ENVIRONMENTAL
PRODUCT DECLARATION

PRODUCT ENVIRONMENTAL PROFILE - TOKO

Reference product: TokoP RF-MF 40-BC C65 BLE 01

Registration number	TRLX-00027-V01.01-EN	**Drafting rules**	PCR-ed-EN-2021 09 06
		Supplemented by	PSR-0014-ed2.0-EN2023 07 13
Verifier accreditation number	VH45	**Information and reference documents**	www.pep-ecopassport.org
Date of issue	03.03.2026	**Validity period**	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006.			
Internal		**External**	X
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain).			
PEPs are compliant with XP C08-100-1:2016 or 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“.			

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1. GENERAL INFORMATION

1.1 Product information

Round LED downlight with faceted aluminium reflector. With CASAMBI module for integration into a wirelessly controllable mesh network of up to 250 divices. The system is commissioned using the Casambi app (iOS and Android). Radio range of the radio module under ideal conditions: 25 m. The radio range can vary depending on the influencing factors in the environment (e.g. walls, ceilings, floors, machines, steel beams, live cables). The radio range can be increased by using an additional radio module as a repeater. Ceiling recessed mounting. Fastening via spring (Oktalite folding spring). Ceiling thickness - . Cut-out opening Ø 175 mm, Recess depth > 150 mm. Optical system with 3-D faceted reflector. Medium Flood distribution characteristic. beam angle 28°. Luminaire luminous flux and light color fixed. System luminous flux 3965 lm, System power 39 W, Light colour warm white, correlated colour temperature (CCT) 3100 K Brilliant Colour, general colour rendering index (CRI) Ra > 95. Colour locus tolerance (initial MacAdam) < 2 SDCM. Mean rated service life L80 (tq 25 °C) = 50,000 h. Flicker: Pst LM < 1 at full load. Stroboscopic effect: SVM < 0.4 at full load. Luminaire body of die-cast aluminium. Surface coated white (similar to RAL 9016). height: 117 mm, Outer diameter: 193 mm. Safety class (EN 61140): II, protection rating (DIN EN 60529): IP20. Permissible ambient temperature (ta): 25 °C Weight: 1.15 kg. Connection cable with adapter for Wieland GST 18i3 rapid connector system. The rated operating voltage of the luminaire is 230 V, 50/60 Hz. With Bluetooth Low Energy (BLE) control gear unit. The control gear unit is replaceable in accordance with the ecodesign requirements (VO (EU) 2019/2020). The luminaire complies with the fundamental requirements of applicable EU regulations and product safety legislation and bears the CE symbol.

1. GENERAL INFORMATION

Table 1: Key technological data

Information	Unit	
Light source	-	Integrated LED module
Power supply	-	Integrated power supply
Color temperature	K	3,100
Protection index for water and dust (IP)	-	IP20
Impact resistance index (IK)	-	IK00
Nominal operating voltage	V	220-240
Declared lifetime of the luminaire	hr	50,000
Outgoing luminous flux/Useful output flux	lm	3,965
Electrical input power	W	39
Luminous efficiency	lm/W	102
Dimension	mm	117 x 193 x 150
Reference use scenario	-	Retail
Lifetime in years according to reference use scenario	yr	10

1.2 Goal and Scope

Following information has been used to generate the PEP:

Table 2: Goal and Scope

Information	
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours
Reference flow / declared unit*	0.1765 pieces of product
Life cycle stages covered	Cradle-to-grave and Module D
Product category according to PSR	Luminaires
Product family name	**Toko**
Product name	TokoP RF-MF 40-BC C65 BLE 01
All products of the product family ("X" refer to placeholders for different product codes)	Please find a full list of aliases on Table 12 within this document.

*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). Consequently, the reference flow of the following product correspond to: (1,000/3,965) x (35,000/50,000) = 0.1765

2. CONSTITUENT MATERIALS

2.1 Overview

The product composition is shown in the following table.

Table 3: Product composition

	Weight [in kg]	Share [in %]
Total Weight	1.298	100
Product	1.150	89
Packaging	0.148	11

2.2 Product

The material composition of the product is shown in the following table.

