epddanmark

Owner: Fischer Lighting
No.: MD-20037-EN
Issued: 04-01-2021
Valid to: 04-01-2026

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Fischer Lighting
Skjulhøj Allé 46
2720 Vanløse
Denmark
DK37815322

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
This EPD covers four specific lighting systems:

1. Product 1: August
2. Product 2: Natural History - ReUse
3. Product 3: Natural History – coated/sand blasted and new diffuser
4. Product 4: VENUS

The products consist of fixtures, where the exiting fixture is reused from another building instead of it being disposed of as waste. The electronics in the existing fixture is replaced and upgraded to LED, and additional components are added.

The four declared products contain the same driver and LED diode type, however they differ in form, size, weight, painting/no-painting, diffuser added/no diffuser added, and whether they include intelligent solutions for lighting control.

Number of declared datasets/product variations: 4

Production site
Greve and Roskilde, Denmark

Product(s) use
Office lighting

Declared or functional unit
1 lighting system used in an office in Denmark for 15 years, in accordance with the reference PCR.

Year of data
2019

Issued: 04-01-2021
Valid to: 04-01-2026

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2 and ISO 14025.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☒Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Linda Høibye

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	X	MND	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below (unit: grams).

Component	Product 1	Product 2	Product 3	Product 4
Reused steel fixture	628	7625	7625	3910
Funnel/Parabol	555	–	–	–
Diffuser ring	98	–	–	–
Aluminum profile	–	318	318	–
LED board	14	87	87	488
Driver	112	112	112	112
Cooling system/heatsink Alu	170	–	–	–
Optics – lens	29	–	–	–
Diffuser	–	–	316	1522
Coating	–	–	200	–
Other	9	17	17	19
TOTAL	**1615**	**8159**	**8675**	**6051**

Representativity

This declaration represents the production of four specific lighting systems on the production sites located in Greve and Roskilde. Product-specific bill of materials are based on average values for 2019. Background data are based on primarily GaBi Professional Database and Ecoinvent and data were assessed based on their data quality and representativeness. Some of the upstream generic data used for electronic components were old but were assessed to be the best available data and a conservative estimate of the current situation. The results for end-of-life is for one specific scenario, where 100% of the products are reused in place after use after the life span of 15 years, however, the electronics (LED board and driver) are replaced.

Hazardous substances

The products do not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation" with a content exceeding 0,1 weight % (http://echa.europa.eu/candidate-list-table). Absence of these substances is declared by the producer, Fischer Lighting.

Essential characteristics (CE)

The declared products are in conformity with the essential requirements of the following European Directives and harmonized standards:

Low Voltage Directive (LVD), 2006/95/EC:

- EN 60598-1:2008A11:2009
- EN 60598-2-5:1998

Electromagnetic Compatibility Directive (EMC), 2004/108/EC:

- EN 55015:2006+A1:2007+A2:2009
- EN 61547:2009
- EN 61547:2009
- EN 61000-3-2:2006+A2:2009
- EN 61000-3-3:2008

Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2001/65/EC:

- EN 50581:2012

Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the website www.fischer-lighting.com.

Reference Service Life (RSL)

The scenario used for the service life of the products is 15 years as required by the reference PCR.

Picture of products

Product 1: August

Product 2: Natural History - ReUse

Product 3: Natural History – coated/sand blasted and new diffuser

Product 4: VENUS

LCA background

Declared unit / Functional unit

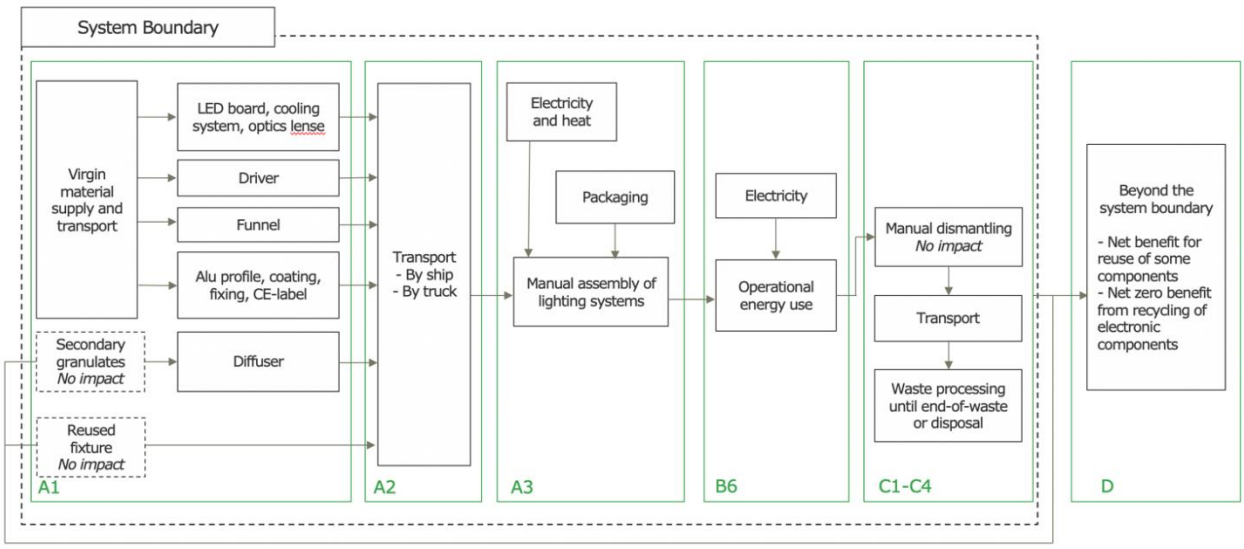
The LCI and LCIA results in this EPD relates to the declared unit 1 lighting system used in an office in Denmark for 15 years

Name	Product 1	Product 2	Product 3	Product 4	Unit
Declared unit	1	1	1	1	lighting system used for 15 years
Conversion factor to 1 kg	1.61	8.14	8.66	6.04	kg/ lighting system used for 15 years

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2, and PCR Part B: Requirements on the EPD for Luminaires, lamps and components for luminaires, version 1.6.

Flow diagram



System boundary

This EPD is based on a "cradle-to-gate with options, modules C1-C4 and D" LCA, in which 100 weight-% of the product has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804+A2, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Raw material supply
A2 – Transport to manufacturing
A3 – Manufacturing

The product stage consists of raw material extraction and production, supply of recycled materials, transport to manufacturing, production of packaging, energy, and assembly of the lighting systems. Management of generated waste is included up to the "end-of-waste" state or final disposal.

Raw materials and components originate from different suppliers. The reused fixtures originate from buildings in Denmark. The diffuser is made from secondary materials from upcycled fishnets. The assembly of the lighting systems is performed in Denmark at two different locations. As the assembly process is done by manual labor, only electricity for lighting, machinery, forklifts and hand tools, and heating have been included. Packaging of the final product consists of pallets, pallet frames and cardboard.

