Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Lina80 – Microprism – Direct

from: Halla, a.s.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11985
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 CONSTRUCTION PRODUCTS, version 1.3.1
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Claudia A. Peña. The review panel may be contacted via info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: LCA Studio s.r.o. Ing. Petra Kšenžighová, Ing. et Ing. Tatiana Trecáková, PhD., prof. Ing. Vladimír Kočí, Ph.D.,MBA Šárecká 1962/5, 16000 Prague 6, Czech Republic, www.lcastudio.cz LCA Studio
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: prof. Ing. Silvia Vilčeková, Ph.D., Silcert, s.r.o. Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 140255.

Company information

Owner of the EPD: **Halla, a.s.**
Contact: Martin Čapek, Production Director (capekm@halla.cz)
Description of the organisation: We are a Czech manufacturing company with a many-year tradition and international reach. Our interior LED lights, designed by leading designers, regularly win major design awards. Thanks to the tests performed in the light laboratory they also comply with the technical requirements on modern lighting. We flexibly create tailor-made solutions for our clients, providing them with excellent service. We produce light for a better quality of life.
Product-related or management system-related certifications: ISO 9001, ISO 14001
Name and location of production site(s): **Halla, a.s.** Litvínovská 288/11, 190 00 Praha 9

Product information

Product name: Lina80 – Microprism – Direct
Product identification:
Lina80

Product description: Lina80 is a versatile lighting fixture that uses direct illumination within an aluminium profile, mounted on a removable chassis. It is available in two different color temperature options, 3000K and 4000K, and comes in lengths up to 4493mm. The certified version of this fixture has dimensions 1122x80x93mm. It is offerend in both ON/OFF and DALI versions. Color Rendering Index is Ra80/90. LED sources retain 90% of their initial output at 50 000hours. The luminous efficacy of Lina80 – Microprism – Direct is approximately 115lm/w.

Lina80 is produced in different lengths. For the purposes of this EPD, a length of 1 metre is considered.

UN CPC code: 4653 Lighting equipment

Geographical scope: Global, Czech Republic

LCA information

Functional unit / declared unit: Declared unit is 1000 lumens of the versatile lighting fixture.

Reference service life: 50 000 hours.

Time representativeness: Site specific data from producer are based on 1 year average for process data (reference year 2022). Time scope less than 10-years was applied for background data. Time scope less than 2-years was applied for specific data.

Database(s) and LCA software used: Software LCA for Experts. Sphera databases, ecoinvent database, EPD of LED driver producer.

Description of system boundaries:
The system boundary is cradle to grave and module D (A+B+C+D) according to EN 15804 + A2/AC:2021. It covers the production of raw materials, all relevant transport down to the factory gate, manufacturing by Halla, a.s., transport from the Halla, a.s. plant to the site (800 km), installation of versatile lighting fixture including product unpacking, operational energy of use of versatile lighting fixture (considered European residual electricity grid mix), deconstruction of the versatile lighting fixture, transport of deconstructed materials, waste processing, recovery, and disposal of used versatile lighting fixture.

System diagram:

