Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Junistar Soft TW

EPD-Global

Owner of the declaration:
SG Armaturen AS

Product:
Junistar Soft TW

Declared unit:
1 pcs

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR - Part B for luminaires, lamps, and components for luminaires

Program operator:
EPD-Global

Declaration number:
NEPD-18520-22681

Issue date:
13.10.2026

Valid to:
13.10.2031

EPD software:
LCAno EPD generator ID: 1771146

General information

Product

Junistar Soft TW

Owner of the declaration:

SG Armaturen AS
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Program operator:

EPD-Global
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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Manufacturer:

SG Armaturen AS
Skytterheia 25
4790 Lillesand, Norway

Declaration number:

NEPD-18520-22681

Place of production:

SG Armaturen production site Dong Guan (China)
No. 96 Wen Quan South Road, Shi Long Information Industrial Park
523325 Dong Guan, China

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR - Part B for luminaires, lamps, and components for luminaires

Management system:

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD-Global shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

958560931

Declared unit:

1 pcs Junistar Soft TW

Issue date:

13.10.2026

Declared unit with option:

A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, C2, C3, C4, D

Valid to:

13.10.2031

Year of study:

2023

Functional unit:

1 Junistar Soft TW LED luminaire manufactured and installed, used according to a specific lighting regime over 15 years, including waste treatment at end-of-life.

Comparability:

EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not viewed in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD-Global. Approval number: NEPDT63

Developer of EPD: Eva Linn Jenssen

Reviewer of company-specific input data and EPD: Audun Skare

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools. Approval number: NEPDT41.

Third party verifier:

Vito D'Incognito, Take Care International, Take Care International

(no signature required)

Approved:

Håkon Hauan, CEO EPD-Global

Product

Product description:

Junistar Soft TW is equipped with the revolutionary Tunable White (TW) LEDDim technology. You can regulate both the lighting level and colour without extra cabling, using SG's TW LEDDim Smart dimmer. Control it manually or via the LEDDim app.When using the SG Smart Gateway, you can also set a daylight sequence which changes colour and intensity throughout the day. You can choose a standard rhythm or set your own. Junistar Soft TW comes in two colour temperature ranges: 2700-6500K for traditional TW with the typical circadian spectrum, or 2000-4000K for typical residential use including warm and cosy colour temperatures. This is similar to DimToWarm, but with independent control of light level and colour temperature.

System Wattage: 11.0 W. Luminous flux: 650lm (@4000K) . Efficacy: 59 lm/W. Colour temperature: 2000-4000K. Colour rendering: Ra>90. MacAdams factor: SDCM: 2. Lifetime: L90/B10>100,000 . Light distribution: Direct. Control/Dimming: TW LEDDim. Luminiare class: Class II SELV. Housing: Aluminium. Optics: Tempered glass. Height: 53.0mm. Diameter: 94.0mm. Cut-out: 83.0mm. EAN: 7021989033219

The EPD also cover the following products:

EAN: 7021989033202 - JUNISTAR SOFT WHITE TW LEDDIM 2700-6500K
EAN: 7021989033226 - JUNISTAR SOFT BLACK TW LEDDIM 2700-6500K
EAN: 7021989033233 - JUNISTAR SOFT BLACK TW LEDDIM 2000-4000K

Please note that the above has been calculated with the Norwegian Energy-mix. If you want an EPD with a specific energy-mix, please send us a request.

Product specification

Materials	kg	%
Adhesive	0.000045	0.01066
Electronic - Connector	0.01629	3.86
Electronic - LED chip	0.00048	0.1137
Electronic - LED driver	0.082	19.43
Electronic - Wire	0.0117	2.77
Glass	0.00745	1.77
Metal - Aluminium	0.2528	59.90
Metal - Stainless steel	0.01096	2.60
Plastic - Polyamide	0.03019	7.15
Plastic - Polycarbonate (PC)	0.0034	0.8057
Plastic - Polyethylene (LDPE)	0.002049	0.4855
Plastic - Polyvinyl chloride (PVC)	0.004616	1.09
Silicon products	0.00003	0.007109
Total	0.422	100.00

Packaging	kg	%
Packaging - Cardboard	0.0658	93.60
Packaging - Recycled paper	0.0045	6.40
Total incl. packaging	0.4923	100.00

Technical data:

Link to product data on our website:
https://www.sg-as.com/int/en/pdf/article/903321/700971/specification_903321.pdf

Link to CE Declaration:
https://www.sg-as.com/file/techfile/MN8Z/Junistar%20Soft%20TW.pdf

Market:

Nordic + Northwestern Europe

Reference service life, product

15 years. Estimated based on the characteristics of the product and the intended application.

