Environmental Product Declaration

BEGA North America Luminaire Products

Garden Floodlight Product Category

At BEGA, we believe companies must learn to live lightly, lift people up, and do everything possible to leave our planet better than we found it. Sustainable resource management and the creation of exemplary production facilities, for both our workforce and the environment, have been part of BEGA's basic entrepreneurial principles from the very beginning. We understand success is not just reflected in the profit and loss statement, and fundamentally believe in our ability to do good by being good.

Environmental Product Declaration for BEGA Product(s):

77008

Low-voltage in-grade floodlight with asymmetric light distribution.

ASTM INTERNATIONAL

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 and EN 15804+A2. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. 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, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428 USA
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	ASTM, General Program Instructions, v8.0, April 29, 2020
MANUFACTURER NAME AND ADDRESS	BEGA North America 1000 BEGA Way, Carpinteria, CA 93013 United States of America
DECLARATION NUMBER	EPD 815
DECLARED PRODUCT & FUNCTIONAL UNIT	Garden Floodlight Luminaire Product Functional Unit = 1 system involving a luminaire, a lamp or a component for a luminaire
REFERENCE PCR AND VERSION NUMBER	PCR for Building-Related Products and Services, Institut Bauen und Umwelt e.V. (IBU) - Part A: Calculation Rules for the Life Cycle As-sessment and Requirements on the Project Re-port according to EN 15804+A2:2019, Version 1.4, 15.04.2024. Part B: Requirements on the EPD for Luminaires, lamps and components for luminaires, V12, 30/09/2024
DESCRIPTION OF PRODUCT(S) APPLICATION/USE	Outdoor architectural lighting products
PRODUCT RSL DESCRIPTION	10 years
MARKETS OF APPLICABILITY	North America
DATE OF ISSUE	11/22/2024
PERIOD OF VALIDITY	5 years
EPD TYPE	Product Specific
DATASET VARIABILITY	N/A
EPD SCOPE	Cradle-to-Grave and Module D (A + B + C + D)
YEAR(S) OF REPORTED PRIMARY DATA	2023
LCA SOFTWARE & VERSION NUMBER	LCA for Experts 10.8.0.14
LCI DATABASE(S) & VERSION NUMBER	LCA for Experts Sphera database & USLCI v2.0
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1; CML 4.1; EN 15804+A2
The sub-category PCR review was conducted by:	Institut Bauen und Umwelt e.V.
This declaration was independently verified in accordance with ISO 14025: 2006. The IBU: Product Category Rules for Building-Related Products and Services, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, based on EN 15804+A2 serves as the core PCR. ☐ INTERNAL ☒ EXTERNAL	Tim Brooke, ASTM International
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Lindita Bushi, PhD, Athena Sustainable Materials Institute

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance using EPD information shall consider all relevant information modules over the full life cycle of the products within the building. This PCR allows EPD comparability only when the same functional requirements between products are ensured and the requirements of EN 15804+A2 §5.5 are met. It should be noted that different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