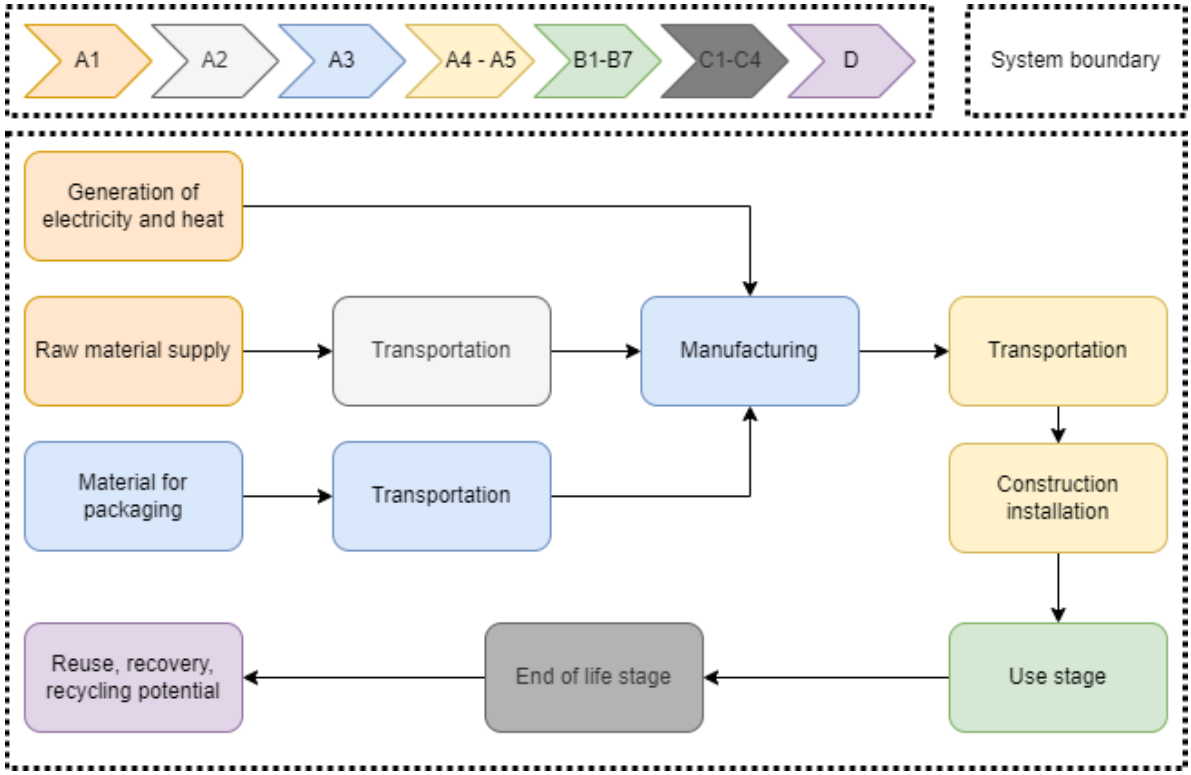

Figure 1 System boundary of the LCA study conducted on production of Lina80 – Microprism – Direct

More information:

Cut off rules: The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 95 % of flows were included.

Allocations: All material and energy flows were assigned to one product. Allocation was not necessary.

No secondary fuels and materials except general content of steel and iron scrap in steel, cold rolled production and general content of stainless steel scrap in stainless steel production. Generic process data for the production of input materials and components were used.

Electricity consumption: Sphera DB process of Czech residual grid mix is used for production process in Halla, a.s.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction 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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	CZ	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium	2,5914	0	0
PMMA	0,1737	0	0
Polycarbonate	0,0682	0	0
Polystyrene	0,0153	0	0
Steel, cold rolled	0,1410	12,65	0
Stainless steel	0,0044	15,60	0
Bronze	0,0104	0	0
PVC	0,0639	0	0
Cu wire	0,0773	0	0
Brass	0,0004	0	0
LED module	0,0535	0	0
LED driver	0,1969	0	0
TOTAL	3,3965	1,85	0
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Paper	0,3560	10,48	0,43
LDPE	0,0455	1,34	0
TOTAL	0,4015	11,82	0,43

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per 1000 lumens of Lina80 – Microprism – Direct
No substances from the SVHC list to report			

