ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

CitySoul gen2 LED Mini

Signify N.V.

EPD HUB, HUB-3716

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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 Mini
Product number / reference	912300024408 / BPP530 LED60-4S/830 II DM50 D9 AL GR
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 all urban applications, 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 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.
GTIN (Global Trade Item Number)	Not applicable

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.

NOBB (Norwegian Building Product Database)	Not applicable
A1-A3 Specific data (%)	2.74

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	5100
Electrical power, Watt	41.5
Luminous efficiency, Lm/W	122.892
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	72.96	APAC , EU
Minerals	16.17	EU
Fossil materials	10.87	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	0.684

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass, kg	12.89
Mass of packaging, kg	1.778
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)	113
GWP-fossil, A1-A3 (kg CO_2e)	115
Secondary material, inputs (%)	48.5
Secondary material, outputs (%)	0.22
Total energy use, A1-A3 (kWh)	381
Net freshwater use, A1-A3 (m^3)	4.92E-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

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)

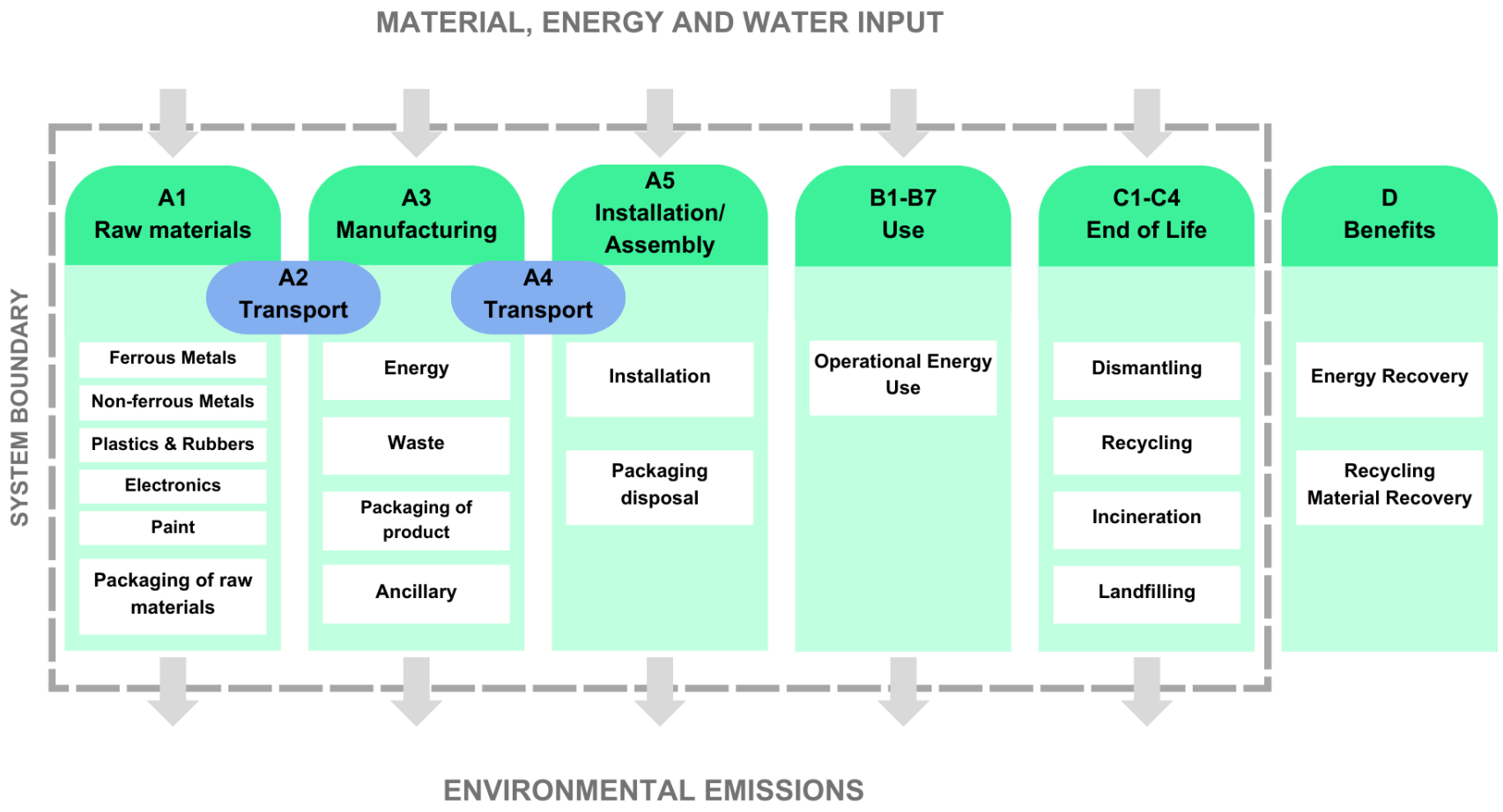
During the use phase, the product consumes electricity (B6), which is calculated multiplying the Wattage x Assigned lifetime (hours) x Country energy mix factor. To know which Country energy mix was used in this EPD, please refer to Annex 2.

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	1.10E+02	1.01E+00	1.79E+00	1.13E+02	4.36E+00	2.74E+00	ND	ND	ND	ND	ND	1.37E+03	ND	0.00E+00	3.83E-01	1.01E+00	6.63E-01	-9.12E+00
GWP – fossil	kg CO_2e	1.10E+02	1.01E+00	4.23E+00	1.15E+02	4.36E+00	2.34E-01	ND	ND	ND	ND	ND	1.36E+03	ND	0.00E+00	3.82E-01	1.01E+00	9.05E-01	-9.11E+00
GWP – biogenic	kg CO_2e	3.59E-01	2.28E-04	-2.51E+00	-2.15E+00	9.87E-04	2.51E+00	ND	ND	ND	ND	ND	3.05E+00	ND	0.00E+00	8.35E-05	-6.11E-04	-2.42E-01	-3.11E-03
GWP – LULUC	kg CO_2e	1.75E-01	4.52E-04	5.75E-02	2.32E-01	1.95E-03	4.16E-05	ND	ND	ND	ND	ND	4.17E+00	ND	0.00E+00	1.69E-04	2.51E-04	1.52E-04	-3.41E-03
Ozone depletion pot.	kg CFC_{-11}e	1.25E-06	1.49E-08	1.00E-07	1.37E-06	6.43E-08	1.56E-09	ND	ND	ND	ND	ND	2.50E-05	ND	0.00E+00	5.35E-09	2.40E-09	1.99E-09	-3.67E-08
Acidification potential	mol H^+e	7.40E-01	3.75E-03	1.68E-02	7.61E-01	1.49E-02	6.78E-04	ND	ND	ND	ND	ND	7.99E+00	ND	0.00E+00	1.27E-03	2.17E-03	7.84E-04	-9.49E-02
EP-freshwater[2)]	kg Pe	4.12E-02	7.79E-05	1.39E-03	4.27E-02	3.39E-04	1.14E-05	ND	ND	ND	ND	ND	1.26E+00	ND	0.00E+00	2.97E-05	1.05E-04	5.34E-05	-5.16E-03
EP-marine	kg Ne	1.19E-01	1.20E-03	6.86E-03	1.27E-01	4.88E-03	3.19E-04	ND	ND	ND	ND	ND	1.25E+00	ND	0.00E+00	4.13E-04	5.51E-04	1.36E-03	-1.16E-02
EP-terrestrial	mol Ne	1.23E+00	1.31E-02	4.55E-02	1.29E+00	5.31E-02	2.90E-03	ND	ND	ND	ND	ND	1.12E+01	ND	0.00E+00	4.49E-03	5.91E-03	3.28E-03	-1.20E-01
POCP ("smog")[3)]	kg NMVOCe	4.09E-01	5.27E-03	1.89E-02	4.33E-01	2.19E-02	8.22E-04	ND	ND	ND	ND	ND	3.70E+00	ND	0.00E+00	1.77E-03	1.71E-03	1.08E-03	-3.61E-02
ADP-minerals & metals[4)]	kg Sbe	2.85E-03	2.79E-06	2.33E-05	2.88E-03	1.22E-05	3.37E-07	ND	ND	ND	ND	ND	1.83E-02	ND	0.00E+00	1.26E-06	1.06E-05	2.99E-07	-1.77E-04
ADP-fossil resources	MJ	1.22E+03	1.46E+01	5.87E+01	1.30E+03	6.32E+01	1.17E+00	ND	ND	ND	ND	ND	3.16E+04	ND	0.00E+00	5.36E+00	2.47E+00	1.75E+00	-9.41E+01
Water use[5)]	m^3e depr.	2.96E+01	7.18E-02	1.65E+00	3.13E+01	3.12E-01	1.38E-01	ND	ND	ND	ND	ND	8.62E+02	ND	0.00E+00	2.49E-02	8.92E-02	5.52E-02	-8.77E-01