Table 4: Material composition - product

		Weight [in kg]	Share [in %]
Total weight		1.150	100
Metals		0.904	79
	Aluminium	0.887	77
	Steel	0.017	1
	Stainless Steel	0.000	0
	Copper	0.000	0
Plastics		0.030	3
	Acrylonitrile butadiene styrene (ABS)	0.000	0
	Poly Vinyl Chloride (PVC)	0.005	0
	Polyamide (PA)	0.000	0
	Ethylene Propylene Diene Monomer (EPDM)	0.000	0
	Polycarbonate/Polybutylene terephthalate (PC/PBT) blend	0.006	1
	Polycarbonate (PC)	0.019	2
	Polycarbonate/Acrylonitrile butadiene styrene (PC/ABS) blend	0.000	0
	Polymethyl Methacrylate (PMMA)	0.000	0
	Polyurethane (PU)	0.000	0
	Silicone	0.000	0
	Polyethylene (PE)	0.000	0
Graphite		0.000	0
Other		0.216	19
	Electronics	0.216	19
	Batteries	0.000	0
	Glass	0.000	0
	Paint	0.000	0

2.3 Packaging

The product composition is shown in the following table.

Table 5: Material composition - packaging

	Weight [in kg]	Share [in %]
Total weight	0.148	100
Paper/Cardboard	0.148	100
Plastic	0.000	0
Wood	0.000	0

3. INFORMATION ON LIFE CYCLE STAGES

3.1 Manufacturing stage (A1-A3)

The manufacturer sources all parts from different suppliers. The production site is in Germany. During the production is no energy or material input is required.Material were modelled with a global process from ecoinvent 3.9.1.Further, transport distances for materials were calculated according to PEP-PCR-ed4- EN-2021 09 06 since no specific data regarding transport were available. Ship: 19,000 km, Lorry: 1,000 km. A basic assumption in accordance with PSR-0014-ed2.0-EN-2023 07 13 was used to model the waste streams of the packaging for the raw materials. According to the PSR 5% of the luminaire's mass shall be considered as packaging (14,9 kg*0,05= 0,745 kg). The packaging materials shall then be split as follows: Wood: 50% (0,3725 kg), Cardboard: 40 % (0,298 kg), LDPE:10 % (0,0745 kg). Further, transportation from the production site to storage site was modeled with 78 km according to the information given by the supplier. Also,to produce the luminaire a marginal sum of electricity was used which was cut-off. Addidtionally, for production of the luminaire only recyclable waste from cardboard was generated with transportation to the location of the end-of-life-stage of 10 km according to manufacturer specific data.

3.2 Distribution stage (A4)

The main market of the product is Europe and there is no specific data available. For this reason, an intracontinental transport (3,500 km by truck (diesel driven, EURO 0-6, >27t payload) to the place of use following PEP-PCR–ed4-EN-2021 09 06 is considered.

3.3 Installation stage (A5)

The product can easily be installed without any special tool. No energy or material input is required. Packaging waste is treated according to the scenario given in PEP-PSR-0014-ed2-EN-2023 07 13 by PEP ecopassport.

3.4 Use stage (B1-B7)

The product has no direct emissions (B1). No maintenance (B2), repair (B3), replacement (B4), or refurbishment (B5) is required. The use of the product does consume electricity (B6), but no water (B7).

The operational electricity consumption over the entire lifetime of the product is 1950 kWh. It has been calculated according to PSR edition 2. The used energy model refers to an average European electricity grid mix from Sphera's Managed LCA Content.

3.5 End-of-life stage (C1-C4)

The product falls under the Waste from Electrical and Electronic Equipment (WEEE) directive 2012/19/ EU. Therefore, a collection rate of 100% and a typical end-of-life scenario for electronic products is assumed. All (mechanical and electronic) metals are recycled. Plastic & renewable materials are incinerated with energy recovery. Batteries & glass are landfilled. For the transport to end-of-life treatment 1,000 km by truck according to PEP PCR is considered.

