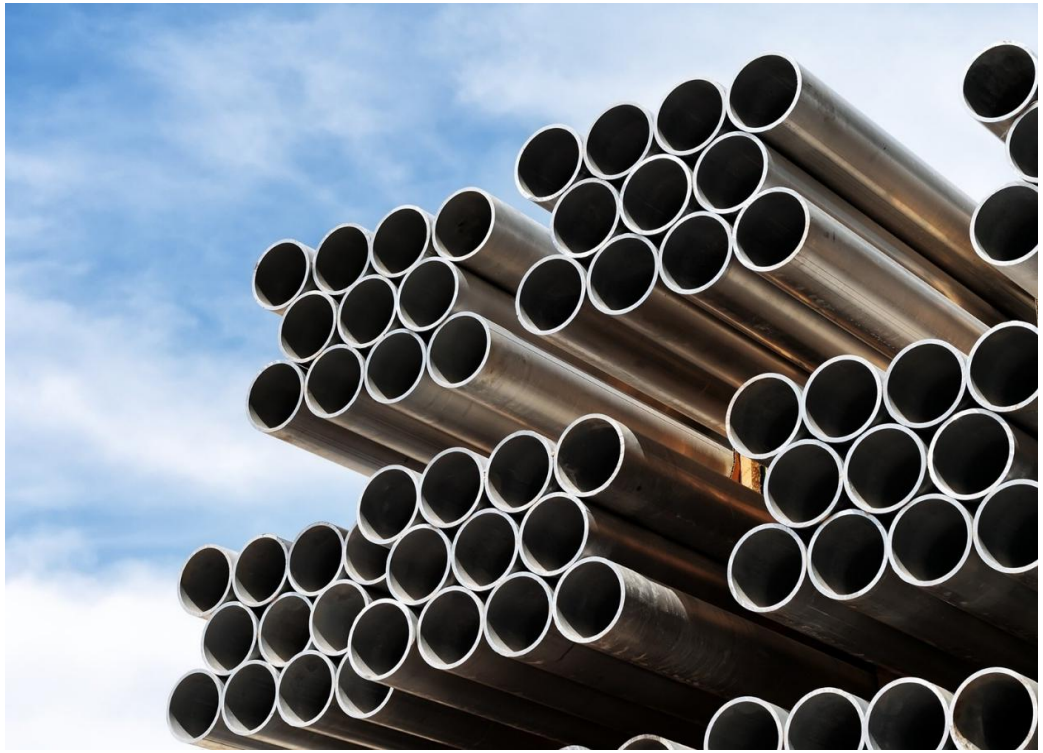
ArcelorMittal

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Seamless Structural Hollow Sections in accordance with EN 10210
ArcelorMittal Tubular Products Europe



EPD HUB, EPD number HUB-3788

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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.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	ArcelorMittal Europe - Tubular Products
Address	24-26, boulevard d'Avranches L 1160 Luxembourg
Contact details	unai.aramburu@arcelormittal.com
Website	https://tubular.arcelormittal.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Ipek Goktas, One Click LCA
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Sarah Curpen, an authorized verifier acting for EPD Hub Limited.

This EPD is intended for business-to-business and/or business-to-consumer communication. 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.

PRODUCT

Product name	Seamless Structural Hollow Sections in Accordance with EN 10210
Additional labels	Structural Hollow Sections (SHS), Hollow Structural Sections (HSS)
Product reference	EN 10219 (cold-formed), EN 10210 (hot-finished)
Place(s) of raw material origin	Italy, Croatia, Romania, Other (Europe)
Place of production	Roman (RO)
Place(s) of installation and use	Europe
Period for data	01.01-31.12.2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	0%
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	53%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	1,16E+00
GWP-total, A1-A3 ($kgCO_2e$)	1,16E+00
Secondary material, inputs (%)	116
Secondary material, outputs (%)	99
Total energy use, A1-A3 (kWh)	6,03
Net freshwater use, A1-A3 (m^3)	0,02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ArcelorMittal Europe – Tubular Products is a division of ArcelorMittal Downstream Solutions and a leading European producer of steel pipes and tubes. With production facilities located across Europe and a broad distribution network, the company supplies a wide range of tubular steel products to markets including construction, energy, automotive, agriculture, and mechanical engineering.

