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Type III Environmental Product Declaration No. 678/2024

LED OUTDOOR PARK AND STREET LIGHTING FIXTURES VOLTEA™

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BASIC INFORMATION

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

Life cycle analysis (LCA):	A1-A3, B6, C1-C4 and D modules in accordance with EN 15804 (Cradle-to-Gate with options)
The year of preparing the EPD:	202**4**
Product standard:	EN 62717:2017-11, EN 60598-2-3, EN 62722-2-1
Service Life:	minimum 100.000 h (8h/day)
PCR:	ITB-PCR A
Declared unit:	1 kg
Reasons for performing LCA:	B2B
Representativeness:	Polish, European, 202**3**

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MANUFACTURER

VOLTEA™ operates in the electronics industry and produces led outdoor park and street lighting fixtures for the lighting industry. VOLTEA™ was established in 2005 and initially dealt with the segment of small electronics devices, including MP3 players, which was developing in the country at that time. The company has prompted to undertake extensive cooperation with entities from the lighting industry in order to offer clients integrated services in the field of design, transport and installation of energy-saving LED lamps.

VOLTEA produces its own branded products including outdoor park and street LED fixtures covered by this EPD. In 2012, VOLTEA™ started working on an effective and simple solution to increase the safety of common spaces - automatic lamps with an emergency and evacuation module, which were certified by the Scientific and Research Center for Fire Protection in Józefów the following year. VOLTEA™ also begins the production of automatic lamps based on modern microwave sensors, and in 2014 it introduces megamatic, duomatic and variomatic sensors that allow specialists to extensively adjust the parameters individually for each lamp, regardless of the installation location.. Information on VOLTEA™ offer is available at: https://voltea.pl/produkty/

PRODUCTS DESCRIPTION AND APPLICATION

LED lighting fixtures are a light source with different parameters. They are to be built of lighting modules connected to a dedicated low-voltage power supply and assambled into the aluminium housing. The LED lighting fixtures are designed for a broad range of outdoor applications such as streets and parks of different sizes. Set of products covered by this EPD is shown in Table 1.

Table 1. Light products offered by VOLTEA™ used as a representative base in the calculation process in EPD.

LED Lighting Fixture	Types	Weight [kg]	Housing material
DROGER	**0-70W, 0-130W, 0-180W 0-100W Pedestrian Crossings**	3,5; 4,9; 7,4; 4,9	Aluminum
DROGER SG	**0-70W, 0-120W 0-100W Pedestrian Crossings**	2,45; 2,85; 2,85	Aluminum
MODERNA	**0-40W**	5,6	Aluminum

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The detailed technical documents related to the Linear, Rectangular and Round LED products are available at VOLTEA™ website https://voltea.pl/wp-content/uploads/2024/02/katalog-voltea-2024.pdf

DROGER

Product description

- Supply voltage: 220-240V 50/60Hz
- Power [W]: 0-70; 0-120; 0-180; 0-100 Pedestrian cross
- Luminous flux: 11200; 22100; 30600; 17000 lm
- Effectivness: 170lm/W
- Color temperature: 4000K
- Impact resistance: IK 09
- Degree of tightness: IP66
- Service life: 100 000h
- Protection class: II
- Operating temperature range: -40*C up to +50*C
- Pole mounting diameter dimensions: 48-60 mm

DROGER SG

Product description

- Supply voltage: 220-240V 50/60Hz
- Power: 0-70; 0-120; 0-100 W
- Luminous flux: 11200; 19200; 16000 lm
- Effectivness: 160lm/W
- Color temperature: 4000K
- Impact resistance: IK 09
- Degree of tightness: IP66
- Service life: 100 000h
- Protection class: II
- Operating temperature range: -40*C up to +50*C
- Pole mounting diameter dimensions: 48-60 mm

MODERNA

Product description

- Supply voltage: 220-240V 50/60Hz
- Power: 0-70W
- Luminous flux: Up to 11200lm
- Effectivness: 160lm/W
- Color temperature: 4000K
- Impact resistance: IK 09
- Degree of tightness: IP66
- Service life: 100 000h
- Protection class: II
- Operating temperature range: -40*C up to +50*C
- Pole mounting diameter dimensions: 48-600mm

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LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 kg of product. The family of LED outdoor park and street lighting fixtures includes multiple product types (table 1) and is assembled on the manufacturing site of VOLTEA™ (Lisi Ogon, Poland). This EPD provides also a method to convert the environmental impacts (of 1 kg of average product) to a specific/selected LED product.