Use stage (B1-B7) includes:

B6 – Operational energy use

The use stage consists of electricity for the lighting systems when they are assumed to be used in an office building in Denmark for 15 years. The electricity use calculation follows the formula provided in the reference PCR. The electricity has been assumed to be the Danish grid consumption mix.

End of life stage (C1-C4) includes:

C1 – De-construction demolition
C2 – Transport
C3 – Waste processing
C4 – Disposal

The end-of-life stage consists of the transportation and waste management processes to manage the product as waste after the use phase scenario of 15 years life span.

The end-of life scenario is that that 100% of the products are reused in place after use after the life span of 15 years, however, the electronics (LED board and driver) are replaced. The old electronic components were assumed to be collected separately and sent to recycling. The other components were assumed to be reused, thus replacing the need for production of new components (see module D). The generated waste in modules C1-C4 is included up to the "end-of-waste" state or final disposal, with the potential net benefits reported in module D.

The generated waste in modules C1-C4 is included up to the "end-of-waste" state or final disposal, with the potential net benefits reported in module D.

Beyond the system boundary (D) includes:

D – Re-use, recovery and recycling potential

Module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits, due to reuse, recycling and incineration of materials with energy recovery in modules C1-C4. The reused components made from virgin materials in the product stage, such as the funnel, were assumed to replace similar components from virgin materials. No credit is included for the reused fixture and secondary plastic granulates from fishnets as the net output was zero as the same materials are modelled as inputs to the product stage. No value-correction factor for quality losses was applied for the reused components as they do not deteriorate when used in an indoor environment for 15 years. No credit was included for the recycling of electronic components (LED board and driver).

LCA results

Product 1: August

ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.21E+01	1.19E+02	0.00E+00	1.93E-04	1.93E-03	0.00E+00	-6,76E+00
GWP-fossil	[kg CO_2 eq.]	3.57E+01	1.20E+02	0.00E+00	1.90E-04	1.90E-03	0.00E+00	-6,75E+00
GWP-biogenic	[kg CO_2 eq.]	-3.73E+00	-1.27E+00	0.00E+00	2.06E-06	2.06E-05	0.00E+00	-1,58E-03
GWP-luluc	[kg CO_2 eq.]	5.74E-02	2.37E-01	0.00E+00	1.55E-06	1.55E-05	0.00E+00	-3,92E-03
ODP	[kg CFC 11 eq.]	2.49E-06	3.06E-12	0.00E+00	3.52E-20	3.52E-19	0.00E+00	-1,85E-07
AP	[mol H^+ eq.]	2.39E-01	1.75E-01	0.00E+00	2.22E-07	2.22E-06	0.00E+00	-3,65E-02
EP-freshwater	[kg PO_4 eq.]	3.88E-02	5.22E-04	0.00E+00	5.84E-10	5.84E-09	0.00E+00	-4,12E-04
EP-marine	[kg N eq.]	4.61E-02	5.74E-02	0.00E+00	6.81E-08	6.81E-07	0.00E+00	-4,96E-03
EP-terrestrial	[mol N eq.]	4.97E-01	5.77E-01	0.00E+00	8.09E-07	8.09E-06	0.00E+00	-5,35E-02
POCP	[kg NMVOC eq.]	1.39E-01	1.42E-01	0.00E+00	1.84E-07	1.84E-06	0.00E+00	-1,58E-02
ADPm[1]	[kg Sb eq.]	1.31E-02	4.96E-05	0.00E+00	1.55E-11	1.55E-10	0.00E+00	-7,53E-05
ADPf[1]	[MJ]	5.28E+02	1.33E+03	0.00E+00	2.56E-03	2.56E-02	0.00E+00	-8,11E+01
WDP[1]	[m^3]	1.37E+01	7.75E+00	0.00E+00	1.87E-06	1.87E-05	0.00E+00	-2,12E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.90E-06	1.64E-06	0.00E+00	1.47E-12	1.47E-11	0.00E+00	-8,14E-07
IRP[2]	[kBq U235 eq.]	3.92E+00	7.76E+00	0.00E+00	6.99E-07	6.99E-06	0.00E+00	-3,30E-01
ETP-fw[1]	[CTUe]	3.29E+03	4.15E+02	0.00E+00	1.92E-03	1.92E-02	0.00E+00	-4,74E+01
HTP-c[1]	[CTUh]	8.27E-07	3.97E-08	0.00E+00	3.96E-14	3.96E-13	0.00E+00	-7,86E-07
HTP-nc[1]	[CTUh]	3.88E-06	8.43E-07	0.00E+00	2.02E-12	2.02E-11	0.00E+00	-1,02E-07
SQP[1]	-	9.53E+02	1.47E+03	0.00E+00	8.99E-04	8.99E-03	0.00E+00	-8,56E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	5.42E+01	2.04E+03	0.00E+00	1.48E-04	1.48E-03	0.00E+00	-8,49E+00
PERM	[MJ]	3.80E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PERT	[MJ]	9.22E+01	2.04E+03	0.00E+00	1.48E-04	1.48E-03	0.00E+00	-8,49E+00
PENRE	[MJ]	5.24E+02	1.33E+03	0.00E+00	2.57E-03	2.57E-02	0.00E+00	-8,11E+01
PENRM	[MJ]	3.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PENRT	[MJ]	5.28E+02	1.33E+03	0.00E+00	2.57E-03	2.57E-02	0.00E+00	-8,11E+01
SM	[kg]	8.10E-01	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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
FW	[m^3]	3.28E-01	9.11E-01	0.00E+00	1.73E-07	1.73E-06	0.00E+00	-5,56E-02
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.56E-06	2.09E-06	0.00E+00	1.19E-10	1.19E-09	0.00E+00	-1,15E-06
NHWD	[kg]	9.07E-01	4.37E+00	0.00E+00	4.07E-07	4.07E-06	0.00E+00	-8,49E-01
RWD	[kg]	1.98E-03	7.32E-02	0.00E+00	4.74E-09	4.74E-08	0.00E+00	-1,06E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-01	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
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	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							

BIOGENIC CARBON CONTENT PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0.00E+00
Biogenic carbon content in accompanying packaging	[kg C]	1.16E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Product 2: Natural History – ReUse

ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.53E+01	2.97E+02	0.00E+00	3.02E-04	3.02E-03	0.00E+00	-3,26E+00
GWP-fossil	[kg CO_2 eq.]	3.92E+01	3.00E+02	0.00E+00	2.96E-04	2.96E-03	0.00E+00	-3,25E+00
GWP-biogenic	[kg CO_2 eq.]	-3.97E+00	-3.19E+00	0.00E+00	3.23E-06	3.23E-05	0.00E+00	1,54E-03
GWP-luluc	[kg CO_2 eq.]	6.66E-02	5.91E-01	0.00E+00	2.43E-06	2.43E-05	0.00E+00	-2,65E-03
ODP	[kg CFC 11 eq.]	2.63E-06	7.66E-12	0.00E+00	5.51E-20	5.51E-19	0.00E+00	-4,40E-08
AP	[mol H^+ eq.]	2.61E-01	4.38E-01	0.00E+00	3.47E-07	3.47E-06	0.00E+00	-1,59E-02
EP-freshwater	[kg PO_4 eq.]	4.27E-02	1.30E-03	0.00E+00	9.14E-10	9.14E-09	0.00E+00	-1,40E-04
EP-marine	[kg N eq.]	5.12E-02	1.43E-01	0.00E+00	1.07E-07	1.07E-06	0.00E+00	-2,15E-03
EP-terrestrial	[mol N eq.]	5.47E-01	1.44E+00	0.00E+00	1.26E-06	1.26E-05	0.00E+00	-2,32E-02
POCP	[kg NMVOC eq.]	1.51E-01	3.55E-01	0.00E+00	2.87E-07	2.87E-06	0.00E+00	-6,77E-03
ADPm[1]	[kg Sb eq.]	1.32E-02	1.24E-04	0.00E+00	2.43E-11	2.43E-10	0.00E+00	-1,20E-05
ADPf[1]	[MJ]	5.91E+02	3.32E+03	0.00E+00	4.00E-03	4.00E-02	0.00E+00	-4,32E+01
WDP[1]	[m^3]	1.48E+01	1.94E+01	0.00E+00	2.93E-06	2.93E-05	0.00E+00	-5,52E-01
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.78E-06	4.10E-06	0.00E+00	2.30E-12	2.30E-11	0.00E+00	-1,71E-07
IRP[2]	[kBq U235 eq.]	4.80E+00	1.94E+01	0.00E+00	1.09E-06	1.09E-05	0.00E+00	-5,05E-01
ETP-fw[1]	[CTUe]	3.50E+03	1.04E+03	0.00E+00	3.00E-03	3.00E-02	0.00E+00	-2,32E+01
HTP-c[1]	[CTUh]	2.85E-08	9.92E-08	0.00E+00	6.19E-14	6.19E-13	0.00E+00	-5,24E-09
HTP-nc[1]	[CTUh]	1.34E-06	2.11E-06	0.00E+00	3.16E-12	3.16E-11	0.00E+00	-4,15E-08
SQP[1]	-	1.04E+03	3.66E+03	0.00E+00	1.41E-03	1.41E-02	0.00E+00	-3,62E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	7.11E+01	5.09E+03	0.00E+00	2.32E-04	2.32E-03	0.00E+00	-1,64E+01
PERM	[MJ]	4.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PERT	[MJ]	1.12E+02	5.09E+03	0.00E+00	2.32E-04	2.32E-03	0.00E+00	-1,64E+01
PENRE	[MJ]	5.91E+02	3.32E+03	0.00E+00	4.02E-03	4.02E-02	0.00E+00	-4,32E+01
PENRM	[MJ]	4.18E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PENRT	[MJ]	5.91E+02	3.32E+03	0.00E+00	4.02E-03	4.02E-02	0.00E+00	-4,32E+01
SM	[kg]	7.65E+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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
FW	[m^3]	3.79E-01	2.28E+00	0.00E+00	2.70E-07	2.70E-06	0.00E+00	-4,26E-02
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.21E-06	5.21E-06	0.00E+00	1.86E-10	1.86E-09	0.00E+00	-7,29E-07
NHWD	[kg]	1.05E+00	1.09E+01	0.00E+00	6.37E-07	6.37E-06	0.00E+00	-7,95E-01
RWD	[kg]	3.33E-03	1.83E-01	0.00E+00	7.41E-09	7.41E-08	0.00E+00	-2,32E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.96E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-01	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
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	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							

BIOGENIC CARBON CONTENT PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0.00E+00
Biogenic carbon content in accompanying packaging	[kg C]	1.27E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Product 3: Natural History – coated/sand blasted and new diffuser

ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	4.35E+01	2.64E+02	0.00E+00	3.02E-04	3.02E-03	0.00E+00	-1,14E+01
GWP-fossil	[kg CO_2 eq.]	4.74E+01	2.67E+02	0.00E+00	2.96E-04	2.96E-03	0.00E+00	-1,14E+01
GWP-biogenic	[kg CO_2 eq.]	-3.93E+00	-2.83E+00	0.00E+00	3.23E-06	3.23E-05	0.00E+00	-3,25E-02
GWP-luluc	[kg CO_2 eq.]	7.20E-02	5.26E-01	0.00E+00	2.43E-06	2.43E-05	0.00E+00	-7,99E-03
ODP	[kg CFC 11 eq.]	3.75E-06	6.81E-12	0.00E+00	5.51E-20	5.51E-19	0.00E+00	-1,16E-06
AP	[mol H^+ eq.]	2.94E-01	3.90E-01	0.00E+00	3.47E-07	3.47E-06	0.00E+00	-4,81E-02
EP-freshwater	[kg PO_4 eq.]	4.51E-02	1.16E-03	0.00E+00	9.14E-10	9.14E-09	0.00E+00	-2,54E-03
EP-marine	[kg N eq.]	5.60E-02	1.28E-01	0.00E+00	1.07E-07	1.07E-06	0.00E+00	-6,93E-03
EP-terrestrial	[mol N eq.]	5.95E-01	1.28E+00	0.00E+00	1.26E-06	1.26E-05	0.00E+00	-7,15E-02
POCP	[kg NMVOC eq.]	1.68E-01	3.15E-01	0.00E+00	2.87E-07	2.87E-06	0.00E+00	-2,41E-02
ADPm[1]	[kg Sb eq.]	1.33E-02	1.10E-04	0.00E+00	2.43E-11	2.43E-10	0.00E+00	-9,50E-05
ADPf[1]	[MJ]	7.53E+02	2.95E+03	0.00E+00	4.00E-03	4.00E-02	0.00E+00	-2,05E+02
WDP[1]	[m^3]	2.48E+01	1.72E+01	0.00E+00	2.93E-06	2.93E-05	0.00E+00	-1,05E+01
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.94E-06	3.65E-06	0.00E+00	2.30E-12	2.30E-11	0.00E+00	-3,34E-07
IRP[2]	[kBq U235 eq.]	5.99E+00	1.72E+01	0.00E+00	1.09E-06	1.09E-05	0.00E+00	-1,69E+00
ETP-fw[1]	[CTUe]	3.69E+03	9.22E+02	0.00E+00	3.00E-03	3.00E-02	0.00E+00	-2,16E+02
HTP-c[1]	[CTUh]	3.32E-08	8.82E-08	0.00E+00	6.19E-14	6.19E-13	0.00E+00	-9,91E-09
HTP-nc[1]	[CTUh]	1.54E-06	1.87E-06	0.00E+00	3.16E-12	3.16E-11	0.00E+00	-2,47E-07
SQP[1]	-	1.06E+03	3.26E+03	0.00E+00	1.41E-03	1.41E-02	0.00E+00	-2,41E+01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	8.10E+01	4.52E+03	0.00E+00	2.32E-04	2.32E-03	0.00E+00	-2,63E+01
PERM	[MJ]	4.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PERT	[MJ]	1.22E+02	4.52E+03	0.00E+00	2.32E-04	2.32E-03	0.00E+00	-2,63E+01
PENRE	[MJ]	7.45E+02	2.96E+03	0.00E+00	4.02E-03	4.02E-02	0.00E+00	-2,05E+02
PENRM	[MJ]	7.60E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
PENRT	[MJ]	7.53E+02	2.96E+03	0.00E+00	4.02E-03	4.02E-02	0.00E+00	-2,05E+02
SM	[kg]	7.65E+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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
FW	[m^3]	6.11E-01	2.03E+00	0.00E+00	2.70E-07	2.70E-06	0.00E+00	-2,75E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.22E-06	4.64E-06	0.00E+00	1.86E-10	1.86E-09	0.00E+00	-7,36E-07
NHWD	[kg]	1.07E+00	9.70E+00	0.00E+00	6.37E-07	6.37E-06	0.00E+00	-8,13E-01
RWD	[kg]	4.00E-03	1.63E-01	0.00E+00	7.41E-09	7.41E-08	0.00E+00	-2,99E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.48E+00	0.00E+00	0,00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-01	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
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0,00E+00
Caption	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							