General Information

Description of Company/Organization

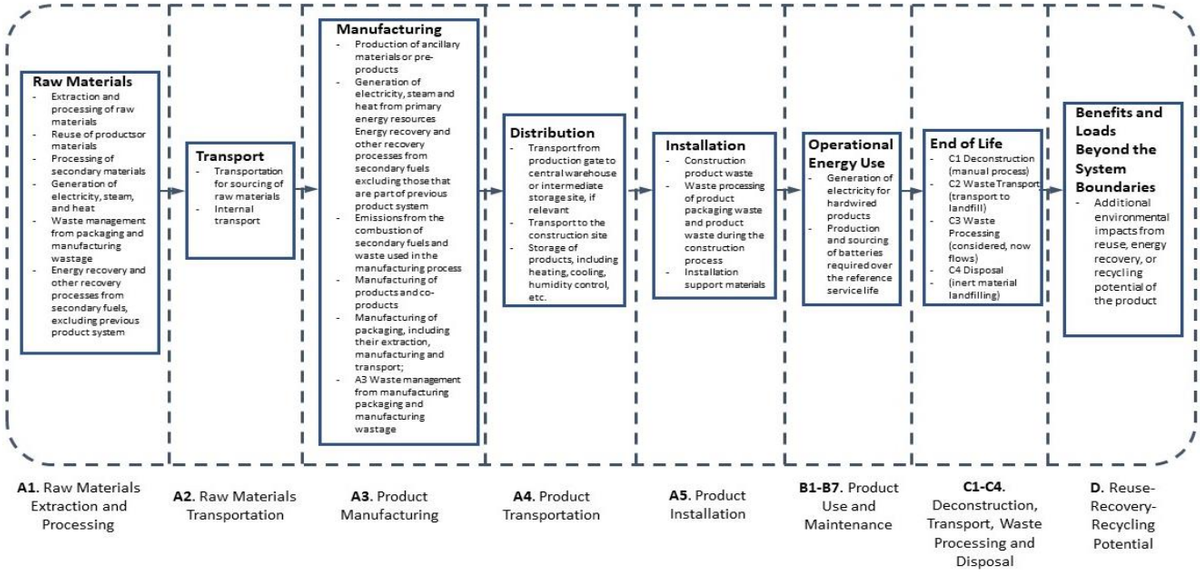
BEGA North America is a leading manufacturer of high-quality outdoor architectural lighting and furniture solutions, with a state-of-the-art manufacturing facilities in Carpinteria, CA, and Broomfield, CO. BEGA has an unwavering commitment to quality above all, in our people, products, partners, and processes.

Product Description

Garden Floodlight

Low-voltage in-grade floodlight with asymmetric light distribution, resistant to foot traffic. Features include:
- 2700K (K27), 3000K (K3), 3500K (K35), 4000K (K4)
- Clear safety glass
- Corrosion-resistant 304 grade stainless steel
- High temperature silicone gasket
- Composite installation housing
- Pure anodized aluminum reflector

Flow Diagram



Manufacturer Specific EPD

This product-specific EPD was developed based on the Cradle-to-Grave Life Cycle Assessment. This EPD represents BEGA North America's Carpinteria, CA facility. The EPD accounts for raw material extraction and processing, transport, product manufacturing, distribution, installation, maintenance, disposal, and potential benefits and loads following the end of life disposal. Manufacturing data were gathered directly from company personnel. When updated company-specific data were not available the ratio of production units, within the 2023 calendar year, was used as a proxy. For any product group EPDs, an impact assessment was completed for each product and the highest impacts were reported as conservative representations of the product group. Product grouping was considered appropriate if the individual product impacts differed by no more than ±10% in any impact category.

Application

The Home & Garden collection is a family of residential-scale garden and pathway luminaires suitable for various private garden and pathway applications. In-grade floodlights with asymmetric light distribution are ideal for accenting small trees, shrubs, or other landscape features. Not to be installed in concrete or near vehicular traffic. Low voltage magnetic transformer is required for operation.

Material Composition

The primary product components and/or materials must be indicated as a percentage mass to enable the user of the EPD to understand the composition of the product in delivery status.

The composition of the Garden Floodlight product(s) is as follows:

Material	B77008
Aluminum	0.88%
Recycled Aluminum	22.30%
Copper	1.27%
Copper/Rubber	2.25%
EPDM	0.09%
Glass	13.74%
Nylon	3.40%
Plastic	3.75%
Polyphenylene Sulfide	29.29%
Stainless Steel	23.04%
Total	**100.00%**

Technical Data

For the declared product, the following technical data in the delivery status must be provided with reference to the test standard:

Technical Data	
Product	**B77008**
Dimensions	4 3/8" x 2 3/4" x 4 7/8"
Weight	1.9 lbs
Operating voltage	12V AC
Minimum start temperature	-40° C
LED module wattage	3.0 W
System wattage	4.2 W
Controllability	Non-Dimming
Color rendering index	Ra > 90
Luminaire lumens	319 lm
LED service life (L70)	60000 hrs