Reference service life, building or construction works

60 years. Standard service life for buildings to the PCR Part A of EPD Norway.

LCA: Calculation rules

Declared unit:

1 pcs Junistar Soft TW

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) can be excluded. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

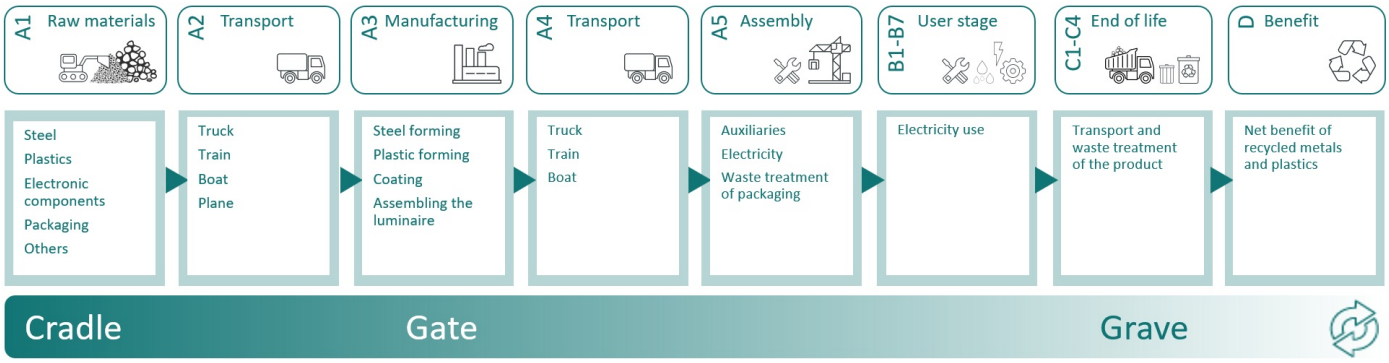
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Adhesive	ecoinvent 3.10.1	Database	2023
Electronic - Connector	ecoinvent 3.10.1	Database	2023
Electronic - LED chip	Scholand et al. (2012) + Ecoinvent 3.10.1	Scientific literature + database	2023
Electronic - LED driver	Material composition + ecoinvent 3.10.1	Supplier data + database	2023
Electronic - Wire	Material composition + ecoinvent 3.6	Supplier data + database	2019
Glass	ecoinvent 3.10.1	Database	2023
Metal - Aluminium	Modified ecoinvent 3.11	Database	2023
Metal - Stainless steel	Modified ecoinvent 3.6	Database	2019
Packaging - Cardboard	Modified ecoinvent 3.10.1	Database	2023
Packaging - Recycled paper	Modified ecoinvent 3.10.1	Database	2023
Plastic - Polyamide	ecoinvent 3.10.1	Database	2023
Plastic - Polycarbonate (PC)	ecoinvent 3.10.1	Database	2023
Plastic - Polyethylene (LDPE)	ecoinvent 3.10.1	Database	2023
Plastic - Polyvinyl chloride (PVC)	Product composition + ecoinvent 3.10.1	Supplier data + database	2023
Silicon products	ecoinvent 3.10.1	Database	2023

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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

System boundary:



Additional technical information:

Link to Mounting instruction on our website:
https://www.sg-as.com/file/techfile/WJX7/Junistar%20Soft%20TW%20LEDDim_User%20manual.pdf

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Scenario: Office

Module A4 = Transportation by truck (40 km) from the production site in Dong Guan, China to the harbor. After this the goods are transported by ship (19000 km) from Dong Guan, China to Hamburg, Germany. Then with a truck (650 km) from Hamburg, Germany to the warehouse in Lillesand, Norway or to the warehouse in Mechelen, Belgium + 800 km for Nordic / Northwestern Europe Market.

