Product Environmental Profile

ECOdrive 12W Nano DALI LED driver

eldoLED

Programme operator:	PEP ECOPASSPORT® PROGRAM
Registration number:	AYII-12000-V01.01-EN
EPD Prepared by:	Sluicebox

General information

General Information	Description
LCA Practitioner:	Sluicebox
The name of the product:	ECOdrive 12W LED Driver with nano form factor (DALI)
Type of PEP	Single commercial reference
The version of the PCR applied:	PCR-ed4-EN-2021-09-06 Product Category Rules for Electrical, Electronic and HVAC-R Products
The version of the PSR applied, where appropriate:	PSR-0005-ed3.1-EN-2023 12 08 PSR SPECIFIC RULES FOR Electrical switchgear and control gear

Company information

Company: eldoLED | Acuity Inc.
Address: Science Park Eindhoven 5125, 5692 ED Son, The Netherlands
Phone: +31 (0)40 782 04 00
Email: support@eldoled.com

Description of the organization: The ECOdrive 12W Nano DALI LED driver is manufactured by eldoLED B.V. is a subsidiary of Acuity Inc.; eldoLED is the LED driver brand of Acuity Brands Lighting. eldoLED specializes in developing high-performance, intelligent LED drivers that provide features such as flicker-free dimming, optimum power efficiency, configurability, and robust thermal management. Founded in 2007 and headquartered in Eindhoven, the Netherlands, with additional offices in Conyers, GA and Wilmington, MA, the company creates cutting-edge technology solutions within LED lighting. Their products support various industry-standard protocols including 0-10V, DALI, and DMX with RDM, making them versatile for different lighting applications.

Management system certifications: ISO 14001 (Netherlands. HQ).

Name and location of production sites: Apodaca, Mexico.

Reference product information

Product name:: ECOdrive 12W LED Driver with nano form factor (DALI)

Product identification: EC12NA-E1Z0D-NZ

Product description: The product under study is the ECOdrive 12W LED Driver with nano form factor (DALI), referred to as “ECOdrive 12W Nano DALI LED driver”, designed for use in various lighting applications such as downlights, pendant lights, spotlights, and wall washers. This LED driver enables smooth, flicker-free dimming and supports multiple control protocols, including DALI-2, Pulse dimming, and LEDcode2 (Casambi). It is engineered for compact installations, fitting through small apertures as narrow as 35mm, making it ideal for applications with limited space. The primary function of the 12W Nano LED is to convert electrical energy into visible light, offering a sustainable lighting option for residential, commercial, and industrial settings.

LCA information

Functional unit: The functional unit for this LCA study is an ECOdrive 12W Nano DALI LED driver, providing a maximum output power of 12W through a LED driver, for a service life of 10 years.

Reference service life: 10 years

Time representativeness: Production data for 12 months (January 2024 – December 2024) has been used.

Geographical representativeness: Product manufacturing in Mexico, use and end-of-life phase as Europe.

Technological representativeness: The data modelled for the ECOdrive 12W Nano DALI LED driver was provided by the manufacturer relating to specific technological processes. The data met the specified time-related, geographical, and technological scope for each unit process.

Database(s) and LCA software used: ecoinvent version 3.10 (allocation, cut-off by classification) modelled by Sluicebox version 2025.3.44.

System diagram:

Description of system boundaries: Cradle-to-grave including modules A1-A3. A4, A5, B1-B7 and C1-C4. Optional module D has not been included.

	Manufacturing			Distribution	Installation	Use stage							End of life				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Geog.	MX	MX	MX	-	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	X

According to these stages:

- Manufacturing stage (A1-A3): from the extraction of natural resources to product and packaging manufacturing and their delivery to the manufacturer's last logistics platform.
- Distribution stage (A4): transportation from the last manufacturer's logistics platform to the arrival of the product at the place of use and production of reconditioning packaging.
- Installation stage (A5): installation of the product at the place of use.
- Use stage (B1-B7): use of the product and maintenance necessary to ensure the ability for use.
- End-of-life stage (C1-C4): removal, dismantling and transportation of the end-of-life product to a treatment centre or landfill site, and the end-of-life treatment.
- Net benefits and loads beyond the system boundaries stage (D): potential for reuse, recovery and/or recycling, expressed as net benefits and impacts. This stage is optional and not considered into this LCA study.