BIOGENIC CARBON CONTENT PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0.00E+00
Biogenic carbon content in accompanying packaging	[kg C]	1.27E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Product 4: VENUS

ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	5.01E+01	2.64E+02	0.00E+00	8.90E-04	8.90E-03	0.00E+00	-6.33E+00
GWP-fossil	[kg CO_2 eq.]	5.47E+01	2.67E+02	0.00E+00	8.73E-04	8.73E-03	0.00E+00	-6.33E+00
GWP-biogenic	[kg CO_2 eq.]	-4.66E+00	-2.83E+00	0.00E+00	9.50E-06	9.50E-05	0.00E+00	7.03E-03
GWP-luluc	[kg CO_2 eq.]	7.61E-02	5.26E-01	0.00E+00	7.15E-06	7.15E-05	0.00E+00	-2.87E-03
ODP	[kg CFC 11 eq.]	2.83E-06	6.81E-12	0.00E+00	1.62E-19	1.62E-18	0.00E+00	-1.76E-08
AP	[mol H^+ eq.]	3.43E-01	3.90E-01	0.00E+00	1.02E-06	1.02E-05	0.00E+00	-2.17E-02
EP-freshwater	[kg PO_4 eq.]	4.64E-02	1.16E-03	0.00E+00	2.69E-09	2.69E-08	0.00E+00	-6.02E-04
EP-marine	[kg N eq.]	6.52E-02	1.28E-01	0.00E+00	3.14E-07	3.14E-06	0.00E+00	-3.61E-03
EP-terrestrial	[mol N eq.]	6.92E-01	1.28E+00	0.00E+00	3.72E-06	3.72E-05	0.00E+00	-3.71E-02
POCP	[kg NMVOC eq.]	1.93E-01	3.15E-01	0.00E+00	8.46E-07	8.46E-06	0.00E+00	-1.21E-02
ADPm[1]	[kg Sb eq.]	1.33E-02	1.10E-04	0.00E+00	7.15E-11	7.15E-10	0.00E+00	-1.59E-05
ADPf[1]	[MJ]	8.71E+02	2.95E+03	0.00E+00	1.18E-02	1.18E-01	0.00E+00	-1.83E+02
WDP[1]	[m^3]	5.11E+01	1.72E+01	0.00E+00	8.62E-06	8.62E-05	0.00E+00	-3.35E+01
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.47E-06	3.65E-06	0.00E+00	6.77E-12	6.77E-11	0.00E+00	-1.91E-07
IRP[2]	[kBq U235 eq.]	5.66E+00	1.72E+01	0.00E+00	3.22E-06	3.22E-05	0.00E+00	-7.87E-01
ETP-fw[1]	[CTUe]	4.21E+03	9.22E+02	0.00E+00	8.82E-03	8.82E-02	0.00E+00	-4.60E+02
HTP-c[1]	[CTUh]	1.45E-07	8.82E-08	0.00E+00	1.82E-13	1.82E-12	0.00E+00	-9.94E-09
HTP-nc[1]	[CTUh]	1.51E-05	1.87E-06	0.00E+00	9.30E-12	9.30E-11	0.00E+00	-4.77E-08
SQP[1]	-	1.22E+03	3.26E+03	0.00E+00	4.14E-03	4.14E-02	0.00E+00	-7.89E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	7.76E+01	4.52E+03	0.00E+00	6.82E-04	6.82E-03	0.00E+00	-1.13E+01
PERM	[MJ]	4.75E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.25E+02	4.52E+03	0.00E+00	6.82E-04	6.82E-03	0.00E+00	-1.13E+01
PENRE	[MJ]	8.35E+02	2.96E+03	0.00E+00	1.18E-02	1.18E-01	0.00E+00	-1.83E+02
PENRM	[MJ]	3.67E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.72E+02	2.96E+03	0.00E+00	1.18E-02	1.18E-01	0.00E+00	-1.83E+02
SM	[kg]	3.91E+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
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	1.20E+00	2.03E+00	0.00E+00	7.95E-07	7.95E-06	0.00E+00	-7.87E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS								
Parameter	**Unit**	**A1-A3**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	2.35E-06	4.64E-06	0.00E+00	5.48E-10	5.48E-09	0.00E+00	-1.81E-06
NHWD	[kg]	1.72E+00	9.70E+00	0.00E+00	1.88E-06	1.88E-05	0.00E+00	-9.34E-02
RWD	[kg]	4.69E-03	1.63E-01	0.00E+00	2.18E-08	2.18E-07	0.00E+00	-3.34E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.47E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.80E-01	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
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	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							

BIOGENIC CARBON CONTENT PER 1 PIECE OF LIGHTING SYSTEM USED FOR 15 YEARS		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0.00E+00
Biogenic carbon content in accompanying packaging	[kg C]	1.50E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

Technical information on scenarios

Reference service life

RSL information	Value	Unit
Reference Service Life (*Based on the reference PCR)*	15	Years

Use (B1-B7)

Scenario information	Product 1	Product 2	Product 3	Product 4	Unit
B6 Operational energy use					
Electricity use (15 years)	375.0	937.5	833.5	833.5	kWh
Active power	10	25	25	25	W
Passive power	0	0	0.5	0.5	W
Illuminance	Constant	Constant	Constant	Constant	–
Dimmable	No	No	Yes	Yes	–
Presence control	No	No	Yes	Yes	–

End of life (C1-C4)

Scenario information	Product 1	Product 2	Product 3	Product 4	Unit
Collected separately	1.62	8.16	8.68	6.05	kg
Collected with mixed waste	0	0	0	0	kg
For reuse	1.49	7.96	8.48	5.45	kg
For recycling	0.13	0.20	0.20	0.60	kg
For energy recovery	0	0	0	0	kg
For final disposal	0	0	0	0	kg
Assumptions for scenario development	Product reused on site, with new driver and LED board. Electronic components recycled.	Product reused on site, with new driver and LED board. Electronic components recycled.	Product reused on site, with new driver and LED board. Electronic components recycled.	Product reused on site, with new driver and LED board. Electronic components recycled.	–

Re-use, recovery and recycling potential (D)

Scenario information	Product 1	Product 2	Product 3	Product 4	Unit
Funnel/Parabol	0.56	–	–	–	kg
Aluminum profile	–	0.32	0.32	–	kg
Cooling system/heatsink Alu	0.17	–	–	–	kg
Optics – lens	0.029	–	–	–	kg
Diffuser	–	–	0.32	1.5	kg
Coating	–	–	0.20	–	kg
Other	0.009	0.017	0.017	0.019	kg

Note: the reused steel fixture is not credited in module D as the net output from the product system is zero.