Module A5 = Installation is performed in the Nordic / Northwestern Europe Market and done by manual labor, with the use of electrical machines, that fall under the cut-off criteria of 1% and is therefore neglected. Packaging of the final product consist of a corrugated board box.

Module B6 = The operational energy use of the luminaire is calculated based on the methodology provided in IBU PCR Part B for luminaires, lamps, and components for luminaires. The energy consumption model for luminaire used in the PCR follows the application scenarios developed in EN 15193:2007. To calculate the electricity use of the luminaire, the following scenario parameters have been applied:

- Active power of the luminaire (Pa) = 11 watt
- Passive power of the luminaire (Pp) = 0 watt
- Daylight time usage (tD) = 2250 hours
- Non-daylight time usage (tN) = 250 hours
- Standard year time (ty) = 8760 hours
- The occupancy depency factor (FO) = 1
- The daylight dependency factor (FD) = 0.9
- The product specific constant illuminance factor (FCP) = 1
- The non-daylight dimming factor (FN) = 1
- The application specific empiric lifetime of the luminaire in years (a) = 15 years (corresponding to the reference service life of the product).

Module C1 = The de-installation of the luminaire is done by manual labor, with the help of electrical machines. The use of portable electrical devices (e.g., drill) usually have low energy requirements falling under the cut-off-criterion of 1% and is therefore neglected.

Module C2 = Transportation from building site to the waste treatment facility with an average distance of 300km.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in EN 50693, Product Category Rules for life cycle assessments of electronic and electrical products and systems, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with and without energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals, plastics, and electronic components allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Freight, Transoceanic (km)	65.0 %	19000.00	0.003	l/tkm	57.00
Truck, 16-32 tonnes, EURO 6 (km) - Europe	38.8 %	1450.00	0.044	l/tkm	63.80
Truck, 16-32 tonnes, EURO 6 (km) - Rest of World	38.8 %	40.00	0.044	l/tkm	1.76

Assembly (A5)	Unit	Value			
Waste, packaging, corrugated board box, with recycled content, to average treatment (kg) - A5 including transport	kg	0.0658			
Waste, packaging, paper printed, 100% recycled content, to average treatment (kg) - Global - A5, incl. 85 km transp	kg	0.0045			

Operational energy (B6)	Unit	Value			
Electricity, Norway (kWh)	kWh	375.38			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Rest of World	38.8 %	300.00	0.044	l/tkm	13.20

Waste processing (C3)	Unit	Value			
Waste treatment of polyethylene (PE), incineration with energy recovery and fly ash extraction (kg)	kg	0.001025			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	0.03618			
Aluminium to recycling (kg)	kg	0.177			
Copper to recycling (kg)	kg	0.006779			
Steel to recycling (kg)	kg	0.02371			
Waste treatment per kg used PWB, shredding and separation - C3 (kg)	kg	0.0464			
Waste treatment per kg used electronic components, manual seperation (kg)	kg	0.11			
Waste treatment per kg electronics scrap from PWB, with components, recycling of metals C3 (kg)	kg	0.0232			
Glass to recycling (kg)	kg	0.00447			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0.0000361			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0.001265			
Landfilling of aluminium (kg)	kg	0.07584			
Landfilling of copper (kg)	kg	0.004519			
Landfilling of steel (kg)	kg	0.005928			
Landfilling of plastic mixture (kg)	kg	0.03721			
Landfilling of hazardous waste (kg)	kg	0.0232			
Landfilling of glass (kg)	kg	0.00298			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	0.0616			
Substitution of thermal energy, district heating (MJ)	MJ	0.932			
Substitution of primary aluminium with net scrap (kg)	kg	-0.006548			
Substitution of primary copper with net scrap (kg)	kg	0.006765			
Substitution of primary steel with net scrap (kg)	kg	0.01496			
Substitution of primary metals with net scrap from PWB, with components (kg)	kg	0.006822			
Substitution of primary glass with net scrap (kg)	kg	0.00447			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact

