

Environmental Product Declaration



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

GA Standard LED Spot Track Light

from

Lival Oy Ab



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11100
Publication date:	2023-10-17
Valid until:	2028-10-17

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): 2019:14, Construction products, version 1.2.5. Un CPC code 4653 – Lighting equipment
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com . The review panel may be contacted via info@environdec.com . Chair of the PCR review: Claudia A. Peña.
Life Cycle Assessment (LCA)
LCA accountability: Aleksii Laurila/Minttu Valjakka, Environmental consultant. Organization: Ecobio Oy.
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: Pär Lindman, Miljögraff Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input type="checkbox"/> 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 14025.

Company information

Owner of the EPD: Lival Oy Ab

Contact: Catharina Stenfors, Catharina.stenfors@lival.com / Elisabet Henriksson-Tekoniemi, elisabet.henriksson-tekoniemi@lival.com

Description of the organisation:

Lival Group is a significant European provider of track lighting systems and luminaires. Thanks to manufacturing of complete lighting systems - Lival has become a leading manufacturer globally. Lival provides its customers with unique platforms of spotlights, Global branded tracks and adapters. Lival Group has two manufacturing sites in Finland, Lival in Sipoo and Nordic Aluminium in Kirkkonummi. The Group's net sales were 150M euros in year 2022 and it employed more than 100 persons.

Product-related or management system-related certifications:

Product designation to standard EN 60598-2-1:1989 and EN 60598-1:2015.

Lival is certified according to SA 8000, OHSAS 18001, ISO 14001 and SMETA.

Name and location of production site(s):

Aluminium cast body:

- Foshan City Sunrise Lighting Technology Co., Ltd.
Guo Ruijun Factory, Guojia Development Zone, Shangan Community, Danzao Town, Nanhai District Foshan City, China
- Yong Chao Mold & Plastic Co., Ltd.
No. 77, Hai Bing Road, Chen Wu 6th Industrial Zone, Wu Sha Village, Changan Town, Dongguan City, Guangdong, China

Printed circuit board (PCB) and luminaire:

Signify Electronics Xiamen Co., Ltd.

No.2000, North Yunding Road, Xiamen, China, 361009

Adapter assembly:

EKOY, Eino Korhonen Oy.

Teollisuustie 25, 06150 Porvoo, Finland.

Final assembly:

Liisbet Tukat OÜ.

Emmaste, Nurste, 92002 Hiiu maakond, Estonia

Product information

Product name: GA Standard LED Spot Track Light

Product identification: GA Standard LED Spot Track Light's light source is light emitting diode (LED) with power output of 26 W. The product consists of aluminium cast body, printed circuit board (PCB), luminaire and adapter.

Product description: GA Standard LED Spot Track Light is used for lighting purpose in retail, hospitality, office, and home segments.

UN CPC code: 4653 – Lighting equipment

Geographical scope: The production and assembly of components and the final product consider production locations in several different countries including Finland, Estonia and China. The use stage and end-of-life scenarios are based on main customer location which is Europe.

LCA information

Functional unit / declared unit: The functional unit used in the study is lighting for one year with 26 W Standard Led Spot Track Light. The product is used approximately 3 000 h per year for lighting purpose.

Reference service life: 10 years.

