

Product Environmental Profile of luminaires for outdoor lighting - Linealuce mini 27 RGBW family

Reference product: UG49



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Independent verification of the declaration and data, in compliance with ISO 14025: 2006

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The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)

PEP are compliant with XP C08-100-1:2016 or EN 50693:2019

The elements of the present PEP cannot be compared with elements from another program.

Document in compliance with ISO 14025 : 2006 « Environmental labels and declarations. Type III environmental declarations»



General information

Company information:

iGuzzini illuminazione S.p.A via Mariano Guzzini, 37 62019, Recanati, Italy

Web Site available at: <https://www.iguzzini.com/it/>

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Reference product:

“Linealuce UG49”

The assessed product range covers outdoor lighting luminaires for the “Linealuce” family. The luminaires are used for professional lighting of outdoor environments.

The main technical features of the reference product UG49 are described in the table below.

Characteristics	Unit	Linealuce family
Product code	-	UG49
Light source	-	Integrated LED module
Power supply	-	27,2
Color temperature	K	RGBW40
Protection index for water and dust (IP)	-	IP66
Impact resistance index (IK)	-	IK06
Nominal operating voltage	V	220-240
Assigned lifetime	Hours	100.000
Declaration lifetime of the LED module	Hours	100.000
Useful output flux	Lumen	436,8
Electrical power	W	27,2
Luminous efficiency	Lumen/W	16,0
Dimension	mm	1511x27x37

Functional unit:

“Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours”.

The reference flow is calculated as:

(1,000/outgoing luminous flux of the analyzed product in lumens) x (35,000/declared product lifetime of the analyzed product in hours):

$$(1.000/436,8) \times (35.000/100.000) = 0,801$$

Homogeneous environmental family:

The reference product represents the Linealuce luminaires family, which differs in terms of power, useful output flux (lumen) and size.

The range of variations for the products in the same family is the following:

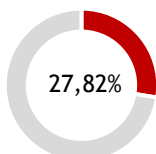
Linealuce RGBW Family	Unit	Value for the reference product	Minimum value in product range	Maximum value in product range
Power	W	27,2	10,9	27,2
Useful output flux	Lumen	436,8	175	561,6
Size	kg	3,1930	2,229	3,1930

The present PEP declaration is valid for all the products in the described homogenous environmental family. The spreadsheet provided as annex shall be used by the PEP user to extrapolate the impact of the other products for the Linealuce family, based on the technical parameters of the considered product, as requested by the PSR.



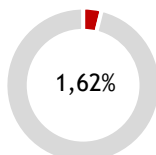
Constituent materials

METALS



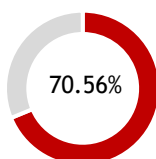
	kg	%
Aluminum	0,917	25,01
Zamak	0,086	2,35
Steel	0,017	0,47

PLASTICS



	kg	%
Polycarbonate (PC)	0,044	79,39
Polyethylene terephthalate (PET)	0,005	9,01
Silicon	0,003	6,16
Nylon (PA66)	0,002	3,61
Polyethylene (PL)	0,001	1,44
Polyurethane (PU)	0,000	0,40

OTHER MATERIALS



	kg	%
Electronical components	1,619	44,16
Glass	0,390	10,63
Chemicals	0,063	1,73
Paper	0,041	1,11
Cardboard - Packaging	0,230	6,29
Plastic (PE) - Packaging	0,047	1,29
Wood - Packaging	0,196	5,35

Total reference product	3,193	87,07
Total packaging	0,474	12,93
TOTAL	3,667	100%

The list above includes also materials with a certain amount of recycled content, in order to reduce the impacts linked to the production of virgin materials. In particular:

- The paperboard box of packaging is made of 100% of recycled content;
- The “housing” of UG49 is made of 75% of recycled aluminum;
- The pallet used for shipment is reused.