Placing on the Market / Application Rules

The Garden Floodlight Luminaire Products conform to the certifications and sustainability regulations below:
- NRTL listed to North American Standards, suitable for wet locations
- Protection class IP 67

Properties of Declared Product as Shipped

Packaging varies according to order quantity. Products are shipped in cardboard boxes and packaging may include plastic wrap and/or shrink wrap, edge protectors, cardboard dividers, vinyl strapping material, packaging tape, and labels. Wood pallets are used with larger shipments.

Methodological Framework

Functional Unit

The declaration refers to the functional unit of 1 system involving a luminaire, a lamp or a component for a luminaire as specified in the PCR.

Product	B77008
Functional unit	1 system involving a luminaire, a lamp or a component for a luminaire
Mass (kg / Functional Unit)	0.86

System Boundary

This is a Cradle-to-Grave and Module D (A + B + C + D) Environmental Product Declaration.
The following life cycle phases were considered:

Product Stage			Construction Process Stage		Use Stage							End of Life Stage*				Benefits and Loads Beyond the System Boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to the site	Construction/ installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Description of the System Boundary Stages Corresponding to the PCR

(X = Included; MND = Module Not Declared)

*This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

Any stages not reported have an impact value of 0.

Reference Service Life

The lifetime of this Luminaire Product is 10 years. The building estimated service life is 75 years.

Allocation

Allocation was determined on a per kilogram basis for primary data. For secondary data, cut-off methodology was used. All upstream recycling benefits that would have been accounted for in module A1 were nullified and accounted for in module D to avoid allocation by system expansion within the system boundaries.

Cut-off Criteria

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected. The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible.

For Hazardous Substances 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 EPD is in compliance with the cut-off criteria. No processes were neglected or excluded. Capital items for the production processes (machine, buildings, etc.) were not taken into consideration.

Data Sources

Primary data were collected for every process in the product system under the control of BEGA North America. Secondary data from the LCA for Experts Sphera database & USLCI v2.0 databases were utilized. These data were evaluated and have temporal, geographic, and technical coverage appropriate to the scope of the Luminaire Products product category.

Data Quality

The data sources used are complete and representative of North America in terms of the geographic and technological coverage and are a recent vintage (i.e. less than ten years old).The data used for primary data are based on direct information sources of the manufacturer. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty.

Period Under Review

The period under review is the full calendar year of 2023.

Treatment of Biogenic Carbon

The uptake and release of biogenic carbon throughout the product life cycle follows EN 15804+A2.

Comparability and Benchmarking

A comparison or an evaluation of EPD data is only possible if all data sets to be compared were created according to EN 15804+A2 and the building context, respectively the product-specific characteristics of performance, are taken into account. Environmental declarations from different programs may not be comparable. Full conformance with the IBU: Product Category Rules for Building-Related Products and Services, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, v.1.3, August 2021 and IBU: Product Category Rules Part B: Requirements on the EPD for Luminaires, lamps and components for luminaires, Version 7, Published August 2023. allows EPD comparability only when all stages of the product's life cycle have been considered. However, variations and deviations are possible.

Estimates and Assumptions

End of Life

The 2021 PEP ecopassport Product Category Rules for Electrical, Electronic and HVAC-R Products, steel and other ferrous metals applies 20% landfill disposed and 80% recycled end of life parameters. As a result, in the End of Life phase, metal materials were assumed to have an 80% recycling rate and 20% landfill rate. All other materials were assumed to have a 100% landfill rate.

Units

The LCA results within this EPD are reported in SI units.