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per 1000 lumens of Lina80 – Microprism – Direct										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO2 eq.	2,57E+01	6,06E-01	7,19E-02	1,73E+02	1,24E-03	6,77E-02	9,55E-01	1,23E-03	-1,36E+01
GWP-biogenic	kg CO2 eq.	-2,43E-01	-8,98E-03	2,99E-01	8,20E-02	5,86E-07	-1,00E-03	6,31E-05	-4,23E-05	2,08E-03
GWP-luluc	kg CO2 eq.	1,40E-02	5,62E-03	1,65E-06	1,14E-02	8,12E-08	6,28E-04	2,23E-05	3,88E-06	-1,84E-03
GWP-total	kg CO2 eq.	2,54E+01	6,03E-01	3,71E-01	1,73E+02	1,24E-03	6,73E-02	9,55E-01	1,19E-03	-1,36E+01
ODP	kg CFC 11 eq.	6,94E-08	5,31E-14	3,52E-14	1,73E-09	1,24E-14	5,93E-15	4,27E-13	3,18E-15	-1,90E-11
AP	mol H+ eq.	1,33E-01	7,24E-04	3,15E-05	2,57E-01	1,84E-06	8,09E-05	2,52E-04	8,85E-06	-4,71E-02
EP-freshwater	kg P eq.	4,04E-03	2,21E-06	7,11E-09	7,87E-05	5,62E-10	2,47E-07	8,00E-08	2,51E-09	-6,47E-06
EP-marine	kg N eq.	1,78E-02	2,42E-04	1,05E-05	7,04E-02	5,03E-07	2,70E-05	7,10E-05	2,29E-06	-8,84E-03
EP-terrestrial	mol N eq.	1,87E-01	2,95E-03	1,41E-04	7,52E-01	5,37E-06	3,30E-04	1,02E-03	2,52E-05	-9,63E-02
POCP	kg NMVOC eq.	5,70E-02	6,14E-04	2,84E-05	1,99E-01	1,42E-06	6,86E-05	1,96E-04	6,90E-06	-2,61E-02
ADP-minerals&metals*	kg Sb eq.	1,33E-03	3,94E-08	3,54E-10	2,09E-05	1,49E-10	4,40E-09	4,52E-09	5,77E-11	-7,80E-07
ADP-fossil*	MJ	3,52E+02	8,25E+00	8,15E-02	3,72E+03	2,65E-02	9,22E-01	1,09E+00	1,66E-02	-1,88E+02
WDP*	m3	4,22E+00	6,99E-03	1,61E-02	1,31E+01	9,35E-05	7,81E-04	9,68E-02	1,37E-04	-7,70E-01
Acronyms	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									

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per 1000 lumens of Lina80 – Microprism – Direct										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	2,57E+01	6,12E-01	7,19E-02	1,73E+02	1,24E-03	6,83E-02	9,55E-01	1,23E-03	-1,36E+01
Particulate matter	Disease incidences	1,13E-06	4,88E-09	2,37E-10	2,30E-06	1,64E-11	5,45E-10	2,49E-09	1,09E-10	-4,93E-07

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Ionising radiation, human health	kBq U235 eq.	3,02E+00	1,54E-03	1,00E-03	9,04E+01	6,46E-04	1,72E-04	1,27E-02	2,20E-05	-3,06E+00
Ecotoxicity fresh water	CTUe	3,62E+02	5,81E+00	3,29E-02	3,65E+02	2,61E-03	6,49E-01	4,67E-01	1,20E-02	-4,65E+01
Human toxicity, cancer	CTUh	5,64E-07	1,17E-10	1,84E-12	2,10E-08	1,50E-13	1,31E-11	2,62E-11	1,40E-12	-5,44E-09
Human toxicity, non-cancer	CTUh	6,50E-05	5,17E-09	1,09E-10	6,77E-07	4,84E-12	5,78E-10	3,19E-09	1,47E-10	-1,11E-07
Land Use	Pt	8,87E+01	3,44E+00	1,68E-02	3,41E+02	2,44E-03	3,85E-01	1,64E-01	4,05E-03	-1,24E+01

Resource use indicators

Results per 1000 lumens of Lina80 – Microprism – Direct										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,14E+02	5,84E-01	1,71E-02	5,37E+02	3,84E-03	6,52E-02	1,81E-01	2,71E-03	-6,03E+01
PERM	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
PERT	MJ	1,10E+02	5,84E-01	1,71E-02	5,37E+02	3,84E-03	6,52E-02	1,81E-01	2,71E-03	-6,03E+01
PENRE	MJ	3,89E+02	8,27E+00	8,15E-02	3,72E+03	2,66E-02	9,24E-01	1,09E+00	1,66E-02	-1,88E+02
PENRM	MJ.	1,62E+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
PENRT	MJ	3,56E+02	8,27E+00	8,15E-02	3,72E+03	2,66E-02	9,24E-01	1,09E+00	1,66E-02	-1,88E+02
SM	kg	1,46E-02	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	3,00E-23	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	3,52E-22	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	m3	2,59E-01	6,44E-04	3,85E-04	8,14E-01	5,81E-06	7,19E-05	2,37E-03	4,20E-06	-1,18E-01
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