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	8.42E-06	1.00E-07	2.85E-07	8.80E-06	4.36E-07	8.30E-09	ND	ND	ND	ND	ND	2.85E-05	ND	0.00E+00	3.03E-08	2.88E-08	1.37E-08	-4.97E-07
Ionizing radiation[6)]	kBq U235e	4.14E+00	1.27E-02	1.79E-01	4.33E+00	5.51E-02	1.42E-03	ND	ND	ND	ND	ND	8.73E+02	ND	0.00E+00	4.34E-03	8.81E-03	2.71E-03	-5.72E-01
Ecotoxicity (freshwater)	CTUe	7.41E+02	2.06E+00	1.88E+01	7.62E+02	8.95E+00	3.35E+00	ND	ND	ND	ND	ND	4.82E+03	ND	0.00E+00	8.48E-01	2.91E+00	2.51E+02	-2.64E+01
Human toxicity, cancer	CTUh	7.99E-08	1.67E-10	1.85E-09	8.19E-08	7.19E-10	1.60E-10	ND	ND	ND	ND	ND	4.59E-07	ND	0.00E+00	6.50E-11	2.16E-10	5.66E-10	-3.98E-09
Human tox. non-cancer	CTUh	2.04E-06	9.40E-09	5.04E-08	2.10E-06	4.09E-08	6.49E-09	ND	ND	ND	ND	ND	2.38E-05	ND	0.00E+00	3.36E-09	1.18E-08	1.14E-08	-1.77E-07
SQP[7)]	-	3.73E+02	1.46E+01	1.81E+02	5.69E+02	6.37E+01	5.69E-01	ND	ND	ND	ND	ND	7.03E+03	ND	0.00E+00	3.20E+00	4.21E+00	2.43E+00	-1.98E+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	1.08E+02	1.99E-01	1.59E+01	1.24E+02	8.67E-01	-3.07E+01	ND	ND	ND	ND	ND	8.67E+03	ND	0.00E+00	7.35E-02	3.48E-01	-4.45E+00	-3.59E+00
Renew. PER as material	MJ	3.87E+00	0.00E+00	1.83E+01	2.22E+01	0.00E+00	-2.22E+01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-5.80E-03	-1.08E-02	0.00E+00
Total use of renew. PER	MJ	1.12E+02	1.99E-01	3.42E+01	1.46E+02	8.67E-01	-5.29E+01	ND	ND	ND	ND	ND	8.67E+03	ND	0.00E+00	7.35E-02	3.42E-01	-4.46E+00	-3.59E+00
Non-re. PER as energy	MJ	1.19E+03	1.46E+01	4.44E+01	1.25E+03	6.32E+01	-7.27E-01	ND	ND	ND	ND	ND	3.16E+04	ND	0.00E+00	5.36E+00	-9.96E+00	-1.52E+01	-9.41E+01
Non-re. PER as material	MJ	2.92E+01	0.00E+00	-5.53E-01	2.86E+01	0.00E+00	-2.42E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-1.31E+01	-1.31E+01	0.00E+00
Total use of non-re. PER	MJ	1.22E+03	1.46E+01	4.39E+01	1.28E+03	6.32E+01	-3.14E+00	ND	ND	ND	ND	ND	3.16E+04	ND	0.00E+00	5.36E+00	-2.31E+01	-2.84E+01	-9.41E+01
Secondary materials	kg	6.25E+00	0.00E+00	0.00E+00	6.25E+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	4.30E-02	7.83E-05	1.82E-01	2.25E-01	3.42E-04	1.48E-05	ND	ND	ND	ND	ND	4.17E-02	ND	0.00E+00	3.07E-05	1.18E-04	2.48E-05	-3.64E-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	-1.48E-02
Use of net fresh water	m^3	4.52E-01	2.15E-03	3.78E-02	4.92E-01	9.35E-03	2.25E-03	ND	ND	ND	ND	ND	2.73E+01	ND	0.00E+00	7.10E-04	1.36E-03	-8.09E-03	-3.52E-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	1.90E+01	2.47E-02	2.27E-01	1.93E+01	1.07E-01	3.63E-02	ND	ND	ND	ND	ND	8.00E+01	ND	0.00E+00	9.35E-03	3.13E-02	2.89E-02	-1.75E+00
Non-hazardous waste	kg	3.72E+02	4.56E-01	1.69E+01	3.89E+02	1.98E+00	1.91E+00	ND	ND	ND	ND	ND	6.19E+03	ND	0.00E+00	1.75E-01	1.58E+00	1.68E+01	-1.90E+01
Radioactive waste	kg	1.03E-03	3.10E-06	4.29E-05	1.07E-03	1.35E-05	3.56E-07	ND	ND	ND	ND	ND	2.24E-01	ND	0.00E+00	1.06E-06	2.17E-06	6.65E-07	-1.38E-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	1.85E-02	1.85E-02	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	2.85E-02	0.00E+00	-4.91E-07
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	-2.59E-15
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	3.90E+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	1.64E+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	2.26E+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	1.10E+02	1.00E+00	4.47E+00	1.15E+02	4.33E+00	2.33E-01	ND	ND	ND	ND	ND	1.36E+03	ND	0.00E+00	3.80E-01	1.01E+00	1.15E+00	-9.05E+00
Ozone depletion Pot.	kg CFC_{-11}e	1.23E-06	1.19E-08	9.77E-08	1.34E-06	5.13E-08	1.33E-09	ND	ND	ND	ND	ND	2.09E-05	ND	0.00E+00	4.27E-09	2.01E-09	1.61E-09	-3.38E-08
Acidification	kg SO_2e	6.23E-01	2.88E-03	1.21E-02	6.38E-01	1.13E-02	4.98E-04	ND	ND	ND	ND	ND	6.81E+00	ND	0.00E+00	9.76E-04	1.73E-03	5.73E-04	-8.17E-02
Eutrophication	kg PO_4^3e	1.30E-01	6.63E-04	9.52E-03	1.40E-01	2.76E-03	1.55E-04	ND	ND	ND	ND	ND	8.80E-01	ND	0.00E+00	2.37E-04	2.79E-04	6.72E-04	-5.26E-03
POCP (“smog”)	kg C_2H_4e	4.76E-02	2.45E-04	1.40E-03	4.92E-02	1.01E-03	3.78E-05	ND	ND	ND	ND	ND	3.71E-01	ND	0.00E+00	8.74E-05	1.04E-04	1.05E-04	-4.72E-03
ADP-elements	kg Sbe	2.83E-03	2.72E-06	2.28E-05	2.85E-03	1.19E-05	2.81E-07	ND	ND	ND	ND	ND	1.83E-02	ND	0.00E+00	1.23E-06	1.06E-05	2.77E-07	-1.76E-04
ADP-fossil	MJ	1.16E+03	1.44E+01	5.58E+01	1.23E+03	6.24E+01	1.14E+00	ND	ND	ND	ND	ND	1.62E+04	ND	0.00E+00	5.29E+00	2.33E+00	1.71E+00	-8.49E+01