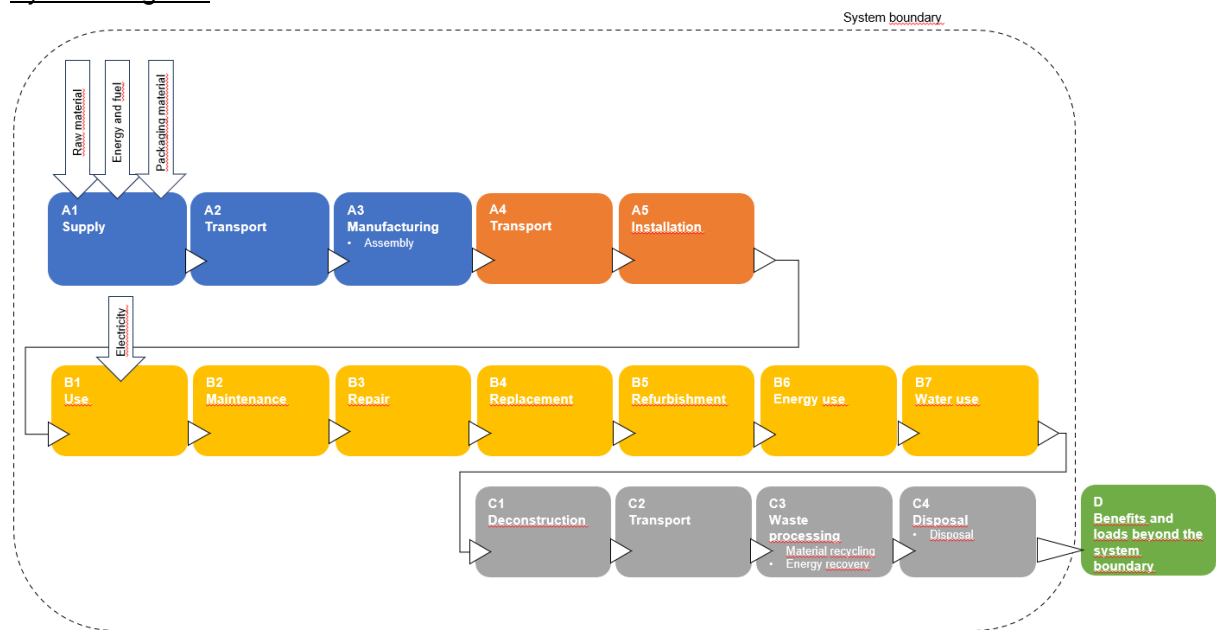
Time representativeness: The data is collected covering production year 2022 for subcontractors responsible for the production of subassemblies as well the assembly of the final product. Ecoinvent data used for modelling is from 2022 and Industrial data is from 2023.

Database(s) and LCA software used: Ecoinvent 3.8 and Industrial data 2.0, and SimaPro LCA software (version 9.4.0.2).

Description of system boundaries:

Cradle to grave and module D. The system covers the product stage (A1-A3 the construction process stage (A4-A5), the use stage (B), the end-of-life stage (C1-C4) and benefits and loads beyond the system boundary (D).

System diagram:



More information:

LCA practitioner: Ecobio Oy, info@ecobio.fi. Explanatory material can be obtained from the EPD owner and/or LCA practitioner.

Data quality: The quality requirements for the life cycle assessment were set according to the EN ISO 14044 and the EN 15804 standards.

Cut-off rule: Cut-off criteria was no applied for the LCA.

Allocation: Co-product allocation was applied for the aluminum cast body of the GA Standard Led Spot Track Light. Economic co-product allocation based on the hierarchy presented for co-product allocation on the EN 15804:2012+A2:2019.

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	x
Geography	GLO, EU27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU 27	EU27
Specific data used	10 %					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0 %					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0 %					-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components		Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium cast body	Aluminium	0,396	0 %	0 %
	Stainless steel	0,004	0 %	0 %
	Polyamide	0,001	0 %	0 %
	Glass	0,033	0 %	0 %
	Sub-assembly Total	0,434	0 %	0 %
Adapter	Brass	0,007	0 %	0 %
	Polyamide	0,008	5-10 %	0 %
	Polycarbonate	0,047	15-25 %	0 %
	Steel	0,001	0 %	0 %
	Printed circuit board	0,045	0 %	0 %
	Sub-assembly Total	0,107	9 %	0 %
Luminaire	MCPCB substrate (mostly aluminium)	0,001	0 %	0 %
	Chip (consisting of Gallium Nitride)	0,00006	0 %	0 %
	Phosphor	0,00005	0 %	0 %
	Silicon	0,0002	0 %	0 %
	Gold	0,000004	0 %	0 %
	Sub-assembly Total	0,001	0 %	0 %
TOTAL		0,542	2 %	0 %
Packaging materials		Weight, kg	Weight-% (versus the product)	
Corrugated board box		0,145	29,5 %	
Packaging film, low density polyethylene		0,004	0,9 %	
TOTAL		0,149	30,4	