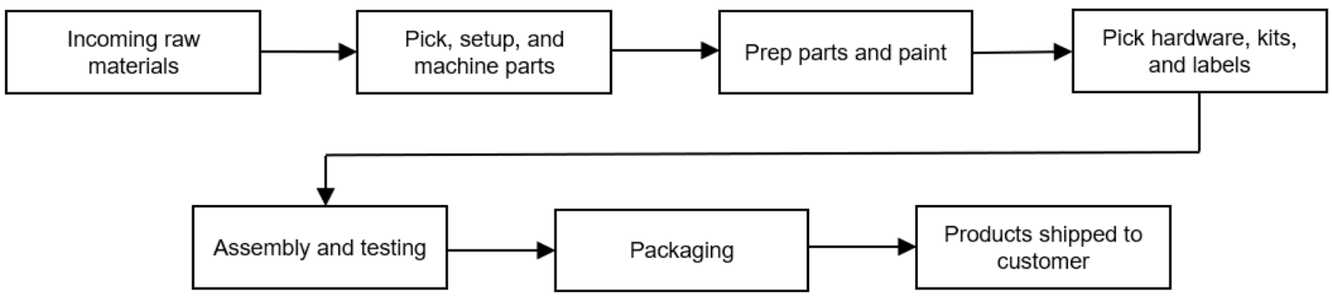
LCA: Scenarios and Additional Technical Information

Background data

For life cycle modeling of the considered products, the LCA for Experts for Life Cycle Engineering, developed by Sphera, is used. The LCA for Experts-database contains consistent and documented datasets which are documented in the online LCA for Experts-documentation. To ensure comparability of results in the LCA, the basic data of the LCA for Experts database were used for energy, transportation and auxiliary materials.

Manufacturing

Materials are received on-site and sent to storage. When a purchase order requiring certain parts is created and scheduled, the required parts are picked and brought to the machine shop area where they are machined as required. If the product requires painting, the components will then go through the painting process. After that, all required parts as well as necessary hardware are prepared into kits and labeled. Next the kit components are assembled and tested and finally assembled. The products are then packaged and shipped from the manufacturing gate.



Packaging

The packaging material is composed of plastic wrap, paper, cardboard, and tape as listed below.

		Product
Packaging Material	**Unit**	**B77008**
Plastic Wrap	kg per Functional Unit	0.04311
Paper		0.00002
Cardboard		0.00546
Tape		0.00029

Transportation

Transport to Building Site (A4)		
Name	**Unit**	**B77008**
Fuel type	-	Diesel
Liters of fuel (for freight (combination) truck with a 32t payload)	l/100km	38
Capacity utilization (including empty runs)	%	90
Capacity utilization volume factor	-	1
Transport distance	km	500
Gross mass of products transported	kg	0.86

Product Installation

Product(s) installed by luminaire industry professionals following national and local guidelines.

Installation into the building (A5)		
Name	**B77008**	**Unit per FU**
Auxiliary materials	0.00	kg
Auxiliary material transport (Truck)	0.00	km
Auxiliary material transport (Ship)	0.00	km
Water consumption	0.00	m^3
Other resources	0.00	kg
Electricity consumption	0.00	kWh
Other energy carriers	0.00	MJ
Product loss per functional unit	0.04	kg
Waste materials at install site	0.04	kg
Output substance (recycle)	0.00	kg
Output substance (landfill)	0.00	kg
Output substance (incineration)	0.00	kg
Packaging waste (recycle)	0.00	kg
Packaging waste (landfill)	0.00	kg
Packaging waste (incineration)	0.00	kg
Direct emissions to ambient air*, soil, and water	0.01	kg CO_2
VOC emissions	-	kg

*CO2 emissions to air from disposal of packaging

The replacement (B4) stage is the sum of the impacts for the life cycle of the product (A1+A2+A3+A4+A5+C1+C2+C3+C4) multiplied by the number of times it is replaced during the 75 year Estimated Building Service Life (ESBL), with the number of replacement within that ESBL based upon the product's Reference Service Life (RSL).