3.6 Benefits and loads beyond the system boundaries stage (D)

The recycling of the product (incl. packaging) and incineration with energy recovery generates environmental benefits and loads beyond the system boundaries (D). The calculation of this module is in line with the formulars described in PEP-PCR–ed4-EN-2021 09 06. The amount of the material flows used for the calculation are listed in the table below.

Table 6: Material flows for benefits and loads beyond the system boundaries per functional unit

	Weight [in kg]
Total weight going into incineration with energy recovery	0.241
Total weight going into recycling	0.908

4. ENVIRONMENTAL INFORMATION

The environmental information included in this study cover all stages of the life cycle („cradle-to grave").
The life cycle is divided into manufacturing stage (A1-A3), distribution stage (A4), installation stage (A5), use stage (B1-B7, but only applicable modules are shown), End-of-life stage (C1-C4) and benefits and loads beyond the system boundaries (D). The results refer to the core environmental impact indicators and mandatory indicators describing resource use, waste categories, and output flows according to PEP-PCR–ed4,- EN-2021 09 06 and EN 15804+A2:2019.

The results have been calculated using the LCA Software "LCA for Experts 10" and the LCI database "Sphera Managed LCA Content".

4.1 Results per functional unit

The following results of the environmental declaration have been developed, considering an outgoing artificial luminous flux of 1,000 lumens over a reference lifetime of 35,000 hours.

Acronyms: GWP-total=Global Warming Potential total; GWP-biogenic=Global Warming Potential biogenic; GWP-fossil=Global Warming Potential fossil; GWP-luluc=Global Warming Potential land use and land use change; ODP=Ozone Depletion; AP=Acidification; EP=Eutrophication; POCP=Photochemical ozone formation; ADPE=Depletion of abiotic resources-minerals and metals; ADPF=Depletion of abiotic resources-fossil fuels; WDP=Water resource depletion; PERE=Renewable primary energy (without raw material); PERM=Renewable primary energy (raw material); PERT=Total use of renewable primary energy; PENRE=Non-renewable primary energy (without raw material); PENRM=Non-renewable primary energy (raw material); PENRT=Total use of non-renewable primary energy; SM=Use of secondary materials; RSF=Use of renewable secondary fuels; NRSF=Use of non-renewable secondary fuels; FW=Net use of fresh water; HWD=Hazardous waste disposed; NHWD=Non-hazardous waste disposed; RWD=Radioactive waste disposed; CRU=Components for reuse; MFR=Materials for recycling; MER=Materials for energy recovery; EEE=Exported electricity; EET=Exported thermal energy; Biog. C in product=Biogenic carbon content of the product; Biog. C in packaging=Biogenic carbon content of the associated packaging

4. ENVIRONMENTAL INFORMATION

Table 7: Results core environmental impact indicators per functional unit

Impact category	Unit	Total (excl. D)	Manufacturing			Distribution	Installation
			A1	A2	A3	A4	A5
GWP - total	kg CO2 eq.	5.90E+01	3.61E+00	1.87E-02	1.20E-01	6.42E-02	2.22E-02
GWP - fossil	kg CO2 eq.	5.82E+01	3.60E+00	1.79E-02	1.07E-01	6.31E-02	1.46E-02
GWP - biogenic	kg CO2 eq.	5.78E-01	-3.17E-03	7.08E-04	1.23E-02	9.15E-04	7.50E-03
GWP - luluc	kg CO2 eq.	1.88E-01	7.76E-03	1.42E-04	3.48E-04	1.76E-04	6.46E-05
ODP	kg CFC-11 eq.	1.26E-09	1.97E-11	2.69E-15	5.81E-13	7.21E-15	3.44E-14
AP	Mole of H+ eq.	1.37E-01	1.66E-02	1.18E-04	2.11E-04	1.04E-03	3.70E-05
EP - freshwater	kg P eq.	1.23E-04	4.72E-06	3.82E-08	1.64E-06	5.76E-08	2.95E-07
EP - marine	kg N eq.	3.21E-02	3.00E-03	4.40E-05	9.59E-05	3.74E-04	1.94E-05
EP- terrestrial	Mole of N eq.	3.59E-01	3.26E-02	4.79E-04	9.13E-04	4.09E-03	1.67E-04
POCP	kg NMVOC eq.	8.13E-02	9.05E-03	1.15E-04	1.96E-04	1.03E-03	3.07E-05
ADPE	kg Sb eq.	1.40E-04	1.29E-04	1.02E-09	2.51E-08	2.29E-09	9.03E-09
ADPF	MJ	1.15E+03	3.73E+01	2.27E-01	1.26E+00	7.61E-01	1.96E-01
WDP	m^3 world equiv.	1.45E+01	8.28E-01	7.09E-05	8.66E-03	1.64E-04	1.75E-03