Indicator	Unit	A1	A2	A3	A4	A5	B1	B2	B3
GWP-total	kg CO_2 -eq	6.22E+00	4.12E-03	1.86E-01	2.35E-01	1.25E-01	0	0	0
GWP-fossil	kg CO_2 -eq	6.25E+00	4.12E-03	1.85E-01	2.35E-01	1.30E-03	0	0	0
GWP-biogenic	kg CO_2 -eq	-4.51E-02	8.29E-07	4.02E-04	1.21E-04	1.24E-01	0	0	0
GWP-luluc	kg CO_2 -eq	1.26E-02	1.87E-06	7.01E-05	1.02E-04	4.35E-07	0	0	0
ODP	kg CFC11 -eq	9.35E-06	6.10E-11	1.24E-09	2.91E-09	2.60E-11	0	0	0
AP	mol H+ -eq	4.26E-02	9.43E-06	1.02E-03	3.10E-03	4.87E-06	0	0	0
EP-FreshWater	kg P -eq	5.11E-03	3.23E-07	3.70E-05	1.24E-05	9.24E-08	0	0	0
EP-Marine	kg N -eq	7.70E-03	2.19E-06	2.14E-04	7.70E-04	1.89E-06	0	0	0
EP-Terrestial	mol N -eq	7.84E-02	2.36E-05	2.28E-03	8.53E-03	1.91E-05	0	0	0
POCP	kg NMVOC -eq	2.82E-02	1.32E-05	6.25E-04	2.59E-03	7.14E-06	0	0	0
ADP-minerals&metals[1]	kg Sb-eq	9.59E-04	1.38E-08	7.70E-07	5.57E-07	4.18E-09	0	0	0
ADP-fossil[1]	MJ	7.83E+01	5.79E-02	1.82E+00	3.13E+00	1.71E-02	0	0	0
WDP[1]	m^3	4.07E+00	2.71E-04	2.28E-02	1.30E-02	4.39E-04	0	0	0

Indicator	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 -eq	0	0	9.23E+00	0	0.00E+00	2.83E-02	1.29E-01	1.01E-02	-4.09E-01
GWP-fossil	kg CO_2 -eq	0	0	8.99E+00	0	0.00E+00	2.82E-02	1.29E-01	1.01E-02	-4.08E-01
GWP-biogenic	kg CO_2 -eq	0	0	2.05E-01	0	0.00E+00	5.68E-06	3.85E-04	3.53E-06	-1.01E-03
GWP-luluc	kg CO_2 -eq	0	0	4.20E-02	0	0.00E+00	1.28E-05	6.58E-05	2.44E-05	1.09E-04
ODP	kg CFC11 -eq	0	0	2.42E-07	0	0.00E+00	4.43E-10	2.77E-10	8.20E-11	-3.94E-04
AP	mol H+ -eq	0	0	1.24E-01	0	0.00E+00	6.46E-05	1.55E-04	3.03E-05	-2.72E-02
EP-FreshWater	kg P -eq	0	0	9.48E-03	0	0.00E+00	2.21E-06	8.58E-06	1.91E-06	-1.49E-03
EP-Marine	kg N -eq	0	0	1.08E-02	0	0.00E+00	1.50E-05	3.80E-05	8.60E-05	-1.42E-03
EP-Terrestial	mol N -eq	0	0	1.32E-01	0	0.00E+00	1.62E-04	3.77E-04	9.36E-05	-1.89E-02
POCP	kg NMVOC -eq	0	0	4.01E-02	0	0.00E+00	9.06E-05	1.21E-04	3.47E-05	-5.56E-03
ADP-minerals&metals[1]	kg Sb-eq	0	0	1.43E-03	0	0.00E+00	9.45E-08	1.66E-07	1.36E-08	-4.55E-04
ADP-fossil[1]	MJ	0	0	1.09E+02	0	0.00E+00	3.97E-01	3.57E-01	9.43E-02	-5.32E+00
WDP[1]	m^3	0	0	4.71E+02	0	0.00E+00	1.86E-03	1.24E-02	2.98E-03	-1.78E-01

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. 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

Remarks to environmental impacts

The product is compliant with the European RoHS Directive 2011/65/EU on Restriction of the use of certain Hazardous Substances in Electrical and Electronic equipment and with the European REACH regulation (EC) no 1907/2006 on Registration, Evaluation, Authorization and Restriction of Chemicals.