Replacement (B4)		
Name	**B77008**	**Unit per FU**
Reference Service Life (RSL)	10	years
Estimated Building Service Life (EBSL)	75	years
Number of replacements / EBSL	6.5	replacements
Electricity consumption	0	kWh
Litres of fuel	0	l/100km
Replacement of worn parts	0	kg

Product Use

The operational energy use phase involves the operational usage of the luminaire product during its Estimated Building Service Life (EBSL).

Operational Energy Use (B6)		
Name	**B77008**	**Unit per EBSL**
Water consumption	-	m^3
Electricity consumption	574.9	kWh
Other energy carriers	0.0	MJ
Equipment output	-	kW

Disposal

The product can be mechanically dissembled to separate the different materials. 80% of the metal materials used are recyclable. The remainder of components are disposed of according to standard municipal solid waste deposition.

End of life (C1-C4)		
Name	**B77008**	**Unit**
Collected separately	0.32	kg
Collected as mixed construction waste	0.54	kg
Reuse	0.00	kg
Recycling	0.32	kg
Landfilling	0.54	kg
Energy recovery	0.00	kg

Re-use Phase

The product is not typically reused during its reference service life. At the end of life, metal components can be mechanically separated and 80% are recycled. The remaining metals and other materials are sent 100% to landfill.

Re-Use, Recovery, and/or Recycling Potential (D)		
Name	**Value**	**Unit**
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	0.00	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00	MJ
Process and conversion efficiencies	-	
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);	80% of product metal materials are recycled at the end of life (Module D).	

Garden Floodlight B77008 Results per Functional Unit Over the Building Lifetime of 75 Years - Including Replacements

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C1	C2	C3	C4	D
GWP	Global warming potential	kg CO_2-Eq.	3.9E+00	4.0E-02	5.1E-03	2.7E+01	2.7E+02	0.0E+00	8.0E-03	0.0E+00	1.7E-01	-7.6E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.8E-11	1.5E-12	5.1E-17	1.9E-10	3.1E-11	0.0E+00	3.0E-13	0.0E+00	5.6E-16	-6.1E-14
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	1.8E-02	2.4E-04	1.7E-05	1.2E-01	3.4E-01	0.0E+00	4.8E-05	0.0E+00	7.9E-04	-3.2E-03
EP	Eutrophication potential	kg N-Eq.	7.2E-04	1.3E-05	9.5E-06	6.5E-03	2.8E-02	0.0E+00	2.7E-06	0.0E+00	2.5E-04	-1.1E-04
SP	Smog formation potential	kg O_3-Eq.	2.3E-01	6.6E-03	1.3E-04	1.6E+00	5.0E+00	0.0E+00	1.3E-03	0.0E+00	2.5E-03	-3.7E-02
FFD	Fossil Fuel Depletion	MJ-surplus	7.8E+00	7.1E-02	2.1E-03	5.1E+01	2.9E+02	0.0E+00	1.4E-02	0.0E+00	2.3E-02	-6.6E-01

**All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results shown below were calculated using CML 2001 - April 2016 Methodology.

CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C1	C2	C3	C4	D
GWP	Global warming potential	kg CO_2-Eq.	3.9E+00	4.0E-02	5.4E-03	2.7E+01	2.7E+02	0.0E+00	8.0E-03	0.0E+00	1.8E-01	-7.6E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	5.4E-11	1.5E-12	3.0E-15	3.6E-10	1.9E-09	0.0E+00	3.0E-13	0.0E+00	3.3E-14	-3.6E-12
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	1.8E-02	2.0E-04	1.3E-05	1.2E-01	3.3E-01	0.0E+00	3.9E-05	0.0E+00	3.7E-04	-3.2E-03
EP	Eutrophication potential	kg$(PO_4)^3$-Eq.	1.5E-03	3.5E-05	1.3E-05	1.2E-02	3.6E-02	0.0E+00	7.0E-06	0.0E+00	3.5E-04	-2.2E-04
POCP	Formation potential of tropospheric ozone	kg C_2H_4-Eq.	1.1E-03	2.3E-05	3.1E-06	8.1E-03	2.8E-02	0.0E+00	4.6E-06	0.0E+00	1.1E-04	-2.1E-04
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	1.6E-04	1.7E-11	3.4E-10	1.1E-03	3.3E-05	0.0E+00	3.3E-12	0.0E+00	3.8E-09	-1.1E-05
ADPF	Abiotic depletion potential for fossil resources	MJ	6.6E+01	5.1E-01	1.6E-02	4.3E+02	3.3E+03	0.0E+00	1.0E-01	0.0E+00	1.7E-01	-8.4E+00