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	1.10E+02	1.01E+00	4.29E+00	1.15E+02	4.36E+00	2.34E-01	ND	ND	ND	ND	ND	1.36E+03	ND	0.00E+00	3.82E-01	1.01E+00	9.05E-01	-9.11E+00

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	7.56E+00	6.92E-02	1.23E-01	7.75E+00	2.99E-01	1.88E-01	ND	ND	ND	ND	ND	9.37E+01	ND	0.00E+00	2.63E-02	6.90E-02	4.55E-02	-6.26E-01
GWP – fossil	kg CO_2 éq/FU	7.52E+00	6.92E-02	2.91E-01	7.88E+00	2.99E-01	1.61E-02	ND	ND	ND	ND	ND	9.32E+01	ND	0.00E+00	2.62E-02	6.91E-02	6.21E-02	-6.25E-01
GWP – biogenic	kg CO_2 éq/FU	2.46E-02	1.56E-05	-1.72E-01	-1.47E-01	6.77E-05	1.72E-01	ND	ND	ND	ND	ND	2.09E-01	ND	0.00E+00	5.73E-06	-4.19E-05	-1.66E-02	-2.13E-04
GWP – LULUC	kg CO_2 éq/FU	1.20E-02	3.10E-05	3.94E-03	1.60E-02	1.34E-04	2.86E-06	ND	ND	ND	ND	ND	2.86E-01	ND	0.00E+00	1.16E-05	1.72E-05	1.04E-05	-2.34E-04
Ozone depletion pot.	kg CFC_{-11}e/FU	8.59E-08	1.02E-09	6.89E-09	9.38E-08	4.42E-09	1.07E-10	ND	ND	ND	ND	ND	1.72E-06	ND	0.00E+00	3.67E-10	1.65E-10	1.37E-10	-2.52E-09
Acidification potential	mole H^+e/FU	5.08E-02	2.57E-04	1.15E-03	5.22E-02	1.02E-03	4.65E-05	ND	ND	ND	ND	ND	5.48E-01	ND	0.00E+00	8.74E-05	1.49E-04	5.38E-05	-6.51E-03
EP-freshwater[2)]	kg Pe/FU	2.83E-03	5.35E-06	9.55E-05	2.93E-03	2.33E-05	7.82E-07	ND	ND	ND	ND	ND	8.68E-02	ND	0.00E+00	2.04E-06	7.22E-06	3.67E-06	-3.54E-04
EP-marine	kg Ne/FU	8.15E-03	8.26E-05	4.71E-04	8.71E-03	3.35E-04	2.19E-05	ND	ND	ND	ND	ND	8.60E-02	ND	0.00E+00	2.83E-05	3.78E-05	9.32E-05	-7.93E-04
EP-terrestrial	mol Ne/FU	8.43E-02	9.01E-04	3.12E-03	8.83E-02	3.65E-03	1.99E-04	ND	ND	ND	ND	ND	7.71E-01	ND	0.00E+00	3.08E-04	4.05E-04	2.25E-04	-8.23E-03
POCP ("smog")[3)]	kg NMVOCe/	2.81E-02	3.62E-04	1.30E-03	2.97E-02	1.50E-03	5.64E-05	ND	ND	ND	ND	ND	2.54E-01	ND	0.00E+00	1.22E-04	1.17E-04	7.38E-05	-2.48E-03
ADP-minerals & metals[4)]	kg Sbe/FU	1.96E-04	1.92E-07	1.60E-06	1.97E-04	8.34E-07	2.31E-08	ND	ND	ND	ND	ND	1.26E-03	ND	0.00E+00	8.62E-08	7.29E-07	2.05E-08	-1.21E-05
ADP-fossil resources	MJ/FU	8.40E+01	1.00E+00	4.03E+00	8.91E+01	4.34E+00	8.01E-02	ND	ND	ND	ND	ND	2.17E+03	ND	0.00E+00	3.68E-01	1.69E-01	1.20E-01	-6.46E+00
Water use[5)]	m^3e priv. /FU	2.03E+00	4.93E-03	1.13E-01	2.15E+00	2.14E-02	9.48E-03	ND	ND	ND	ND	ND	5.91E+01	ND	0.00E+00	1.71E-03	6.12E-03	3.79E-03	-6.02E-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	5.78E-07	6.87E-09	1.96E-08	6.04E-07	2.99E-08	5.70E-10	ND	ND	ND	ND	ND	1.96E-06	ND	0.00E+00	2.08E-09	1.97E-09	9.37E-10	-3.41E-08
Ionizing radiation[6)]	kBq U235e/FU	2.84E-01	8.69E-04	1.23E-02	2.97E-01	3.78E-03	9.75E-05	ND	ND	ND	ND	ND	5.99E+01	ND	0.00E+00	2.98E-04	6.04E-04	1.86E-04	-3.92E-02
Ecotoxicity (freshwater)	CTUe/FU	5.09E+01	1.41E-01	1.29E+00	5.23E+01	6.14E-01	2.30E-01	ND	ND	ND	ND	ND	3.31E+02	ND	0.00E+00	5.82E-02	1.99E-01	1.72E+01	-1.81E+00
Human toxicity, cancer	CTUh/FU	5.48E-09	1.15E-11	1.27E-10	5.62E-09	4.94E-11	1.10E-11	ND	ND	ND	ND	ND	3.15E-08	ND	0.00E+00	4.46E-12	1.48E-11	3.88E-11	-2.73E-10
Human tox. non-cancer	CTUh/FU	1.40E-07	6.45E-10	3.46E-09	1.44E-07	2.81E-09	4.45E-10	ND	ND	ND	ND	ND	1.63E-06	ND	0.00E+00	2.30E-10	8.10E-10	7.82E-10	-1.22E-08
SQP[7)]	-/FU	2.56E+01	1.00E+00	1.24E+01	3.90E+01	4.37E+00	3.90E-02	ND	ND	ND	ND	ND	4.83E+02	ND	0.00E+00	2.20E-01	2.89E-01	1.67E-01	-1.36E+00