Manufacture

The product components are manufactured or assembled by iGuzzini S.p.A. in Recanati (Italy) manufacturing site. iGuzzini applies an environmental management system, certified according to ISO 14001:2015 and an energy management system certified according to ISO 50001:2018 (the certificates are available at: <https://www.iguzzini.com/it/certificazioni/>).

In 2023 iGuzzini gained the gold medal in the EcoVadis platform.

In 2022, iGuzzini disclosed its sustainability performances within the Fagerhult Group Sustainability Report. In the same year iGuzzini plant of Recanati passed to 100% green energy procurement verified and certified by GO (origin guarantee certificates).

All lighting products manufactured by iGuzzini comply to the European directive “2011/65/EU ROHS 2 - Restriction of dangerous substances in electrical and electronic equipment”.



Distribution

There is no hub for the distribution. Products leaving the production site in Recanati (MC), Italy, are delivered directly to the final clients. The distribution of the final destinations is the following:

Destination	Share (%)	Type transport considered
Emirates	15%	Intracontinental
China	13%	Intracontinental
Italy	12%	Local
Swiss	10%	Intercontinental
Poland	8%	Intercontinental
Finland	7%	Intercontinental
Spain	4%	Intercontinental
Norway	4%	Intercontinental
Malaysia	3%	Intracontinental
France	3%	Intercontinental
New York	3%	Intracontinental
Germain	3%	Intercontinental
Brazil	3%	Intracontinental
New Zeland	3%	Intracontinental
India	2%	Intracontinental
England	2%	Intercontinental
Belgium	2%	Intercontinental
Other (Europe)	2%	Intercontinental
Other (extra EU)	1%	Intracontinental



Installation

The luminaires are provided to the client with the power supply, the fixing elements and the assembly elements, fittings and other electrical connectors needed for installation. Therefore, the installation of the luminaire does not require additional components and the product is easily installed using manual tools. In this phase the end of life (EoL) of the packaging of the final product is considered as well.



Use

Energy efficient light sources (LED lighting) are integrated. The use phase consists of electricity use during the whole lifetime of the product. The assigned lifetime of the luminaire is 100.000 hours.



End of life

The company is affiliated with a WEEE (Waste Electrical and Electronic Equipment) Italian consortium (Ecolight, <https://ecolight.it/>). The product at its end of life is managed as prescribed by the current legislation about EEE waste (Directive 2012/19/EU) and the waste treatment scenarios of the Countries in which the product is distributed. According to the most recent data available, waste treatment scenarios are the following:

Scenario	Recycling	Energy recovery	Incineration	Landfill
Emirates	6%	-	-	94%
China	20%	-	-	80%
Italy	95%	2%	0%	3%
Swiss	34%	-	-	66%
Poland	23%	-	-	77%
Finland	59%	-	-	41%
Spain	34%	-	-	66%
Norway	59%	-	-	41%
Malaysia	0%	-	-	100%
France	77%	8,50%	6%	8,50%
New York	15%	-	-	85%
German	54%	-	-	46%
Brazil	1%	-	-	99%
New Zealand	9%	-	-	91%
India	1%	-	-	99%
England	59%	-	-	41%
Belgium	54%	-	-	46%
Other (Europe)	43%	-	-	58%
Other (extra EU)	10%	-	-	90%

The end of life scenarios are made with the following assumptions:

- In Italian scenario the transport to the end of life is assumed to be 150 km and the treatment of waste is based on Ecolight statistics;
- In French scenario the transport to the end of life is assumed to be 1000 km and the treatment of waste is based on PSR statistics;
- In other European scenarios the transport to the end of life is assumed to be 1000 km and the treatment of waste is based on Global E-Waste Monitor report;
- For the not-Europeans scenarios the transport to end of life is assumed to be 1000 km and the treatment of waste is based on global statistics.



Environmental impacts

The evaluation of environmental impacts examines the manufacturing, distribution, installation, use and end-of-life stages of the Reference Product life cycle.