System boundary

The life cycle analysis of the declared products covers "Product Stage" A1-A3, B6, C1-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculation. It can be assumed that the total sum of omitted processes does not exceed 1% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Allocation

The allocation rules used for this EPD are based on general ITB's document PCR A. In the aggregated module A1-A3, material losses in the assembly of the products in the factory are defined on the averaged specific values for the site. Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers a wide range of products. Their production resources and processing stages are basically similar, so it is possible to average the production by product weigh so production is averaged for all products. Avoided burden approach is applied in the use of recycled and/or secondary raw materials, as well as loads and benefits beyond the system boundary from material recycling. No loads and benefits beyond the system boundary from energy recovery from the end of life of the product or packaging is included.

System limits

In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per assembly process, utilized thermal energy, and electric power consumption. Thus material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 5 % of energy usage and mass per module A, B, C or D. Machines and facilities required during production are neglected. The production of etiquettes, tape and glue was also not considered.

Modules A1 and A2: *Raw materials supply and transport*

The modules A1 and A2 represent the extraction and processing of raw materials and components and transport to the production VOLTEA™ site. The mass dominant housings and LED modules of the LED outdoor park and street lighting fixtures are imported (train, sea and road freight). Other input elements are glass, polycarbonate lenses, aluminum plate with diodes, aluminum housing, acid-resistant steel connection screws, power supply, copper wire, silicone gasket, Zhaga sockets made of IPS plastic. VOLTEA Street and Park LED fixtures has got different aluminium housings. For A2 module (transport) European averages for fuel data are applied. Modules LED based on PCB aluminum has density 2,66 gr/cm^3 and are composed of the materials provided in Table 2.

Table 2. Materials of LED PCB Aluminium in China.

Materials	Weight %
Aluminum	75.3%
Copper	8.0%
Epoxy Resin	5.1%
Fibrous Glass	4.1%
Inorganic Pigment	2.3%
PA6	1.7%
Titanium dioxide	1.7%
Solder	0.7%
Silicone	0.6%
Acrylate Resin	0.3%
Tin	0.2%
Total	100.0%

Table 3. Average weight of the basic elements in VOLTEA™ LED Park and Street Lighting fixtures, all produced in China (ex. VOLTEA™ Moderna weights 4,58kg).

Materials	Average model, weight [%]
LED PCB Aluminium	3.28%
LED Aluminium housing, painted	61.63%
Glass	13.09%
Polycarbonate lenses	3.06%
Plastic cube	1.22%
Power supply	7.38%
Copper wire, 2.5 mm2	2.83%
Silicone gasket	2.18%
Zhaga sockets made of IPS	2.32%
Stainless steel screws	3.02%
Sum of main	100.0%

Module A3: *Production*

The product specific manufacturing process line is presented in Figure 1. Electricity and gas are in part consumed in the process manufacturer VOLTEA™ in Poland. Manufacturing of the product is mostly done by Chinese suppliers for the fixtures elements. The final assembly of the LED modules is implemented by VOLTEA™ (Lisi Ogon, Poland).

