ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

CitySoul gen2 LED Large

Signify N.V.

EPD HUB, HUB-3715

Published on 15.01.2026, last updated on 15.01.2026, valid until 15.01.2031

MANUFACTURER AND SITE

Manufacturer	Signify N.V.
Address	High Tech Campus 48, 5656 AE Eindhoven, The Netherlands
Contact details	sustainability@signify.com
Website	https://www.signify.com/global
Place of production	VALLADOLID, SPAIN
Place(s) of raw material origin	APAC, EU
Place(s) of installation and use	EU
Period for data	Calendar Year 2023

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR version 1.2, 24 Mar 2025
Sector	Electrical product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, B6, and modules C1-C4, D
EPD author	Signify / Sustainability
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

PRODUCT SPECIFICATION

Product name	CitySoul gen2 LED Large
Product number / reference	912300024413 / BPP531 LED120-4S/830 II DM50 SRT IACZ-4-
GTIN (Global Trade Item Number)	Not applicable
NOBB (Norwegian Building Product Database)	Not applicable
A1-A3 Specific data (%)	2.93

PRODUCT DESCRIPTION

CitySoul LED gen2 is one of the most versatile and inspirational LED urban street lighting families designed by us to date. This highly efficient range delivers excellent lighting levels whilst also providing the right ambience for every urban application, from the suburbs to the city center. This modular city lighting family has evolved with new innovations such as the Lyre and the Accent bracket, making it the ideal toolbox for every urban context. To give your cityscape a coherent, elegant and discreet identity, the design is flatter, completely round, and the transitions with the spigot and bracket entirely flush. It also comes in two sizes and is suitable for side-entry, post-top, catenary and suspended mounting. CitySoul LED gen2 is highly efficient and easy to maintain. Thanks to the built in LEDGINE-O engine, and the wide range of application-tailored optics, this urban lighting solution delivers the right amount of light and in the right direction on your street, enabling further energy savings. The luminaires can even be equipped with our dedicated light recipe that preserves dark skies. CitySoul LED gen2 is also future ready with a choice of one or two System Ready (SR) sockets that enable the luminaire to be paired with both standalone and advanced control and lighting software applications such as Interact from Signify. In addition, every CitySoul LED gen2 luminaire is uniquely identifiable, thanks to the Signify Service tag app. By simply scanning a QR code, placed inside the door of the mast or directly on the luminaire, you can instantly access the

This EPD is intended for business-to-business and/or business-to-consumer communication. Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. 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.

configuration of the luminaire. This makes maintenance and programing operations faster and easier, and enables you to create a digital library of lighting assets and spare parts.

PRODUCT CLASSIFICATION

Declared operating voltage, Volt	220-240
Light source colour temperature, Kelvin	3000
Protection index for water and dust (IP)	66
Impact resistance index (IK)	8
Luminous flux, Lumens	10080
Electrical power, Watt	81
Luminous efficiency, Lm/W	124.4
Additional characteristic	Not applicable

ABOUT THE MANUFACTURER

Signify is the world leader in lighting for professionals, consumers and lighting for the Internet of Things. Our energy efficient lighting products, systems and services enable our customers to enjoy a superior quality of light, and make people's lives safer and more comfortable, businesses more productive and cities more liveable.

For more information, please visit: https://www.signify.com/global

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	75	APAC , EU
Minerals	12.95	APAC , EU
Fossil materials	12.05	APAC , EU
Bio-based materials	0	

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.438

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass, kg	15.965
Mass of packaging, kg	1.155
Functional unit (from PEP PSR0014)	Provide lighting that delivers an outgoing artificial luminous flux of 1000 lumens during a reference lifetime of 35000 hours
Reference service life (years)	25
Assigned lifetime (hours)	100000
GWP-total, A1-A3 (kg CO_2e)	146
GWP-fossil, A1-A3 (kg CO_2e)	146
Secondary material, inputs (%)	48.9
Secondary material, outputs (%)	59.7
Total energy use, A1-A3 (kWh)	481
Net freshwater use, A1-A3 (m^3)	6.24E-01

LIFE CYCLE ASSESSMENT

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Installation stage		Use stage							End of life stage				Beyond the system
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	X	ND	X	X	X	X	X
Raw materials	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demo.	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling

Modules not declared = ND.

CUT - OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. There is no neglected unit process more than 1% of total mass or energy flows. The module-specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, ancillary materials, energy & water consumption, material loss and waste generation at the manufacturing site are attributed to the bill of materials of the products, therefore, they are allocated by partitioning the quantities on the base of the total production in kg throughout the year. Thus, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

Proxy data is used for certain materials due to their unavailability in the database. Conservative choices have been adopted when exact information was missing. Regarding module C1-C4: EOL scenarios are based on default values from EN 50693. For stages description please refer to section Product life cycle in this EPD report.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA Luminaire EPD Generator v2.2.7. The LCA and EPD have been prepared according to the reference standards, EN 50693, and ISO 14040/14044. Ecoinvent v 3.10.1 and One Click LCA databases were used as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, cut-off, EN 15804+A2'.

No other sources were used in the modelling of this EPD.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	Not applicable

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production. The material losses occurring during the manufacturing processes are treated as per the waste handling practices in the factory, while scenario assumptions are made in the absence of exact data. The study also considers the fuels used by machines as well as losses during electricity transmission.

The product is made of metals, plastics, and electronic components. All components are transported to the production facility, where the main manufacturing processes primarily are associated with assembly. A2 transport distances are calculated always taking the capital city of component country of origin as a starting point and exact manufacturing location as destination. The finished product can be packaged with polyethylene, cardboard, and/or paper as packaging material before shipment to customers. Manufacturing loss, ancillaries and wastes are calculated according to the data that each manufacturing site is sharing with Signify. The total annual amount of waste in kg is allocated to the total annual production in kg at the specific manufacturing site responsible to produce the studied product. Thus, it is possible to allocate it according to the weight of the product analysed in this study.

Co-product allocation is neglected as revenue of co-product is very low, hence, the waste undergoes a conservative waste treatment.
The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

A4 transport distances are calculated always taking the exact manufacturing location to customer location. If the customer's location is defined as a country or its capital city, the calculation is made to the respective capital city. If the customer's location is specified as a region, the distance is calculated to the capital city of the best-performing sales country within that region. The transportation method is a combination of lorry and container ship where needed. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Environmental impacts from installation include waste packaging materials (A5). The packaging waste treatment is assumed to be conservative with incineration without energy recovery. The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

PRODUCT USE AND MAINTENANCE (B1-B7)

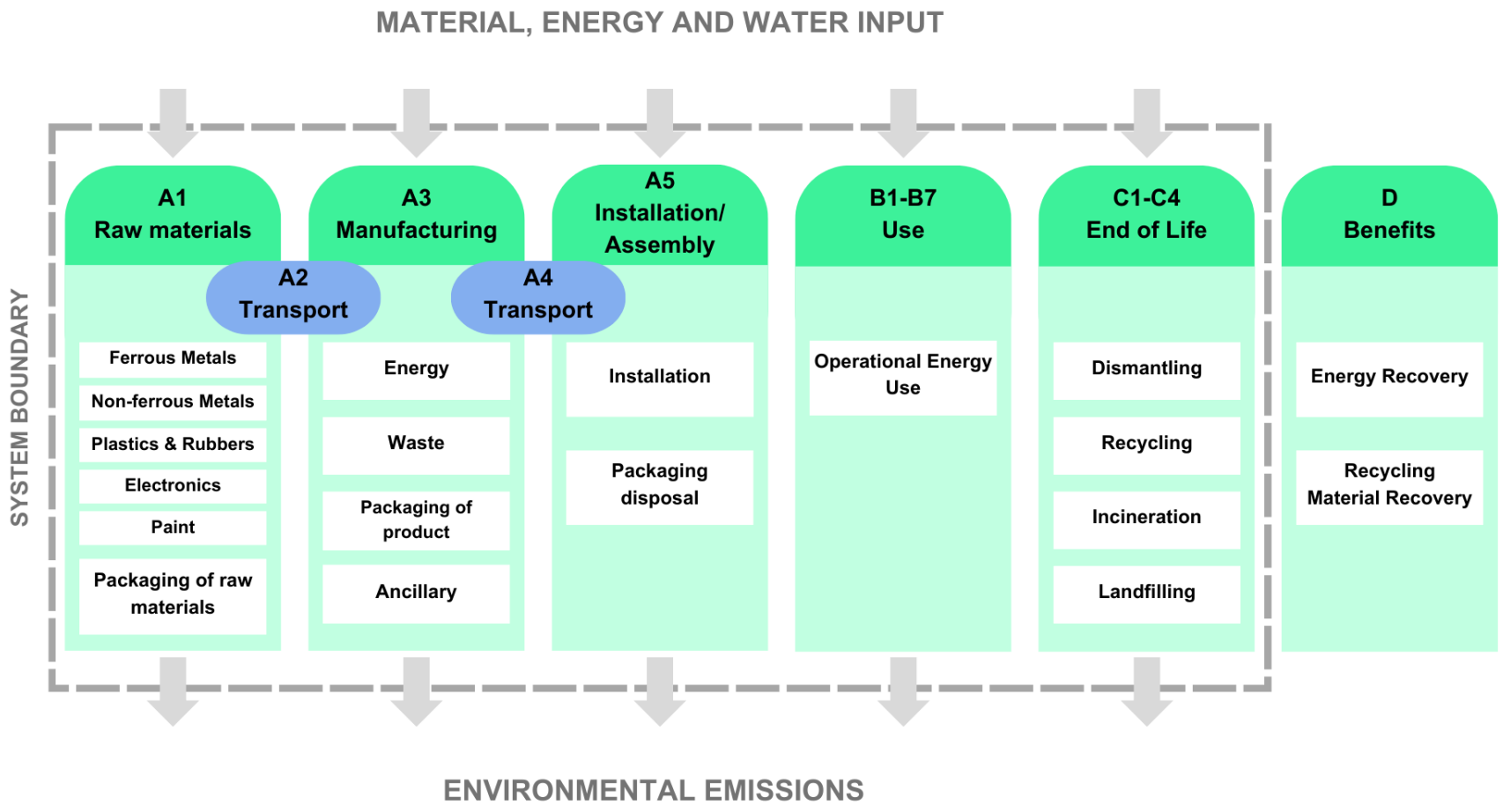
During the use phase, the product consumes electricity (B6), which is calculated multiplying the Wattage x Assigned lifetime (hours) x Country energy mix factor. To know which Country energy mix was used in this EPD, please refer to Annex 2.