Impact category	Unit	Use		End of life			Benefits*
		B2	B6	C2	C3	C4	D
GWP - total	kg CO2 eq.	0.00E+00	5.51E+01	1.57E-02	4.41E-02	8.95E-07	-1.39E+00
GWP - fossil	kg CO2 eq.	0.00E+00	5.44E+01	1.48E-02	4.40E-02	8.64E-07	-1.41E+00
GWP - biogenic	kg CO2 eq.	0.00E+00	5.59E-01	7.69E-04	3.70E-05	2.83E-08	2.34E-02
GWP - luluc	kg CO2 eq.	0.00E+00	1.79E-01	1.55E-04	1.99E-05	3.54E-09	-3.45E-03
ODP	kg CFC-11 eq.	0.00E+00	1.24E-09	2.49E-15	9.96E-14	2.40E-18	-2.18E-11
AP	Mole of H+ eq.	0.00E+00	1.19E-01	2.70E-05	3.12E-05	6.10E-09	-5.51E-03
EP - freshwater	kg P eq.	0.00E+00	1.16E-04	4.05E-08	1.33E-08	1.28E-12	-1.36E-06
EP - marine	kg N eq.	0.00E+00	2.86E-02	1.15E-05	1.20E-05	1.60E-09	-1.22E-03
EP- terrestrial	Mole of N eq.	0.00E+00	3.20E-01	1.22E-04	1.46E-04	1.74E-08	-1.34E-02
POCP	kg NMVOC eq.	0.00E+00	7.09E-02	2.43E-05	3.10E-05	4.78E-09	-3.50E-03
ADPE	kg Sb eq.	0.00E+00	1.13E-05	9.99E-10	9.28E-10	5.34E-14	-2.03E-05
ADPF	MJ	0.00E+00	1.11E+03	1.93E-01	1.06E-01	1.13E-05	-1.75E+01
WDP	m^3 world equiv.	0.00E+00	1.36E+01	6.87E-05	8.08E-03	9.34E-08	-1.43E-01

*Benefits and loads beyond the system boundaries

4. ENVIRONMENTAL INFORMATION

Table 8: Results indicators describing resource use, waste categories, and output flows per functional unit

Impact category	Unit	Total (excl. D)	Manufacturing			Distribution	Installation
			A1	A2	A3	A4	A5
PERE	MJ	7.68E+02	9.44E+00	1.35E-02	2.57E-01	1.91E-02	9.22E-02
PERM	MJ	5.16E-01	1.54E-01	0.00E+00	4.01E-01	0.00E+00	-3.89E-02
PERT	MJ	7.69E+02	9.60E+00	1.35E-02	6.57E-01	1.91E-02	5.33E-02
PENRE	MJ	1.15E+03	3.71E+01	2.27E-01	1.27E+00	7.61E-01	1.96E-01
PENRM	MJ	2.52E-02	1.95E-01	0.00E+00	-1.65E-02	0.00E+00	0.00E+00
PENRT	MJ	1.15E+03	3.73E+01	2.27E-01	1.26E+00	7.61E-01	1.96E-01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	6.12E-01	2.22E-02	6.87E-06	4.55E-04	1.14E-05	1.17E-04
HWD	kg	1.58E-06	2.64E-08	8.82E-12	7.89E-09	2.76E-11	2.90E-09
NHWD	kg	1.57E+00	6.58E-01	2.87E-05	3.89E-02	7.43E-05	2.29E-03
RWD	kg	1.76E-01	8.58E-04	3.92E-07	2.39E-05	1.05E-06	4.68E-06
MFR	kg	1.89E-01	0.00E+00	0.00E+00	7.44E-03	0.00E+00	2.14E-02
MER	kg	6.59E-02	0.00E+00	0.00E+00	2.10E-02	0.00E+00	2.35E-03
EEE	MJ	7.34E-02	5.91E-04	0.00E+00	0.00E+00	0.00E+00	6.01E-03
EET	MJ	1.65E-01	1.06E-03	0.00E+00	0.00E+00	0.00E+00	9.15E-03
Biog. C in packaging	kg	1.43E+00	3.91E-01	0.00E+00	1.03E+00	0.00E+00	0.00E+00