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Lise Hvid Horup Sørensen and Kristian Jelse Rambøll A/S Hannemanns Allé 53 DK-2300 København S Denmark Ramboll Sweden AB Vädursgatan 6 SE-412 50 Göteborg Sweden E-mail: lhhs@ramboll.dk
LCA software /background data	GaBi (version 9.2) Generic data are primarily based on life cycle inventory data from GaBi Professional Database 2019 and Ecoinvent version 3.6.
3rd party verifier	Linda Høibye, COWI A/S

General programme instructions
Version 2.0, www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product Category Rules/c-PCR
PCR Part B: Requirements on the EPD for Luminaires, lamps and components for luminaires, version 1.6, dated 2017-11-30.

Project report
Lise Hvid Horup Sørensen and Kristian Jelse. PR-Lighting systems-EN. Dated 2020-12-20

EN 15942

DS/EN 15942:2011 – ”Sustainability of construction works – Environmental product declarations – Communication format business-to-business”

ISO 14025
DS/EN ISO 14025:2010 – ”Environmental labels and declarations – Type III environmental declarations – Principles and procedures”

ISO 14040
DS/EN ISO 14040:2008 – ”Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ”Environmental management – Life cycle assessment – Requirements and guidelines”

Materialepas - DCMP

Materialepas (DCMP – Digital Construction Material Passport) er et sæt data der beskriver og definerer egenskaber ved materialer i produktet der giver dem værdi til nyttiggørelse, genbrug og genanvendelse

Dette midlertidige dokument er ikke en officielt DCMP-rapport, men bygger på udfyldelsen af et DCMP på VENUS armaturet af Fischer Lighting i DCMP Editor.

Ejer af passet:	Fischer Lighting	
Oprettet:	18-01-2023	
Senest ændret	31-01-2023	Rev. Nr.: 01
3. parts verificeret: Ja	Verificeringsorganisation: Transition ApS	

VENUS - Fischer Lighting

The purpose of the material passport is to provide essential information about a number of key areas relating to construction products and their impact on the environment, health and resource consumption.

The material passport's potential applications include use as a basis for the selection and specification of construction products, for documentation in certification processes (DGNB, BREEAM, LEED, etc.) and for Facility Management. This guarantees that the construction product meets legal requirements (EU and Danish legislation) as well as other company-specific requirements and expectations for sustainability.

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Identification

Product name	Venus
Manufacturer's Article numbers	FLK-0100980, FLK-0101417, FLK-0100894, FLK.0101047, FLX-0101196, FLK-0101052
Classifications	SFB-63, BIM7AA-636, CCS-K
Description	Venus is an antidote to the ubiquitous 60x60cm recessed ceiling light designed for modular acoustic t-rail ceilings but often also used in gypsum ceilings. This fixture is made from reclaimed housings that save up to 7,5 kg og steel per unit and comes in depths from 50-127 mm depending on the original design. No matter which type of reclaimed housing it always delivers the same look and light. The simple move to convert the square grid into a round light fitting brekas the monotomy of the grid and delivers an even lighting surface for ambient lighting conditions for offices, workplaces and the like. The electronics in the existing fixture are replaced and upgraded to LED, and additional components are added including a driver. The fixture follows the principles of Design for Disassembly. Furthermore, the product is elected, by Solar Impulse Foundation, to be among the 1000 most scalable sustainable solutions in the world.
Application	Ceiling fixture for installation in 60x60 system ceilings. The product is primarily used in office- and educational buildings.
Functional unit	pcs
Weight	6,0515 kg/pcs

Content

General

Is there a safety datasheet (SDS) available for this product?	No
Is there SDS available for one or more of the products subcomponents?	No
Is there an Environmental Product Declaration (EPD) available?	Yes
Name of the EPD provider	EPD Danmark
Name of EPD identifier	Linda Høibye
Functional unit	Pcs
Total percentage of recycled content in the product	64,6 %

Product content	Sub content	Exist at manufacturing (all stages)	Wt% of parent		Country of origin
Reused Steel Fixture		X	64,6	Is reused	Denmark
LED Board		X	8,1	-	China
	Aluminium plate	X	6,9	-	-
	Diodes	X	0,6	-	-
	Wiring	X	0,2	-	-
	Coating	X	0,3	-	-
Driver		X	1,9	-	Poland
Fixing		X	0,2	-	-
	Screws	X	0,1	-	-
	Magnets	X	0,1	-	-
	Space Nylon	X	0		
Diffuser		X	25,2	-	Taiwan
Cable		X	0,1	-	-
CE-sticker		X	0	-	-

Construction

Packaging

Returnable transport packaging	Yes
Re-usable packaging	Yes
Return Packaging	Yes
Packaging comment	Packaging of the final product consists of pallets, pallet frames and cardboard. In relation, the manufacturer offers an arrangement for a deposit on packaging.

Storage

Special storage requirements	No
Special surrounding material requirements	No
Storage comment	Indoor storage without contact with water and high humidity levels.

Operation

Special use or maintenance requirements	No
Special energy supply requirements	Yes
Reference lifetime (years)	15
Note	Reference life time is indicated accordingly to the PCR. The lifetime is potentially infinite as the different components of the light fixture can be replaced whenever the respective components lifetime has been reached. Fischer Lighting has as warranty period of 5 years of the overall product.
Critical moisture content	Yes
Operation information	Power Range 14-48W electricity Max LM (+- 10%) 7680 Colour Temp. 3000/4000 K Possibility of Human Centric Lighting, Dali and wireless controls

Indoor climate

Intended for indoor use Yes

Emission value

Testing standard	Type	Amount	Unit
Testing – day 3			
EN 16516:2017/FprA1	TVOC	< 2	µg/m^3
ISO 16000-3:2011	Formaldehyde	< 3	µg/m^3
EN 16516:2017/FprA1	VVOC	0	µg/m^3
EN 16516:2017/FprA1	SVOC	0	µg/m^3
EN 16516:2017/FprA1	TVOC	< 3	ug/m^{2}h
EN 16516:2017/FprA1	VVOC	0	ug/m^{2}h
EN 16516:2017/FprA1	SVOC	0	ug/m^{2}h
ISO 16000-3:2011	Formaldehyde	< 5	ug/m^{2}h
Testing- day 29			
ISO 16000-3:2011	Formaldehyde	< 3	µg/m^3
ISO 16000-3:2011	Formaldehyde	< 5	ug/m^{2}h
Testing – week 4			
EN 16516:2017/FprA1	TVOC	< 2	µg/m^3
EN 16516:2017/FprA1	TVOC	< 3	ug/m^{2}h

Resource potential

	Installation method	Disassembly
Installation options	Built-in ceiling panel system 60x60 - without electricity plug	Can be removed by hand or with simple tools: By releasing components by loosening brackets and screws or by tilting, pushing, pulling, lifting away, etc.
	Built-in ceiling panel system 60x60 - with electricity plug	Can be removed by hand or with simple tools: By releasing components by loosening brackets and screws or by tilting, pushing, pulling, lifting away, etc.