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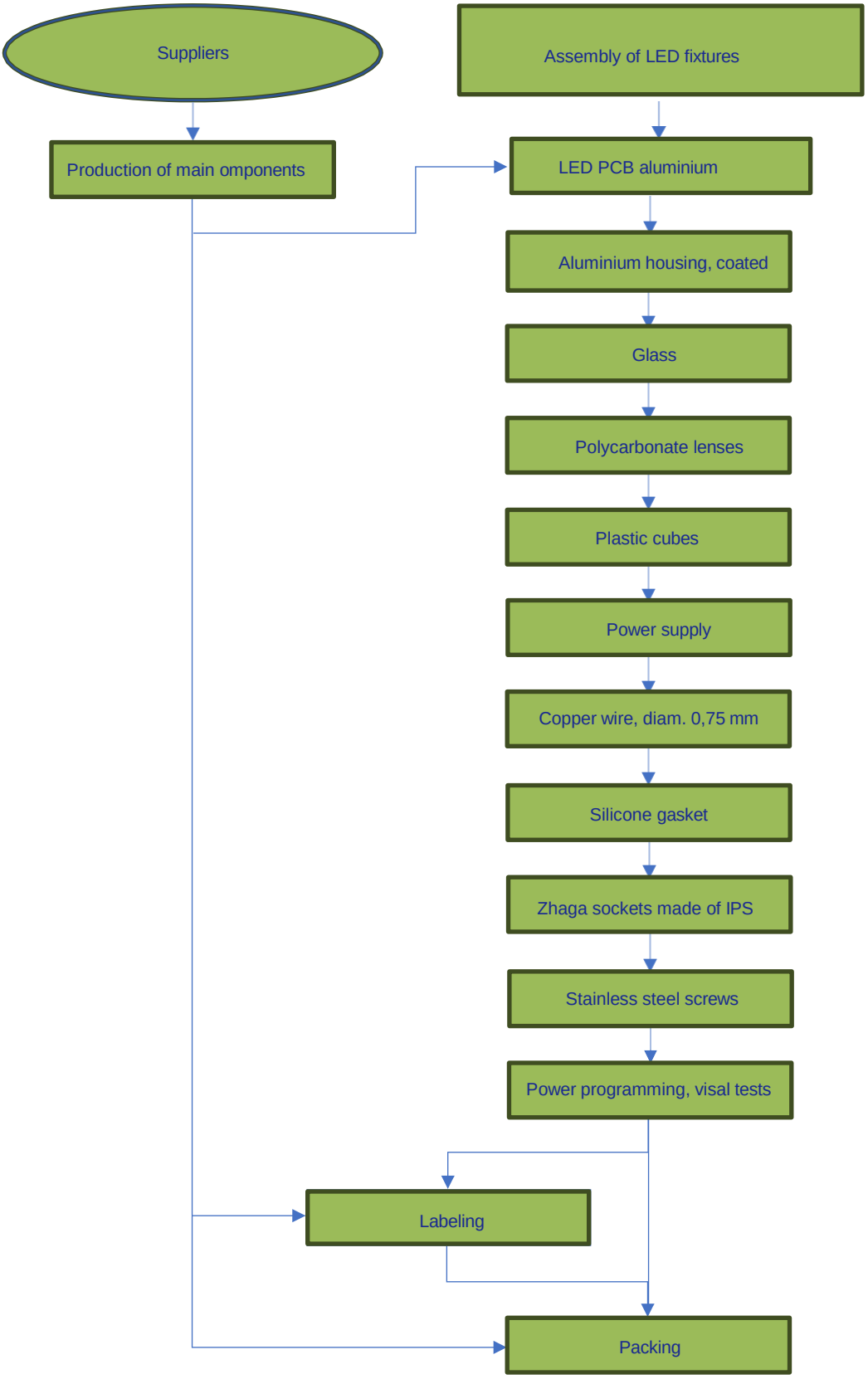
Figure 1. A basic scheme of the VOLTEA™ park and street LED fixtures product manufacturing process.



Module B6: Use stage

During the use-stage, consumption of electricity is taken into account. Total active time is 100,000 h (34 years, 8 h a day). Correction factors FCP/FD for dimming is 1/1. Electricity Mix is EU (Ecoinvent). The minimal nominal power required to produce light from the supply voltage is used for the calculation. As the EPD includes devices with different luminous flux, the B6 phase interaction values are given for 4 representative flux values: 5000lm, 10000lm, 20000lm, 30000lm Precise power consumption data for specific lighting solutions (if different) may be calculated separately.