Waste indicators

Results per 1000 lumens of Lina80 – Microprism – Direct										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,73E-06	3,06E-11	2,91E-12	2,66E-07	1,90E-12	3,42E-12	4,26E-11	3,61E-13	-7,80E-09
Non-hazardous waste disposed	kg	4,58E+00	1,19E-03	8,67E-03	7,90E-01	5,64E-06	1,33E-04	1,12E-01	8,31E-02	-2,93E+00
Radioactive waste disposed	kg	1,47E-02	1,07E-05	6,80E-06	6,18E-01	4,41E-06	1,19E-06	9,10E-05	1,90E-07	-1,43E-02

Output flow indicators

Results per 1000 lumens of Lina80 – Microprism – Direct										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
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
Material for recycling	kg	3,17E-02	0,00E+00	2,16E-01	0,00E+00	0,00E+00	0,00E+00	1,66E+00	0,00E+00	1,58E+00
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
Exported energy, electricity	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	-1,82E+00
Exported energy, thermal	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	-4,18E+00

Additional environmental information

Lina80 – Microprism – Direct is manufactured in three variations of luminous flux - 1646 lm, 2601 lm. 4424 lm. Conversion factors have been calculated to enable the conversion of results per 1000 lumens to correspondent luminous fluxes.

Conversion factors for Lina80 – Microprism – Direct:

	A1-A3	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
1646 lm	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65
2601 lm	1,65	1,65	1,65	2,68	1,65	1,65	1,65	1,65	1,65
4424 lm	1,65	1,65	1,65	4,83	1,65	1,65	1,65	1,65	1,65

More information can be found on the website www.halla.eu.

Our company is constantly working on sustainability and reducing the carbon footprint. We are certified and work on continuous improvement in accordance with the ISO 14001 standard.

High efficiency and a long service life
We offer a 5-year warranty on our luminaires and in their development, we focus, among other things, on their economy and achieving the best possible efficiency.

Circular packaging and recyclable materials
For one third of our luminaires we use returnable boxes, linear luminaires are even packed without any plastic material. For the rest of our products, we use stretch film with a 75% recycling rate. We reuse all packaging for the movement of materials and semi-finished products in production.

In the last 3 years we have reduced the total volume of waste in production by 28 % (of which the proportion of mixed waste is 16.5 %). We recycle iron, plastic, paper and aluminium.

PV panels and energy consumption
In our office building and the production hall, we use energy from our own solar panels on the roof, and we have been using PV since 2009.

In the last two years, we have changed our heating method and saved energy by 23 %. We have reduced our electricity consumption by 40 % by controlling the lighting intensity with sensors, and thanks to this control we have also extended the life of the installed luminaires by 30 %.

Greenery and surroundings
We support projects to maintain greenery and water in the landscape and plant greenery on our land.

Additional social and economic information

The company Halla, a.s. honestly declares that it condemns the employment of children, violations of human rights and freedoms, disrespect for equality regardless of origin, gender, or race in any form.

Halla has a clear ownership structure and regularly pays statutory taxes, fees and comply with the legislation of the Czech Republic and the European Union.

The company undertake activities in the field of supporting education, culture, sports, and charity. It is also interested in what is happening in their region, it is partner in several cultural events and contributes to charity projects.

References

General Programme Instructions of the International EPD® System. Version 4.1.

Product Category Rules (PCR) document for Construction Products (PCR 2019:14 Version 1.3.1 2023-07-08)

ISO 14020:2000 Environmental labels and declarations — General principles, 2000-09

ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework, 2006-07

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines, 2006-07

EN 15804+A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, 2021

Ecoinvent: www.ecoinvent.org, ecoinvent database.

Sphera: software LCA for Experts. 2023, Sphera solutions, www.sphera.com

EPD®

www.environdec.com