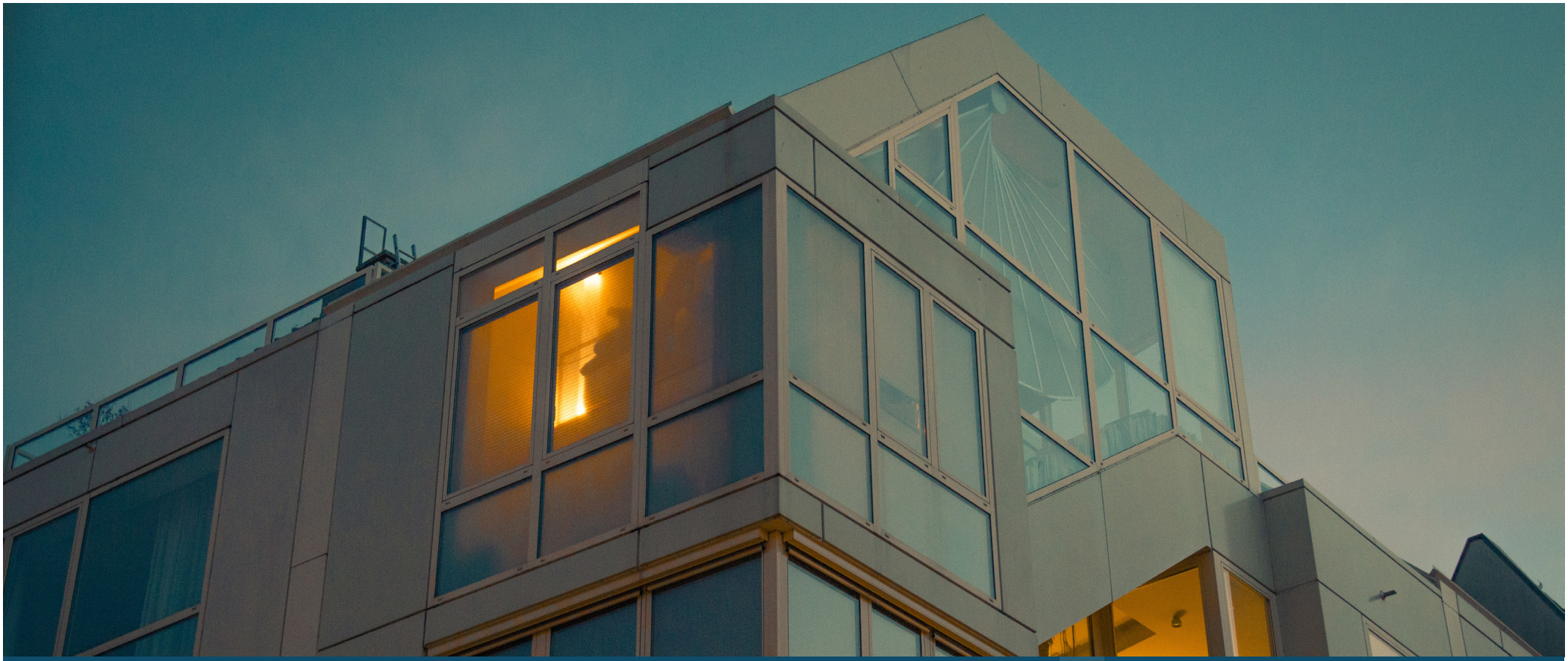
		Specify
Demountable without deterioration	Yes	
Procedures to protect health/ environment	No	
Disassembly of product	10. quick release/split click/ gravity	
Product consist of separate parts naturally	Yes	
Restrictions/ recommendations	Yes	It is recommended to reach out to the manufacturer if components need replacement or the fixture no longer is needed in the certain building. To be updated when QR-Code is clarified.
Take-back agreement	Yes	The manufacturer offers a take-back agreement. Contact the manufacturer for more information.
Lease option	Yes	The manufacturer offers a leasing option. Contact the manufacturer for more information.
HP 1 to HP 15 for original product	No	
HP 1 to HP 15 differs after application	No	
Material recovery possible	Yes	

Estimated future recovery potential in wt-%

Hazardous waste	0%
Landfill	0%
Energy utilization	0%
Recovered substitute product (may be included as downcycled, such as road fill, drainage, etc.)	0%

Recycling in new building – adding other (raw) materials ensures higher functional value (composites)	7,2%
Reuse in new construction – with lover functional value in buildings, decomposition, granulation, etc. but no added material	25,5%
Biodegradation, composting, returning to source without decomposition, or ecological loss of value	0%
Ready to recycle with the addition of material (similar functional value in the building)	0%
Ready to recycle after extensive cleaning (removal of mortar, paint, etc.) similar functional/economic value in the building	0%
Ready to recycle after simple cleaning with similar functional/economic value in the building	64,6%

FISCHER LIGHTING
FOR A BRIGHTER FUTURE



BÆREDYGTIG BELYSNING
I DGNB-CERTIFICERET BYGGERI

FISCHER LIGHTING
FOR A BRIGHTER FUTURE

Nu kan belysning også bidrage til DGNB-certificeringen

Størstedelen af alle nye LED armaturer designes i dag til at skulle smides ud efter brug. Inspireret af verdensmål nr. 3, 7 og 12 har Fischer Lighting i stedet udviklet et bæredygtigt lyskoncept, der giver bedre indeklima og arbejdsmiljø. Det er godt for både sundhed og produktivitet, og nu kan vi ovenikøbet sætte tal på effekten.

Fischer Lighting kan bidrage til en DGNB-certificering med point inden for en række kriterier. Antallet af point vil variere fra byggeri til byggeri.

I samarbejde med Viegand Maagøe og MOE har Fischer Lighting udviklet en dokumentationspakke, som gør det lettere for auditorer at beregne vores løsningers specifikke bidrag til de forskellige kriterier i DGNB-certificeringen.

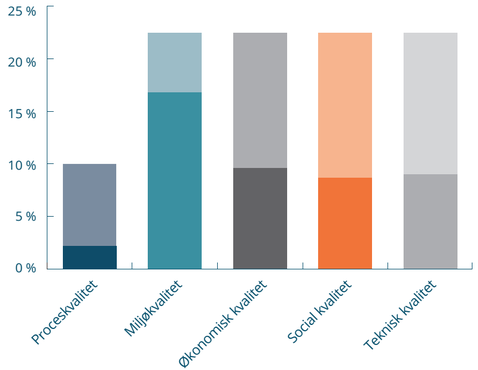
HVAD ER DGNB?