Impact category	Unit	Use		End of life			Benefits*
		B2	B6	C2	C3	C4	D
PERE	MJ	0.00E+00	7.58E+02	1.45E-02	6.21E-02	2.19E-06	-1.18E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	0.00E+00	7.58E+02	1.45E-02	6.21E-02	2.19E-06	-1.18E+01
PENRE	MJ	0.00E+00	1.11E+03	1.93E-01	2.59E-01	1.13E-05	-1.75E+01
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	-1.54E-01	0.00E+00	0.00E+00
PENRT	MJ	0.00E+00	1.11E+03	1.93E-01	1.06E-01	1.13E-05	-1.75E+01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-01
FW	m3	0.00E+00	5.89E-01	7.17E-06	2.09E-04	2.73E-09	-7.09E-03
HWD	kg	0.00E+00	1.54E-06	7.72E-12	5.89E-10	2.48E-15	-1.63E-08
NHWD	kg	0.00E+00	8.59E-01	2.69E-05	7.53E-03	5.65E-05	-4.17E-01
RWD	kg	0.00E+00	1.75E-01	3.63E-07	1.28E-05	1.20E-10	-9.39E-04
MFR	kg	0.00E+00	0.00E+00	0.00E+00	1.60E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	4.26E-02	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	6.68E-02	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	1.55E-01	0.00E+00	0.00E+00
Biog. C in packaging	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Benefits and loads beyond the system boundaries

4. ENVIRONMENTAL INFORMATION

4.2 Results per unit of product

The following results of the environmental declaration have been developed, considering one piece of product.

Table 9: Results core environmental impact indicators per unit of product

Impact category	Unit	Total (excl. D)	Manufacturing			Distribution	Installation
			A1	A2	A3	A4	A5
GWP - total	kg CO2 eq.	3.34E+02	2.04E+01	1.06E-01	6.78E-01	3.64E-01	1.26E-01
GWP - fossil	kg CO2 eq.	3.30E+02	2.04E+01	1.01E-01	6.06E-01	3.57E-01	8.27E-02
GWP - biogenic	kg CO2 eq.	3.27E+00	-1.80E-02	4.01E-03	6.98E-02	5.18E-03	4.25E-02
GWP - luluc	kg CO2 eq.	1.07E+00	4.39E-02	8.02E-04	1.97E-03	9.98E-04	3.66E-04
ODP	kg CFC-11 eq.	7.13E-09	1.11E-10	1.52E-14	3.29E-12	4.08E-14	1.95E-13
AP	Mole of H+ eq.	7.77E-01	9.41E-02	6.71E-04	1.20E-03	5.89E-03	2.09E-04
EP - freshwater	kg P eq.	6.97E-04	2.67E-05	2.16E-07	9.29E-06	3.26E-07	1.67E-06
EP - marine	kg N eq.	1.82E-01	1.70E-02	2.49E-04	5.43E-04	2.12E-03	1.10E-04
EP- terrestrial	Mole of N eq.	2.03E+00	1.85E-01	2.71E-03	5.17E-03	2.32E-02	9.45E-04
POCP	kg NMVOC eq.	4.61E-01	5.13E-02	6.52E-04	1.11E-03	5.82E-03	1.74E-04
ADPE	kg Sb eq.	7.94E-04	7.30E-04	5.79E-09	1.42E-07	1.30E-08	5.11E-08
ADPF	MJ	6.51E+03	2.11E+02	1.28E+00	7.13E+00	4.31E+00	1.11E+00
WDP	m^3 world equiv.	8.20E+01	4.69E+00	4.02E-04	4.90E-02	9.29E-04	9.89E-03