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	7.41E+00	1.37E-02	1.09E+00	8.51E+00	5.95E-02	-2.11E+00	ND	ND	ND	ND	ND	5.95E+02	ND	0.00E+00	5.05E-03	2.39E-02	-3.05E-01	-2.46E-01
Renew. PER as material	MJ/FU	2.66E-01	0.00E+00	1.26E+00	1.52E+00	0.00E+00	-1.52E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-3.98E-04	-7.39E-04	0.00E+00
Total use of renew. PER	MJ/FU	7.68E+00	1.37E-02	2.35E+00	1.00E+01	5.95E-02	-3.63E+00	ND	ND	ND	ND	ND	5.95E+02	ND	0.00E+00	5.05E-03	2.35E-02	-3.06E-01	-2.46E-01
Non-re. PER as energy	MJ/FU	8.16E+01	1.00E+00	3.05E+00	8.57E+01	4.34E+00	-4.99E-02	ND	ND	ND	ND	ND	2.17E+03	ND	0.00E+00	3.68E-01	-6.83E-01	-1.04E+00	-6.46E+00
Non-re. PER as material	MJ/FU	2.00E+00	0.00E+00	-3.79E-02	1.97E+00	0.00E+00	-1.66E-01	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	-8.98E-01	-9.02E-01	0.00E+00
Total use of non-re. PER	MJ/FU	8.36E+01	1.00E+00	3.01E+00	8.76E+01	4.34E+00	-2.16E-01	ND	ND	ND	ND	ND	2.17E+03	ND	0.00E+00	3.68E-01	-1.58E+00	-1.95E+00	-6.46E+00
Secondary materials	kg/FU	4.29E-01	0.00E+00	0.00E+00	4.29E-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	2.95E-03	5.37E-06	1.25E-02	1.54E-02	2.35E-05	1.02E-06	ND	ND	ND	ND	ND	2.86E-03	ND	0.00E+00	2.11E-06	8.12E-06	1.70E-06	-2.50E-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	-1.02E-03
Use of net fresh water	m^3/FU	3.10E-02	1.47E-04	2.60E-03	3.38E-02	6.42E-04	1.54E-04	ND	ND	ND	ND	ND	1.87E+00	ND	0.00E+00	4.88E-05	9.33E-05	-5.56E-04	-2.42E-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	1.31E+00	1.69E-03	1.56E-02	1.32E+00	7.35E-03	2.49E-03	ND	ND	ND	ND	ND	5.49E+00	ND	0.00E+00	6.42E-04	2.15E-03	1.98E-03	-1.20E-01
Non-hazardous waste	kg/FU	2.55E+01	3.13E-02	1.16E+00	2.67E+01	1.36E-01	1.31E-01	ND	ND	ND	ND	ND	4.24E+02	ND	0.00E+00	1.20E-02	1.08E-01	1.15E+00	-1.30E+00
Radioactive waste	kg/FU	7.04E-05	2.13E-07	2.95E-06	7.35E-05	9.25E-07	2.44E-08	ND	ND	ND	ND	ND	1.54E-02	ND	0.00E+00	7.30E-08	1.49E-07	4.56E-08	-9.48E-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	1.27E-03	1.27E-03	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	0.00E+00	ND	0.00E+00	0.00E+00	1.95E-03	0.00E+00	-3.37E-08
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	-1.78E-16
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	2.67E-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	1.13E-01	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	1.55E-01	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	7.52E+00	6.88E-02	3.06E-01	7.90E+00	2.97E-01	1.60E-02	ND	ND	ND	ND	ND	9.33E+01	ND	0.00E+00	2.61E-02	6.90E-02	7.92E-02	-6.21E-01
Ozone depletion Pot.	kg CFC-$_{11}$e/FU	8.44E-08	8.15E-10	6.70E-09	9.19E-08	3.52E-09	9.09E-11	ND	ND	ND	ND	ND	1.44E-06	ND	0.00E+00	2.93E-10	1.38E-10	1.11E-10	-2.32E-09
Acidification	kg SO_2e/FU	4.27E-02	1.97E-04	8.31E-04	4.38E-02	7.79E-04	3.41E-05	ND	ND	ND	ND	ND	4.67E-01	ND	0.00E+00	6.70E-05	1.19E-04	3.93E-05	-5.61E-03
Eutrophication	kg PO_4^3e/FU	8.90E-03	4.55E-05	6.54E-04	9.60E-03	1.90E-04	1.07E-05	ND	ND	ND	ND	ND	6.04E-02	ND	0.00E+00	1.63E-05	1.91E-05	4.61E-05	-3.61E-04
POCP (“smog”)	kg C_2H_4e/FU	3.26E-03	1.68E-05	9.62E-05	3.38E-03	6.94E-05	2.59E-06	ND	ND	ND	ND	ND	2.55E-02	ND	0.00E+00	6.00E-06	7.12E-06	7.22E-06	-3.24E-04
ADP-elements	kg Sbe/FU	1.94E-04	1.87E-07	1.56E-06	1.96E-04	8.14E-07	1.93E-08	ND	ND	ND	ND	ND	1.25E-03	ND	0.00E+00	8.41E-08	7.26E-07	1.90E-08	-1.21E-05
ADP-fossil	MJ/FU	7.93E+01	9.89E-01	3.83E+00	8.41E+01	4.28E+00	7.86E-02	ND	ND	ND	ND	ND	1.11E+03	ND	0.00E+00	3.63E-01	1.60E-01	1.17E-01	-5.83E+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	7.53E+00	6.92E-02	2.95E-01	7.90E+00	2.99E-01	1.61E-02	ND	ND	ND	ND	ND	9.35E+01	ND	0.00E+00	2.62E-02	6.91E-02	6.21E-02	-6.26E-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, 1.5 kg
2. Market for corrugated board box, 0.13 kg
3. Market for packaging film, low density polyethylene, 0.05 kg
4. Market for packaging film, low density polyethylene, 0.0021 kg
5. Market for printed paper, offset, 0.05 kg
6. Market for printed paper, offset, 0.05 kg
7. 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, 4150.0 kWh

TRANSPORT SCENARIO DOCUMENTATION - A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50 %
Bulk density of transported products / kg/m3	2.27E+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	41.5
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	12.89
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	2.85E-02
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	4.56E+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 15802+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

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

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	5,88E+00	2,61E-01	-1,25E-01	6,02E+00	3,02E-01	5,41E-01	MND	MND	MND	MND	MND	4,06E+02	MND	MNR	1,77E-02	2,62E-01	1,88E-01	-1,09E+01

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)	GERMANY	3.90E-01
AFRICA	7.30E-01	INDIA	1.50E+00
APAC	9.50E-01	ITALY	3.50E-01
AUSTRALIA	8.40E-01	LATAM	3.90E-01
AUSTRIA	2.30E-01	NAM	4.50E-01
BELGIUM	2.00E-01	NETHERLANDS	3.90E-01
CHINA	1.02E+00	NORWAY	4.50E-02
DENMARK	1.60E-01	ROW	7.30E-01
EU	3.30E-01	SPAIN	2.10E-01
FINLAND	1.54E-01	SWEDEN	3.70E-02
FRANCE	8.70E-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	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/757	1634	11.8	138.5	0.284	0.284	0.213	0.213	0.156	389.5	292.2	292.2	214.2
2	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/757	1892	13.8	137.1	0.333	0.333	0.249	0.249	0.183	455.6	341.7	341.7	250.6
3	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/757	2150	15.6	137.8	0.376	0.376	0.282	0.282	0.207	515.0	386.2	386.2	283.2
4	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/757	2550	19.0	134.2	0.458	0.458	0.343	0.343	0.252	627.2	470.4	470.4	345.0
5	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/757	3010	21.0	143.3	0.506	0.506	0.380	0.380	0.278	693.3	519.9	519.9	381.3
6	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/757	3440	23.5	146.4	0.566	0.566	0.425	0.425	0.311	775.8	581.8	581.8	426.7
7	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/757	3825	27.0	141.7	0.651	0.651	0.488	0.488	0.358	891.3	668.5	668.5	490.2
8	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/757	4760	33.5	142.1	0.807	0.807	0.605	0.605	0.444	1105.9	829.4	829.4	608.2
9	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/757	5544	40.0	138.6	0.964	0.964	0.723	0.723	0.530	1320.5	990.4	990.4	726.3