Additional environmental impact indicators

Indicator	Unit	A1	A2	A3	A4	A5	B1	B2	B3
PM	Disease incidence	3.77E-07	3.03E-10	1.38E-08	1.03E-08	9.90E-11	0	0	0
IRP[2]	kgBq U235 -eq	5.79E-01	4.74E-05	8.29E-03	3.03E-03	2.41E-05	0	0	0
ETP-fw[1]	CTUe	1.38E+02	9.20E-03	5.53E-01	3.48E-01	1.14E-02	0	0	0
HTP-c[1]	CTUh	6.39E-09	0.00E+00	2.70E-11	0.00E+00	0.00E+00	0	0	0
HTP-nc[1]	CTUh	2.36E-07	4.30E-11	1.65E-09	1.47E-09	2.20E-11	0	0	0
SQP[1]	dimensionless	2.63E+01	3.51E-02	4.17E-01	1.27E+00	9.90E-03	0	0	0

Indicator	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	0	0	6.79E-07	0	0.00E+00	2.07E-09	1.22E-09	6.79E-10	-5.85E-08
IRP[2]	kgBq U235 -eq	0	0	3.43E+00	0	0.00E+00	3.25E-04	2.71E-03	2.96E-04	-3.47E-02
ETP-fw[1]	CTUe	0	0	1.88E+02	0	0.00E+00	6.31E-02	2.67E-01	5.72E+00	-3.21E+01
HTP-c[1]	CTUh	0	0	2.18E-08	0	0.00E+00	0.00E+00	1.13E-10	5.00E-12	-9.61E-10
HTP-nc[1]	CTUh	0	0	1.16E-06	0	0.00E+00	2.95E-10	9.37E-10	1.06E-10	-8.92E-08
SQP[1]	dimensionless	0	0	5.80E+01	0	0.00E+00	2.41E-01	9.02E-02	1.76E-01	-6.05E+00

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. 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
2. 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.

Resource use

Indicator		Unit	A1	A2	A3	A4	A5	B1	B2	B3
	PERE	MJ	8.13E+00	8.05E-04	2.17E-01	4.30E-02	3.37E-04	0	0	0
	PERM	MJ	9.08E-01	0.00E+00	0.00E+00	0.00E+00	-4.54E-01	0	0	0
	PERT	MJ	9.03E+00	8.05E-04	2.17E-01	4.30E-02	-4.53E-01	0	0	0
	PENRE	MJ	7.62E+01	5.79E-02	1.82E+00	3.13E+00	1.71E-02	0	0	0
	PENRM	MJ	2.17E+00	0.00E+00	0.00E+00	0.00E+00	-8.85E-03	0	0	0
	PENRT	MJ	7.84E+01	5.79E-02	1.82E+00	3.13E+00	8.29E-03	0	0	0
	SM	kg	2.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0
	RSF	MJ	4.11E-02	3.37E-07	1.96E-06	1.27E-05	1.21E-07	0	0	0
	NRSF	MJ	1.58E-02	0.00E+00	3.44E-08	0.00E+00	0.00E+00	0	0	0
	FW	m^3	5.80E-02	7.92E-06	3.90E-03	3.46E-04	7.92E-06	0	0	0

Indicator		Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
	PERE	MJ	0	0	1.55E+03	0	0.00E+00	5.52E-03	4.82E-02	2.18E-02	-1.09E+00
	PERM	MJ	0	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	0	0	1.55E+03	0	0.00E+00	5.52E-03	4.82E-02	2.18E-02	-1.09E+00
	PENRE	MJ	0	0	1.09E+02	0	0.00E+00	3.97E-01	3.57E-01	9.42E-02	-5.32E+00
	PENRM	MJ	0	0	0.00E+00	0	0.00E+00	0.00E+00	-2.71E+00	0.00E+00	0.00E+00
	PENRT	MJ	0	0	1.09E+02	0	0.00E+00	3.97E-01	-2.35E+00	9.42E-02	-5.32E+00
	SM	kg	0	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.93E-02
	RSF	MJ	0	0	8.54E-04	0	0.00E+00	2.31E-06	8.77E-06	3.79E-06	-8.32E-05
	NRSF	MJ	0	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	8.22E-06	-2.82E-02
	FW	m^3	0	0	1.10E+01	0	0.00E+00	5.43E-05	2.82E-04	3.15E-05	-5.42E-03