The product portfolio includes seamless, welded, precision, and cold drawn tubes, with advanced finishing capabilities such as galvanizing, coating, laser cutting, and bending. ArcelorMittal Tubular Products is committed to sustainability and innovation, supporting the development of high-performance, low-emission steel solutions through its industrial operations and global R&D network.

The company engages closely with customers to develop value-added solutions and contributes to the steel industry's transformation toward circular and low-carbon production.

PRODUCT DESCRIPTION

This declaration covers structural hollow sections produced by ArcelorMittal Europe – Tubular Products. The structural hollow sections are produced in circular shape for load-bearing and structural applications.

Depending on the manufacturing route, sections are hot finished in accordance with EN 10210. The steel used is typically non-alloyed or fine grain structural steel. Products carry CE marking and meet applicable requirements under the Construction Products Regulation (EU No. 305/2011). Each supply is accompanied by a material certificate and a declaration of performance.

Technical Characteristics:
Structural hollow sections offer high strength-to-weight ratio, dimensional accuracy and excellent weldability.

These products are widely used in the construction industry, are very versatile and can be applied as structural elements in various applications such as agricultural equipment, cranes, buildings, pavilions, stadiums, civil and mechanical engineering, and other sectors such as renewable energy installations.

They are considered in EN 1993 (Eurocode 3), the European reference code for the design of steel structures, in EN 1090, the European reference standard for the construction of steel structures, as well as in Regulation (EU) No 5/2011, the European Construction Products Regulation.

Manufacturing Process:
Structural hollow sections are highly versatile products that can be used as structural elements in various applications, including agricultural equipment, cranes, buildings, pavilions, stadiums, civil and mechanical engineering, and other sectors such as renewable energy installations.

These products are widely used in the construction industry and are considered in EN 1993 (Eurocode 3), the European reference code for the design of steel structures, in EN 1090, the European reference standard for the execution of steel structures, as well as in Regulation (EU) No. 5/2011, the European Regulation for Construction Products.

Further information can be found at www.tubular.arcelormittal.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	Italy, Croatia, Romania, Other (Europe)
Minerals	-	-
Fossil materials	-	-
Bio-based materials	-	-

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	0,0005

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

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

SYSTEM BOUNDARY

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

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

Modules not declared = ND

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The product stage (Modules A1–A3) covers all relevant processes from raw material extraction to the finished product leaving the gate of ArcelorMittal's manufacturing sites.

A1 – Raw Material Supply:

This stage covers the extraction and processing of raw materials required for seamless steel tube production. Steel used for seamless tubes is typically produced via the Electric Arc Furnace (EAF) route from scrap which allows for lower direct CO_2 emissions compared to blast furnace methods. The choice of raw materials and steelmaking route significantly influences the environmental footprint, particularly in terms of greenhouse gas emissions and energy intensity.

A2 – Transport to Manufacturing Site:

Transportation of raw materials to production facilities includes road, rail, and maritime transport modes. The environmental burdens account for fuel consumption, associated emissions, and wear on transport infrastructure.

A3 – Manufacturing and Packaging:

The manufacturing of seamless hollow structural sections involves hot rolling and piercing processes, followed by elongation through mandrel or plug mills (for EN 10210 hot-finished products). This stage includes:

- Energy use
- Use of process water and lubricants,
- Ancillary materials,
- Packaging (e.g., plastic straps, wooden supports),
- Internal transportation,
- Material losses and waste processing,
- Handling and on-site treatment or recycling of production waste (such as mill scale, scrap, sludges),
- Electricity transmission losses

The packaging is designed to protect products during transport and handling. Typical materials include recyclable steel, plastic and wooden components.

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover the construction phase.
Air, soil, and water impacts during the assembly stage have not been studied.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use stage have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

These modules consider the dismantling of the considered product (C1), the transportation of the dismantled components to their final end-of-life destination (C2), the waste processing for recovery or recycling (C3) as well as the disposal (C4).

For module C1, diesel consumption used in demolition machines is taken into consideration.

For module C2, the transportation of the dismantled components is considered by truck over 100 km for all recovery applications such as reuse, recycling, incineration, and 50 km for the disposal applications such as landfilling.

