

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 & EN 15804:2012+A2:2019/AC:2021



**BOX MP D/I 4K SENS DALI  
37W**

Developed in  
cooperation with




for



Publication date:  
2024-03-01  
Valid until:  
2029-02-28

## Accountabilities for LCA and independent third-party verification

<b>Life Cycle Assessment (LCA)</b>	<p>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, <a href="http://www.lcastudio.cz">www.lcastudio.cz</a></p> 
<b>Third-party verification</b>	<p>Independent third-party verification of the declaration and data, according to ISO 14025:2006, via EPD verification by individual verifier:</p> <p>Third-party verifier: prof. Ing. Silvia Vilčeková, Ph.D., Silcert, s.r.o.</p>

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

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

## Company Information

<b>Owner of the EPD</b>	Elektroskandia Sverige AB
<b>Contact</b>	<a href="mailto:info@cardi.se">info@cardi.se</a>
<b>Production Site</b>	Slovakia, Kolárovo

## Product Information

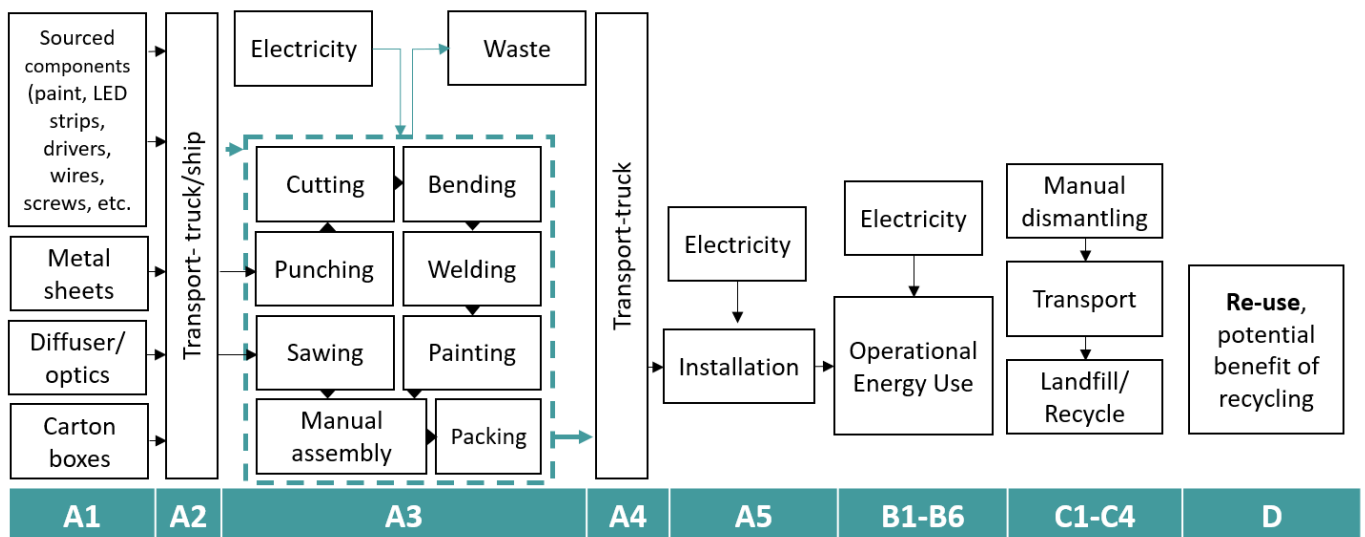
<b>Product name:</b>	BOX MP D/I 4K SENS DALI 37W
<b>Product Family:</b>	BOX
<b>Product description:</b>	<p>The BOX product line is of classic design that is easy to adapt in many different applications. The luminaire ensures end-users comfort by providing consistent glare reduction. The BOX luminaire product line has variant with wireless sensor.</p> <p>BOX MP D/I 4K SENS DALI 37W will be the subject of this EPD. This version of BOX was selected, as it likely represents the worst-case scenario based on product with the highest component variety and highest production time from the BOX product line. All the BOX luminaires are manufactured at the same manufacturing site in Slovakia.</p>
<b>Weight</b>	5900g
<b>Lumen output</b>	5000lm
<b>Geographical scope:</b>	Global, Slovakia