Modules *C1-C4 and D: End-of-life (EOL)*

The product is obliged to be professionally recycled in accordance with the EU Directive 2012/19/EU on waste of electric and electronic equipment (WEEE). The End of Life scenario is based on a material split and respective recycling rates. In the applied scenario, all electronic parts are assumed mainly to be recycled, plastics may be incinerated, aluminium housing may be recycled. The remaining parts are landfilled. The energy required for treatment of materials (e.g. shredding processes) is included. LED modules are disposed by the user (assumed 100% of products is collected. The collected end of life elements are disassembled with electronic parts (like diodes) going to recycling. Non-recycled content is disposed to the municipal waste stream or energy recovery where it undergoes separation, preparation and treatment according to the average European statistics. In the adapted end-of-life scenario, the de-constructed products are transported to recycling plant 25 km on > 7.5t lorry EURO 5. The recycling potential of materials is presented in table 4. Module D presents credits resulting from the recycling of the electronic elements and aluminium housing, and energy recovered. The reused components made from virgin materials in the product stage, such as the diodes or connectors were assumed to replace similar components from raw materials.

Table 4. End-of-life scenario for the product components.

Material	Recycling %	Landfilling %	Energy recovery %
PCB aluminum elements	80	10	10
Aluminium housing	90	10	0
Diodes	90	10	0
Connectors	80	20	0
Solder	100	0	0
Glass	90	10	0
Polycarbonates	90	10	0
Plastic	80	10	10
Other parts	80	10	10

Electricity at end-of-life (module C) has been modelled using an average European electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.03.2023 – 31.03.2024 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by VOLTEA™. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good. The background data for the processes come from the following resources: (database Ecoinvent v.3.9.1 (diodes, connectors, glass, polycarbonate, solder paste, cartoon, foil, transport, PCB aluminium, plastics, and metals) and Ecoinvent (Polish electricity mix and combustion factors for fuels). Specific (LCI) data quality analysis was a part of the input data verification. The time related quality of the data used is valid (5 years).

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Assumptions and estimates

The impacts of the representative of the products were aggregated using weighted average.

Calculation rules

LCA was performed using openLCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method.

Additional information

Additional information Polish electricity mix used is 0.698 kg CO2/kWh (KOBiZE 2021). European electricity mix used is 0.430kg CO2/kWh (Ecoinvent v3.8, RER). The product is compliant with the European Directive 2015/863 of 31 March 2015 on Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic equipment (RoHS) and regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of the products manufactured by VOLTEA™.
The following life cycle modules (table 5) were included in the analysis.

Table 5. System boundaries for the environmental characteristic of the LED Fixtures products.

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			**Construction process**		**Use stage**							**End of life**				**Benefits and loads beyond the system boundary**
Raw material supply	Transport	Manufacturing	Transport to construction 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
MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MD	MND	MD	MD	MD	MD	MD

The method of converting the environmental impact for any specific/selected LED product

The LCA impacts in the table 6 are presented per unit mass of products - 1 kg (averaged for all park and street fixtures). In order to convert LCA to a specific product (presented in Table 1), specific product mass should be determined. Then the value of the LCA impact may be found on the proportion of the specific product mass and the impact of 1 kg (table 6).

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Table 6. Life cycle assessment (LCA) results of the LED products manufactured by VOLTEA™– environmental impacts (DU: 1 kg with specified luminous flux 5000-30000lm, 170lm/W).