Life cycle inventory

- Manufacturing stage
  - Production: Manufacturing plant in Apodaca, Mexico.
  - Electricity energy mix: Electricity, medium voltage {MX}| market for
  - Primary data: bill of material, factory energy consumption, factory processing.
  - Secondary data: emission factors for datasets, transport and waste.

- Distribution stage
  - Distribution scenario: transport from factory to customer site in Europe.
  - Primary data: distribution location based on sales
  - Secondary data: emission factors for datasets, transport vehicle consumptions
- Installation stage:
  - No installation energy required.
  - Waste of packaging (incineration) is utilized.
- Use stage
  - Primary data: product specific use scenario, typical scenario for ECOdrive 12W Nano DALI LED driver
    - Standby Power = 0.5W for 13 hours per day
    - Active Power Usage at maximum 12W for 11 hours per day
      - 50% of time at 30% power
      - 50% of time at 100% power

Activity	Hours	Watt
Active per day	11.4	7.8
Standby per day	13.6	0.5

  - Secondary data: emission factors for datasets
  - Electricity energy mix: Electricity, low voltage {EU}| market-for
- End of life stage
  - Waste scenario: standard EN 50639:2020 scenario is used.
  - Primary data: unit constituent materials
  - Secondary data: waste treatment and transport

Content information

Information	Weight, gram	Percentage, %
Product	75	86.2%
Packaging	12	13.8%
TOTAL	**87**	**100**

Information	Weight, gram	Percentage, %
Electronics	44.0	50.6%
Plastics	27.4	31.5
Packaging - cardboard	12.0	13.8
Metals	3.6	4.1%
TOTAL	**87**	**100**

Results of the environmental performance indicators -

Mandatory impact category indicators according to EN 15804

[1]The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high

Module			Manufacturing			Manufacturing	Distribution	Installation	Use	EOL
Impact Category	**Unit**	**Total**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B6**	**C1 - C4**
Environmental impact indicators										
Acidification	mol H+ eq.	7.67E-01	7.85E-02	7.60E-04	2.35E-03	8.16E-02	2.47E-03	1.49E-05	6.83E-01	2.62E-04
Climate change	kg CO_2 eq.	1.26E+02	8.50E+00	9.05E-02	8.59E-01	9.45E+00	5.91E-01	4.53E-03	1.16E+02	1.48E-01
Climate change biogenic	kg CO_2 eq.	2.66E-01	8.66E-03	2.02E-05	9.22E-05	8.77E-03	3.76E-05	3.18E-06	2.57E-01	4.78E-05
Climate change fossil	kg CO_2 eq.	1.26E+02	8.48E+00	9.03E-02	8.59E-01	9.43E+00	5.90E-01	4.53E-03	1.16E+02	1.47E-01
Climate change luluc	kg CO_2 eq.	3.64E-01	1.10E-02	1.26E-04	1.18E-04	1.12E-02	8.19E-05	2.93E-06	3.53E-01	5.38E-05
ADP-fossil[1] (energy non-renewable)	MJ	2.83E+03	1.10E+02	1.11E+00	6.54E+00	1.18E+02	7.85E+00	2.95E-02	2.70E+03	9.76E-01
Eutrophication freshwater[1]	kg P eq.	1.19E-01	1.04E-02	7.69E-06	1.27E-04	1.05E-02	9.33E-06	1.26E-05	1.08E-01	2.34E-05
Eutrophication marine	kg of N equiv.	1.21E-01	1.20E-02	3.40E-04	6.81E-04	1.30E-02	9.96E-04	4.71E-06	1.07E-01	5.99E-05
Eutrophication terrestrial	mole of N equiv.	1.11E+00	1.30E-01	3.72E-03	6.01E-03	1.40E-01	1.09E-02	5.12E-05	9.59E-01	6.23E-04
Resource use minerals metals[1]	kg Sb eq.	4.28E-03	2.72E-03	1.31E-07	7.58E-07	2.72E-03	1.68E-07	1.89E-08	1.56E-03	2.78E-07
Ozone depletion	kgcfc11eq.	2.51E-06	3.56E-07	1.27E-09	9.06E-09	3.66E-07	9.12E-09	2.56E-11	2.13E-06	1.00E-09
Photochemical ozone formation	kg of NMVOC equiv	3.63E-01	3.97E-02	1.04E-03	2.02E-03	4.28E-02	3.50E-03	1.52E-05	3.16E-01	2.42E-04
Water use	m3	7.63E+01	2.87E+00	6.53E-03	1.04E-01	2.98E+00	1.12E-02	2.85E-04	7.33E+01	1.88E-02
Inventory flows indicator										
PERE	MJ	7.53E+02	1.22E+01	2.69E-02	7.88E-01	1.30E+01	3.04E-02	1.15E-03	7.39E+02	7.11E-02
PERM	MJ	1.89E-01	1.89E-01	0.00E+00	0.00E+00	1.89E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	7.53E+02	1.24E+01	2.69E-02	7.88E-01	1.32E+01	3.04E-02	1.15E-03	7.39E+02	7.11E-02
PENRE	MJ	2.95E+03	1.16E+02	1.18E+00	7.09E+00	1.25E+02	8.33E+00	3.15E-02	2.81E+03	1.04E+00
PENRM	MJ	1.01E+00	1.01E+00	0.00E+00	0.00E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.95E+03	1.17E+02	1.18E+00	7.09E+00	1.26E+02	8.33E+00	3.15E-02	2.81E+03	1.04E+00
Indicators describing the use of secondary materials, water and energy resources										