## LCA Information

<b>Declared Unit</b>	1000lm of the luminaire
<b>Conversion factor</b>	5,0
<b>Reference Service Lifetime</b>	100.000 hours; Lifetime L80/B50 at 25 °C in accordance with IEC 62722-1:2014-9; IEC 6272-2-1:2014-11
<b>Time representativeness:</b>	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.
<b>Database(s) and LCA Software used</b>	LCA for Experts (Sphera), Sphera and ecoinvent databases.
<b>Description of System Boundaries</b>	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., transport from manufacturing plant to the site (1900 km), installation of luminaire including product unpacking, operational energy of use of luminaire (considered European residual electricity grid mix), deconstruction of the luminaire, transport of deconstructed materials, waste processing, recovery, and disposal of used luminaire.
<b>Cut off rules</b>	More than 95 % of flows were included.
<b>Allocations</b>	All material and energy flows were assigned to one product. The allocation of thermal energy consumption is based on the general allocation rule what represents the proportion of production of one product in overall production expressed in a pieces.
	General content of scrap steel and scrap iron in steel production were used in production of a luminaire. No secondary fuels are used in production. Generic process data for the production of input materials and components were used.
<b>Electricity consumption</b>	Sphera DB process of Slovak residual grid mix is used for production process.

**System diagram:**



**Modules declared** (X included, ND not declared), geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Raw Material+ Manufacturing			Assembly		Use							End of life				Resource recovery
	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	Potential benefit of recycling
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	SK	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Product contents declaration- BOX MP D/I 4K SENS DALI 37W**

Component	Weight (kg)	Post-consumer material, weight %	Biogenic material, weight%
Steel, sheet	4,4130	18,20	0
Steel, Zn	0,0586	7,26	0
Polycarbonate	0,1576	0	0
Polyethylene terephthalate	0,0014	0	0
Polyester	0,0553	0	0
Polymethyl methacrylate	0,4100	0	0

Polyamide	0,0008	0	0
Polyethylene	0,0012	0	0
Coating powder	0,1573	0	0
Nylon	0,0003	0	0
Brass	0,0246	0	0
Cable	0,3292	0	0
Paper	0,0009	0	0
Electric component	0,3880	0	0
<b>TOTAL</b>	<b>5,9982</b>	<b>0,81</b>	<b>0</b>

#### Packaging materials declaration- BOX MP D/I 4K SENS DALI 37W

Packaging materials	Weight (kg)	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Paper	0,1600	2,67	0,43
<b>TOTAL</b>	<b>0,1600</b>	<b>2,67</b>	<b>0,43</b>

#### Dangerous substances from the candidate list of SVHC for Authorizsation

Substance	EC No.	CAS No.	Weight % per 1000 lm of BOX MP D/I 4K SENS DALI 37W
No substances from the SVHC list to report.			

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

Results per 1000lm of BOX MP D/I 4K SENS DALI 37W									
Indicator	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-fossil (kg CO <sub>2</sub> eq.)	6,26E+00	2,24E-01	4,81E-04	3,09E+02	2,20E-04	3,94E-02	6,46E-01	6,62E-04	-6,56E-01
GWP-biogenic (kg CO <sub>2</sub> eq.)	-6,36E-02	-3,32E-03	6,81E-02	1,47E-01	1,04E-07	-5,84E-04	2,82E-04	-2,28E-05	2,53E-04
GWP-luluc (kg CO <sub>2</sub> eq.)	3,86E-03	2,07E-03	7,73E-08	2,03E-02	1,44E-08	3,65E-04	1,55E-05	2,09E-06	-1,67E-04
GWP-total (kg CO <sub>2</sub> eq.)	6,20E+00	2,23E-01	6,85E-02	3,10E+02	2,20E-04	3,92E-02	6,47E-01	6,42E-04	-6,56E-01
ODP (kg CFC 11 eq.)	2,38E-07	1,96E-14	3,59E-15	3,10E-09	2,20E-15	3,45E-15	2,66E-13	1,73E-15	-4,35E-14
AP (mol H <sup>+</sup> eq.)	4,81E-02	2,91E-04	3,45E-06	4,60E-01	3,27E-07	4,70E-05	1,62E-04	4,76E-06	-1,11E-03
EP-freshwater (kg P eq.)	2,74E-03	8,17E-07	5,34E-10	1,41E-04	1,00E-10	1,44E-07	5,40E-08	1,36E-09	-9,00E-08
EP-marine (kg N eq.)	4,23E-03	1,02E-04	1,23E-06	1,26E-01	8,94E-08	1,57E-05	4,52E-05	1,23E-06	-2,92E-04
EP-terrestrial (mol N eq.)	4,87E-02	1,23E-03	1,52E-05	1,34E+00	9,55E-07	1,92E-04	6,58E-04	1,35E-05	-3,17E-03
POCP (kg NMVOC eq.)	1,60E-02	2,52E-04	3,26E-06	3,55E-01	2,53E-07	3,99E-05	1,25E-04	3,72E-06	-9,33E-04
ADP-minerals&metals* (kg Sb eq)	4,77E-04	1,45E-08	3,91E-11	3,73E-05	2,65E-11	2,56E-09	2,76E-09	3,11E-11	-1,93E-08
ADP-fossil* (MJ)	8,43E+01	3,05E+00	8,30E-03	6,65E+03	4,72E-03	5,36E-01	6,68E-01	8,94E-03	-8,12E+00
WDP* (m <sup>3</sup> )	9,21E-01	2,58E-03	1,42E-03	2,34E+01	1,66E-05	4,55E-04	6,57E-02	7,36E-05	-1,39E-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