The Reference service life in years is calculated according to the main application type of the product, based on annual operating hours. Impacts due to electricity production include direct emissions to air, transformation, and transmission losses.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment centre. The transport distance is 150 km while the transportation method is assumed to be lorry (C2). According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study, the default values from table G.4 of EN 50693 is used for treating materials in different waste treatment methods. Due to the material and energy recovery potential of parts in the lighting system, the end-of-life product is converted into recycled raw materials, while the energy recovered from incineration displaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

LIFE CYCLE FLOW DIAGRAM - SYSTEM BOUNDARY



ENVIRONMENTAL IMPACT DATA, RESULTS PER DECLARED UNIT

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1.42E+02	1.09E+00	2.84E+00	1.46E+02	5.09E+00	1.79E+00	ND	ND	ND	ND	ND	2.67E+03	ND	0.00E+00	4.63E-01	1.01E+00	6.29E-01	-1.30E+01
GWP – fossil	kg CO_2e	1.41E+02	1.09E+00	3.92E+00	1.46E+02	5.09E+00	1.95E-01	ND	ND	ND	ND	ND	2.65E+03	ND	0.00E+00	4.63E-01	1.01E+00	1.11E+00	-1.30E+01
GWP – biogenic	kg CO_2e	4.73E-01	2.33E-04	-1.12E+00	-6.50E-01	1.15E-03	1.60E+00	ND	ND	ND	ND	ND	5.95E+00	ND	0.00E+00	1.01E-04	-7.58E-04	-4.77E-01	-3.65E-03
GWP – LULUC	kg CO_2e	2.27E-01	5.02E-04	3.72E-02	2.65E-01	2.28E-03	2.71E-05	ND	ND	ND	ND	ND	8.14E+00	ND	0.00E+00	2.05E-04	3.23E-04	1.93E-04	-3.83E-03
Ozone depletion pot.	kg CFC_{-11}e	2.51E-06	1.60E-08	9.34E-08	2.62E-06	7.51E-08	1.02E-09	ND	ND	ND	ND	ND	4.89E-05	ND	0.00E+00	6.47E-09	2.95E-09	2.54E-09	-4.99E-08
Acidification potential	mol H^+e	9.17E-01	8.32E-03	1.37E-02	9.39E-01	1.73E-02	4.44E-04	ND	ND	ND	ND	ND	1.56E+01	ND	0.00E+00	1.54E-03	2.71E-03	1.01E-03	-1.40E-01
EP-freshwater[2)]	kg Pe	5.28E-02	7.63E-05	1.08E-03	5.39E-02	3.96E-04	7.45E-06	ND	ND	ND	ND	ND	2.47E+00	ND	0.00E+00	3.60E-05	1.34E-04	9.33E-05	-7.52E-03
EP-marine	kg Ne	1.53E-01	2.32E-03	5.13E-03	1.60E-01	5.70E-03	2.09E-04	ND	ND	ND	ND	ND	2.45E+00	ND	0.00E+00	5.00E-04	6.65E-04	2.11E-03	-1.68E-02
EP-terrestrial	mol Ne	1.57E+00	2.55E-02	3.61E-02	1.64E+00	6.20E-02	1.90E-03	ND	ND	ND	ND	ND	2.19E+01	ND	0.00E+00	5.44E-03	7.20E-03	4.17E-03	-1.74E-01
POCP ("smog")[3)]	kg NMVOCe	5.19E-01	8.48E-03	1.71E-02	5.45E-01	2.56E-02	5.39E-04	ND	ND	ND	ND	ND	7.22E+00	ND	0.00E+00	2.15E-03	2.09E-03	1.43E-03	-5.24E-02
ADP-minerals & metals[4)]	kg Sbe	3.80E-03	2.71E-06	2.38E-05	3.83E-03	1.42E-05	2.20E-07	ND	ND	ND	ND	ND	3.58E-02	ND	0.00E+00	1.52E-06	1.35E-05	3.77E-07	-2.66E-04
ADP-fossil resources	MJ	1.56E+03	1.54E+01	5.45E+01	1.63E+03	7.38E+01	7.60E-01	ND	ND	ND	ND	ND	6.17E+04	ND	0.00E+00	6.49E+00	3.13E+00	2.26E+00	-1.33E+02
Water use[5)]	m^3e depr.	3.81E+01	7.12E-02	1.50E+00	3.96E+01	3.65E-01	9.10E-02	ND	ND	ND	ND	ND	1.68E+03	ND	0.00E+00	3.01E-02	9.67E-02	6.32E-02	-1.14E+00

1) GWP = Global Warming Potential. 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e. 3) POCP = Photochemical ozone formation. 4) ADP = Abiotic depletion potential. 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.09E-05	9.62E-08	2.18E-07	1.12E-05	5.09E-07	5.39E-09	ND	ND	ND	ND	ND	5.56E-05	ND	0.00E+00	3.67E-08	3.62E-08	1.75E-08	-7.02E-07
Ionizing radiation[6)]	kBq U235e	5.11E+00	1.25E-02	1.44E-01	5.27E+00	6.43E-02	9.27E-04	ND	ND	ND	ND	ND	1.70E+03	ND	0.00E+00	5.25E-03	1.19E-02	3.62E-03	-7.81E-01
Ecotoxicity (freshwater)	CTUe	9.01E+02	2.02E+00	1.56E+01	9.18E+02	1.04E+01	2.22E+00	ND	ND	ND	ND	ND	9.40E+03	ND	0.00E+00	1.03E+00	3.16E+00	3.24E+02	-3.73E+01
Human toxicity, cancer	CTUh	1.04E-07	1.88E-10	1.47E-09	1.06E-07	8.40E-10	1.06E-10	ND	ND	ND	ND	ND	8.96E-07	ND	0.00E+00	7.87E-11	2.52E-10	8.18E-10	-5.69E-09
Human tox. non-cancer	CTUh	2.60E-06	9.06E-09	4.23E-08	2.65E-06	4.78E-08	4.27E-09	ND	ND	ND	ND	ND	4.65E-05	ND	0.00E+00	4.06E-09	1.43E-08	1.60E-08	-2.63E-07
SQP[7)]	-	4.68E+02	1.34E+01	1.44E+02	6.25E+02	7.43E+01	3.69E-01	ND	ND	ND	ND	ND	1.37E+04	ND	0.00E+00	3.88E+00	5.29E+00	3.19E+00	-2.77E+01

