EPD®

ECO PLATFORM EPD VERIFIED

Metalogalva
engineering and protecting steel

In accordance with ISO 14025 and
EN 15804:2012+A2:2019 for:

LIGHTING COLUMN

METALOGALVA – IRMÃOS SILVAS S.A.

ENVIRONMENTAL PRODUCT **DECLARATION**

**PROGRAMME: THE INTERNATIONAL EPD® SYSTEM,
WWW.ENVIRONDEC.COM**

**PROGRAMME OPERATOR: EPD INTERNATIONAL AB
EPD REGISTRATION NUMBER: S-P-05464**

**PUBLICATION DATE: 2021-02-01
VALID UNTIL: 2026-02-01**

**AN EPD SHOULD PROVIDE CURRENT INFORMATION AND MAY BE UPDATED IF CONDITIONS CHANGE.
THE STATED VALIDITY IS THEREFORE SUBJECT TO THE CONTINUED REGISTRATION
AND PUBLICATION AT WWW.ENVIRONDEC.COM**

GENERAL INFORMATION

Programme information

Programme:
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CEN STANDARD EN 15804 SERVES AS THE CORE PRODUCT CATEGORY RULES (PCR)
Product category rules (PCR): PCR 2019:14 Construction products. Version 1.11. 2021-02-05
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☑ EPD verification
Third party verifier: Rubén Carnerero, IK Ingeniería
Procedure for follow-up of data during EPD validity involves third party verifier: ☑ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.
EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

METALOGALVA – IRMÃOS SILVAS S.A.
Maganha - Santiago de Bougado - Apartado 206
4786-909 - Trofa - Portugal

Contact: Sara Pimenta

Description of the organisation:

Metalogalva - Irmãos Silvas, S.A., is a metalworking company, part of the VigentGroup, developing its activity in design and manufacture of metal structures, hot dip galvanizing and powder and liquid painting. The headquarters is located in Trofa city, at 19km of Oporto airport and 28 km of Leixões harbour. Founded in 1971, it is the oldest company of the VigentGroup, with interests in a wide range of economic sectors, namely in the industrial, financial, construction and food distribution areas.

With modern manufacturing facilities, it has 6 national industrial units, covering 60.440m2 of indoor space, and a total area of 199.000m2. With over 600 employees, the company has an annual turnover of over 100 million euros, resulting from the constant technological evolution and productivity increase.

Metalogalva's mission is to produce steel structures, consistently delivering the best products, maintaining the highest levels of service and promoting responsible business and environmental management, welfare, motivation and safety of employees. Achieve maximum productivity, ensuring high quality standards for customer satisfaction, based on a culture of research, development and innovation of their products.

Product-related or management system-related certifications:

- Integrated Management System: quality (ISO9001), environment (ISO 14001), health and safety at work (ISO 45001) and RDI (NP 4457)

Other certifications:

- EN 1090 EXC4 (metal structures CE Marking);
  EN40 / EN1317 (product CE marking);
  ISO 3834-2 (welding);
  CW47.1 (welding – Canadian standard);
  DAST Guideline 022 (galvanization);
  NHSS6 (UK market);

Name and location of production site(s):

METALOGALVA – IRMÃOS SILVAS S.A.
Maganha - Santiago de Bougado - Apartado 206
4786-909 - Trofa - Portugal

Zona Industrial Vista Alegre
3850-184 Albergaria-a-Velha - Portugal

Product information

Product name:
LIGHTING COLUMN

Product identification:
PUBLIC LIGHTING COLUMNS

Product description:

Lighting Columns are structures to hold one or more lanterns (source of light) on the edge, consisting of one or more parts: a pole (structure), possibly an extension piece and if necessary, a bracket. Other denominations for this product are streetlight, light pole, lamp post, streetlamp. Metalogalva has a range of columns for street lighting (roads, public gardens, parking). For public lighting columns, there is specific legislation and community standards, and they are covered by EN 40 and the Regulation nº 305/2011 (CPR) and the product is subject to Verification of Conformity, according to the standard EN 40-5.

The range of models is defined by the material, shape, height, and conditions of use. The material of these columns is steel (sheet). The format of cross-section could be round, octagonal, polygonal, square, or rectangular. Along the length, the column can be straight, with reduction of the dimension between the base and the top (conicity), stepped (composed by one or more tubes) and depending on the height, it can have one or more shafts. Includes top post columns or columns with brackets (a component used to install lantern(s) by means of one or more brackets integrated on the top). The bracket can be made with a fixing angle, can be straight or bended, and made with several lengths until 4.5m (maximum length allowed by EN40). While top post columns (without bracket) can go up to 20m, by normative reasons, poles with brackets can only go until 18m. In general, the columns have a hatch to allow installation and access to electrical equipment, and in case of embedment, an opening for cable entry below the ground.