Results per 1000lm of BOX MP D/I 4K SENS DALI 37W									
Indicator	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup> kg CO <sub>2</sub> eq.	6,27E+00	2,26E-01	4,81E-04	3,09E+02	2,20E-04	3,98E-02	6,46E-01	6,64E-04	-6,57E-01
Particulate matter (Disease incidences)	1,96E-07	1,93E-09	2,00E-11	4,11E-06	2,92E-12	3,17E-10	1,66E-09	5,86E-11	-1,46E-08
Ionising radiation, human health (kBq U235 eq.)	1,85E-01	5,70E-04	1,45E-04	1,62E+02	1,15E-04	1,00E-04	7,20E-03	1,14E-05	-5,34E-02
Ecotoxicity fresh water (CTUe)	5,89E+01	2,14E+00	1,96E-03	6,53E+02	4,64E-04	3,78E-01	3,07E-01	5,61E-03	-6,86E-01
Human toxicity, cancer (CTUe)	8,74E-09	4,32E-11	1,20E-13	3,75E-08	2,66E-14	7,61E-12	1,76E-11	7,51E-13	-6,07E-10
Human toxicity, non-cancer (CTUe)	3,78E-07	1,91E-09	3,16E-12	1,21E-06	8,60E-13	3,36E-10	2,24E-09	7,93E-11	-9,13E-10
Land Use (Pt)	2,17E+01	1,27E+00	1,47E-03	6,10E+02	4,34E-04	2,24E-01	1,08E-01	2,26E-03	2,99E-02

### Resource use indicators

Results per 1000lm of BOX MP D/I 4K SENS DALI 37W									
Indicator	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE (MJ)	1,22E+01	2,16E-01	1,55E-03	9,61E+02	6,83E-04	3,80E-02	1,17E-01	1,46E-03	9,97E-02
PERM (MJ)	1,88E-03	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)	8,74E+00	2,16E-01	1,55E-03	9,61E+02	6,83E-04	3,80E-02	1,17E-01	1,46E-03	9,97E-02
PENRE (MJ)	1,08E+02	3,05E+00	8,30E-03	6,65E+03	4,72E-03	5,38E-01	6,68E-01	8,95E-03	-8,15E+00
PENRM (MJ)	3,27E-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
PENRT (MJ)	8,72E+01	3,05E+00	8,30E-03	6,65E+03	4,72E-03	5,38E-01	6,68E-01	8,95E-03	-8,15E+00
SM (kg)	1,80E-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

<sup>1</sup> 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<sub>2</sub> is set to zero.



RSF (MJ)	1,83E-24	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)	2,16E-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
FW (m <sup>3</sup> )	3,70E-02	2,38E-04	3,41E-05	1,46E+00	1,03E-06	4,18E-05	1,60E-03	2,26E-06	-7,75E-04
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 1000lm of BOX MP D/I 4K SENS DALI 37W									
Indicator	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
Hazardous waste disposed	9,56E-07	1,13E-11	4,51E-13	4,75E-07	3,38E-13	1,99E-12	2,40E-11	1,93E-13	-7,04E-10
Non-hazardous waste disposed	1,14E-01	4,40E-04	3,57E-04	1,41E+00	1,00E-06	7,75E-05	7,96E-02	4,48E-02	-6,81E-03
Radioactive waste disposed	1,74E-03	3,95E-06	9,75E-07	1,10E+00	7,85E-07	6,95E-07	5,18E-05	1,01E-07	-3,53E-04

## Output flow indicators

Results per 1000lm of BOX MP D/I 4K SENS DALI 37W									
Indicator	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)	1,08E-03	0,00E+00	3,20E-02	0,00E+00	0,00E+00	0,00E+00	8,94E-01	0,00E+00	8,50E-01
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)	1,77E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-9,92E-01
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	-2,67E+00



## References

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

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

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

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

ecoinvent: [www.ecoinvent.org](http://www.ecoinvent.org), ecoinvent database

Sphera: software LCA for Experts. [www.sphera.com](http://www.sphera.com), Sphera databases