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1.35E+02	1.97E-01	1.82E+01	1.54E+02	1.01E+00	-1.96E+01	ND	ND	ND	ND	ND	1.69E+04	ND	0.00E+00	8.90E-02	4.49E-01	-8.80E+00	-4.14E+00
Renew. PER as material	MJ	4.70E+00	0.00E+00	9.52E+00	1.42E+01	0.00E+00	-1.42E+01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-1.65E-02	-3.06E-02	0.00E+00
Total use of renew. PER	MJ	1.40E+02	1.97E-01	2.77E+01	1.68E+02	1.01E+00	-3.38E+01	ND	ND	ND	ND	ND	1.69E+04	ND	0.00E+00	8.90E-02	4.33E-01	-8.83E+00	-4.14E+00
Non-re. PER as energy	MJ	1.52E+03	1.54E+01	3.73E+01	1.58E+03	7.38E+01	-1.13E+00	ND	ND	ND	ND	ND	6.17E+04	ND	0.00E+00	6.49E+00	-8.52E+00	-1.81E+01	-1.33E+02
Non-re. PER as material	MJ	2.89E+01	0.00E+00	-1.31E+00	2.76E+01	0.00E+00	-2.35E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-7.25E+00	-1.80E+01	0.00E+00
Total use of non-re. PER	MJ	1.55E+03	1.54E+01	3.60E+01	1.60E+03	7.38E+01	-3.49E+00	ND	ND	ND	ND	ND	6.17E+04	ND	0.00E+00	6.49E+00	-1.58E+01	-3.61E+01	-1.33E+02
Secondary materials	kg	7.81E+00	0.00E+00	0.00E+00	7.81E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renew. secondary fuels	MJ	5.04E-02	7.35E-05	1.13E-01	1.63E-01	3.99E-04	9.74E-06	ND	ND	ND	ND	ND	8.14E-02	ND	0.00E+00	3.71E-05	1.52E-04	3.04E-05	-4.41E-04
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	5.87E-01	2.10E-03	3.48E-02	6.24E-01	1.09E-02	1.48E-03	ND	ND	ND	ND	ND	5.33E+01	ND	0.00E+00	8.60E-04	1.58E-03	-1.13E-02	-4.89E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2.45E+01	2.52E-02	1.97E-01	2.48E+01	1.25E-01	2.39E-02	ND	ND	ND	ND	ND	1.56E+02	ND	0.00E+00	1.13E-02	3.55E-02	4.10E-02	-2.58E+00
Non-hazardous waste	kg	4.68E+02	4.52E-01	1.85E+01	4.87E+02	2.31E+00	1.24E+00	ND	ND	ND	ND	ND	1.21E+04	ND	0.00E+00	2.12E-01	1.73E+00	2.23E+01	-2.71E+01
Radioactive waste	kg	1.26E-03	3.05E-06	3.49E-05	1.30E-03	1.57E-05	2.32E-07	ND	ND	ND	ND	ND	4.38E-01	ND	0.00E+00	1.29E-06	2.92E-06	8.88E-07	-1.88E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	1.94E-01	1.94E-01	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	9.53E+00	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	3.65E+00	0.00E+00	0.00E+00
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	1.54E+00	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	2.12E+00	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1.41E+02	1.08E+00	4.06E+00	1.47E+02	5.06E+00	1.94E-01	ND	ND	ND	ND	ND	2.65E+03	ND	0.00E+00	4.60E-01	1.01E+00	1.60E+00	-1.30E+01
Ozone depletion Pot.	kg CFC_{-11}e	2.17E-06	1.27E-08	8.80E-08	2.27E-06	5.99E-08	8.65E-10	ND	ND	ND	ND	ND	4.08E-05	ND	0.00E+00	5.17E-09	2.46E-09	2.05E-09	-4.60E-08
Acidification	kg SO_2e	7.69E-01	6.54E-03	1.02E-02	7.86E-01	1.32E-02	3.26E-04	ND	ND	ND	ND	ND	1.33E+01	ND	0.00E+00	1.18E-03	2.17E-03	7.42E-04	-1.21E-01
Eutrophication	kg PO_4^3e	1.63E-01	1.03E-03	7.80E-03	1.71E-01	3.23E-03	1.02E-04	ND	ND	ND	ND	ND	1.72E+00	ND	0.00E+00	2.87E-04	3.39E-04	1.14E-03	-7.53E-03
POCP (“smog”)	kg C_2H_4e	5.96E-02	4.18E-04	1.16E-03	6.12E-02	1.18E-03	2.47E-05	ND	ND	ND	ND	ND	7.24E-01	ND	0.00E+00	1.06E-04	1.29E-04	1.73E-04	-6.97E-03
ADP-elements	kg Sbe	3.77E-03	2.64E-06	2.33E-05	3.80E-03	1.38E-05	1.83E-07	ND	ND	ND	ND	ND	3.57E-02	ND	0.00E+00	1.48E-06	1.34E-05	3.51E-07	-2.65E-04
ADP-fossil	MJ	1.48E+03	1.52E+01	5.21E+01	1.54E+03	7.28E+01	7.46E-01	ND	ND	ND	ND	ND	3.17E+04	ND	0.00E+00	6.41E+00	2.94E+00	2.20E+00	-1.21E+02

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG 9)	kg CO2e	1.42E+02	1.09E+00	3.96E+00	1.47E+02	5.09E+00	1.95E-01	ND	ND	ND	ND	ND	2.66E+03	ND	0.00E+00	4.63E-01	1.01E+00	1.11E+00	-1.30E+01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

ENVIRONMENTAL IMPACT DATA, RESULTS PER FUNCTIONAL UNIT

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2 éq/FU	4.93E+00	3.77E-02	9.85E-02	5.07E+00	1.77E-01	6.23E-02	ND	ND	ND	ND	ND	9.25E+01	ND	0.00E+00	1.61E-02	3.51E-02	2.18E-02	-4.53E-01
GWP – fossil	kg CO_2 éq/FU	4.91E+00	3.77E-02	1.36E-01	5.08E+00	1.77E-01	6.76E-03	ND	ND	ND	ND	ND	9.21E+01	ND	0.00E+00	1.61E-02	3.51E-02	3.84E-02	-4.53E-01
GWP – biogenic	kg CO_2 éq/FU	1.64E-02	8.10E-06	-3.90E-02	-2.26E-02	4.00E-05	5.55E-02	ND	ND	ND	ND	ND	2.06E-01	ND	0.00E+00	3.51E-06	-2.63E-05	-1.66E-02	-1.27E-04
GWP – LULUC	kg CO_2 éq/FU	7.88E-03	1.74E-05	1.29E-03	9.19E-03	7.90E-05	9.42E-07	ND	ND	ND	ND	ND	2.83E-01	ND	0.00E+00	7.11E-06	1.12E-05	6.72E-06	-1.33E-04
Ozone depletion pot.	kg CFC_{11}e/FU	8.73E-08	5.54E-10	3.24E-09	9.11E-08	2.61E-09	3.53E-11	ND	ND	ND	ND	ND	1.70E-06	ND	0.00E+00	2.25E-10	1.02E-10	8.82E-11	-1.73E-09
Acidification potential	mole H^+e/FU	3.18E-02	2.89E-04	4.76E-04	3.26E-02	6.02E-04	1.54E-05	ND	ND	ND	ND	ND	5.41E-01	ND	0.00E+00	5.35E-05	9.42E-05	3.52E-05	-4.87E-03
EP-freshwater[2)]	kg Pe/FU	1.83E-03	2.65E-06	3.73E-05	1.87E-03	1.37E-05	2.59E-07	ND	ND	ND	ND	ND	8.57E-02	ND	0.00E+00	1.25E-06	4.67E-06	3.24E-06	-2.61E-04
EP-marine	kg Ne/FU	5.31E-03	8.05E-05	1.78E-04	5.57E-03	1.98E-04	7.27E-06	ND	ND	ND	ND	ND	8.49E-02	ND	0.00E+00	1.73E-05	2.31E-05	7.32E-05	-5.83E-04
EP-terrestrial	mol Ne/FU	5.47E-02	8.86E-04	1.25E-03	5.68E-02	2.15E-03	6.61E-05	ND	ND	ND	ND	ND	7.61E-01	ND	0.00E+00	1.89E-04	2.50E-04	1.45E-04	-6.05E-03
POCP ("smog")[3)]	kg NMVOCe/	1.80E-02	2.94E-04	5.94E-04	1.89E-02	8.88E-04	1.87E-05	ND	ND	ND	ND	ND	2.51E-01	ND	0.00E+00	7.46E-05	7.27E-05	4.96E-05	-1.82E-03
ADP-minerals & metals[4)]	kg Sbe/FU	1.32E-04	9.40E-08	8.27E-07	1.33E-04	4.93E-07	7.62E-09	ND	ND	ND	ND	ND	1.24E-03	ND	0.00E+00	5.28E-08	4.67E-07	1.31E-08	-9.25E-06
ADP-fossil resources	MJ/FU	5.42E+01	5.33E-01	1.89E+00	5.67E+01	2.56E+00	2.64E-02	ND	ND	ND	ND	ND	2.14E+03	ND	0.00E+00	2.25E-01	1.09E-01	7.85E-02	-4.63E+00
Water use[5)]	m^3e priv. /FU	1.32E+00	2.47E-03	5.20E-02	1.38E+00	1.27E-02	3.16E-03	ND	ND	ND	ND	ND	5.84E+01	ND	0.00E+00	1.05E-03	3.36E-03	2.20E-03	-3.96E-02