The environmental impacts assessment of the reference product has been performed using SimaPro 9.4.0.2 software. Background datasets have been retrieved from Ecoinvent 3.8 libraries. The impact indicators and impact models used are the ones indicated by the PCR-ed4-EN-2021 09 06. This environmental declaration has been developed considering an outgoing artificial luminous flux of 1,000 lumens over a reference lifetime of 35,000 hours (Functional Unit).

Results of mandatory indicators per F.U. (for 1.000 lumens during 35.000 hours) of UG49 luminaire:

Impact category	Unit	Total	Manufacturing	Distribution	Installation	Use	EoL
Climate change	kg CO ₂ eq	1196,57	1,71E+01	9,38E+00	1,82E-01	1,17E+03	1,53E+00
Ozone depletion	kg CFC-11 eq	4,92E-05	3,83E-06	2,14E-06	5,00E-09	4,31E-05	5,34E-08
Photochemical ozone formation	kg NMVOC eq	2,80E+00	6,71E-02	4,99E-02	1,38E-04	2,68E+00	1,65E-03
Acidification	mol H ⁺ eq	5,72E+00	2,20E-01	4,82E-02	1,02E-04	5,45E+00	1,28E-03
Eutrophication, freshwater	kg P eq	5,35E-01	1,12E-02	1,43E-04	1,69E-06	5,24E-01	3,41E-05
Eutrophication, marine	kg N eq	1,03E+00	1,95E-02	1,75E-02	1,82E-04	9,91E-01	2,84E-03
Eutrophication, terrestrial	mol N eq	1,04E+01	2,17E-01	1,92E-01	3,18E-04	9,97E+00	4,58E-03
Water use	m ³ depriv.	2,28E+02	8,31E+00	1,04E-01	1,91E-03	2,20E+02	2,38E-02
Abiotic resource depletion, fossils	MJ	1,73E+04	2,03E+02	1,32E+02	3,37E-01	1,70E+04	3,67E+00
Abiotic resource depletion, minerals and metals	kg Sb eq	1,18E-02	4,36E-03	3,91E-06	5,15E-08	7,48E-03	5,71E-07
Climate change - Fossil	kg CO ₂ eq	1,17E+03	1,70E+01	9,38E+00	2,31E-02	1,14E+03	2,88E-01
Climate change - Biogenic	kg CO ₂ eq	2,45E+01	1,14E-01	3,06E-03	1,49E-01	2,31E+01	1,16E+00
Climate change - Land use and LU change	kg CO ₂ eq	2,33E+00	1,78E-02	7,01E-04	9,04E-06	2,31E+00	9,86E-05

Results of mandatory indicators per unit of product (declared unit, 436,8 lumens during 100.000 hours) of UG49 luminaire:

Impact category	Unit	Total	Manufacturing	Distribution	Installation	Use	EoL
Climate change	kg CO ₂ eq	1,49E+03	2,14E+01	1,17E+01	2,28E-01	1,46E+03	1,91E+00
Ozone depletion	kg CFC-11 eq	6,14E-05	4,79E-06	2,66E-06	6,23E-09	5,38E-05	6,66E-08
Photochemical ozone formation	kg NMVOC eq	3,50E+00	8,37E-02	6,23E-02	1,72E-04	3,35E+00	2,06E-03
Acidification	mol H ⁺ eq	7,14E+00	2,75E-01	6,02E-02	1,27E-04	6,81E+00	1,60E-03
Eutrophication, freshwater	kg P eq	6,67E-01	1,39E-02	1,79E-04	2,10E-06	6,53E-01	4,25E-05
Eutrophication, marine	kg N eq	1,29E+00	2,44E-02	2,19E-02	2,27E-04	1,24E+00	3,54E-03
Eutrophication, terrestrial	mol N eq	1,30E+01	2,70E-01	2,39E-01	3,97E-04	1,24E+01	5,72E-03
Water use	m ³ depriv.	2,85E+02	1,04E+01	1,30E-01	2,38E-03	2,74E+02	2,97E-02
Abiotic resource depletion, fossils	MJ	2,16E+04	2,53E+02	1,65E+02	4,21E-01	2,12E+04	4,57E+00
Abiotic resource depletion, minerals and metals	kg Sb eq	1,48E-02	5,44E-03	4,88E-06	6,43E-08	9,33E-03	7,13E-07
Climate change - Fossil	kg CO ₂ eq	1,46E+03	2,12E+01	1,17E+01	2,88E-02	1,43E+03	3,59E-01
Climate change - Biogenic	kg CO ₂ eq	3,06E+01	1,42E-01	3,82E-03	1,86E-01	2,88E+01	1,45E+00
Climate change - Land use and LU change	kg CO ₂ eq	2,91E+00	2,23E-02	8,75E-04	1,13E-05	2,88E+00	1,23E-04