Impact category	Unit	Use		End of life			Benefits*
		B2	B6	C2	C3	C4	D
GWP - total	kg CO2 eq.	0.00E+00	3.12E+02	8.91E-02	2.50E-01	5.07E-06	-7.85E+00
GWP - fossil	kg CO2 eq.	0.00E+00	3.08E+02	8.39E-02	2.49E-01	4.89E-06	-7.96E+00
GWP - biogenic	kg CO2 eq.	0.00E+00	3.17E+00	4.35E-03	2.09E-04	1.60E-07	1.33E-01
GWP - luluc	kg CO2 eq.	0.00E+00	1.02E+00	8.76E-04	1.13E-04	2.01E-08	-1.95E-02
ODP	kg CFC-11 eq.	0.00E+00	7.02E-09	1.41E-14	5.64E-13	1.36E-17	-1.24E-10
AP	Mole of H+ eq.	0.00E+00	6.75E-01	1.53E-04	1.77E-04	3.46E-08	-3.12E-02
EP - freshwater	kg P eq.	0.00E+00	6.59E-04	2.29E-07	7.55E-08	7.27E-12	-7.72E-06
EP - marine	kg N eq.	0.00E+00	1.62E-01	6.50E-05	6.82E-05	9.04E-09	-6.94E-03
EP- terrestrial	Mole of N eq.	0.00E+00	1.81E+00	6.93E-04	8.24E-04	9.86E-08	-7.58E-02
POCP	kg NMVOC eq.	0.00E+00	4.01E-01	1.38E-04	1.75E-04	2.71E-08	-1.98E-02
ADPE	kg Sb eq.	0.00E+00	6.40E-05	5.66E-09	5.25E-09	3.03E-13	-1.15E-04
ADPF	MJ	0.00E+00	6.28E+03	1.09E+00	5.98E-01	6.42E-05	-9.91E+01
WDP	m^3 world equiv.	0.00E+00	7.72E+01	3.89E-04	4.58E-02	5.29E-07	-8.11E-01

*Benefits and loads beyond the system boundaries

4. ENVIRONMENTAL INFORMATION

Table 10: Results indicators describing resource use, waste categories, and output flows per unit of product

Impact category	Unit	Total (excl. D)	Manufacturing			Distribution	Installation
			A1	A2	A3	A4	A5
PERE	MJ	4.35E+03	5.35E+01	7.66E-02	1.45E+00	1.08E-01	5.22E-01
PERM	MJ	2.92E+00	8.74E-01	0.00E+00	2.27E+00	0.00E+00	-2.21E-01
PERT	MJ	4.35E+03	5.44E+01	7.66E-02	3.72E+00	1.08E-01	3.02E-01
PENRE	MJ	6.51E+03	2.10E+02	1.28E+00	7.22E+00	4.31E+00	1.11E+00
PENRM	MJ	1.43E-01	1.11E+00	0.00E+00	-9.36E-02	0.00E+00	0.00E+00
PENRT	MJ	6.51E+03	2.11E+02	1.28E+00	7.13E+00	4.31E+00	1.11E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	3.46E+00	1.26E-01	3.89E-05	2.58E-03	6.47E-05	6.64E-04
HWD	kg	8.94E-06	1.50E-07	5.00E-11	4.47E-08	1.56E-10	1.64E-08
NHWD	kg	8.87E+00	3.73E+00	1.62E-04	2.20E-01	4.21E-04	1.30E-02
RWD	kg	9.97E-01	4.86E-03	2.22E-06	1.35E-04	5.97E-06	2.65E-05
MFR	kg	1.07E+00	0.00E+00	0.00E+00	4.21E-02	0.00E+00	1.21E-01
MER	kg	3.74E-01	0.00E+00	0.00E+00	1.19E-01	0.00E+00	1.33E-02
EEE	MJ	4.16E-01	3.35E-03	0.00E+00	0.00E+00	0.00E+00	3.40E-02
EET	MJ	9.37E-01	5.98E-03	0.00E+00	0.00E+00	0.00E+00	5.18E-02
Biog. C in packaging	kg	8.07E+00	2.22E+00	0.00E+00	5.85E+00	0.00E+00	0.00E+00