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1,59E+00	1,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,09E+01	0,00E+00	0,00E+00	6,29E-04	1,37E-02	4,16E-04	-2,88E-01
GWP-biogenic	kg CO ₂ eq.	-2,16E-02	1,22E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,72E-01	0,00E+00	0,00E+00	6,05E-07	8,03E-06	1,87E-05	-9,73E-04
GWP-luluc	kg CO ₂ eq.	1,07E-03	5,31E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,31E-02	0,00E+00	0,00E+00	2,96E-07	4,02E-07	5,26E-08	-5,41E-03
GWP-total	kg CO ₂ eq.	1,57E+00	1,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,20E+01	0,00E+00	0,00E+00	6,30E-04	1,37E-02	4,35E-04	-2,94E-01
ODP	kg CFC 11 eq.	5,94E-08	3,13E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,56E-06	0,00E+00	0,00E+00	1,41E-10	4,46E-11	4,92E-11	-2,14E-08
AP	mol H ⁺ eq.	1,07E-02	5,48E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,76E-01	0,00E+00	0,00E+00	2,50E-06	4,09E-06	1,30E-06	-2,37E-03
EP-freshwater	kg P eq.	5,85E-04	8,70E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,11E-02	0,00E+00	0,00E+00	4,73E-08	1,88E-07	6,65E-08	-1,44E-04
EP-marine	kg N eq.	1,94E-03	1,65E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,93E-02	0,00E+00	0,00E+00	7,28E-07	2,29E-06	5,48E-06	-2,96E-04
EP-terrestrial	mol N eq.	1,98E-02	1,81E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,58E-01	0,00E+00	0,00E+00	7,96E-06	1,90E-05	5,42E-06	-2,98E-03
POCP	kg NMVOC eq.	5,51E-03	5,53E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,10E-02	0,00E+00	0,00E+00	2,45E-06	5,47E-06	1,61E-06	-9,91E-04
ADP-minerals&metals*	kg Sb eq.	7,98E-05	4,70E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,86E-04	0,00E+00	0,00E+00	2,87E-09	1,13E-09	6,68E-10	-3,18E-06
ADP-fossil*	MJ	1,52E+01	2,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,55E+02	0,00E+00	0,00E+00	9,39E-03	3,53E-03	3,78E-03	-3,64E+00
WDP*	m ³	2,58E-01	6,12E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,67E+00	0,00E+00	0,00E+00	3,11E-05	5,85E-05	2,82E-05	-4,83E-02
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

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,60E+00	1,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,12E+01	0,00E+00	0,00E+00	6,30E-04	1,37E-02	4,17E-04	-2,95E-01
Respiratory inorganics ²	disease inc.	1,28E-07	1,17E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,59E-07	0,00E+00	0,00E+00	4,68E-11	3,12E-09	2,74E-11	-2,36E-08
Ionizing radiation HH ²	kBq U235 eq	5,32E-02	1,05E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,78E+01	0,00E+00	0,00E+00	4,99E-05	2,62E-05	3,61E-05	-3,92E-02
Freshwater ecotoxicity ²	CTUe	6,22E+01	1,59E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,15E+02	0,00E+00	0,00E+00	7,66E-03	4,06E-01	5,06E+00	-7,50E+00
Human toxicity, cancer effects ²	CTUh	1,59E-09	5,16E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,27E-08	0,00E+00	0,00E+00	2,80E-13	5,48E-11	2,61E-13	-7,75E-10
Human toxicity, non-cancer effects ²	CTUh	4,49E-08	1,67E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,07E-07	0,00E+00	0,00E+00	7,75E-12	3,35E-10	5,01E-12	-1,33E-08
Land use ²	Pt	7,31E+00	1,40E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E+02	0,00E+00	0,00E+00	5,55E-03	2,07E-03	8,23E-03	-3,51E-01

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 CO₂ is set to zero.