The installation of the columns in the ground can be made by base plate or planting depth. In the first option the columns have a base plate, and its fixation is made using a set of anchor bolts embedded in a concrete foundation. With planting depth, they can be installed in natural ground with or without concrete surrounding the planting depth, depending on the resistance conditions of the soil found in situ. All models that Metalogalva has now certified, include several heights from 2.5 meters to 20 meters, with top diameters between 60mm and 168mm, and conicities that can go from 10mm / m to 18.5mm / m.

Product group classification UN CPC 42110

LCA information

Functional unit / declared unit: 1 tonne of product

Reference service life: 35 years, for a metal frame with 80 µm of zinc coating (2% by mass).

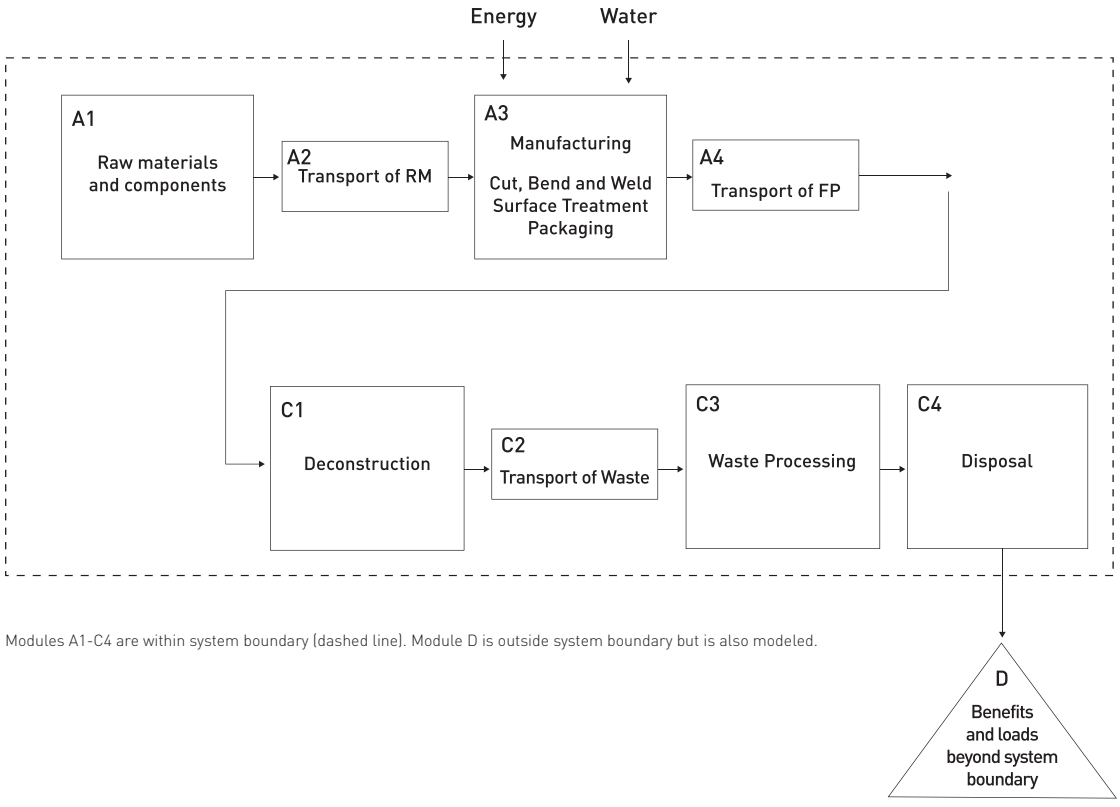
Time representativeness: 2020

Database(s) and LCA software used: Databases Ecoinvent 3.7.1 and EF Database 2.0, and software Simapro 9.2.0.1

Description of system boundaries: The EPD type is cradle to gate with options, modules C1–C4, and module D (A1–A3, C,D and additional module A4).

Excluded life cycle stages:
Modules A5, B1-B5 are not assessed.
In B1-B5, only minimal maintenance is required.

System diagram:



Modules A1-C4 are within system boundary (dashed line). Module D is outside system boundary but is also modeled.