1) GWP = Global Warming Potential. 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e. 3) POCP = Photochemical ozone formation. 4) ADP = Abiotic depletion potential. 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence /FU	3.77E-07	3.34E-09	7.55E-09	3.88E-07	1.77E-08	1.87E-10	ND	ND	ND	ND	ND	1.93E-06	ND	0.00E+00	1.27E-09	1.26E-09	6.09E-10	-2.44E-08
Ionizing radiation[6)]	kBq U235e/FU	1.78E-01	4.32E-04	5.00E-03	1.83E-01	2.23E-03	3.22E-05	ND	ND	ND	ND	ND	5.92E+01	ND	0.00E+00	1.82E-04	4.13E-04	1.26E-04	-2.71E-02
Ecotoxicity (freshwater)	CTUe/FU	3.13E+01	7.03E-02	5.40E-01	3.19E+01	3.63E-01	7.73E-02	ND	ND	ND	ND	ND	3.26E+02	ND	0.00E+00	3.56E-02	1.10E-01	1.12E+01	-1.30E+00
Human toxicity, cancer	CTUh/FU	3.61E-09	6.51E-12	5.10E-11	3.66E-09	2.91E-11	3.69E-12	ND	ND	ND	ND	ND	3.11E-08	ND	0.00E+00	2.73E-12	8.76E-12	2.84E-11	-1.97E-10
Human tox. non-cancer	CTUh/FU	9.03E-08	3.15E-10	1.47E-09	9.21E-08	1.66E-09	1.48E-10	ND	ND	ND	ND	ND	1.61E-06	ND	0.00E+00	1.41E-10	4.97E-10	5.56E-10	-9.14E-09
SQP[7)]	-/FU	1.63E+01	4.67E-01	4.99E+00	2.17E+01	2.58E+00	1.28E-02	ND	ND	ND	ND	ND	4.77E+02	ND	0.00E+00	1.35E-01	1.84E-01	1.11E-01	-9.62E-01

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ/FU	4.69E+00	6.85E-03	6.30E-01	5.33E+00	3.51E-02	-6.80E-01	ND	ND	ND	ND	ND	5.88E+02	ND	0.00E+00	3.09E-03	1.56E-02	-3.06E-01	-1.44E-01
Renew. PER as material	MJ/FU	1.63E-01	0.00E+00	3.31E-01	4.94E-01	0.00E+00	-4.92E-01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-5.73E-04	-1.06E-03	0.00E+00
Total use of renew. PER	MJ/FU	4.86E+00	6.85E-03	9.61E-01	5.82E+00	3.51E-02	-1.17E+00	ND	ND	ND	ND	ND	5.88E+02	ND	0.00E+00	3.09E-03	1.50E-02	-3.07E-01	-1.44E-01
Non-re. PER as energy	MJ/FU	5.29E+01	5.33E-01	1.30E+00	5.48E+01	2.56E+00	-3.94E-02	ND	ND	ND	ND	ND	2.14E+03	ND	0.00E+00	2.25E-01	-2.96E-01	-6.29E-01	-4.63E+00
Non-re. PER as material	MJ/FU	1.00E+00	0.00E+00	-4.54E-02	9.57E-01	0.00E+00	-8.17E-02	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-2.52E-01	-6.23E-01	0.00E+00
Total use of non-re. PER	MJ/FU	5.39E+01	5.33E-01	1.25E+00	5.57E+01	2.56E+00	-1.21E-01	ND	ND	ND	ND	ND	2.14E+03	ND	0.00E+00	2.25E-01	-5.48E-01	-1.25E+00	-4.63E+00
Secondary materials	kg/FU	2.71E-01	0.00E+00	0.00E+00	2.71E-01	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renew. secondary fuels	MJ/FU	1.75E-03	2.55E-06	3.92E-03	5.67E-03	1.39E-05	3.38E-07	ND	ND	ND	ND	ND	2.83E-03	ND	0.00E+00	1.29E-06	5.28E-06	1.06E-06	-1.53E-05
Non-ren. secondary fuels	MJ/FU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3/FU	2.04E-02	7.28E-05	1.21E-03	2.17E-02	3.79E-04	5.15E-05	ND	ND	ND	ND	ND	1.85E+00	ND	0.00E+00	2.99E-05	5.47E-05	-3.93E-04	-1.70E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg/FU	8.52E-01	8.75E-04	6.84E-03	8.60E-01	4.34E-03	8.31E-04	ND	ND	ND	ND	ND	5.42E+00	ND	0.00E+00	3.93E-04	1.23E-03	1.42E-03	-8.97E-02
Non-hazardous waste	kg/FU	1.62E+01	1.57E-02	6.42E-01	1.69E+01	8.04E-02	4.29E-02	ND	ND	ND	ND	ND	4.19E+02	ND	0.00E+00	7.37E-03	6.02E-02	7.76E-01	-9.41E-01
Radioactive waste	kg/FU	4.39E-05	1.06E-07	1.21E-06	4.52E-05	5.46E-07	8.06E-09	ND	ND	ND	ND	ND	1.52E-02	ND	0.00E+00	4.47E-08	1.02E-07	3.08E-08	-6.54E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	6.74E-03	6.74E-03	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	3.31E-01	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	1.27E-01	0.00E+00	0.00E+00
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	5.34E-02	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	7.34E-02	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2 éq./FU	4.91E+00	3.75E-02	1.41E-01	5.09E+00	1.76E-01	6.74E-03	ND	ND	ND	ND	ND	9.21E+01	ND	0.00E+00	1.60E-02	3.51E-02	5.55E-02	-4.50E-01
Ozone depletion Pot.	kg CFC_{-11}e/FU	7.55E-08	4.42E-10	3.06E-09	7.89E-08	2.08E-09	3.00E-11	ND	ND	ND	ND	ND	1.42E-06	ND	0.00E+00	1.79E-10	8.53E-11	7.12E-11	-1.60E-09
Acidification	kg SO_2e/FU	2.67E-02	2.27E-04	3.54E-04	2.73E-02	4.60E-04	1.13E-05	ND	ND	ND	ND	ND	4.61E-01	ND	0.00E+00	4.10E-05	7.52E-05	2.58E-05	-4.20E-03
Eutrophication	kg PO_4^3e/FU	5.64E-03	3.59E-05	2.71E-04	5.95E-03	1.12E-04	3.54E-06	ND	ND	ND	ND	ND	5.97E-02	ND	0.00E+00	9.97E-06	1.18E-05	3.95E-05	-2.61E-04
POCP (“smog”)	kg C_2H_4e/FU	2.07E-03	1.45E-05	4.03E-05	2.13E-03	4.10E-05	8.56E-07	ND	ND	ND	ND	ND	2.51E-02	ND	0.00E+00	3.67E-06	4.49E-06	6.00E-06	-2.42E-04
ADP-elements	kg Sbe/FU	1.31E-04	9.17E-08	8.10E-07	1.32E-04	4.80E-07	6.35E-09	ND	ND	ND	ND	ND	1.24E-03	ND	0.00E+00	5.15E-08	4.65E-07	1.22E-08	-9.21E-06
ADP-fossil	MJ/FU	5.12E+01	5.26E-01	1.81E+00	5.36E+01	2.53E+00	2.59E-02	ND	ND	ND	ND	ND	1.10E+03	ND	0.00E+00	2.22E-01	1.02E-01	7.65E-02	-4.19E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG [9]	kg CO_2e/FU	4.92E+00	3.77E-02	1.37E-01	5.09E+00	1.77E-01	6.76E-03	ND	ND	ND	ND	ND	9.23E+01	ND	0.00E+00	1.61E-02	3.51E-02	3.84E-02	-4.53E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation – A3 (Energy data source)

1. Energy supply, electricity production, co-generation oil and gas, Heat and power co-generation, natural gas, combined cycle power plant, 400MW electrical, Spain, ecoinvent 3.10.1, 0.0249 kgCO2e/MJ
2. Energy supply, electricity production, solar photovoltaic, Electricity production, photovoltaic, 570kWp open ground installation, multi-Si, Spain, ecoinvent 3.10.1, 0.0673 kgCO2e/kWh

Transport scenario documentation - A4

1. Transport, freight, lorry >32 metric ton, EURO5, 2760.17 km
2. Transport, freight, sea, container ship, 0 km

Installation scenario documentation - A5 (Waste materials data source)

1. Market for corrugated board box, 1.0 kg
2. Market for packaging film, low density polyethylene, 0.05 kg
3. Market for packaging film, low density polyethylene, 0.0021 kg
4. Market for printed paper, offset, 0.05 kg
5. Market for printed paper, offset, 0.05 kg
6. Market for printed paper, offset, 0.001 kg
7. Market for printed paper, offset, 0.001 kg
8. Market for printed paper, offset, 0.001 kg

Use stages scenario documentation - B6-B7 (Energy data source)

1. Energy supply, electricity transformation and distribution, distribution low voltage, Market group for electricity, low voltage, Europe, 8100.0 kWh

TRANSPORT SCENARIO DOCUMENTATION - A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50 %
Bulk density of transported products / kg/m3	1.53E+02
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1

INSTALLATION SCENARIO DOCUMENTATION - A5

Scenario parameter	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0
Water use / m³	0
Other resource use / kg	0
Direct emissions to ambient air, soil and water / kg	0

USE STAGES SCENARIO DOCUMENTATION - B6-B7 USE OF ENERGY AND WATER

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	Not applicable
Net fresh water consumption / m^3	0
Power output of equipment / kW	81
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc. / Units as appropriate	For more details see product classification table and product description.
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants / Units as appropriate	For more details see product classification table and product description.