² 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.

Resource use indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,67E+00	2,88E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,31E+02	0,00E+00	0,00E+00	1,59E-04	2,50E-04	4,91E-04	-1,34E+00
PERM	MJ	5,90E-01	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,26E+00	2,88E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,31E+02	0,00E+00	0,00E+00	1,59E-04	2,50E-04	4,91E-04	-1,34E+00
PENRE	MJ	1,52E+01	2,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,55E+02	0,00E+00	0,00E+00	9,39E-03	3,53E-03	3,78E-03	-3,64E+00
PENRM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,52E+01	2,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,55E+02	0,00E+00	0,00E+00	9,39E-03	3,53E-03	3,78E-03	-3,64E+00
SM	kg	7,40E-04	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	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	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	8,10E-03	2,28E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,59E-01	0,00E+00	0,00E+00	1,19E-06	3,87E-06	5,05E-06	-6,98E-03
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

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,16E-05	5,34E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,98E-04	0,00E+00	0,00E+00	2,52E-08	2,30E-08	4,72E-09	3,71E-05
Non-hazardous waste disposed	kg	2,40E-01	1,05E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,29E+00	0,00E+00	0,00E+00	3,98E-04	2,35E-04	1,63E-02	-8,44E-02
Radioactive waste disposed	kg	2,70E-05	1,38E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,79E-03	0,00E+00	0,00E+00	6,29E-08	1,28E-08	2,57E-08	-1,50E-05

Output flow indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Material for recycling	kg	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,04	0,00	0,00
Materials for energy recovery	kg	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00
Exported energy, electricity	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Exported energy, thermal	MJ	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Additional environmental information

As most of the environmental impacts related to the life cycle of GA Standard Led Spot Track Light come from operational energy use, end user of the product can affect by:

- avoiding unnecessary use of the product. This could mean turning off the lights during night-time especially when the product is used in a store.
- selecting sustainable electricity production mix. Electricity production mix based on renewable energy sources can have significantly lower climate change impact compared to electricity produced with fossil energy sources.

Note! The results of the operational energy use were modelled based on average European grid mix for low voltage electricity (GWP-GHG impact 399,7 g_{CO₂-eq}/kWh. Energy sources: non-renewable (fossil) 44 %, non-renewable (nuclear) 39 %, renewable 17 %) with 50 000 use hours. The end user's ability to affect product's environmental impact should be compared through these bases.

In addition, At Lival, environmental issues are an integral part of business activities. Lival considers it a matter of conscience to search for solutions that enable a balance between economic growth and minimal ecological impact, e.g., Life Cycle thinking, material and energy efficiency as well as least possible waste and emissions. Lival is certified to ISO 14001.

Lival's aim is to be carbon neutral by year 2030.

Additional social and economic information

Lival has for more than 20 years applied the SA 8000 standard as a framework for responsible practices.

Legal compliance: Lival complies with national and international laws and regulations in the countries in which we operate. Lival respects international norms of behaviour and is guided by international treaties and recommendations such as the UN's Universal Declaration of Human Rights and Convention on the Rights of the Child, the ILO's Declaration on Fundamental Principles and Rights at Work.

Health and safety: At Lival health and safety issues are high priority. Our aim is zero accidents and a wellbeing and healthy staff in a safe working environment. Lival is certified to OHSAS 18001.

Working hours: Lival complies with applicable laws and industry standards including criteria laid out in the SA 8000 standard on working hours and public holidays.

Information related to Sector EPD

Does not apply to this case.

Differences versus previous versions

Does not apply to this case as there are no previous versions.

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2019:14. Construction products. Version 1.2.5.

Ecobio LCA report - Lival Oy Ab's GA Standard LED Spot Track Light. 2023.