Impact category	Unit	Use		End of life			Benefits*
		B2	B6	C2	C3	C4	D
PERE	MJ	0.00E+00	4.30E+03	8.22E-02	3.52E-01	1.24E-05	-6.67E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	0.00E+00	4.30E+03	8.22E-02	3.52E-01	1.24E-05	-6.67E+01
PENRE	MJ	0.00E+00	6.28E+03	1.09E+00	1.47E+00	6.42E-05	-9.91E+01
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	-8.70E-01	0.00E+00	0.00E+00
PENRT	MJ	0.00E+00	6.28E+03	1.09E+00	5.98E-01	6.42E-05	-9.91E+01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.73E-01
FW	m3	0.00E+00	3.33E+00	4.06E-05	1.19E-03	1.55E-08	-4.01E-02
HWD	kg	0.00E+00	8.73E-06	4.38E-11	3.34E-09	1.40E-14	-9.25E-08
NHWD	kg	0.00E+00	4.87E+00	1.52E-04	4.27E-02	3.20E-04	-2.36E+00
RWD	kg	0.00E+00	9.92E-01	2.06E-06	7.23E-05	6.81E-10	-5.32E-03
MFR	kg	0.00E+00	0.00E+00	0.00E+00	9.08E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	2.41E-01	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	3.78E-01	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	8.80E-01	0.00E+00	0.00E+00
Biog. C in packaging	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Benefits and loads beyond the system boundaries

5. EXTRAPOLATION RULE FOR PRODUCT VARIANTS

5.1 Extrapolation coefficients

The extrapolation coefficients included in the PEP have been developed according to the valid PCR & PSR. The table below shows the key properties of the reference product, function as extrapolation basis.

Table 11: Reference values for the extrapolation

Export Tabelle mit textlicher Formatierung		
Parameter	Unit	Value
Weight of structural/mechanical parts	kg	1.004
Weight of power equipment	kg	0.144
Weight of light source	kg	0.002
Weight of light management system	kg	0
Weight of product (excl. packaging)	kg	1.150
Weight of packaging	kg	0.148
Typical power consumption	W	39
Lumen output	lm	3965
Energy saving coefficient	-	0.5

The extrapolation at the level of the functional unit needs to be done according to the following formula:

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

The required extrapolation coefficients at the product level are listed in the following table. The Lighting output should be taken from the datasheet of the individual variant (value of phi).

Table 12: Extrapolation coefficients at the product level

Product variant	Fabrication stage	Distribution stage	Installation stage	Use stage	End of life stage
Toko RF-XX(X) XX-XX(X) CXX ET XX	0.79	0.73	1.29	2.00 x P in datasheet / 39 W	0.66
Toko RF-XX(X) XX-XX(X) CXX BLE XX	0.82	0.76	1.29	1.00 x P in datasheet / 39 W	0.69
Toko RF-XX(X) XX-XX(X) CXX ETDD XX	0.87	0.79	1.29	1.00 x P in datasheet / 39 W	0.72
Toko RF-XX(X)-c XX-XX(X) CXX ET XX	0.82	0.78	1.29	2.00 x P in datasheet / 39 W	0.71
Toko RF-XX(X)-c XX-XX(X) CXX BLE XX	0.85	0.80	1.29	1.00 x P in datasheet / 39 W	0.74

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