For modules C3 & C4, based on common practices, the following end of life scenario is considered:

- 89% of the steel is recycled
- 10% of the steel is reused
- 1% of the steel is sent to landfill

At the end-of-life, the steel material leaves the system in C3 to be recycled and reused in module D as well as disposal in module C4.

Module D includes any declared benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state in the form of reuse, recovery and/or recycling potentials.

Steel is assumed to reach the end of waste status directly at the construction site. The treatment as well as net impacts and benefits of reuse or recycling potentials (for the net scrap amount only) are grouped to module D.

Potential environmental benefits are given for the net steel scrap that is produced at the end of a final product's life. This net scrap is determined as follows:

- Net scrap = Amount of steel recycled at end-of-life – Scrap input from previous product life cycles

Accordingly, in this study, no benefits are allocated to Module D, as the burden-free scrap is fully assigned to Module A1. Consequently, all environmental benefits associated with the use of recycled scrap are credited in A1.

SYSTEM BOUNDARY DIAGRAM

A1: RAW MATERIAL EXTRACTION	**Steel Production**	▪ **EAF Route**: Steel scrap is melted using electric arc furnaces, allowing for high recycled content and reduced CO_2 emissions compared to conventional routes.
A2: TRANSPORT TO PRODUCTION SITE	**Transport**	▪ Steel is transported from European suppliers via road, rail, and maritime modes, depending on distance and logistical needs.
A3: MANUFACTURING	**Forming**	▪ **EN 10210 (hot-finished)**: Solid steel billets are heated and pierced to create a hollow shell, which is then hot rolled and finished using mandrel or plug mill processes to achieve the required dimensions and mechanical properties. ▪ The seamless process eliminates the need for welding, resulting in uniform mechanical characteristics throughout the cross-section.
	Cutting and Finishing	▪ Tubes are cut to specified lengths and subjected to dimensional and surface inspections. ▪ Optional finishing processes may include shot blasting, painting, or galvanizing, depending on customer requirements.
	Quality Control and Certification	▪ Products undergo rigorous testing to verify dimensional accuracy and mechanical performance in compliance with EN standards. ▪ CE marking and third-party certification are standard procedures to ensure product quality and traceability.
C1-C4: END OF LIFE	**Disposal Process**	▪ The disposal process comprises product disassembly, transportation to appropriate facilities, waste treatment for recycling and re-use, and final disposal in landfill for non-recoverable materials.

LIFE-CYCLE ASSESSMENT

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. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. 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, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Partly allocated by revenue
Packaging material	No allocation
Ancillary materials	Allocated by revenue
Manufacturing energy and waste	Allocated by revenue

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No averaging
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	0%

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

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	7,19E-01	5,78E-02	3,81E-01	1,16E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,01E-05	1,07E-02	3,80E-02	6,24E-05	0,00E+00
GWP – fossil	kg CO_2e	7,17E-01	5,77E-02	3,81E-01	1,16E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,01E-05	1,07E-02	2,16E-02	6,24E-05	0,00E+00
GWP – biogenic	kg CO_2e	7,43E-04	3,63E-05	1,07E-04	8,86E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,20E-09	2,25E-06	1,63E-02	-1,99E-08	0,00E+00
GWP – LULUC	kg CO_2e	7,16E-04	6,21E-05	3,38E-05	8,12E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,23E-09	4,01E-06	1,78E-05	3,57E-08	0,00E+00
Ozone depletion pot.	kg $CFC\text{-}_{11}e$	6,83E-09	8,99E-10	1,08E-08	1,86E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,38E-12	2,15E-10	1,45E-10	1,81E-12	0,00E+00
Acidification potential	mol H^+e	2,53E-03	4,93E-04	9,75E-04	3,99E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,13E-07	3,44E-05	9,56E-05	4,43E-07	0,00E+00
EP-freshwater[2)]	kg Pe	2,64E-04	1,38E-05	1,83E-04	4,61E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,60E-09	7,19E-07	8,46E-06	5,13E-09	0,00E+00
EP-marine	kg Ne	5,59E-04	1,66E-04	2,74E-04	9,99E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,77E-07	1,17E-05	4,51E-05	1,69E-07	0,00E+00
EP-terrestrial	mol Ne	5,77E-03	1,80E-03	2,48E-03	1,00E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	4,13E-06	1,27E-04	2,52E-04	1,84E-06	0,00E+00
POCP ("smog")[3)]	kg NMVOCe	2,15E-03	5,42E-04	1,02E-03	3,71E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,23E-06	5,61E-05	7,49E-05	6,60E-07	0,00E+00
ADP-minerals & metals[4)]	kg Sbe	1,28E-06	1,61E-07	3,71E-07	1,81E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,23E-11	2,94E-08	3,89E-07	9,92E-11	0,00E+00
ADP-fossil resources	MJ	1,07E+01	8,26E-01	7,81E+00	1,93E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,18E-03	1,54E-01	1,61E-01	1,53E-03	0,00E+00
Water use[5)]	m^3e depr.	5,06E-01	1,22E-02	2,94E-01	8,13E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,94E-06	7,91E-04	5,06E-03	4,42E-06	0,00E+00