Results of mandatory indicators per unit of product (UG49 luminaire) - Detail of the use phase with the decomposition of module B (B1-B7) according to EN 15978 and EN 15804:

Impact category	Unit	Total	B1	B2	B3	B4	B5	B6	B7
Climate change	kg CO ₂ eq	1,46E+03	-	-	-	-	-	1,46E+03	-
Ozone depletion	kg CFC-11 eq	5,38E-05	-	-	-	-	-	5,38E-05	-
Photochemical ozone formation	kg NMVOC eq	3,35E+00	-	-	-	-	-	3,35E+00	-
Acidification	mol H ⁺ eq	6,81E+00	-	-	-	-	-	6,81E+00	-
Eutrophication, freshwater	kg P eq	6,53E-01	-	-	-	-	-	6,53E-01	-
Eutrophication, marine	kg N eq	1,24E+00	-	-	-	-	-	1,24E+00	-
Eutrophication, terrestrial	mol N eq	1,24E+01	-	-	-	-	-	1,24E+01	-
Water use	m ³ depriv.	2,74E+02	-	-	-	-	-	2,74E+02	-
Abiotic resource depletion, fossils	MJ	2,12E+04	-	-	-	-	-	2,12E+04	-
Abiotic resource depletion, minerals and metals	kg Sb eq	9,33E-03	-	-	-	-	-	9,33E-03	-
Climate change - Fossil	kg CO ₂ eq	1,43E+03	-	-	-	-	-	1,43E+03	-
Climate change - Biogenic	kg CO ₂ eq	2,88E+01	-	-	-	-	-	2,88E+01	-
Climate change - Land use and LU change	kg CO ₂ eq	2,88E+00	-	-	-	-	-	2,88E+00	-

Within the determination of the impacts of the manufacturing, installation, use and end of life the choice of the dataset relating to electricity consumption fell on low voltage energy (230 V) for all the geographical areas considered in the study. Furthermore, energy mixes were used for each country.

Results of mandatory inventory flow indicators per F.U. (1.000 lumens during 35.000 hours) and declared unit (436,8 lumens during 100.000 hours) of UG49 luminaire:

Indicators	Unit	F.U.	D.U.
Renewable primary energy (without raw material)	MJ	3,57E+03	4,46E+03
Renewable primary energy (raw material)	MJ	1,44E+01	1,79E+01
Total use of renewable primary energy	MJ	3,59E+03	4,48E+03
Nonrenewable primary energy (without raw material)	MJ	1,81E+04	2,26E+04
Nonrenewable primary energy (raw material)	MJ	1,55E+02	1,94E+02
Total use of non-renewable primary energy	MJ	1,82E+04	2,28E+04
Use of secondary materials	kg	7,44E-01	9,29E-01
Use of renewable secondary fuels	MJ	-	-
Use of non-renewable secondary fuels	MJ	4,36E+01	5,44E+01
Net use of fresh water	m ³	5,53E-03	6,90E-03
Hazardous waste disposed	kg	2,15E-02	2,69E-02
Non-hazardous waste disposed	kg	7,25E-01	9,05E-01
Radioactive waste disposed	kg	-	-
Components for reuse	kg	1,57E-01	1,96E-01
Materials for recycling	kg	*	*
Materials for energy recovery	kg	*	*
Exported energy	MJ	-	-
Biogenic carbon content of the product	kg	3,29E-02	4,10E-02
Biogenic carbon content of the associated packaging	kg	3,42E-01	4,27E-01

*The use of the symbol * indicates that the value depends on the country where the WEEE is disposed*



Extrapolation rules

Extrapolations rules have been calculated following PCR-ed4-EN-2021 09 06 and PSR-0014-ed1.0-EN-2018 07 18. The defined rules shall be applied using the Extrapolation rules file provided in the following tables.