END OF LIFE SCENARIO DOCUMENTATION

Scenario information	Value
Collection process – kg collected separately	15.965
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	9.53E+00
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	5.93E+00
Scenario assumptions e.g. transportation	Lorry, 16-32 metric ton, EURO5; 150 km

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

Program assistant: Xinyuan Zhang

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools
Tool verifier: Hai Ha Nguyen
Tool verification validity: 28 March 2025 - 27 March 2028

APPENDIX 1

MATERIAL COMPOSITION

The product material composition is illustrated in the table below. The material weight is given in grams and in percentage on total product weight.

Table 1: Material composition

Material	Weight (g)	Weight-%
Aluminium	8940.27	69.36
Copper	23.53	0.18
Glass	1880.00	14.58
Other Plastics	1106.50	8.58
Paint	156.73	1.22
PBC Alu	42.20	0.33
PCB Copper	107.53	0.83
PCB Iron	106.25	0.82
PCB Non-ferrous metal	0.25	0.00
PCB Support	138.16	1.07
PCB Tin	7.71	0.06
Silica Sand	204.50	1.59
Steel	176.57	1.37

Tin	0.27	0.00

APPENDIX 2

USE PHASE (B6) VALUES FOR DIFFERENT COUNTRY MIX

In this EPD the B6 impact has been calculated using the energy mix of EU. The table in this appendix is useful for conversion and comparison of B6 values with other energy country mix. The Global Warming Potential Total (GWP tot) value is illustrated for each country. The value refers to 1 kwh.

Example on how to use the table:

If for example this EPD was done according to EU energy mix and you want to see how the GWP total changes according to a Finland country energy mix, you can take the original value in the results table here highlighted in yellow:

ENVIRONMENTAL IMPACT DATA, RESULTS PER DECLARED UNIT

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1]	kg CO_2e	4.44E-01	4.75E-03	2.34E-02	4.72E-01	9.50E-04	8.13E-03	ND	ND	ND	ND	ND	4.06E+02	ND	0.00E+00	5.50E-04	2.23E-03	7.33E-04	-2.82E-02

Divide that value according to the EU value from the following table (EU = 3.30E-01) and then multilplying for the Finland value from the same table (FINLAND = 1.54E-01).

Thus, the calculation of this example would be:

New B6 GWP tot for Finland = (4.06E-02 / 3.30E-01) x 1.54E-01 = 1.89E-02.

Country	GWP tot (kg CO2 eq. per kwh)		
AFRICA	7.30E-01	GERMANY	3.90E-01
APAC	9.50E-01	INDIA	1.50E+00
AUSTRALIA	8.40E-01	ITALY	3.50E-01
AUSTRIA	2.30E-01	LATAM	3.90E-01
BELGIUM	2.00E-01	NAM	4.50E-01
CHINA	1.02E+00	NETHERLANDS	3.90E-01
DENMARK	1.60E-01	NORWAY	4.50E-02
EU	3.30E-01	ROW	7.30E-01
FINLAND	1.54E-01	SPAIN	2.10E-01
FRANCE	8.70E-02	SWEDEN	3.70E-02
		UK	2.60E-01

Source Ecoinvent 3.10.1

APPENDIX 3 - EPD HUB ALIGNED

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a reference variant of a product family, based on various light management scenarios and power inputs of the luminaires within the same product familiy.

To calculate the Scaled Impact (*SI*), we have followed the below methods:

1. Calculate the power scaling factor (PSF), which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF), where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system). The presented controls factors values in Table A1 are based on BS EN 15193-1:2017. Please refer to this publication or contact Signify directly for more information.

$$TSF = PSF * CSF$$

Table 1: Light management function (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

3. Lastly, the GWP of the base variant is then scaled by the TSF.

$$Scaled\ Impact = GWP_{case} * TSF$$

The following list of product configurations is not exhaustive. Please use the formula defined in point 1 above to calculate the exact power scaling factor (PSF) for any specific configuration.

Table 2: GWP per scaling factor (EPD Hub aligned)

	12NC or Product Family Code	Description	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
							NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
1	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/740	4816	31.0	155.4	0.383	0.383	0.287	0.287	0.210	1021.9	766.4	766.4	562.0
2	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/740	5676	36.5	155.5	0.451	0.451	0.338	0.338	0.248	1203.1	902.4	902.4	661.7
3	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/740	6290	42.0	149.8	0.519	0.519	0.389	0.389	0.285	1384.4	1038.3	1038.3	761.4
4	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/740	7310	48.0	152.3	0.593	0.593	0.444	0.444	0.326	1582.2	1186.7	1186.7	870.2
5	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/740	8160	54.0	151.1	0.667	0.667	0.500	0.500	0.367	1780.0	1335.0	1335.0	979.0
6	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/740	8925	61.0	146.3	0.753	0.753	0.565	0.565	0.414	2010.7	1508.1	1508.1	1105.9
7	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/740	9660	67.0	144.2	0.827	0.827	0.620	0.620	0.455	2208.5	1656.4	1656.4	1214.7
8	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/740	10625	70.0	151.8	0.864	0.864	0.648	0.648	0.475	2307.4	1730.6	1730.6	1269.1
9	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/740	11475	76.0	151.0	0.938	0.938	0.704	0.704	0.516	2505.2	1878.9	1878.9	1377.9
10	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/740	12180	82.0	148.5	1.012	1.012	0.759	0.759	0.557	2703.0	2027.2	2027.2	1486.6

11	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/740	13020	89.0	146.3	1.099	1.099	0.824	0.824	0.604	2933.7	2200.3	2200.3	1613.5
12	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/740	13860	95.0	145.9	1.173	1.173	0.880	0.880	0.645	3131.5	2348.6	2348.6	1722.3
13	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/740	14700	102.0	144.1	1.259	1.259	0.944	0.944	0.693	3362.2	2521.7	2521.7	1849.2
14	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/740	15540	108.0	143.9	1.333	1.333	1.000	1.000	0.733	3560.0	2670.0	2670.0	1958.0
15	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/740	16380	116.0	141.2	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
16	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/740	17640	116.0	152.1	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
17	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/740	18480	122.0	151.5	1.506	1.506	1.130	1.130	0.828	4021.5	3016.1	3016.1	2211.8
18	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED225-4S/740	19090	128.0	149.1	1.580	1.580	1.185	1.185	0.869	4219.3	3164.4	3164.4	2320.6
19	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED235-4S/740	19920	136.0	146.5	1.679	1.679	1.259	1.259	0.923	4483.0	3362.2	3362.2	2465.6
20	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED240-4S/740	19920	138.0	144.3	1.704	1.704	1.278	1.278	0.937	4548.9	3411.7	3411.7	2501.9
21	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/730	4644	33.0	140.7	0.407	0.407	0.306	0.306	0.224	1087.8	815.8	815.8	598.3
22	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/730	5610	39.0	143.8	0.481	0.481	0.361	0.361	0.265	1285.6	964.2	964.2	707.1
23	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/730	6460	45.0	143.6	0.556	0.556	0.417	0.417	0.306	1483.3	1112.5	1112.5	815.8
24	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/730	7310	51.0	143.3	0.630	0.630	0.472	0.472	0.346	1681.1	1260.8	1260.8	924.6

25	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/730	8160	58.0	140.7	0.716	0.716	0.537	0.537	0.394	1911.9	1433.9	1433.9	1051.5
26	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/730	8820	65.0	135.7	0.802	0.802	0.602	0.602	0.441	2142.6	1606.9	1606.9	1178.4
27	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/730	9660	72.0	134.2	0.889	0.889	0.667	0.667	0.489	2373.3	1780.0	1780.0	1305.3
28	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/730	10625	75.0	141.7	0.926	0.926	0.694	0.694	0.509	2472.2	1854.2	1854.2	1359.7
29	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/730	11340	81.0	140.0	1.000	1.000	0.750	0.750	0.550	2670.0	2002.5	2002.5	1468.5
30	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/730	12180	88.0	138.4	1.086	1.086	0.815	0.815	0.598	2900.7	2175.6	2175.6	1595.4
31	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/730	13020	95.0	137.1	1.173	1.173	0.880	0.880	0.645	3131.5	2348.6	2348.6	1722.3
32	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/730	13860	102.0	135.9	1.259	1.259	0.944	0.944	0.693	3362.2	2521.7	2521.7	1849.2
33	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/730	14700	110.0	133.6	1.358	1.358	1.019	1.019	0.747	3625.9	2719.4	2719.4	1994.3
34	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/730	15540	116.0	134.0	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
35	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/730	16380	116.0	141.2	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
36	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/730	17640	124.0	142.3	1.531	1.531	1.148	1.148	0.842	4087.4	3065.6	3065.6	2248.1
37	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/730	18260	130.0	140.5	1.605	1.605	1.204	1.204	0.883	4285.2	3213.9	3213.9	2356.9
38	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED225-4S/730	19090	138.0	138.3	1.704	1.704	1.278	1.278	0.937	4548.9	3411.7	3411.7	2501.9