Manufacturing Process:

For this product, Metalogalva dedicates four production units, two dedicated to the manufacture of the metallic structure (M2 and M4), and two other dedicated to corrosion protection (M1 and Galvaza). The process of manufacturing a public lighting column includes several steps, according to the model selected.

For tubular or stepped lighting columns:

- Cutting of the tubes.
- Welding of the tubes - parallel sided stepped.
- Welding of the base plate at the bottom (when applicable fixation with anchor bolts kit).
- Cutting of the door opening to electrical equipment and/ or cable entry.
- Finishing operations according to the fixing system of the luminaire and / or arms at the top (drilling at the top; reducing the diameter on the top; others).

For round, octagonal, or polygonal lighting columns:

- Cutting of the steel sheet plate, according to the 2D planification of the format model. The result is one trapezoid steel sheet.
- Bending of the trapezoid steel sheet. The result is a single open piece with conicity (shaft).
- Automated welding of the longitudinal edges of the shaft.
- Welding of the base plate at the bottom (when applicable fixation with anchor bolts kit).
- Cutting of the door opening to electrical equipment and/ or cable entry.
- Finishing operations according to the fixing system of the luminaire and / or arms at the top (drilling at the top; reducing the diameter on the top; others).
- Some of the models are curved conical columns. After the steps above, they are bended at the top to ensure a specific curvature.

The brackets for the top are manufactured through bending steel sheet or tube cutting, according to the cross-section and format applicable.

All columns have a corrosion protection: hot dip galvanizing according to norm EN ISO 1461. On demand, the galvanized surface may be painted (Duplex System).

Cut-off rule:

1% cut-off rule was applied for input flows in the inventory.

Excluded processes:

Capital goods and activities that are not directly associated to the production of the assessed product, but that indirectly contribute to it, were not included in the assessment.

These include the buildings and machinery, social areas, the training center, the laboratories, and the overall maintenance of the units.

Assumptions:

1. The study was carried out considering an average pole - the total materials used to produce the different models of the lighting columns family were accounted for, thus representing a column with an average composition of the columns produced in this family.

2. It was assumed that the trucks and ships companies' that transport the columns to the clients around the world try to capitalize their assets and return fully loaded.

Allocation:

1. Galvanization of products sold by Metalogalva is processed in units M1 and Galvaza. However, these units also galvanize products manufactured by other companies that procure the galvanization service of Metalogalva.

The lighting column family is then just a fraction of all the galvanized products in M1 and Galvaza. The allocation of materials, energy and auxiliary products used in M1 and Galvaza units for the galvanization of this product is made considering the ratio (in weight) of columns galvanized in the unit/total products galvanized in the unit. For instance, considering that this product in one of the units represents 20% of all the tons of galvanized in that unit, the amount of zinc for galvanization was assumed to be 20% of all the zinc used for galvanization.

2. The same methodology was used in unit M2, that cuts the materials that are then sent to M4 to be bended and then galvanized in Galvaza and cuts and bends the materials that are galvanized in M1.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							Resource recovery stage				
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU27, UKR, TUR, IND	EU27, RoW	EU27	EU27									EU27	EU27	EU27	EU27	EU27
Specific data used		> 90%				-	-	-	-	-	-	-	-	-	-	-	-
Variation – products		Not relevant				-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites		Not relevant				-	-	-	-	-	-	-	-	-	-	-	-

Content information:

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel	980	100	0
Zinc	20	100	0
TOTAL	**1000**	**100**	**0**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Wood	1.6	0.16	
Cardboard	0.3	0.03	
Plastic	0.2	0.02	
TOTAL	**2.1**	**0.21**	

For the manufacturing of this product there are no substances listed in the "Candidate List of substances of Very High Concern for authorisation".

Packaging

The product is delivered on the site. Columns are grouped and belted together in batches. For protection, either wooden bars or foam are placed between them. Some clients demand protection with cardboard and plastic film.

End-of-Life

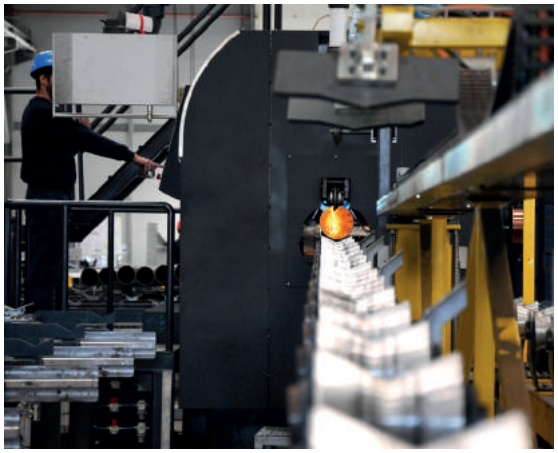
For the end-of-life of the lighting pole it is assumed that the pole is dismantled, and the totality of the components are collected. Five per cent of the materials are mixed with the dismantling waste and ninety-five per cent is separated and sent to recycling (EPLCA, 2020).