10	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/757	6460	44.0	146.8	1.060	1.060	0.795	0.795	0.583	1452.5	1089.4	1089.4	798.9
11	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/757	7224	50.0	144.5	1.205	1.205	0.904	0.904	0.663	1650.6	1238.0	1238.0	907.8
12	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/757	8064	57.0	141.5	1.373	1.373	1.030	1.030	0.755	1881.7	1411.3	1411.3	1034.9
13	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/757	8820	61.0	144.6	1.470	1.470	1.102	1.102	0.808	2013.7	1510.3	1510.3	1107.6
14	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/757	9660	67.0	144.2	1.614	1.614	1.211	1.211	0.888	2211.8	1658.9	1658.9	1216.5
15	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/757	10080	71.0	142.0	1.711	1.711	1.283	1.283	0.941	2343.9	1757.9	1757.9	1289.1
16	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED125-4S/757	10500	74.0	141.9	1.783	1.783	1.337	1.337	0.981	2442.9	1832.2	1832.2	1343.6
17	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED130-4S/757	10920	77.0	141.8	1.855	1.855	1.392	1.392	1.020	2541.9	1906.4	1906.4	1398.1
18	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/740	1634	11.8	138.5	0.284	0.284	0.213	0.213	0.156	389.5	292.2	292.2	214.2
19	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/740	1892	13.8	137.1	0.333	0.333	0.249	0.249	0.183	455.6	341.7	341.7	250.6
20	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/740	2150	15.6	137.8	0.376	0.376	0.282	0.282	0.207	515.0	386.2	386.2	283.2
21	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/740	2550	19.0	134.2	0.458	0.458	0.343	0.343	0.252	627.2	470.4	470.4	345.0
22	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/740	3010	21.0	143.3	0.506	0.506	0.380	0.380	0.278	693.3	519.9	519.9	381.3
23	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/740	3440	23.5	146.4	0.566	0.566	0.425	0.425	0.311	775.8	581.8	581.8	426.7

24	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/740	3825	27.0	141.7	0.651	0.651	0.488	0.488	0.358	891.3	668.5	668.5	490.2
25	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/740	4760	33.5	142.1	0.807	0.807	0.605	0.605	0.444	1105.9	829.4	829.4	608.2
26	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/740	5544	40.0	138.6	0.964	0.964	0.723	0.723	0.530	1320.5	990.4	990.4	726.3
27	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/740	6460	44.0	146.8	1.060	1.060	0.795	0.795	0.583	1452.5	1089.4	1089.4	798.9
28	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/740	7224	50.0	144.5	1.205	1.205	0.904	0.904	0.663	1650.6	1238.0	1238.0	907.8
29	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/740	8064	57.0	141.5	1.373	1.373	1.030	1.030	0.755	1881.7	1411.3	1411.3	1034.9
30	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/740	8820	61.0	144.6	1.470	1.470	1.102	1.102	0.808	2013.7	1510.3	1510.3	1107.6
31	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/740	9660	67.0	144.2	1.614	1.614	1.211	1.211	0.888	2211.8	1658.9	1658.9	1216.5
32	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/740	10080	71.0	142.0	1.711	1.711	1.283	1.283	0.941	2343.9	1757.9	1757.9	1289.1
33	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED125-4S/740	10500	74.0	141.9	1.783	1.783	1.337	1.337	0.981	2442.9	1832.2	1832.2	1343.6
34	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED130-4S/740	10920	77.0	141.8	1.855	1.855	1.392	1.392	1.020	2541.9	1906.4	1906.4	1398.1
35	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/730	1634	12.6	129.7	0.304	0.304	0.228	0.228	0.167	416.0	312.0	312.0	228.8
36	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/730	1892	14.6	129.6	0.352	0.352	0.264	0.264	0.193	482.0	361.5	361.5	265.1
37	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/730	2150	16.6	129.5	0.400	0.400	0.300	0.300	0.220	548.0	411.0	411.0	301.4

38	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/730	2550	20.5	124.4	0.494	0.494	0.370	0.370	0.272	676.7	507.6	507.6	372.2
39	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/730	3010	22.0	136.8	0.530	0.530	0.398	0.398	0.292	726.3	544.7	544.7	399.4
40	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/730	3400	25.5	133.3	0.614	0.614	0.461	0.461	0.338	841.8	631.4	631.4	463.0
41	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/730	3825	28.5	134.2	0.687	0.687	0.515	0.515	0.378	940.8	705.6	705.6	517.5
42	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/730	4760	35.5	134.1	0.855	0.855	0.642	0.642	0.470	1171.9	878.9	878.9	644.6
43	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/730	5610	40.0	140.3	0.964	0.964	0.723	0.723	0.530	1320.5	990.4	990.4	726.3
44	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/730	6460	46.5	138.9	1.120	1.120	0.840	0.840	0.616	1535.1	1151.3	1151.3	844.3
45	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/730	7224	54.0	133.8	1.301	1.301	0.976	0.976	0.716	1782.7	1337.0	1337.0	980.5
46	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/730	8064	58.0	139.0	1.398	1.398	1.048	1.048	0.769	1914.7	1436.0	1436.0	1053.1
47	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/730	8820	65.0	135.7	1.566	1.566	1.175	1.175	0.861	2145.8	1609.3	1609.3	1180.2
48	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/730	9660	72.0	134.2	1.735	1.735	1.301	1.301	0.954	2376.9	1782.7	1782.7	1307.3
49	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/730	10080	76.0	132.6	1.831	1.831	1.373	1.373	1.007	2508.9	1881.7	1881.7	1379.9
50	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/727	1634	14.2	115.1	0.342	0.342	0.257	0.257	0.188	468.8	351.6	351.6	257.8
51	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/727	1892	16.4	115.4	0.395	0.395	0.296	0.296	0.217	541.4	406.0	406.0	297.8

