6.83e-2	1.56e-1	0	9.05e+0	1.01e+2	0	4.15e-3	0	1.12e-2
GWP-biogenic	EF3.1	kg CO2 eq	6.22e-2	1.54e-6	2.10e-1	0	1.65e-1	4.99e-1	0	9.34e-8	0	6.17e-6
GWP-luluc	EF3.1	kg CO2 eq	3.40e-2	2.71e-5	2.80e-5	0	1.22e-2	5.09e-2	0	1.65e-6	0	6.77e-7
ODP	EF3.1	kg CFC11 eq	1.57e-7	9.60e-10	1.99e-10	0	4.02e-7	6.61e-7	0	5.83e-11	0	2.78e-11
AP	EF3.1	mol H+ eq	6.99e-2	3.87e-4	1.34e-4	0	7.01e-2	2.83e-1	0	2.35e-5	0	8.25e-6
POCP	EF3.1	kg NMVOC eq	3.80e-2	5.44e-4	1.41e-4	0	4.12e-2	1.99e-1	0	3.30e-5	0	1.36e-5
EP-fw	EF3.1	kg P eq	5.40e-3	5.37e-6	1.60e-5	0	1.13e-2	6.24e-2	0	3.26e-7	0	4.05e-6
EP-marine	EF3.1	kg N eq	1.16e-2	1.57e-4	5.72e-5	0	1.24e-2	5.77e-2	0	9.55e-6	0	4.26e-4
EP-terrestrial	EF3.1	mol N eq	1.17e-1	1.72e-3	5.16e-4	0	1.37e-1	5.00e-1	0	1.04e-4	0	3.37e-5
WDP	EF3.1	m3 world eq deprived	2.61e+0	4.33e-3	1.25e-2	0	2.30e+0	2.20e+1	0	2.63e-4	0	-9.22e-3
ADP-fossil	EF3.1	MJ, net calorific value	6.47e+1	9.35e-2	4.70e-2	0	6.69e+1	1.10e+3	0	5.68e-3	0	2.46e-3
ADP-minerals&metals	EF3.1	kg Sb eq	6.93e-4	2.19e-7	2.83e-7	0	2.96e-3	1.35e-4	0	1.33e-8	0	2.25e-9

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 Indicators

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

Indicator	Unit	A1A2A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
PERE	MJ	2.24e+1	1.26e-2	6.99e-3	0	1.39e+1	2.08e+2	0	7.64e-4	0	4.12e-4
PERM	MJ	0	0	0	0	0	0	0	0	0	0
PERT	MJ	2.24e+1	1.26e-2	6.99e-3	0	1.39e+1	2.08e+2	0	7.64e-4	0	4.12e-4
PENRE	MJ	6.24e+1	9.80e-2	4.95e-2	0	7.00e+1	1.14e+3	0	5.95e-3	0	2.57e-3
PENRM	MJ	5.27e+0	0	0	0	0	0	0	0	0	0
PENRT	MJ	6.77e+1	9.80e-2	4.95e-2	0	7.00e+1	1.14e+3	0	5.95e-3	0	2.57e-3
SM	kg	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m3	1.17e-1	1.28e-4	3.51e-4	0	8.08e-2	6.82e-1	0	7.77e-6	0	-2.14e-4
RE	MJ	0	0	0	0	0	0	0	0	0	0

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, NRPRM 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

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

Indicator	Unit	A1A2A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
HWD	kg	0	0	0	0	0	0	0	0	0	0
NHWD	kg	2.12e-1	0	2.89e-1	0	2.66e-1	0	0	0	0	9.53e-2
RWD	kg	0	0	0	0	0	0	0	0	0	0
HLRW	kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ILLRW	kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	1.16e-1
MER	kg	0	0	0	0	0	0	0	0	0	0
MNER	kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EEE	MJ	0	0	0	0	0	0	0	0	0	0
EET	MJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

Indicator	Unit	A1A2A3	A4	A5	B2	B4	B6	C1	C2	C3	C4
BCRP	kg CO2	0	0	0	0	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0	0	0	0	0
BCRK	kg CO2	-2.51e-1	0	0	0	0	0	0	0	0	0
BCEK	kg CO2	0	0	2.51e-1	0	0	0	0	0	0	0
BCEW	kg CO2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CCE	kg CO2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CCR	kg CO2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CWNR	kg CO2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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.

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Liters of Fuel:	4.4 l/100km
Vehicle Type:	Semi-trailer truck
Transport Distance:	1000 km
Packaging Mass:	0.137 kg
Weight of products transported:	0.212 kg
Capacity utilization volume factor:	=1

Installation in to the building/construction site (A5)

A5 Module

Mass of Packaging Waste Specified by Type:	0.137 kg
Biogenic Carbon Contained in Packaging:	0.0582 kg
Assumptions for scenario development:	Installation is performed manually using hand tools, so it is assumed that no energy from power tools or other sources is consumed.

Replacement (B4)

B4 Module

Replacement of Worn Parts:	0.133 kg
Further assumptions for scenario development:	5,000 hours are used as the lifetime of the driver, and rounding up to the next whole number, it takes 5 replacements over the 71,000-hour life of the luminaire. The replacement of the control gear includes the raw materials needed (considers 50% scrap rate for manufacturing), transport of raw materials, manufacturing of materials, manufacturing waste, distribution, and installation.

Operational Energy Use & Operational Water Use

B6 & B7 Modules

Energy Input:	2840 kWh
Characteristic Performance:	

The overall energy consumption of the luminaire over its lifetime is expressed in kilowatt-hour, and it is calculated by multiplying the declared power by the lifetime of the luminaire. The product consumes 40 watts of electricity to power all components, and the life of the luminaire is 71,000 hours.