SM	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
RSF	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
NRSF	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
FW	m^3	1.78E+00	6.68E-02	1.52E-04	2.41E-03	6.94E-02	2.61E-04	6.64E-06	1.71E+00	4.38E-04
Waste category indicators										
HWD	kg	3.82E+00	4.54E-01	1.73E-03	3.06E-01	7.62E-01	2.52E-03	2.31E-02	2.98E+00	5.50E-02
NHWD	kg	3.34E+01	8.09E+00	1.32E-02	1.54E+00	9.64E+00	3.05E-02	3.29E-04	2.37E+01	6.80E-02
RWD	kg	1.93E-02	2.36E-04	5.44E-07	6.07E-06	2.43E-04	5.84E-07	1.21E-08	1.91E-02	1.75E-06
Output flows indicators										
CRU	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
MFR	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
MER	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
EE	MJ	7.31E-01	0.00E+00	0.00E+00	9.80E-02	9.80E-02	0.00E+00	2.11E-01	0.00E+00	4.22E-01
Biogenic carbon content										
Product	kg of C	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
Packaging	kg of C	5.75E-03	5.75E-03	0.00E+00	0.00E+00	5.75E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Abbreviations are explained below:

- PERE = Use of renewable primary energy as energy source
- 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 as energy source
- 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 material
- RSF = Use of renewable secondary fuels
- NRSF = Use of non-renewable secondary fuels
- FW = Use of net fresh water
- HWD = Hazardous waste disposed
- NHWD = Non-hazardous waste disposed
- RWD = Radioactive waste disposed
- CRU = Components for re-use
- MFR = Materials for recycling
- MER = Materials for energy recovery
- EE = Exported energy

References

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	ISO 14044:2006+A1+A2:2020 Environmental management - Life cycle assessment - Requirements and guidelines
ISO 14040:2006	ISO 14040:2006 +A1:2020 Environmental management - Life Cycle Assessment-Principles and Framework
PCR-ed4-EN-2021-09-06	Product Category Rules for Electrical, Electronic and HVAC-R Products
PSR-0005-ed3.1-EN-2023 12 08	PSR SPECIFIC RULES FOR Electrical switchgear and control gear

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Verifier accreditation number: VH50	**Information and reference documents:** www.pep-ecopassport.org
Date of issue: 04-2025	**Validity Period:** 5 years
Independent verification of the declaration and data in compliance with ISO 14025:2006	
Internal: ☐	**External:** ×
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain).	
PEPs are compliant with EN 50693:2019 The components of the present PEP may not be compared with components from any other program	
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"	