Benefits and loads beyond the system boundary were calculated using a net scrap formulation proposed by World Steel Association in life cycle inventory methodology report (2017), where the net scrap is determined as a difference between the amount of steel recycled at end-of-life and the scrap input from previous product life cycle (assumed as 85%).

ENVIRONMENTAL INFORMATION

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit											
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	C1	C2	C3	C4	D
GWP-total[a]	kg CO_2 eq.	2.4E+03	8.0E+01	9.5E+01	2.6E+03	2.4E+02	0.0E+00	3.7E+00	1.8E+01	1.6E-01	-6.2E+00
GWP-fossil	kg CO_2 eq.	2.4E+03	8.0E+01	9.5E+01	2.6E+03	2.4E+02	0.0E+00	3.7E+00	1.8E+01	1.6E-01	-6.2E+00
GWP-biogenic	kg CO_2 eq.	1.4E+00	5.4E-02	-1.6E+01	-1.5E+01	1.9E-01	0.0E+00	2.6E-03	6.1E-02	1.7E-03	1.8E-02
GWP-luluc	kg CO_2 eq.	1.7E+00	7.8E-04	9.1E-01	2.6E+00	1.9E-03	0.0E+00	4.9E-05	1.3E-02	7.9E-06	4.4E-04
ODP	kg CFC 11 eq.	1.1E-04	1.7E-05	3.4E-05	1.6E-04	5.7E-05	0.0E+00	8.3E-07	2.5E-06	2.7E-08	-1.3E-06
AP	mol H^+ eq.	9.5E+00	2.2E+00	6.7E-01	1.2E+01	9.3E-01	0.0E+00	2.5E-02	1.4E-01	1.5E-03	-1.4E-01
EP-freshwater	kg PO_4^{3-} eq.	3.4E-01	1.4E-04	1.1E-02	3.5E-01	4.1E-04	0.0E+00	2.6E-05	1.1E-03	5.0E-06	1.5E-05
EP-freshwater	kg P eq	1.1E-01	4.7E-05	3.7E-03	1.1E-01	1.3E-04	0.0E+00	8.6E-06	3.7E-04	1.6E-06	4.9E-06
EP-marine	kg N eq.	2.1E+00	5.4E-01	8.3E-02	2.7E+00	2.9E-01	0.0E+00	1.1E-02	5.1E-02	5.8E-04	-3.9E-02
EP-terrestrial	mol N eq.	2.3E+01	6.0E+00	9.3E-01	3.0E+01	3.2E+00	0.0E+00	1.2E-01	5.7E-01	6.3E-03	-4.5E-01
POCP	kg NMVOC eq.	1.1E+01	1.5E+00	3.2E-01	1.2E+01	8.7E-01	0.0E+00	3.0E-02	1.5E-01	1.9E-03	-1.1E-01
ADP-minerals&metals[b]	kg Sb eq.	6.9E-02	1.3E-06	1.8E-04	6.9E-02	1.0E-05	0.0E+00	2.2E-07	6.7E-07	6.0E-09	-3.6E-06
ADP-fossil[c]	MJ	2.4E+04	1.1E+03	3.4E+03	2.9E+04	3.5E+03	0.0E+00	5.2E+01	2.3E+02	1.9E+00	-7.8E+01
WDP	m^3	7.3E+02	-2.4E-01	3.6E+02	1.1E+03	-7.4E-01	0.0E+00	1.7E-02	1.1E+00	1.5E-03	2.7E-02
Acronyms	GWP-total = Total global warming potential; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential. Accumulated Exceedance; EP-freshwater = Eutrophication potential. fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential. fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential. Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential. deprivation-weighted water consumption										
Notes	[a] The total global warming potential (GWP-total) is the sum of: — GWP-fossil — GWP-biogenic — GWP-luluc [b,c] The abiotic depletion potential is calculated and declared in two different indicators: — ADP-minerals&metals include all non-renewable. abiotic material resources (i.e. excepting fossil resources); — ADP-fossil include all fossil resources and includes uranium.										