39	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/727	4590	37.0	124.1	0.457	0.457	0.343	0.343	0.251	1219.6	914.7	914.7	670.8
40	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/727	5610	43.5	129.0	0.537	0.537	0.403	0.403	0.295	1433.9	1075.4	1075.4	788.6
41	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/727	6460	51.0	126.7	0.630	0.630	0.472	0.472	0.346	1681.1	1260.8	1260.8	924.6
42	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/727	7310	58.0	126.0	0.716	0.716	0.537	0.537	0.394	1911.9	1433.9	1433.9	1051.5
43	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/727	8064	66.0	122.2	0.815	0.815	0.611	0.611	0.448	2175.6	1631.7	1631.7	1196.6
44	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/727	8820	74.0	119.2	0.914	0.914	0.685	0.685	0.502	2439.3	1829.4	1829.4	1341.6
45	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/727	9660	77.0	125.5	0.951	0.951	0.713	0.713	0.523	2538.1	1903.6	1903.6	1396.0
46	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/727	10500	85.0	123.5	1.049	1.049	0.787	0.787	0.577	2801.9	2101.4	2101.4	1541.0
47	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/727	11340	92.0	123.3	1.136	1.136	0.852	0.852	0.625	3032.6	2274.4	2274.4	1667.9
48	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/727	12180	100.0	121.8	1.235	1.235	0.926	0.926	0.679	3296.3	2472.2	2472.2	1813.0
49	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/727	13020	108.0	120.6	1.333	1.333	1.000	1.000	0.733	3560.0	2670.0	2670.0	1958.0
50	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/727	13860	116.0	119.5	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
51	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/727	14525	124.0	117.1	1.531	1.531	1.148	1.148	0.842	4087.4	3065.6	3065.6	2248.1
52	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/727	15540	126.0	123.3	1.556	1.556	1.167	1.167	0.856	4153.3	3115.0	3115.0	2284.3

53	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/727	16185	134.0	120.8	1.654	1.654	1.241	1.241	0.910	4417.0	3312.8	3312.8	2429.4
54	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/727	17430	142.0	122.7	1.753	1.753	1.315	1.315	0.964	4680.7	3510.6	3510.6	2574.4
55	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/727	18040	148.0	121.9	1.827	1.827	1.370	1.370	1.005	4878.5	3658.9	3658.9	2683.2
56	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/722	5100	45.0	113.3	0.556	0.556	0.417	0.417	0.306	1483.3	1112.5	1112.5	815.8
57	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/722	5950	53.0	112.3	0.654	0.654	0.491	0.491	0.360	1747.0	1310.3	1310.3	960.9
58	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/722	6800	61.0	111.5	0.753	0.753	0.565	0.565	0.414	2010.7	1508.1	1508.1	1105.9
59	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/722	7560	70.0	108.0	0.864	0.864	0.648	0.648	0.475	2307.4	1730.6	1730.6	1269.1
60	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/722	8500	75.0	113.3	0.926	0.926	0.694	0.694	0.509	2472.2	1854.2	1854.2	1359.7
61	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/722	9240	83.0	111.3	1.025	1.025	0.769	0.769	0.564	2735.9	2051.9	2051.9	1504.8
62	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/722	10080	91.0	110.8	1.123	1.123	0.843	0.843	0.618	2999.6	2249.7	2249.7	1649.8
63	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/722	10920	100.0	109.2	1.235	1.235	0.926	0.926	0.679	3296.3	2472.2	2472.2	1813.0
64	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/722	11760	110.0	106.9	1.358	1.358	1.019	1.019	0.747	3625.9	2719.4	2719.4	1994.3
65	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/722	12600	118.0	106.8	1.457	1.457	1.093	1.093	0.801	3889.6	2917.2	2917.2	2139.3
66	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/722	13440	120.0	112.0	1.481	1.481	1.111	1.111	0.815	3955.6	2966.7	2966.7	2175.6

67	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/722	14110	128.0	110.2	1.580	1.580	1.185	1.185	0.869	4219.3	3164.4	3164.4	2320.6
68	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/722	14940	138.0	108.3	1.704	1.704	1.278	1.278	0.937	4548.9	3411.7	3411.7	2501.9
69	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/840	5100	39.0	130.8	0.481	0.481	0.361	0.361	0.265	1285.6	964.2	964.2	707.1
70	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/840	5950	45.5	130.8	0.562	0.562	0.421	0.421	0.309	1499.8	1124.9	1124.9	824.9
71	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/840	6800	53.0	128.3	0.654	0.654	0.491	0.491	0.360	1747.0	1310.3	1310.3	960.9
72	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/840	7650	60.0	127.5	0.741	0.741	0.556	0.556	0.407	1977.8	1483.3	1483.3	1087.8
73	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/840	8500	64.0	132.8	0.790	0.790	0.593	0.593	0.435	2109.6	1582.2	1582.2	1160.3
74	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/840	9350	71.0	131.7	0.877	0.877	0.657	0.657	0.482	2340.4	1755.3	1755.3	1287.2
75	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/840	10080	78.0	129.2	0.963	0.963	0.722	0.722	0.530	2571.1	1928.3	1928.3	1414.1
76	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/840	10920	85.0	128.5	1.049	1.049	0.787	0.787	0.577	2801.9	2101.4	2101.4	1541.0
77	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/840	11760	93.0	126.5	1.148	1.148	0.861	0.861	0.631	3065.6	2299.2	2299.2	1686.1
78	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/840	12600	100.0	126.0	1.235	1.235	0.926	0.926	0.679	3296.3	2472.2	2472.2	1813.0
79	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/840	13440	102.0	131.8	1.259	1.259	0.944	0.944	0.693	3362.2	2521.7	2521.7	1849.2
80	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/840	14280	110.0	129.8	1.358	1.358	1.019	1.019	0.747	3625.9	2719.4	2719.4	1994.3

81	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/840	15120	116.0	130.3	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
82	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED200-4S/840	16600	132.0	125.8	1.630	1.630	1.222	1.222	0.896	4351.1	3263.3	3263.3	2393.1
83	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/830	5100	40.0	127.5	0.494	0.494	0.370	0.370	0.272	1318.5	988.9	988.9	725.2
84	BGP/BPP/BRP/BSP/BVP531	BGP/BRP/BPP/BSP/BVP531 LED70-4S/830	5950	47.0	126.6	0.580	0.580	0.435	0.435	0.319	1549.3	1161.9	1161.9	852.1
85	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/830	6800	54.0	125.9	0.667	0.667	0.500	0.500	0.367	1780.0	1335.0	1335.0	979.0
86	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/830	7650	62.0	123.4	0.765	0.765	0.574	0.574	0.421	2043.7	1532.8	1532.8	1124.0
87	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/830	8500	66.0	128.8	0.815	0.815	0.611	0.611	0.448	2175.6	1631.7	1631.7	1196.6
88	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/830	9350	73.0	128.1	0.901	0.901	0.676	0.676	0.496	2406.3	1804.7	1804.7	1323.5
89	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/830	10080	81.0	124.4	1.000	1.000	0.750	0.750	0.550	2670.0	2002.5	2002.5	1468.5
90	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/830	10920	88.0	124.1	1.086	1.086	0.815	0.815	0.598	2900.7	2175.6	2175.6	1595.4
91	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/830	11760	96.0	122.5	1.185	1.185	0.889	0.889	0.652	3164.4	2373.3	2373.3	1740.4
92	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/830	12600	104.0	121.2	1.284	1.284	0.963	0.963	0.706	3428.1	2571.1	2571.1	1885.5
93	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/830	13440	106.0	126.8	1.309	1.309	0.981	0.981	0.720	3494.1	2620.6	2620.6	1921.7
94	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/830	14280	114.0	125.3	1.407	1.407	1.056	1.056	0.774	3757.8	2818.3	2818.3	2066.8