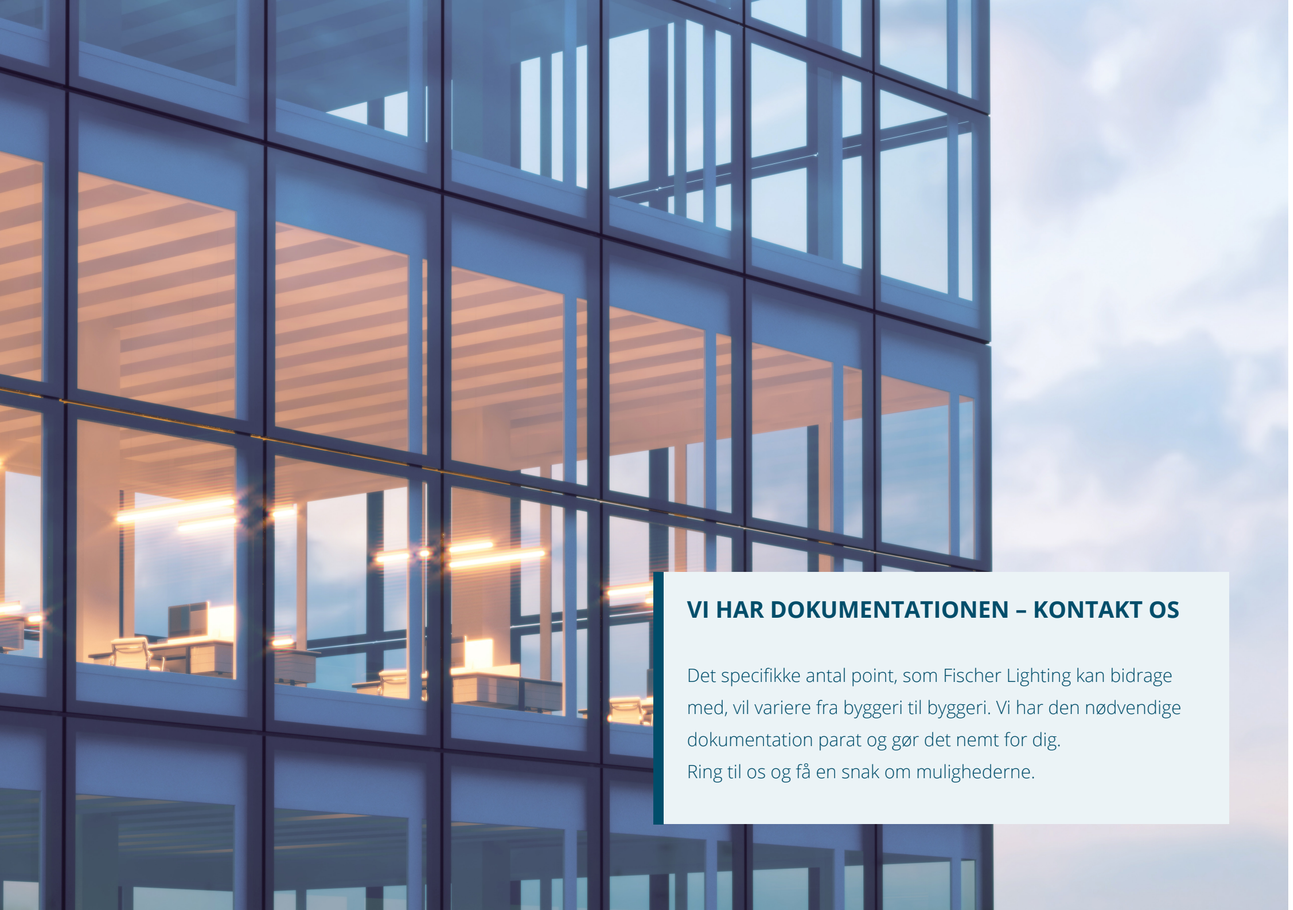
DGNB er en certificeringsstandard for bæredygtige bygninger. Certificeringen lægger vægt på miljømæssige, økonomiske og sociale forhold.
Non-profit-organisationen Green Building Council Denmark står bag den danske version af DGNB.

Mere information om DGNB kan findes her:
https://www.dk-gbc.dk

DGNB-certificeringen består af fem kategorier, som hver omfatter en række kriterier. Fischer Lighting kan bidrage til alle fem kategorier, men især inden for Miljøkvalitet kan vi gøre en forskel.

- Proceskvalitet: 2,2 % af 10 %
- Miljøkvalitet: 16,8 % af 22,5 %
- Økonomisk kvalitet: 9,6 % af 22,5 %
- Social kvalitet: 8,7 % af 22,5 %
- Teknisk kvalitet: 9 % af 22,5 %





VI HAR DOKUMENTATIONEN – KONTAKT OS

Det specifikke antal point, som Fischer Lighting kan bidrage med, vil variere fra byggeri til byggeri. Vi har den nødvendige dokumentation parat og gør det nemt for dig.
Ring til os og få en snak om mulighederne.

Fischer Lighting giver point til DGNB-regnskabet

Hvert år kasseres millioner af ellers velfungerende lamper til fordel for nye LED armaturer. Vi mener ikke, at der er nogen grund til at smide ud, hvis man i stedet kan forny og få noget, der er bedre og holder længere. Ved at genbruge eksisterende lysarmaturer kan man spare helt op til 42% CO_2 i forhold til at købe nye lysarmaturer, og det er ofte billigere end at købe nyt.

Fischer Lightings bæredygtige tilgang til belysning gør det til et attraktivt valg, som også kan give point til DGNB-regnskabet.

Fischer Lighting kan bidrage til alle de kriterier, som er listet i tabellen til højre. Det specifikke antal point, som Fischer Lighting kan bidrage med, afhænger af det enkelte byggeri.

Proceskvalitet	PRO 1.5	Vejledning om vedligehold og brug i bygningen	1,1 %
	PRO 2.2	Dokumentation af kvalitet i udførelsen	1,1 %
Miljøkvalitet	ENV 1.1	Livscyklusvurdering - Miljøpåvirkning	7,9 %
	ENV 1.2	Miljøricisi til byggevarer	3,4 %
	ENV 2.1	Livscyklusvurdering - Primærenergi	5,5 %
Økonomisk kvalitet	ECO 1.1	Bygningsrelaterede levetidsomkostninger	9,6 %
Social kvalitet	SOC 1.2	Indendørs luftkvalitet	2,6 %
	SOC 1.4	Visuel komfort	2,6 %
	SOC 1.5	Brugernes muligheder for styring af indeklimaet	1,7 %
	SOC 1.7	Tryghed og sikkerhed	0,9 %
	SOC 2.3	Forhold for cyklister	0,9 %
Teknisk kvalitet	TEC 1.4	De tekniske systemers tilpasningsevne	3,0 %
	TEC 1.5	Bygningens vedligehold og rengøringsvenlighed	3,0 %
	TEC 1.6	Egnethed med henblik på nedtagning og genanvendelse	1,5 %
	TEC 1.8	Dokumentation med miljøvaredeklarationer (EPD)	1,5 %

>> En bygnings aftryk er summen af de materialer, der former den. Derfor er byggevareproducenternes aktive valg om let tilgængelig dokumentation af deres produkter og fokus på bæredygtig udvikling af stor betydning for kvaliteten af det færdige byggeri. Som DGNB-konsulent giver det mig mulighed for tidligt at kunne levere velunderbygget rådgivning, så der kan træffes de optimale valg for kunden og projektet.