Indicator	Unit	A1-A3	B6				C1	C2	C3	C4	D
			5000lm	10000lm	20000m	30000lm					
Global Warming Potential	eq. kg CO_2	1.64E+01	2.05E+03	4.11E+03	8.21E+03	1.23E+04	3.75E-01	1.67E-02	4.48E+00	2.48E-02	-9.98E+00
Greenhouse potential - fossil	eq. kg CO_2	1.62E+01	2.05E+03	4.08E+03	8.16E+03	1.22E+04	3.73E-01	1.67E-02	4.37E+00	2.46E-02	-9.97E+00
Greenhouse potential - biogenic	eq. kg CO_2	8.48E-02	-5.10E-01	2.23E+01	4.47E+01	6.69E+01	2.24E-03	1.40E-05	2.22E-02	2.30E-04	2.47E-02
Global warming potential - land use and land use change	eq. kg CO_2	3.14E-02	2.83E-01	1.21E+00	2.42E+00	3.62E+00	9.72E-05	9.76E-06	8.61E-02	5.96E-06	-2.89E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	2.95E-07	1.51E-05	1.70E-05	3.40E-05	5.09E-05	1.36E-09	3.62E-10	1.18E-07	7.51E-11	-1.02E-07
Soil and water acidification potential	eq. mol H+	1.15E-01	1.48E+01	2.93E+01	5.86E+01	8.77E+01	2.10E-03	5.10E-05	6.64E-02	6.06E-05	-6.75E-02
Eutrophication potential - freshwater	eq. kg P	8.74E-03	1.03E+00	4.91E+00	9.81E+00	1.47E+01	3.10E-04	1.41E-06	5.42E-03	1.54E-06	-3.18E-03
Eutrophication potential - seawater	eq. kg N	2.05E-02	2.09E+00	4.23E+00	8.46E+00	1.27E+01	3.60E-04	1.64E-05	5.59E-03	2.11E-05	-1.10E-02
Eutrophication potential - terrestrial	eq. mol N	2.11E-01	2.15E+01	3.68E+01	7.36E+01	1.10E+02	3.34E-03	1.70E-04	6.14E-02	2.30E-04	-1.14E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	6.73E-02	6.12E+00	1.06E+01	2.12E+01	3.18E+01	1.38E-03	7.37E-05	2.21E-02	1.50E-04	-3.51E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	6.42E-04	1.29E-03	1.33E-03	2.66E-03	3.98E-03	1.36E-07	7.48E-08	5.60E-04	1.28E-08	-9.17E-06
Abiotic depletion potential - fossil fuels	MJ	2.06E+02	2.38E+04	4.68E+04	9.37E+04	1.40E+05	3.28E+00	2.36E-01	6.70E+01	8.54E-02	-9.58E+01
Water deprivation potential	eq. m^3	7.35E+01	5.95E+02	1.19E+03	2.38E+03	3.57E+03	6.12E-02	1.34E-03	7.42E-05	1.52E-03	-2.11E-01

Table 7. Life cycle assessment (LCA) results of the LED products manufactured by VOLTEA™ – additional impacts indicators (DU: 1 kg).

Indicator	Unit	A1-A3	B6				C1	C2	C3	C4	D
			5000lm	10000lm	20000m	30000lm					
Particulate matter	disease incidence	1.05E-06	2.59E-05	4.84E-05	9.68E-05	1.40E-04	1.70E-06	9.71E-10	3.86E-07	3.40E-07	5.12E-07
Potential human exposure efficency relative to U235	kBq U235 eq	1.44E+00	3.34E+01	1.34E+02	2.69E+02	4.02E+02	9.91E-03	4.70E-04	1.04E+00	3.30E-04	-1.77E-01
Potential comparative toxic unit for ecosystems	CTUe	1.18E+02	4.67E+03	1.15E+04	2.30E+04	3.45E+04	6.90E+00	1.24E-01	6.51E+01	1.24E+00	-3.00E+01
Potential comparative toxic unit for humans (cancer effects)	CTUh	1.60E-08	6.98E-07	1.47E-06	2.95E-06	4.41E-06	2.88E-08	8.57E-12	1.83E-08	5.74E-09	9.38E-09
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	4.81E-07	3.03E-05	6.55E-05	1.30E-04	2.00E-04	7.10E-09	1.65E-10	6.61E-07	6.15E-10	-1.85E-07
Potential soil quality index	dimensionless	5.58E+01	4.80E+03	9.87E+03	1.97E+04	2.95E+04	1.11E+00	9.74E-02	1.77E+01	1.12E-01	-1.58E+01

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Table 8. Life cycle assessment (LCA) results of the LED modules products manufactured by VOLTEA™ - the resource use (DU: 1 kg).