End of Life

C1 - C4 Modules

Recovery

Recycling: 0.116 kg
Landfill: 0.0953 kg

Disposal

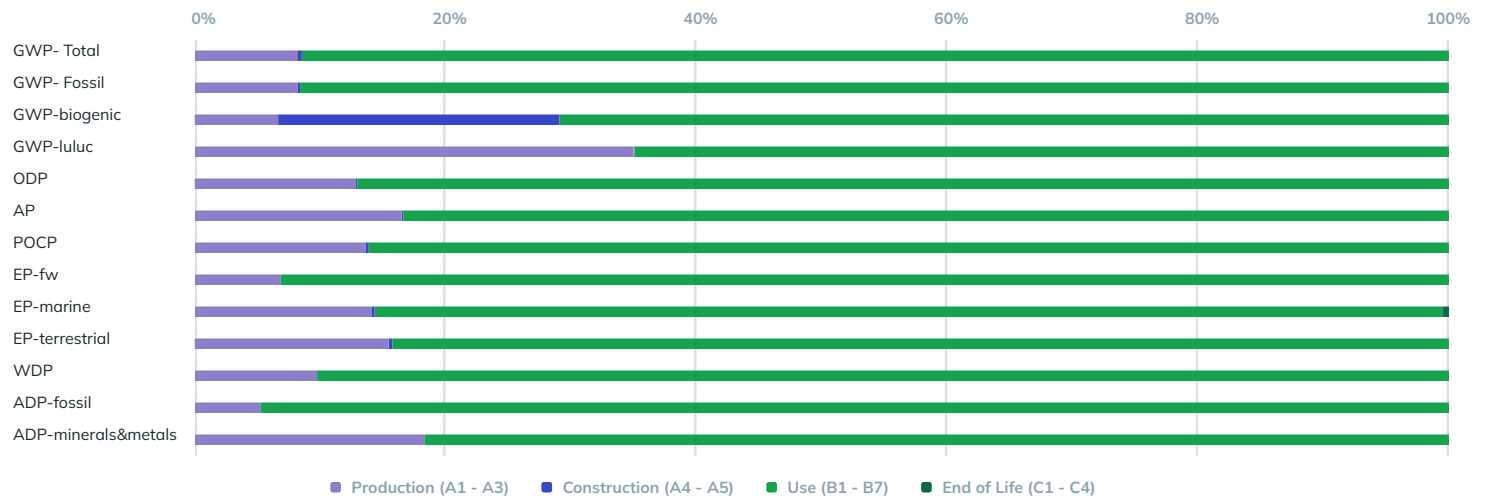
Product or Material for Final Disposal: 0.212 kg

Assumptions for scenario development:

At the end of the reference product's life, deinstallation is performed using manual tools that do not require electricity or other energy use. A default distance of 100 km is used to represent the transport stage to the approved treatment center, and the disposal of the product is assumed to be 55% recycled and 45% landfilled.

Interpretation

The Use Stage contributes to over 80% for each environmental impact indicator, and this is mainly driven by electricity use and the replacement of the luminaire's driver of the product's life.



Additional Environmental Information

LANTANA LED Integral products do not contain any substances identified as hazardous.

LANTANA Integral and Remote products do not release any dangerous substances.

If the necessary sensors are applied to obtain light management functionality, the energy consumption during the use phase may be reduced:

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

Further Information

To find the results for other Integral products, the results from this EPD can be multiplied by the extrapolation factors below.

Product	Manufacturing	Distribution	Installation	Use	End-of-Life
Integral L2-4ft, 80 CRI	1.33E+00	1.33E+00	1.33E+00	1.33E+00	1.33E+00
Integral L1-4ft, 80 CRI	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00
Integral L3-4ft, 90 CRI	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Integral L2-4ft, 90 CRI	1.61E+00	1.61E+00	1.61E+00	1.61E+00	1.61E+00
Integral L1-4ft, 90 CRI	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00
Integral L3-6ft, 80 CRI	9.22E-01	9.16E-01	8.52E-01	1.00E+00	7.91E-01
Integral L2-6ft, 80 CRI	1.23E+00	1.22E+00	1.14E+00	1.33E+00	1.05E+00
Integral L1-6ft, 80 CRI	1.84E+00	1.83E+00	1.70E+00	2.00E+00	1.58E+00
Integral L3-6ft, 90 CRI	1.11E+00	1.10E+00	1.03E+00	1.20E+00	9.52E-01
Integral L2-6ft, 90 CRI	1.48E+00	1.47E+00	1.37E+00	1.61E+00	1.27E+00
Integral L1-6ft, 90 CRI	2.22E+00	2.21E+00	2.05E+00	2.41E+00	1.90E+00
Integral L3-8ft, 80 CRI	9.03E-01	8.89E-01	8.33E-01	1.00E+00	5.93E-01
Integral L2-8ft, 80 CRI	1.34E+00	1.32E+00	1.24E+00	1.49E+00	8.81E-01
Integral L1-8ft, 80 CRI	1.81E+00	1.78E+00	1.67E+00	2.00E+00	1.19E+00
Integral L3-8ft, 90 CRI	1.09E+00	1.07E+00	1.00E+00	1.20E+00	7.14E-01
Integral L2-8ft, 90 CRI	1.45E+00	1.43E+00	1.34E+00	1.61E+00	9.52E-01
Integral L1-8ft, 90 CRI	2.18E+00	2.14E+00	2.01E+00	2.41E+00	1.43E+00

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