52	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/727	2125	18.8	113.0	0.453	0.453	0.340	0.340	0.249	620.6	465.5	465.5	341.3
53	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/727	2580	21.0	122.9	0.506	0.506	0.380	0.380	0.278	693.3	519.9	519.9	381.3
54	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/727	3010	24.5	122.9	0.590	0.590	0.443	0.443	0.325	808.8	606.6	606.6	444.8
55	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/727	3400	28.5	119.3	0.687	0.687	0.515	0.515	0.378	940.8	705.6	705.6	517.5
56	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/727	3825	32.5	117.7	0.783	0.783	0.587	0.587	0.431	1072.9	804.7	804.7	590.1
57	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/727	4704	40.5	116.1	0.976	0.976	0.732	0.732	0.537	1337.0	1002.7	1002.7	735.3
58	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/727	5610	45.0	124.7	1.084	1.084	0.813	0.813	0.596	1485.5	1114.2	1114.2	817.0
59	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/727	6384	53.0	120.5	1.277	1.277	0.958	0.958	0.702	1749.6	1312.2	1312.2	962.3
60	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/727	7224	61.0	118.4	1.470	1.470	1.102	1.102	0.808	2013.7	1510.3	1510.3	1107.6
61	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/727	8064	66.0	122.2	1.590	1.590	1.193	1.193	0.875	2178.8	1634.1	1634.1	1198.3
62	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/727	8820	74.0	119.2	1.783	1.783	1.337	1.337	0.981	2442.9	1832.2	1832.2	1343.6
63	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/727	9660	84.0	115.0	2.024	2.024	1.518	1.518	1.113	2773.0	2079.8	2079.8	1525.2
64	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/722	1634	15.8	103.4	0.381	0.381	0.286	0.286	0.209	521.6	391.2	391.2	286.9
65	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/722	1870	18.4	101.6	0.443	0.443	0.333	0.333	0.244	607.4	455.6	455.6	334.1

66	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/722	2125	21.5	98.8	0.518	0.518	0.389	0.389	0.285	709.8	532.3	532.3	390.4
67	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/722	2580	23.5	109.8	0.566	0.566	0.425	0.425	0.311	775.8	581.8	581.8	426.7
68	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/722	2975	28.0	106.3	0.675	0.675	0.506	0.506	0.371	924.3	693.3	693.3	508.4
69	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/722	3400	32.0	106.3	0.771	0.771	0.578	0.578	0.424	1056.4	792.3	792.3	581.0
70	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/722	4250	38.5	110.4	0.928	0.928	0.696	0.696	0.510	1271.0	953.2	953.2	699.0
71	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/722	5100	46.5	109.7	1.120	1.120	0.840	0.840	0.616	1535.1	1151.3	1151.3	844.3
72	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/722	5880	56.0	105.0	1.349	1.349	1.012	1.012	0.742	1848.7	1386.5	1386.5	1016.8
73	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/722	6720	61.0	110.2	1.470	1.470	1.102	1.102	0.808	2013.7	1510.3	1510.3	1107.6
74	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/722	7560	70.0	108.0	1.687	1.687	1.265	1.265	0.928	2310.8	1733.1	1733.1	1271.0
75	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/722	8400	81.0	103.7	1.952	1.952	1.464	1.464	1.073	2674.0	2005.5	2005.5	1470.7
76	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/840	1634	13.6	120.1	0.328	0.328	0.246	0.246	0.180	449.0	336.7	336.7	246.9
77	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/840	1892	15.8	119.7	0.381	0.381	0.286	0.286	0.209	521.6	391.2	391.2	286.9
78	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/840	2125	18.2	116.8	0.439	0.439	0.329	0.329	0.241	600.8	450.6	450.6	330.5
79	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/840	2580	20.5	125.9	0.494	0.494	0.370	0.370	0.272	676.7	507.6	507.6	372.2

80	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/840	3010	24.0	125.4	0.578	0.578	0.434	0.434	0.318	792.3	594.2	594.2	435.8
81	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/840	3400	27.5	123.6	0.663	0.663	0.497	0.497	0.364	907.8	680.9	680.9	499.3
82	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/840	4250	35.0	121.4	0.843	0.843	0.633	0.633	0.464	1155.4	866.6	866.6	635.5
83	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/840	5100	40.0	127.5	0.964	0.964	0.723	0.723	0.530	1320.5	990.4	990.4	726.3
84	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/840	5950	47.5	125.3	1.145	1.145	0.858	0.858	0.630	1568.1	1176.1	1176.1	862.4
85	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/840	6720	55.0	122.2	1.325	1.325	0.994	0.994	0.729	1815.7	1361.7	1361.7	998.6
86	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/840	7560	60.0	126.0	1.446	1.446	1.084	1.084	0.795	1980.7	1485.5	1485.5	1089.4
87	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/840	8400	67.0	125.4	1.614	1.614	1.211	1.211	0.888	2211.8	1658.9	1658.9	1216.5
88	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/830	1634	14.2	115.1	0.342	0.342	0.257	0.257	0.188	468.8	351.6	351.6	257.8
89	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/830	1892	16.4	115.4	0.395	0.395	0.296	0.296	0.217	541.4	406.0	406.0	297.8
90	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/830	2125	18.8	113.0	0.453	0.453	0.340	0.340	0.249	620.6	465.5	465.5	341.3
91	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/830	2580	21.0	122.9	0.506	0.506	0.380	0.380	0.278	693.3	519.9	519.9	381.3
92	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/830	3010	24.5	122.9	0.590	0.590	0.443	0.443	0.325	808.8	606.6	606.6	444.8
93	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/830	3400	28.5	119.3	0.687	0.687	0.515	0.515	0.378	940.8	705.6	705.6	517.5

94	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/830	4250	36.5	116.4	0.880	0.880	0.660	0.660	0.484	1204.9	903.7	903.7	662.7
95	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/830	5100	41.5	122.9	1.000	1.000	0.750	0.750	0.550	1370.0	1027.5	1027.5	753.5
96	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/830	5880	49.0	120.0	1.181	1.181	0.886	0.886	0.649	1617.6	1213.2	1213.2	889.7
97	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/830	6720	57.0	117.9	1.373	1.373	1.030	1.030	0.755	1881.7	1411.3	1411.3	1034.9
98	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/830	7560	62.0	121.9	1.494	1.494	1.120	1.120	0.822	2046.7	1535.1	1535.1	1125.7
99	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/830	8400	70.0	120.0	1.687	1.687	1.265	1.265	0.928	2310.8	1733.1	1733.1	1271.0
100	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/830	1634	14.2	115.1	0.342	0.342	0.257	0.257	0.188	468.8	351.6	351.6	257.8
101	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/830	1892	16.4	115.4	0.395	0.395	0.296	0.296	0.217	541.4	406.0	406.0	297.8
102	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/827	2150	19.0	113.2	0.458	0.458	0.343	0.343	0.252	627.2	470.4	470.4	345.0
103	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/827	2580	22.5	114.7	0.542	0.542	0.407	0.407	0.298	742.8	557.1	557.1	408.5
104	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/827	2975	26.5	112.3	0.639	0.639	0.479	0.479	0.351	874.8	656.1	656.1	481.2
105	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/827	3400	30.5	111.5	0.735	0.735	0.551	0.551	0.404	1006.9	755.2	755.2	553.8
106	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/827	4250	37.0	114.9	0.892	0.892	0.669	0.669	0.490	1221.4	916.1	916.1	671.8
107	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/827	5100	45.0	113.3	1.084	1.084	0.813	0.813	0.596	1485.5	1114.2	1114.2	817.0

108	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/827	5880	53.0	110.9	1.277	1.277	0.958	0.958	0.702	1749.6	1312.2	1312.2	962.3
109	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/827	6720	59.0	113.9	1.422	1.422	1.066	1.066	0.782	1947.7	1460.8	1460.8	1071.2
110	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/827	7560	67.0	112.8	1.614	1.614	1.211	1.211	0.888	2211.8	1658.9	1658.9	1216.5