**All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain the resource use throughout the life cycle of the product.

EN15804+A2 – Core environmental indicators, units and models

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C1	C2	C3	C4	D
GWP-total	Climate change - total	kg CO_2-Eq.	4.1E+00	4.1E-02	6.5E-03	2.8E+01	2.8E+02	0.0E+00	8.2E-03	0.0E+00	2.2E-01	-7.7E-01
GWP-fossil	Climate change - fossil	kg CO_2-Eq.	4.1E+00	4.1E-02	1.1E-03	2.7E+01	2.8E+02	0.0E+00	8.2E-03	0.0E+00	3.0E-02	-7.8E-01
GWP-biogenic	Climate change - biogenic	kg CO_2-Eq.	1.8E-02	0.0E+00	5.4E-03	1.4E+00	6.5E-02	0.0E+00	0.0E+00	0.0E+00	1.9E-01	1.7E-03
GWP-luluc	Climate change - land use and land use change	kg CO_2-Eq.	1.6E-03	0.0E+00	4.9E-07	1.0E-02	2.8E-02	0.0E+00	0.0E+00	0.0E+00	5.4E-06	-8.5E-04
ODP	Ozone depletion	kg CFC-11 Eq.	4.3E-11	1.0E-12	2.5E-15	2.9E-10	1.6E-09	0.0E+00	2.1E-13	0.0E+00	2.8E-14	-3.1E-12
AP	Acidification	mol H^+ Eq.	2.1E-02	2.7E-04	1.6E-05	1.4E-01	3.7E-01	0.0E+00	5.3E-05	0.0E+00	4.5E-04	-3.7E-03
EP-freshwater	Eutrophication aquatic freshwater	kg$(PO_4)^3$-Eq.	6.5E-06	1.1E-08	1.2E-06	1.3E-04	1.5E-04	0.0E+00	2.3E-09	0.0E+00	1.2E-05	-7.3E-07
EP-marine	Eutrophication aquatic marine	kg N Eq.	3.8E-03	1.0E-04	3.0E-06	2.7E-02	8.3E-02	0.0E+00	2.1E-05	0.0E+00	1.9E-04	-5.9E-04
EP-terrestrial	Eutrophication terrestrial	mol N Eq.	4.2E-02	1.1E-03	6.1E-05	2.9E-01	8.9E-01	0.0E+00	2.2E-04	0.0E+00	1.9E-03	-6.5E-03
POCP	Photochemical ozone formation	NMVOC Eq.	1.2E-02	3.0E-04	9.2E-06	7.9E-02	2.4E-01	0.0E+00	6.0E-05	0.0E+00	2.2E-04	-1.8E-03
ADP-minerals & metals	Depletion of abiotic resources - minerals and metals	kg Sb Eq.	1.1E-04	0.0E+00	1.1E-10	7.0E-04	2.6E-05	0.0E+00	0.0E+00	0.0E+00	1.2E-09	-1.1E-05
ADP-fossil	Depletion of abiotic resources - fossil fuels	mol N Eq.	7.0E+01	5.1E-01	1.6E-02	4.6E+02	4.6E+03	0.0E+00	1.0E-01	0.0E+00	1.8E-01	-9.1E+00
WDP	Water use	m^3 world Eq. deprived	6.9E-01	0.0E+00	7.6E-05	4.5E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-03	-2.0E-01