Parameter	Value for reference product
Lighting output [lumens]	436,8
Weight of light source [kg]	0,0027
Weight of luminaire structure and his packaging [kg]	2,434
Weight of power equipment [kg]	1,23
Weight of light management system [kg]	-
Weight of product including its light source (no packaging) [kg]	3,1930
Weight of product including its packaging [kg]	3,6670
Power [W]	27,2

The extrapolation coefficients calculation at the functional unit level shall be taken into account with the following formula:

$$\text{Estrapolatuion coefficient at the product level} \times \frac{\text{Lighting output of reference product (lumen)}}{\text{Lighting output of concerned product (lumens)}}$$

Extrapolation coefficients

The reported extrapolation coefficients are intended at product level (declared unit) and not at functional unit.

Product Code	Manufacturing	Distribution	Installation	Use	EoL
UG19	0,76	0,69	0,65	0,40	0,70
UG20	0,76	0,69	0,65	0,40	0,70
UG21	0,76	0,69	0,65	0,40	0,70
UG22	0,76	0,69	0,65	0,40	0,70
UG29	0,82	0,79	0,69	0,60	0,81
UG30	0,82	0,79	0,69	0,60	0,81
UG31	0,82	0,79	0,69	0,60	0,81
UG32	0,82	0,79	0,69	0,60	0,81
UG39	0,88	0,87	0,76	0,80	0,89
UG40	0,88	0,87	0,76	0,80	0,89
UG41	0,88	0,87	0,76	0,80	0,89
UG42	0,88	0,87	0,76	0,80	0,89
UG49	1,00	1,00	1,00	1,00	1,00
UG50	1,00	1,00	1,00	1,00	1,00
UG51	1,00	1,00	1,00	1,00	1,00
UG52	1,00	1,00	1,00	1,00	1,00

The following table reports the information of the products included in the homogeneous environmental family.

Product Code	System power (Watt)	Total weight (Kg)	Structure weight + Packaging weight (Kg)	Power supply weight (Kg)	Lighting Source weight (Kg)	Packaging weight (Kg)	Luminaries weight (Kg)
UG19	10,9	2,5357	1,305	1,23	0,0011	0,3067	2,229
UG20	10,9	2,5357	1,305	1,23	0,0011	0,3067	2,229
UG21	10,9	2,5357	1,305	1,23	0,0011	0,3067	2,229
UG22	10,9	2,5357	1,305	1,23	0,0011	0,3067	2,229
UG29	16,3	2,9125	1,681	1,23	0,0016	0,3265	2,586
UG30	16,3	2,9125	1,681	1,23	0,0016	0,3265	2,586
UG31	16,3	2,9125	1,681	1,23	0,0016	0,3265	2,586
UG32	16,3	2,9125	1,681	1,23	0,0016	0,3265	2,586
UG39	21,7	3,2082	1,976	1,23	0,0022	0,3622	2,846
UG40	21,7	3,2082	1,976	1,23	0,0022	0,3622	2,846
UG41	21,7	3,2082	1,976	1,23	0,0022	0,3622	2,846
UG42	21,7	3,2082	1,976	1,23	0,0022	0,3622	2,846
UG49	27,2	3,6670	2,434	1,23	0,0027	0,474	3,1930
UG50	27,2	3,658	2,425	1,23	0,0027	0,474	3,184
UG51	27,2	3,658	2,425	1,23	0,0027	0,474	3,184
UG52	27,2	3,658	2,425	1,23	0,0027	0,474	3,184