Indicator	Unit	A1-A3	B6				C1	C2	C3	C4	D
			5000lm	10000lm	20000lm	30000lm					
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.15E+01	9.23E+02	4.32E+03	8.64E+03	1.29E+04	2.92E-01	5.10E-03	2.43E+01	5.02E-03	-1.01E+01
Consumption of renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	2.15E+01	9.23E+02	4.32E+03	8.64E+03	1.29E+04	2.92E-01	5.10E-03	2.43E+01	5.02E-03	-1.01E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.00E+02	2.36E+04	4.65E+04	9.30E+04	1.39E+05	3.24E+00	2.16E-01	6.45E+01	8.05E-02	-9.38E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	5.92E+00	2.38E+02	3.22E+02	6.43E+02	9.63E+02	3.99E-02	2.01E-02	2.48E+00	4.91E-03	-2.05E+00
Total consumption of non-renewable primary energy resources	MJ	2.06E+02	2.38E+04	4.68E+04	9.37E+04	1.40E+05	3.28E+00	2.36E-01	6.70E+01	8.54E-02	-9.58E+01
Consumption of secondary materials	kg	9.45E-01	4.42E+01	2.53E+02	5.06E+02	7.57E+02	1.64E-02	3.60E-04	9.41E-02	1.60E-04	-3.90E-02
Consumption of renew. secondary fuels	MJ	1.87E-01	2.39E+01	1.45E+02	2.90E+02	4.34E+02	9.21E-03	1.20E-04	2.50E-02	4.26E-05	-7.80E-03
Consumption of non-renewable secondary fuels	MJ	5.73E-01	2.22E+02	4.85E+02	9.70E+02	1.45E+03	3.29E-02	5.30E-04	5.24E-02	8.50E-04	-3.55E-02
Net consumption of freshwater	m^3	5.70E+00	7.09E+01	8.79E+02	1.76E+03	2.63E+03	6.12E-02	1.34E-03	7.64E+00	1.52E-03	-2.55E+00

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Table 9. Life cycle assessment (LCA) results of the LED modules products manufactured by VOLTEA™ – waste categories (DU: 1 kg).

Indicator	Unit	A1-A3	B6				C1	C2	C3	C4	D
			5000lm	10000lm	20000lm	30000lm					
Hazardous waste	kg	1.36E-01	1.02E+02	1.36E+02	2.72E+02	4.08E+02	1.74E-02	2.30E-04	1.04E+00	1.81E-03	-1.66E+00
Non-hazardous waste	kg	8.51E-01	4.67E+01	1.17E+02	2.34E+02	3.51E+02	7.82E-01	7.25E-03	2.97E-01	1.67E-01	-2.03E-01
Radioactive waste	kg	3.56E-04	8.21E-03	3.30E-02	6.60E-02	9.88E-02	2.43E-06	1.15E-07	2.70E-04	7.96E-08	-4.36E-05
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.35E-01	4.24E+01	2.45E+02	4.90E+02	7.33E+02	7.82E-02	3.30E-04	8.03E-02	1.26E-02	1.80E-02
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported Energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) ☐ external ☐ internal
External verification of EPD: Michał Piasecki, PhD., D.Sc., eng. LCA, LCI audit and input data verification: Bartosz Żymańczyk, LCA internal verification: Radosław Andrulewicz, BEng

Note 1: The declaration owner has the sole ownership, liability, and responsibility for the information provided and contained in EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.

Note 2: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (see ISO 17025/17065/17029). ITB-EPD program is recognized and registered member of The European Platform - Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- EN 1090-2:2018 - Execution of steel structures and aluminium structures - Technical requirements for steel structures
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- Ozkan, Elif & Elginoz, Nilay & Germirli Babuna, Fatos. (2018). Life cycle assessment of a printed circuit board manufacturing plant in Turkey. Environmental Science and Pollution Research, 2018
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej. Grudzień 2023
- World Steel Association 2017 Life Cycle inventory methodology report for steel products

Instytut Techniki Budowlanej

Type III Environmental Product Declaration No. 678/2024

Instytut Techniki Budowlanej
00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

CERTIFICATE № 678/2024
of TYPE III ENVIRONMENTAL DECLARATION

Products:

LED OUTDOOR PARK AND STREET LIGHTING FIXTURES VOLTEA

Manufacturer:

VOLTEA Poland

Bydgoska 19A, 86-065 Lisi Ogon, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued on 2nd October 2024 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, October 2024