EN15804+A2 – Indicators, units and models for additional impact categories

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C1	C2	C3	C4	D
PM	Particulate matter emissions	Disease incidence	2.6E-07	1.1E-09	1.4E-10	1.8E-06	3.4E-06	0.0E+00	2.1E-10	0.0E+00	3.5E-09	-6.5E-08
IRP	Ionizing radiation, human health	kBq U235 Eq.	1.2E-01	9.0E-21	1.6E-05	7.7E-01	3.8E+01	0.0E+00	1.8E-21	0.0E+00	1.8E-04	-2.7E-02
ETP-fw	Ecotoxicity (freshwater)	CTUe	3.3E+02	2.2E+00	1.0E-01	2.2E+03	1.3E+03	0.0E+00	4.3E-01	0.0E+00	3.1E+00	-4.7E+00
HTP-c	Human toxicity, cancer effects	CTUh	3.0E-07	1.1E-11	5.4E-13	1.9E-06	3.6E-08	0.0E+00	2.2E-12	0.0E+00	2.6E-11	-9.9E-10
HTP-nc	Human toxicity, non-cancer effects	CTUh	4.8E-08	1.0E-09	1.8E-11	3.4E-07	9.5E-07	0.0E+00	2.0E-10	0.0E+00	2.6E-09	-5.9E-09
SQP	Land use related impacts/Soil quality	dimensionless	6.2E+00	0.0E+00	1.4E-03	4.1E+01	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-02	-1.4E+00

The table below presents disclaimers with regard to the declaration of relevant core and additional environmental impact indicators according to the following classification.

Disclaimers to the declaration of core and additional environmental impact indicators

ILCD Classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 - This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 - The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Results below contain the resource use throughout the life cycle of the product.

Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C1	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	MJ	2.2E+01	0.0E+00	0.0E+00	1.4E+02	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-02	-3.3E+00
PERM	Renewable primary energy resources as material utilization	MJ	1.0E-01	0.0E+00	2.0E-03	6.9E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT	Total use of renewable primary energy resources	MJ	2.2E+01	0.0E+00	2.0E-03	1.4E+02	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-02	-3.3E+00
PENRE	Nonrenewable primary energy as energy carrier	MJ	7.0E+01	5.1E-01	0.0E+00	4.6E+02	4.6E+03	0.0E+00	1.0E-01	0.0E+00	1.8E-01	-9.1E+00
PENRM	Nonrenewable primary energy as material utilization	MJ	1.1E+01	0.0E+00	5.5E-01	7.5E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT	Total use of nonrenewable primary energy	MJ	8.1E+01	5.1E-01	5.5E-01	5.3E+02	4.6E+03	0.0E+00	1.0E-01	0.0E+00	1.8E-01	-9.1E+00
SM	Use of secondary material	kg	1.9E-01	0.0E+00	0.0E+00	1.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	Use of renewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	Use of net fresh water	m^3	2.7E-02	0.0E+00	2.5E-06	1.8E-01	1.7E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-05	-6.2E-03

**All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories												
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	Hazardous waste disposed	kg	2.3E-07	0.0E+00	4.0E-12	1.5E-06	2.7E-06	0.0E+00	0.0E+00	0.0E+00	4.4E-11	-2.3E-08
NHWD	Non-hazardous waste disposed	kg	4.0E-01	0.0E+00	4.8E-02	6.2E+00	1.3E+00	0.0E+00	0.0E+00	0.0E+00	5.0E-01	-1.3E+00
HLRW	High-level radioactive waste	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	1.3E-03	0.0E+00	1.7E-07	8.7E-03	4.6E-01	0.0E+00	0.0E+00	0.0E+00	1.9E-06	-2.0E-03
CRU	Components for re-use	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MR	Materials for recycling	kg	4.7E-04	0.0E+00	0.0E+00	3.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-01
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