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	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/757	1634	11.8	138.5	0.284	0.061	0.046	0.046	0.033	83.4	62.6	62.6	45.9
2	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/757	1892	13.8	137.1	0.333	0.062	0.046	0.046	0.034	84.3	63.2	63.2	46.4
3	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/757	2150	15.6	137.8	0.376	0.061	0.046	0.046	0.034	83.8	62.9	62.9	46.1
4	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/757	2550	19.0	134.2	0.458	0.063	0.047	0.047	0.035	86.1	64.6	64.6	47.3
5	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/757	3010	21.0	143.3	0.506	0.059	0.044	0.044	0.032	80.6	60.5	60.5	44.3
6	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/757	3440	23.5	146.4	0.566	0.058	0.043	0.043	0.032	78.9	59.2	59.2	43.4
7	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/757	3825	27.0	141.7	0.651	0.060	0.045	0.045	0.033	81.6	61.2	61.2	44.9
8	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/757	4760	33.5	142.1	0.8	0.059	0.045	0.045	0.033	81.3	61.0	61.0	44.7
9	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/757	5544	40.0	138.6	1.0	0.061	0.046	0.046	0.033	83.4	62.5	62.5	45.9
10	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/757	6460	44.0	146.8	1.1	0.057	0.043	0.043	0.032	78.7	59.0	59.0	43.3
11	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/757	7224	50.0	144.5	1.2	0.058	0.044	0.044	0.032	80.0	60.0	60.0	44.0
12	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/757	8064	57.0	141.5	1.4	0.060	0.045	0.045	0.033	81.7	61.3	61.3	44.9

13	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/757	8820	61.0	144.6	1.5	0.058	0.044	0.044	0.032	79.9	59.9	59.9	44.0
14	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/757	9660	67.0	144.2	1.6	0.058	0.044	0.044	0.032	80.1	60.1	60.1	44.1
15	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/757	10080	71.0	142.0	1.7	0.059	0.045	0.045	0.033	81.4	61.0	61.0	44.8
16	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED125-4S/757	10500	74.0	141.9	1.8	0.059	0.045	0.045	0.033	81.4	61.1	61.1	44.8
17	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED130-4S/757	10920	77.0	141.8	1.9	0.059	0.045	0.045	0.033	81.5	61.1	61.1	44.8
18	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/740	1634	11.8	138.5	0.3	0.061	0.046	0.046	0.033	83.4	62.6	62.6	45.9
19	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/740	1892	13.8	137.1	0.3	0.062	0.046	0.046	0.034	84.3	63.2	63.2	46.4
20	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/740	2150	15.6	137.8	0.4	0.061	0.046	0.046	0.034	83.8	62.9	62.9	46.1
21	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/740	2550	19.0	134.2	0.5	0.063	0.047	0.047	0.035	86.1	64.6	64.6	47.3
22	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/740	3010	21.0	143.3	0.5	0.059	0.044	0.044	0.032	80.6	60.5	60.5	44.3
23	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/740	3440	23.5	146.4	0.6	0.058	0.043	0.043	0.032	78.9	59.2	59.2	43.4
24	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/740	3825	27.0	141.7	0.7	0.060	0.045	0.045	0.033	81.6	61.2	61.2	44.9
25	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/740	4760	33.5	142.1	0.8	0.059	0.045	0.045	0.033	81.3	61.0	61.0	44.7
26	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/740	5544	40.0	138.6	1.0	0.061	0.046	0.046	0.033	83.4	62.5	62.5	45.9

27	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/740	6460	44.0	146.8	1.1	0.057	0.043	0.043	0.032	78.7	59.0	59.0	43.3
28	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/740	7224	50.0	144.5	1.2	0.058	0.044	0.044	0.032	80.0	60.0	60.0	44.0
29	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/740	8064	57.0	141.5	1.4	0.060	0.045	0.045	0.033	81.7	61.3	61.3	44.9
30	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/740	8820	61.0	144.6	1.5	0.058	0.044	0.044	0.032	79.9	59.9	59.9	44.0
31	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/740	9660	67.0	144.2	1.6	0.058	0.044	0.044	0.032	80.1	60.1	60.1	44.1
32	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/740	10080	71.0	142.0	1.7	0.059	0.045	0.045	0.033	81.4	61.0	61.0	44.8
33	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED125-4S/740	10500	74.0	141.9	1.8	0.059	0.045	0.045	0.033	81.4	61.1	61.1	44.8
34	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED130-4S/740	10920	77.0	141.8	1.9	0.059	0.045	0.045	0.033	81.5	61.1	61.1	44.8
35	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/730	1634	12.6	129.7	0.3	0.065	0.049	0.049	0.036	89.1	66.8	66.8	49.0
36	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/730	1892	14.6	129.6	0.4	0.065	0.049	0.049	0.036	89.2	66.9	66.9	49.0
37	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/730	2150	16.6	129.5	0.4	0.065	0.049	0.049	0.036	89.2	66.9	66.9	49.1
38	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/730	2550	20.5	124.4	0.5	0.068	0.051	0.051	0.037	92.9	69.7	69.7	51.1
39	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/730	3010	22.0	136.8	0.5	0.062	0.046	0.046	0.034	84.4	63.3	63.3	46.4
40	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/730	3400	25.5	133.3	0.6	0.063	0.047	0.047	0.035	86.7	65.0	65.0	47.7

41	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/730	3825	28.5	134.2	0.7	0.063	0.047	0.047	0.035	86.1	64.6	64.6	47.3
42	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/730	4760	35.5	134.1	0.9	0.063	0.047	0.047	0.035	86.2	64.6	64.6	47.4
43	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/730	5610	40.0	140.3	1.0	0.060	0.045	0.045	0.033	82.4	61.8	61.8	45.3
44	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/730	6460	46.5	138.9	1.1	0.061	0.046	0.046	0.033	83.2	62.4	62.4	45.7
45	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/730	7224	54.0	133.8	1.3	0.063	0.047	0.047	0.035	86.4	64.8	64.8	47.5
46	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/730	8064	58.0	139.0	1.4	0.061	0.045	0.045	0.033	83.1	62.3	62.3	45.7
47	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/730	8820	65.0	135.7	1.6	0.062	0.047	0.047	0.034	85.2	63.9	63.9	46.8
48	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/730	9660	72.0	134.2	1.7	0.063	0.047	0.047	0.035	86.1	64.6	64.6	47.4
49	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED120-4S/730	10080	76.0	132.6	1.8	0.064	0.048	0.048	0.035	87.1	65.3	65.3	47.9
50	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/727	1634	14.2	115.1	0.3	0.073	0.055	0.055	0.040	100.4	75.3	75.3	55.2
51	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/727	1892	16.4	115.4	0.4	0.073	0.055	0.055	0.040	100.2	75.1	75.1	55.1
52	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/727	2125	18.8	113.0	0.5	0.075	0.056	0.056	0.041	102.2	76.7	76.7	56.2
53	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/727	2580	21.0	122.9	0.5	0.069	0.051	0.051	0.038	94.0	70.5	70.5	51.7
54	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/727	3010	24.5	122.9	0.6	0.069	0.051	0.051	0.038	94.0	70.5	70.5	51.7