95	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/830	15120	122.0	123.9	1.506	1.506	1.130	1.130	0.828	4021.5	3016.1	3016.1	2211.8
96	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED200-4S/830	16600	136.0	122.1	1.679	1.679	1.259	1.259	0.923	4483.0	3362.2	3362.2	2465.6
97	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/827	5100	43.0	118.6	0.531	0.531	0.398	0.398	0.292	1417.4	1063.1	1063.1	779.6
98	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/827	5950	51.0	116.7	0.630	0.630	0.472	0.472	0.346	1681.1	1260.8	1260.8	924.6
99	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/827	6800	59.0	115.3	0.728	0.728	0.546	0.546	0.401	1944.8	1458.6	1458.6	1069.6
100	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/827	7650	64.0	119.5	0.790	0.790	0.593	0.593	0.435	2109.6	1582.2	1582.2	1160.3
101	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/827	8500	72.0	118.1	0.889	0.889	0.667	0.667	0.489	2373.3	1780.0	1780.0	1305.3
102	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/827	9240	80.0	115.5	0.988	0.988	0.741	0.741	0.543	2637.0	1977.8	1977.8	1450.4
103	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/827	10080	87.0	115.9	1.074	1.074	0.806	0.806	0.591	2867.8	2150.8	2150.8	1577.3
104	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/827	10920	96.0	113.8	1.185	1.185	0.889	0.889	0.652	3164.4	2373.3	2373.3	1740.4
105	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/827	11760	104.0	113.1	1.284	1.284	0.963	0.963	0.706	3428.1	2571.1	2571.1	1885.5
106	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/827	12600	108.0	116.7	1.333	1.333	1.000	1.000	0.733	3560.0	2670.0	2670.0	1958.0
107	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/827	13440	116.0	115.9	1.432	1.432	1.074	1.074	0.788	3823.7	2867.8	2867.8	2103.0
108	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/827	14280	124.0	115.2	1.531	1.531	1.148	1.148	0.842	4087.4	3065.6	3065.6	2248.1

PEP ECOPASSPORT ALIGNED

This section represents the scaling method for the **B6 module**. following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a refernce variant of a product family. based on various light management functions. the lumen output (O_{lum}) and reference service life (*RSL*) of each product within the same product familiy.

To calculate the Scaled Impact (SI_{pep}). we have followed the below methods:

1. Calculate the power scaling factor (PSF). which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Using this scaled GWP. we then can apply the PEP Ecopassport method for calculating the environmental impact of the functional unit for a luminary (1000 lumens over 35000 hours). applied to B6. where the Functional Unit application considers the lumen output (Olum) and reference service lifetime (RSL) of the product to estimate the final environmental impact. The scaled impact (SIpep) is presented in Table A4.

$$GSF = \frac{FU_{pep}}{FU_p} = \frac{1.000}{O_{lum}} * \frac{35.000}{RSL}$$

3. Calculate the GWP scaling factor (P*GSF*). by multiplying the PSF by the GSF.

$$PGSF = PSF * GSF$$

4. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF). where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system). as presented in Table A1.

$$TSF = PGSF * CSF$$

Table 3: Light management functions (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

5. Lastly. the GWP of the base variant is then scaled by the TSF.

$$Scaled\ GWP = GWP_{case} * TSF$$

Table 4: Impact per scaling factor (PEP EcoPassport aligned)

	12NC or Product Family Code	Description	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
							NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
1	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/740	4816	31.0	155.4	0.383	0.028	0.021	0.021	0.015	74.3	55.7	55.7	40.8
2	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/740	5676	36.5	155.5	0.451	0.028	0.021	0.021	0.015	74.2	55.6	55.6	40.8
3	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/740	6290	42.0	149.8	0.519	0.029	0.022	0.022	0.016	77.0	57.8	57.8	42.4
4	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/740	7310	48.0	152.3	0.593	0.028	0.021	0.021	0.016	75.8	56.8	56.8	41.7
5	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/740	8160	54.0	151.1	0.667	0.029	0.021	0.021	0.016	76.3	57.3	57.3	42.0
6	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/740	8925	61.0	146.3	0.753	0.030	0.022	0.022	0.016	78.9	59.1	59.1	43.4
7	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/740	9660	67.0	144.2	0.827	0.030	0.022	0.022	0.016	80.0	60.0	60.0	44.0
8	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/740	10625	70.0	151.8	0.9	0.028	0.021	0.021	0.016	76.0	57.0	57.0	41.8
9	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/740	11475	76.0	151.0	0.9	0.029	0.021	0.021	0.016	76.4	57.3	57.3	42.0
10	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/740	12180	82.0	148.5	1.0	0.029	0.022	0.022	0.016	77.7	58.3	58.3	42.7
11	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/740	13020	89.0	146.3	1.1	0.030	0.022	0.022	0.016	78.9	59.1	59.1	43.4
12	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/740	13860	95.0	145.9	1.2	0.030	0.022	0.022	0.016	79.1	59.3	59.3	43.5

13	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/740	14700	102.0	144.1	1.3	0.030	0.022	0.022	0.016	80.1	60.0	60.0	44.0
14	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/740	15540	108.0	143.9	1.3	0.030	0.023	0.023	0.017	80.2	60.1	60.1	44.1
15	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/740	16380	116.0	141.2	1.4	0.031	0.023	0.023	0.017	81.7	61.3	61.3	44.9
16	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/740	17640	116.0	152.1	1.4	0.028	0.021	0.021	0.016	75.9	56.9	56.9	41.7
17	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/740	18480	122.0	151.5	1.5	0.029	0.021	0.021	0.016	76.2	57.1	57.1	41.9
18	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED225-4S/740	19090	128.0	149.1	1.6	0.029	0.022	0.022	0.016	77.4	58.0	58.0	42.5
19	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED235-4S/740	19920	136.0	146.5	1.7	0.030	0.022	0.022	0.016	78.8	59.1	59.1	43.3
20	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED240-4S/740	19920	138.0	144.3	1.7	0.030	0.022	0.022	0.016	79.9	59.9	59.9	44.0
21	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/730	4644	33.0	140.7	0.4	0.031	0.023	0.023	0.017	82.0	61.5	61.5	45.1
22	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/730	5610	39.0	143.8	0.5	0.030	0.023	0.023	0.017	80.2	60.2	60.2	44.1
23	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/730	6460	45.0	143.6	0.6	0.030	0.023	0.023	0.017	80.4	60.3	60.3	44.2
24	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/730	7310	51.0	143.3	0.6	0.030	0.023	0.023	0.017	80.5	60.4	60.4	44.3
25	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/730	8160	58.0	140.7	0.7	0.031	0.023	0.023	0.017	82.0	61.5	61.5	45.1
26	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/730	8820	65.0	135.7	0.8	0.032	0.024	0.024	0.018	85.0	63.8	63.8	46.8

27	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/730	9660	72.0	134.2	0.9	0.032	0.024	0.024	0.018	86.0	64.5	64.5	47.3
28	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/730	10625	75.0	141.7	0.9	0.031	0.023	0.023	0.017	81.4	61.1	61.1	44.8
29	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/730	11340	81.0	140.0	1.0	0.031	0.023	0.023	0.017	82.4	61.8	61.8	45.3
30	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/730	12180	88.0	138.4	1.1	0.031	0.023	0.023	0.017	83.4	62.5	62.5	45.8
31	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/730	13020	95.0	137.1	1.2	0.032	0.024	0.024	0.017	84.2	63.1	63.1	46.3
32	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/730	13860	102.0	135.9	1.3	0.032	0.024	0.024	0.017	84.9	63.7	63.7	46.7
33	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/730	14700	110.0	133.6	1.4	0.032	0.024	0.024	0.018	86.3	64.7	64.7	47.5
34	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/730	15540	116.0	134.0	1.4	0.032	0.024	0.024	0.018	86.1	64.6	64.6	47.4
35	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/730	16380	116.0	141.2	1.4	0.031	0.023	0.023	0.017	81.7	61.3	61.3	44.9
36	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/730	17640	124.0	142.3	1.5	0.030	0.023	0.023	0.017	81.1	60.8	60.8	44.6
37	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/730	18260	130.0	140.5	1.6	0.031	0.023	0.023	0.017	82.1	61.6	61.6	45.2
38	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED225-4S/730	19090	138.0	138.3	1.7	0.031	0.023	0.023	0.017	83.4	62.6	62.6	45.9
39	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED55-4S/727	4590	37.0	124.1	0.5	0.035	0.026	0.026	0.019	93.0	69.8	69.8	51.2
40	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED65-4S/727	5610	43.5	129.0	0.5	0.034	0.025	0.025	0.018	89.5	67.1	67.1	49.2