**All use phase and disposal stages have been considered and only those with non-zero values have been reported*

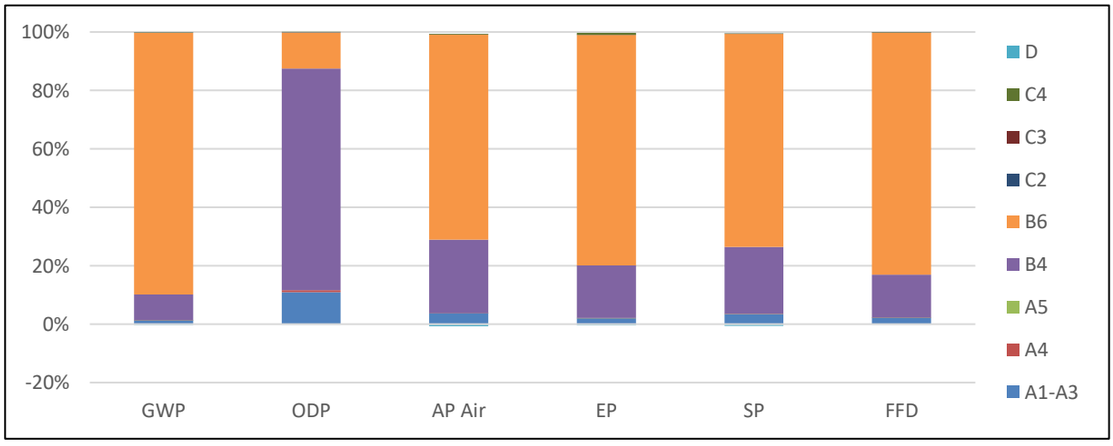
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use												
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
BCRP	Biogenic Carbon Removal from Product	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO_2	1.00E-02	0.00E+00	0.00E+00	6.5E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO_2	0.00E+00	0.00E+00	1.00E-02	6.5E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE	Calcination Carbon Emissions	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCR	Carbonation Carbon Removal	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Garden Floodlight LCA Interpretation

The operational energy use life cycle stage (B6) dominates the impacts across most impact categories, and this is due to the energy applied to operate the luminaire products. For ozone depletion, the replacement stage (B4) dominates the overall life cycle impact from duplicating the upstream material production stages.



Environmental and Health During Manufacturing

BEGA North America has established a robust Environmental, Health, and Safety (EHS) culture. BEGA products incorporate the highest quality materials for long service life and operational reliability. We use low-emissions equipment and less harmful chemical options for our manufacturing processes, and apply best mangement practices that assist in enforcing proper Industrial Hygiene (IH) evaluation and monitoring of materials, chemicals, and processes used for manufacturing. All programs meet or exceed the minimum requirements of Cal/OSHA and Cal/EPA to provide safe, healthy, and environmentally friendly work areas and products.

Environmental and Health During Installation

Under normal use and installation procedures, there are no health or impairment concerns expected during the installation of BEGA products. The products and materials do not create hazardous waste or air emmissions when installed or used.

Extraordinary Effects

Fire
There are no negative environmental effects resulting from exposure to fire.
Water
There are no negative environmental effects resulting from exposure to water.
Mechanical Destruction
There are no negative environmental effects resulting from mechanical destruction.

Delayed Emissions

Global warming potential is calculated using the TRACI 2.1 and CML 4.1 impact assessment methodologies. Delayed emissions are not considered.

Environmental Activities and Certifications

BEGA is committed to social responsibility and minimizing our impact on the environment over time. Our commitment to sustainable resource management is seen throughout our exemplary production facilities, where the electrical power needed for our daily operation includes solar energy. We have also implemented recycling programs that consistently divert more than 90% of our waste from landfills, and manage all hazardous waste through a licensed vendor, and recycled, recovered, or re-used whenever possible. Our efforts towards sustainability earned BEGA North America the “Green Business of the Year” award from the South Coast Area Chamber of Commerce in 2023.

Further Information

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