55	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/727	3400	28.5	119.3	0.7	0.071	0.053	0.053	0.039	96.9	72.6	72.6	53.3
56	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED45-4S/727	3825	32.5	117.7	0.8	0.072	0.054	0.054	0.039	98.2	73.6	73.6	54.0
57	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED55-4S/727	4704	40.5	116.1	1.0	0.073	0.054	0.054	0.040	99.5	74.6	74.6	54.7
58	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED65-4S/727	5610	45.0	124.7	1.1	0.068	0.051	0.051	0.037	92.7	69.5	69.5	51.0
59	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED75-4S/727	6384	53.0	120.5	1.3	0.070	0.053	0.053	0.039	95.9	71.9	71.9	52.8
60	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED85-4S/727	7224	61.0	118.4	1.5	0.071	0.053	0.053	0.039	97.6	73.2	73.2	53.7
61	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED95-4S/727	8064	66.0	122.2	1.6	0.069	0.052	0.052	0.038	94.6	70.9	70.9	52.0
62	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED105-4S/727	8820	74.0	119.2	1.8	0.071	0.053	0.053	0.039	96.9	72.7	72.7	53.3
63	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED115-4S/727	9660	84.0	115.0	2.0	0.073	0.055	0.055	0.040	100.5	75.4	75.4	55.3
64	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/722	1634	15.8	103.4	0.4	0.082	0.061	0.061	0.045	111.7	83.8	83.8	61.4
65	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/722	1870	18.4	101.6	0.4	0.083	0.062	0.062	0.046	113.7	85.3	85.3	62.5
66	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/722	2125	21.5	98.8	0.5	0.085	0.064	0.064	0.047	116.9	87.7	87.7	64.3
67	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/722	2580	23.5	109.8	0.6	0.077	0.058	0.058	0.042	105.2	78.9	78.9	57.9
68	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/722	2975	28.0	106.3	0.7	0.079	0.060	0.060	0.044	108.7	81.6	81.6	59.8

69	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/722	3400	32.0	106.3	0.8	0.079	0.060	0.060	0.044	108.7	81.6	81.6	59.8
70	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/722	4250	38.5	110.4	0.9	0.076	0.057	0.057	0.042	104.7	78.5	78.5	57.6
71	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/722	5100	46.5	109.7	1.1	0.077	0.058	0.058	0.042	105.3	79.0	79.0	57.9
72	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/722	5880	56.0	105.0	1.3	0.080	0.060	0.060	0.044	110.0	82.5	82.5	60.5
73	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/722	6720	61.0	110.2	1.5	0.077	0.057	0.057	0.042	104.9	78.7	78.7	57.7
74	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/722	7560	70.0	108.0	1.7	0.078	0.059	0.059	0.043	107.0	80.2	80.2	58.8
75	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/722	8400	81.0	103.7	2.0	0.081	0.061	0.061	0.045	111.4	83.6	83.6	61.3
76	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/840	1634	13.6	120.1	0.3	0.070	0.053	0.053	0.039	96.2	72.1	72.1	52.9
77	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/840	1892	15.8	119.7	0.4	0.070	0.053	0.053	0.039	96.5	72.4	72.4	53.1
78	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/840	2125	18.2	116.8	0.4	0.072	0.054	0.054	0.040	99.0	74.2	74.2	54.4
79	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/840	2580	20.5	125.9	0.5	0.067	0.050	0.050	0.037	91.8	68.9	68.9	50.5
80	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/840	3010	24.0	125.4	0.6	0.067	0.050	0.050	0.037	92.1	69.1	69.1	50.7
81	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/840	3400	27.5	123.6	0.7	0.068	0.051	0.051	0.038	93.5	70.1	70.1	51.4
82	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/840	4250	35.0	121.4	0.8	0.069	0.052	0.052	0.038	95.2	71.4	71.4	52.3

83	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/840	5100	40.0	127.5	1.0	0.066	0.050	0.050	0.036	90.6	68.0	68.0	49.8
84	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/840	5950	47.5	125.3	1.1	0.067	0.050	0.050	0.037	92.2	69.2	69.2	50.7
85	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/840	6720	55.0	122.2	1.3	0.069	0.052	0.052	0.038	94.6	70.9	70.9	52.0
86	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/840	7560	60.0	126.0	1.4	0.067	0.050	0.050	0.037	91.7	68.8	68.8	50.4
87	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/840	8400	67.0	125.4	1.6	0.067	0.050	0.050	0.037	92.2	69.1	69.1	50.7
88	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/830	1634	14.2	115.1	0.3	0.073	0.055	0.055	0.040	100.4	75.3	75.3	55.2
89	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/830	1892	16.4	115.4	0.4	0.073	0.055	0.055	0.040	100.2	75.1	75.1	55.1
90	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/830	2125	18.8	113.0	0.5	0.075	0.056	0.056	0.041	102.2	76.7	76.7	56.2
91	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/830	2580	21.0	122.9	0.5	0.069	0.051	0.051	0.038	94.0	70.5	70.5	51.7
92	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/830	3010	24.5	122.9	0.6	0.069	0.051	0.051	0.038	94.0	70.5	70.5	51.7
93	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/830	3400	28.5	119.3	0.7	0.071	0.053	0.053	0.039	96.9	72.6	72.6	53.3
94	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/830	4250	36.5	116.4	0.9	0.072	0.054	0.054	0.040	99.2	74.4	74.4	54.6
95	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/830	5100	41.5	122.9	1.0	0.069	0.051	0.051	0.038	94.0	70.5	70.5	51.7
96	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/830	5880	49.0	120.0	1.2	0.070	0.053	0.053	0.039	96.3	72.2	72.2	53.0

97	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED80-4S/830	6720	57.0	117.9	1.4	0.072	0.054	0.054	0.039	98.0	73.5	73.5	53.9
98	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED90-4S/830	7560	62.0	121.9	1.5	0.069	0.052	0.052	0.038	94.8	71.1	71.1	52.1
99	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED100-4S/830	8400	70.0	120.0	1.7	0.070	0.053	0.053	0.039	96.3	72.2	72.2	53.0
100	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED19-4S/830	1634	14.2	115.1	0.3	0.073	0.055	0.055	0.040	100.4	75.3	75.3	55.2
101	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED22-4S/830	1892	16.4	115.4	0.4	0.073	0.055	0.055	0.040	100.2	75.1	75.1	55.1
102	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED25-4S/827	2150	19.0	113.2	0.5	0.075	0.056	0.056	0.041	102.1	76.6	76.6	56.2
103	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED30-4S/827	2580	22.5	114.7	0.5	0.074	0.055	0.055	0.040	100.8	75.6	75.6	55.4
104	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED35-4S/827	2975	26.5	112.3	0.6	0.075	0.056	0.056	0.041	102.9	77.2	77.2	56.6
105	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED40-4S/827	3400	30.5	111.5	0.7	0.076	0.057	0.057	0.042	103.6	77.7	77.7	57.0
106	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED50-4S/827	4250	37.0	114.9	0.9	0.073	0.055	0.055	0.040	100.6	75.4	75.4	55.3
107	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED60-4S/827	5100	45.0	113.3	1.1	0.074	0.056	0.056	0.041	101.9	76.5	76.5	56.1
108	BGP530/BRP530/BPP530/BSP530/BVP530	BGP530/BRP530/BPP530/BSP530/BVP530 LED70-4S/827	5880	53.0	110.9	1.3	0.076	0.057	0.057	0.042	104.1	78.1	78.1	57.3