41	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED75-4S/727	6460	51.0	126.7	0.6	0.034	0.026	0.026	0.019	91.1	68.3	68.3	50.1
42	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED85-4S/727	7310	58.0	126.0	0.7	0.034	0.026	0.026	0.019	91.5	68.7	68.7	50.3
43	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED95-4S/727	8064	66.0	122.2	0.8	0.035	0.027	0.027	0.019	94.4	70.8	70.8	51.9
44	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED105-4S/727	8820	74.0	119.2	0.9	0.036	0.027	0.027	0.020	96.8	72.6	72.6	53.2
45	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED115-4S/727	9660	77.0	125.5	1.0	0.034	0.026	0.026	0.019	92.0	69.0	69.0	50.6
46	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED125-4S/727	10500	85.0	123.5	1.0	0.035	0.026	0.026	0.019	93.4	70.0	70.0	51.4
47	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED135-4S/727	11340	92.0	123.3	1.1	0.035	0.026	0.026	0.019	93.6	70.2	70.2	51.5
48	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED145-4S/727	12180	100.0	121.8	1.2	0.035	0.027	0.027	0.020	94.7	71.0	71.0	52.1
49	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED155-4S/727	13020	108.0	120.6	1.3	0.036	0.027	0.027	0.020	95.7	71.8	71.8	52.6
50	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED165-4S/727	13860	116.0	119.5	1.4	0.036	0.027	0.027	0.020	96.6	72.4	72.4	53.1
51	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED175-4S/727	14525	124.0	117.1	1.5	0.037	0.028	0.028	0.020	98.5	73.9	73.9	54.2
52	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED185-4S/727	15540	126.0	123.3	1.6	0.035	0.026	0.026	0.019	93.5	70.2	70.2	51.4
53	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED195-4S/727	16185	134.0	120.8	1.7	0.036	0.027	0.027	0.020	95.5	71.6	71.6	52.5
54	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED205-4S/727	17430	142.0	122.7	1.8	0.035	0.026	0.026	0.019	94.0	70.5	70.5	51.7

55	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED215-4S/727	18040	148.0	121.9	1.8	0.035	0.027	0.027	0.019	94.6	71.0	71.0	52.1
56	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/722	5100	45.0	113.3	0.6	0.038	0.029	0.029	0.021	101.8	76.3	76.3	56.0
57	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/722	5950	53.0	112.3	0.7	0.038	0.029	0.029	0.021	102.8	77.1	77.1	56.5
58	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/722	6800	61.0	111.5	0.8	0.039	0.029	0.029	0.021	103.5	77.6	77.6	56.9
59	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/722	7560	70.0	108.0	0.9	0.040	0.030	0.030	0.022	106.8	80.1	80.1	58.8
60	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/722	8500	75.0	113.3	0.9	0.038	0.029	0.029	0.021	101.8	76.3	76.3	56.0
61	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/722	9240	83.0	111.3	1.0	0.039	0.029	0.029	0.021	103.6	77.7	77.7	57.0
62	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/722	10080	91.0	110.8	1.1	0.039	0.029	0.029	0.021	104.2	78.1	78.1	57.3
63	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/722	10920	100.0	109.2	1.2	0.040	0.030	0.030	0.022	105.7	79.2	79.2	58.1
64	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/722	11760	110.0	106.9	1.4	0.040	0.030	0.030	0.022	107.9	80.9	80.9	59.4
65	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/722	12600	118.0	106.8	1.5	0.040	0.030	0.030	0.022	108.0	81.0	81.0	59.4
66	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/722	13440	120.0	112.0	1.5	0.039	0.029	0.029	0.021	103.0	77.3	77.3	56.7
67	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/722	14110	128.0	110.2	1.6	0.039	0.029	0.029	0.022	104.7	78.5	78.5	57.6
68	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/722	14940	138.0	108.3	1.7	0.040	0.030	0.030	0.022	106.6	79.9	79.9	58.6

69	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/840	5100	39.0	130.8	0.5	0.033	0.025	0.025	0.018	88.2	66.2	66.2	48.5
70	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/840	5950	45.5	130.8	0.6	0.033	0.025	0.025	0.018	88.2	66.2	66.2	48.5
71	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/840	6800	53.0	128.3	0.7	0.034	0.025	0.025	0.019	89.9	67.4	67.4	49.5
72	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/840	7650	60.0	127.5	0.7	0.034	0.025	0.025	0.019	90.5	67.9	67.9	49.8
73	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/840	8500	64.0	132.8	0.8	0.033	0.024	0.024	0.018	86.9	65.2	65.2	47.8
74	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/840	9350	71.0	131.7	0.9	0.033	0.025	0.025	0.018	87.6	65.7	65.7	48.2
75	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/840	10080	78.0	129.2	1.0	0.033	0.025	0.025	0.018	89.3	67.0	67.0	49.1
76	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/840	10920	85.0	128.5	1.0	0.034	0.025	0.025	0.018	89.8	67.4	67.4	49.4
77	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/840	11760	93.0	126.5	1.1	0.034	0.026	0.026	0.019	91.2	68.4	68.4	50.2
78	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/840	12600	100.0	126.0	1.2	0.034	0.026	0.026	0.019	91.6	68.7	68.7	50.4
79	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/840	13440	102.0	131.8	1.3	0.033	0.025	0.025	0.018	87.6	65.7	65.7	48.2
80	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/840	14280	110.0	129.8	1.4	0.033	0.025	0.025	0.018	88.9	66.7	66.7	48.9
81	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/840	15120	116.0	130.3	1.4	0.033	0.025	0.025	0.018	88.5	66.4	66.4	48.7
82	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED200-4S/840	16600	132.0	125.8	1.6	0.034	0.026	0.026	0.019	91.7	68.8	68.8	50.5

83	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/830	5100	40.0	127.5	0.5	0.034	0.025	0.025	0.019	90.5	67.9	67.9	49.8
84	BGP/BPP/BRP/BSP/BVP531	BGP/BRP/BPP/BSP/BVP531 LED70-4S/830	5950	47.0	126.6	0.6	0.034	0.026	0.026	0.019	91.1	68.3	68.3	50.1
85	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/830	6800	54.0	125.9	0.7	0.034	0.026	0.026	0.019	91.6	68.7	68.7	50.4
86	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/830	7650	62.0	123.4	0.8	0.035	0.026	0.026	0.019	93.5	70.1	70.1	51.4
87	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/830	8500	66.0	128.8	0.8	0.034	0.025	0.025	0.018	89.6	67.2	67.2	49.3
88	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/830	9350	73.0	128.1	0.9	0.034	0.025	0.025	0.019	90.1	67.6	67.6	49.5
89	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/830	10080	81.0	124.4	1.0	0.035	0.026	0.026	0.019	92.7	69.5	69.5	51.0
90	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/830	10920	88.0	124.1	1.1	0.035	0.026	0.026	0.019	93.0	69.7	69.7	51.1
91	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/830	11760	96.0	122.5	1.2	0.035	0.026	0.026	0.019	94.2	70.6	70.6	51.8
92	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/830	12600	104.0	121.2	1.3	0.036	0.027	0.027	0.020	95.2	71.4	71.4	52.4
93	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/830	13440	106.0	126.8	1.3	0.034	0.026	0.026	0.019	91.0	68.2	68.2	50.0
94	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/830	14280	114.0	125.3	1.4	0.034	0.026	0.026	0.019	92.1	69.1	69.1	50.7
95	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED180-4S/830	15120	122.0	123.9	1.5	0.035	0.026	0.026	0.019	93.1	69.8	69.8	51.2
96	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED200-4S/830	16600	136.0	122.1	1.7	0.035	0.027	0.027	0.019	94.5	70.9	70.9	52.0

97	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED60-4S/827	5100	43.0	118.6	0.5	0.036	0.027	0.027	0.020	97.3	73.0	73.0	53.5
98	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED70-4S/827	5950	51.0	116.7	0.6	0.037	0.028	0.028	0.020	98.9	74.2	74.2	54.4
99	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED80-4S/827	6800	59.0	115.3	0.7	0.037	0.028	0.028	0.021	100.1	75.1	75.1	55.1
100	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED90-4S/827	7650	64.0	119.5	0.8	0.036	0.027	0.027	0.020	96.5	72.4	72.4	53.1
101	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED100-4S/827	8500	72.0	118.1	0.9	0.037	0.027	0.027	0.020	97.7	73.3	73.3	53.7
102	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED110-4S/827	9240	80.0	115.5	1.0	0.037	0.028	0.028	0.021	99.9	74.9	74.9	54.9
103	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED120-4S/827	10080	87.0	115.9	1.1	0.037	0.028	0.028	0.021	99.6	74.7	74.7	54.8
104	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED130-4S/827	10920	96.0	113.8	1.2	0.038	0.028	0.028	0.021	101.4	76.1	76.1	55.8
105	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED140-4S/827	11760	104.0	113.1	1.3	0.038	0.029	0.029	0.021	102.0	76.5	76.5	56.1
106	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED150-4S/827	12600	108.0	116.7	1.3	0.037	0.028	0.028	0.020	98.9	74.2	74.2	54.4
107	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED160-4S/827	13440	116.0	115.9	1.4	0.037	0.028	0.028	0.021	99.6	74.7	74.7	54.8
108	BGP/BPP/BRP/BSP/BVP531	BGP/BPP/BRP/BSP/BVP531 LED170-4S/827	14280	124.0	115.2	1.5	0.038	0.028	0.028	0.021	100.2	75.1	75.1	55.1