Stine Brink Rasmussen

DGNB-konsulent, energi- og indeklimarådgiver

MOE A/S

Om Fischer Lighting

Hos Fischer Lighting genbruger vi eksisterende lysarmaturer og producerer bæredygtige LED løsninger, som tilbyder al den funktionalitet, lyskvalitet og energibesparende teknologi, man finder hos almindelige LED armaturer.

Derudover kan vi installere den nyeste sundhedsfremmende LED teknologi, som skaber sundere og mere produktive mennesker. Vi arbejder med førende arkitekter og kan ikke kun opgradere teknologien, men også designet, så man får et helt nyt æstetisk udtryk.

Vi tilpasser løsningerne til jeres armaturer, lokaler og æstetik

At forny er bedre for miljøet og oftest nemmere og billigere end at købe nyt. Derfor producerer vi LED løsninger, til indbygning i eksisterende armaturer, og som tilbyder al den funktionalitet, lyskvalitet og energibesparende teknologi, man opnår med moderne LED.

Når det ikke er muligt at genbruge de eksisterende armaturer tilbyder vi nye og bæredygtigt designet armaturer, udviklet i samarbejde med førende arkitekter.

VÆLGER DU VORES LØSNINGER, VÆLGER DU EN GRØNNERE FREMTID

FISCHER LIGHTING
FOR A BRIGHTER FUTURE

OUR CONTRIBUTION TO A BRIGHTER FUTURE

3 GOOD HEALTH AND WELL-BEING
7 AFFORDABLE AND CLEAN ENERGY
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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DK-2720 Vanløse
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info@fischer-lighting.com
www.fischer-lighting.com

RETUR

ELRETUR EMBALLAGERETUR BATTERIRETUR TEKSTILRETUR

CERTIFIKAT FOR PRODUCENTANSVAR 2024

udstedt til

Fischer Lighting ApS

Tilmeldte produktkategorier

3. Lyskilder

4. Stort udstyr

5. Småt udstyr

Det bekræftes, at virksomhedens ansvar for indsamling og behandling af udtjente elektriske og elektroniske produkter fra ovenstående kategorier varetages af Elretur i henhold til gældende dansk lovgivning. I sin varetagelse af producentansvaret for virksomheden er Elretur garant for legitime affaldsstrømme samt kvalitet i data og registreringer til myndighederne. Gennem sit medlemskab i Elretur tager virksomheden et medansvar i arbejdet med at sikre mere og bedre genanvendelse og genbrug af elektrisk og elektronisk affald.

Virksomheden har indberettet de nødvendige oplysninger om mængder af markedsførte produkter i 2023.

Morten Harboe-Jepsen, Direktør

11 BÆREDYGTIGE BYER OG LOKALSAMFUND

12 ANSVARLIGT FORBRUG OG PRODUKTION

14 LIVET I HAVET

CERTIFIKAT

Dette certifikat tildeles:

Hillerød Kommune

for at upcycle egne gamle armaturer:

765 linjearmaturer fra Hillerød Rådhus

Hillerød Kommune hyldes for den bæredygtige indsats ved at upcycle egne gamle armaturer fra Hillerød Rådhus for at give dem nyt liv andre steder i kommunen.

Fischer Lighting tildeler certifikater til kunder, der driver en ansvarlig virksomhed, og som køber ind efter bæredygtige og cirkulære principper. I Fischer Lighting er vi glade for, at Hillerød Kommune vil være med til at redde de gamle armaturer fra at ende som skrot.

LØSNING
617 Philips linjearmaturerer i 1200 mm og 148 Phillips linjearmaturer i 1500 mm, forvandlet til ny bæredygtig belysning i smukt cirkulært design. Samlet på socialt værksted i Hillerød Kommune.

33.1t

CO_2 besparelse

2.985.706L

Vandbesparelse

Vi værdsætter valget af Fischer Lighting og ser frem til at fortsætte vores videre rejse sammen mod en mere bæredygtig verden.

Februar 2024

Bente Priess Andersen
CEO, Fischer Lighting

FISCHER LIGHTING
FOR A BRIGHTER FUTURE

Fischer Lighting forvandler affald til nye smukke lamper, der gør bygninger grønnere og mennesker sundere. Vi er en virksomhed med en unik cirkulær forretningsmodel baseret på tre bæredygtige koncepter ReUse, ReDesign og ReCreate.

CERTIFIKAT

Dette certifikat tildeles:

Tscherning

for at vælge upcyclede lamper til:

Tscherninghuset

Tscherning hyldes for den bæredygtige indsats ved at vælge upcyclede lamper til Tscherninghuset. Dermed har nedrivningsvirksomheden sparet mange unødige ressourcer ved at genbruge gamle lamper fremfor at købe nye.

Fischer Lighting tildeler certifikater til kunder, som køber ind efter bæredygtige og cirkulære principper, og som sammen med os er med til at give gamle lamper nyt liv og redde dem fra at ende som affald.

LØSNING
Fischer Lighting har i alt levret 162 forskellige lamper til Tscherninghuset, her kan blandt andet nævnes 10 grønne GAIA-lamper, som består af minimum 75 procent genbrugt PET fra plastikflasker.

Med denne lysløsning har Tscherning vægtmæssigt sparet i alt 438 kg stål og 201 kg aluminium fra at ende som affald, svarende til det CO_2 forbrug en benzinbil udleder, hvis den skulle have været 1,13 gange rundt om jorden samt et årsforbrug af frisk drikkevand for ca. 2300 personer.

5.3 ton

CO_2 besparelse

420.281 liter

Vandbesparelse

Vi værdsætter valget af Fischer Lighting som belysningsspartner og ser frem til at fortsætte vores videre rejse sammen mod en mere bæredygtig verden.

April 2024

Bente Priess Andersen
CEO, Fischer Lighting

Kilder: EEA-Europe, Unicef, CES data

FISCHER LIGHTING
FOR A BRIGHTER FUTURE

Fischer Lighting forvandler affald til nye smukke lamper, der gør bygninger grønnere og mennesker sundere. Vi er en virksomhed med en unik cirkulær forretningsmodel baseret på tre bæredygtige koncepter ReUse, ReDesign og ReCreate.