Potential environmental impact – additional mandatory and voluntary indicators

Results per functional or declared unit											
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1.5E-04	2.8E-06	4.3E-06	1.6E-04	1.6E-05	0.0E+00	4.4E-07	2.9E-06	3.7E-08	-6.2E-07
IRP	kBq U-235 eq	4.6E+01	4.6E+00	1.3E+01	6.3E+01	1.5E+01	0.0E+00	2.2E-01	9.4E-01	7.4E-03	-2.9E-01
ETP-fw*	CTUe	7.2E+04	3.6E+02	1.2E+03	7.4E+04	1.4E+03	0.0E+00	2.5E+01	1.6E+02	1.9E+00	-7.0E+02
HTP-c*	CTUh	1.3E-05	1.1E-08	2.6E-08	1.3E-05	2.0E-08	0.0E+00	1.3E-09	2.1E-09	2.2E-11	-8.7E-10
HTP-nc*	CTUh	7.8E-05	3.9E-07	5.2E-06	8.3E-05	2.3E-06	0.0E+00	5.5E-08	1.2E-07	3.5E-09	-3.4E-08
SQP*	Pt	6.5E+03	3.3E+00	8.1E+02	7.3E+03	1.1E+01	0.0E+00	2.9E-01	8.6E+00	1.1E+01	-2.2E+01
Acronyms	PM - Potential incidence of disease due to particulate matter emissions; IRP, Ionising radiation potential - Potential Human exposure efficiency relative to U235; ETP-fw, Ecotoxicity potential, freshwater - Potential Comparative Toxic Unit for ecosystems; HTP-c, Human toxicity, cancer - Potential Comparative Toxic Unit for humans; HTP-nc, Human toxicity, non-cancer - Potential Comparative Toxic Unit for humans; PSQ - Potential soil quality index (dimensionless).										
Notes	**Disclaimer: The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicators.*										

Use of resources

Results per functional or declared unit											
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	3.0E+02	4.2E-01	3.9E+02	6.9E+02	1.5E+00	0.0E+00	2.0E-02	9.0E-01	1.6E-02	1.2E-01
PERM	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT	MJ	3.0E+02	4.2E-01	3.9E+02	6.9E+02	1.5E+00	0.0E+00	2.0E-02	9.0E-01	1.6E-02	1.2E-01
PENRE	MJ	4.6E+00	1.8E-04	1.0E+03	1.0E+03	0.0E+00	0.0E+00	2.7E-03	3.0E-06	-5.9E-05	7.6E+01
PENRM	MJ.	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT	MJ	4.6E+00	1.8E-04	1.0E+03	1.0E+03	0.0E+00	0.0E+00	2.7E-03	3.0E-06	-5.9E-05	7.6E+01
SM	kg	8.83E+02	0.0E+00	0.0E+00	8.83E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	m3	2.0E+01	2.9E-03	4.4E+01	6.3E+01	5.9E-03	1.2E-03	4.4E-02	6.2E-05	1.1E-03	1.2E-03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

Waste production and output flows

Waste production

Results per functional or declared unit											
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5.8E-01	1.2E-03	4.0E-03	5.8E-01	9.1E-03	0.0E+00	1.4E-04	4.0E-04	4.3E-06	-1.3E-04
Non-hazardous waste disposed	kg	3.7E+02	4.9E-02	7.8E-01	3.7E+02	1.4E-01	0.0E+00	1.4E-02	3.5E-01	5.0E+01	-1.5E+01
Radioactive waste disposed	kg	4.3E-02	7.6E-03	1.4E-02	6.4E-02	2.5E-02	0.0E+00	3.7E-04	1.2E-03	1.2E-05	-5.3E-04

Output flows

Results per functional or declared unit											
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Material for recycling	kg	0.0E+00	0.0E+00	8.6E+01	8.6E+01	0.0E+00	0.0E+00	0.0E+00	9.5E+02	0.0E+00	0.0E+00
Materials for energy recovery	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Information on biogenic carbon content

Results per functional or declared unit		
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	4.52

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

References

- General Programme Instructions of the International EPD® System. Version 3.01.
- PCR 2019:14 Construction products. Version 1.11. 2021-02-05.
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. EPLCA, European Platform on Life Cycle Assessment, 2020. Annex C to the PEF/OEF Methods (Updated May 2020) in https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml
- World Steel Association, 2017. Life Cycle assessment methodology report - Life cycle inventory study for steel products.
- World Steel Association, 2018. Life Cycle assessment methodology report - Life cycle inventory study for steel products.
- EPLCA, European Platform on Life Cycle Assessment 2020. Annex C - Values to be used in the application of the Circular Footprint Formula. In https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml

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