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	B1	B2	B3
	HWD	kg	7.65E-01	1.02E-04	2.24E-02	4.41E-03	2.33E-05	0	0	0
	NHWD	kg	2.13E+01	1.91E-03	2.48E-01	8.11E-02	5.41E-03	0	0	0
	RWD	kg	1.44E-04	1.16E-08	1.90E-06	7.52E-07	5.15E-09	0	0	0

Indicator		Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
	HWD	kg	0	0	1.13E+00	0	0.00E+00	6.97E-04	1.36E-03	2.33E-02	-7.86E-02
	NHWD	kg	0	0	4.81E+01	0	0.00E+00	1.31E-02	1.18E-01	1.27E-01	-3.14E+00
	RWD	kg	0	0	7.50E-04	0	0.00E+00	7.96E-08	5.49E-07	2.72E-10	-8.87E-06

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	B1	B2	B3
	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0
	MFR	kg	3.98E-03	0.00E+00	9.71E-03	0.00E+00	6.54E-02	0	0	0
	MER	kg	2.13E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0
	EEE	MJ	3.15E-03	0.00E+00	1.41E-06	0.00E+00	8.69E-07	0	0	0
	EET	MJ	4.92E-04	0.00E+00	1.90E-06	0.00E+00	8.46E-07	0	0	0

Indicator		Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
	CRU	kg	0	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	0	0	0.00E+00	0	0.00E+00	0.00E+00	2.12E-01	0.00E+00	0.00E+00
	MER	kg	0	0	0.00E+00	0	0.00E+00	0.00E+00	3.72E-02	0.00E+00	0.00E+00
	EEE	MJ	0	0	0.00E+00	0	0.00E+00	0.00E+00	2.03E-04	1.32E-05	0.00E+00
	EET	MJ	0	0	0.00E+00	0	0.00E+00	0.00E+00	3.59E-05	4.03E-05	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	2.18E-03
Biogenic carbon content in accompanying packaging	kg C	2.93E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, China (kWh)	ecoinvent 3.10.1	962.03	g CO2-eq/kWh

Dangerous substances

The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.

Name	CASNo	Amount
Lead	7439-92,1	>0,1%

Indoor environment

No effect on indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	Unit	A1	A2	A3	A4	A5	B1	B2	B3
GWPIOBC	kg CO_2 -eq	6.30E+00	4.12E-03	1.86E-01	2.35E-01	1.30E-03	0	0	0

Indicator	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	0	0	9.23E+00	0	0.00E+00	2.83E-02	1.29E-01	1.01E-02	-4.09E-01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

ISO 14025:2010. Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization.
ISO 14044:2006. Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization.
EN 15804:2012+A2:2019. Environmental product declaration - Core rules for the product category of construction products. European Committee for Standardization.
ISO 21930:2017. Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products. International Organization for Standardization.
EN 50693:2019. Product category rules for life cycle assessments of electronic and electrical products and systems. European Committee for Standardization.
Ecoinvent v3, 2019. Allocation, cut-off by classification. Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021). eEPD v2021.09, background information for EPD generator tool system verification, LCA.no. Report number: 07.21. System verification report.
Philis et al., (2022). EPD generator for IBU PCR part B for luminaires, lamps, and components for luminaires, background information for EPD generator application and LCA data, LCA.no. Report number: 04.22. PCR verification report.
EPD Norway (2022). NPCR Part A: Construction products and services. The Norwegian EPD foundation. Version 2.0 published 24.03.2021.
IBU (2017). PCR part B for luminaires, lampes and components for luminaires. Institut Bauen und Umwelt e.V. Version 1.7, published 30.11.2017.

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