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

Note: As A5 is not included, emissions related to the biogenic carbon content of the packaging materials have been balanced within A3.

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[6)]	MJ	1,41E+00	7,61E-02	9,27E-01	2,41E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	7,47E-06	2,52E-03	3,05E-02	1,48E-05	0,00E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,41E+00	7,61E-02	9,27E-01	2,41E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	7,47E-06	2,52E-03	3,05E-02	1,48E-05	0,00E+00
Non-re. PER as energy	MJ	1,07E+01	8,26E-01	7,81E+00	1,93E+01	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,18E-03	1,54E-01	1,61E-01	1,53E-03	0,00E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,07E+01	8,26E-01	7,81E+00	1,93E+01	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,18E-03	1,54E-01	1,61E-01	1,53E-03	0,00E+00
Secondary materials	kg	1,16E+00	9,39E-04	2,57E-03	1,17E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	4,90E-07	6,68E-05	3,08E-04	3,85E-07	0,00E+00
Renew. secondary fuels	MJ	8,44E-05	3,17E-06	5,82E-04	6,69E-04	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,28E-09	8,43E-07	2,40E-05	7,97E-09	0,00E+00
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,42E-02	3,38E-04	6,89E-03	2,14E-02	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	7,79E-08	2,28E-05	8,20E-05	1,59E-06	0,00E+00

6) PER = Primary energy resources.

Note: As A5 is not included, the renewable and non-renewable primary energy content (PERM and PENRM) of the packaging materials has been accounted for within A3. Additionally, all PERM and PENRM associated with the packaging materials have been conservatively assumed to be recovered as energy (PERE and PENRE) in A3, within the scope of energy balancing.

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	3,36E-01	3,18E-03	3,99E-03	3,43E-01	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,31E-06	2,24E-04	2,28E-03	1,69E-06	0,00E+00
Non-hazardous waste	kg	1,20E+00	7,70E-02	9,47E-01	2,23E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,79E-05	4,47E-03	1,29E-01	3,87E-05	0,00E+00
Radioactive waste	kg	3,79E-04	1,75E-06	7,78E-05	4,59E-04	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	1,28E-10	4,61E-08	5,93E-07	2,35E-10	0,00E+00

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 re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,90E-01	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,00E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[7)]	kg CO_2e	7,19E-01	5,78E-02	3,81E-01	1,16E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,01E-05	1,07E-02	3,80E-02	6,24E-05	0,00E+00

7) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. 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

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	The market-based approach is used for electricity. Sources: ▪ Electricity production, nuclear, pressure water reactor, heavy water moderated, Romania, EI v3.10.1 ▪ Electricity production, hydro, run-of-river, Romania, EI v3.10.1 ▪ Electricity production, wind, 1-3MW turbine, onshore, Romania, EI v3.10.1 ▪ Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted, Romania, EI v3.10.1 ▪ Electricity production, natural gas, combined cycle power plant, Romania, EI v3.10.1 ▪ Electricity production, lignite, Romania, EI v3.10.1 Data Quality: Good
Electricity CO2e / kWh	0.203 kg CO2e/kWh
District heating data source and quality	-
District heating CO2e / kWh	-

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	1
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0,10
Recovery process – kg for recycling	0,89
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0,01
Scenario assumptions e.g. transportation	Transportation of the dismantled components is considered by truck over 100km.

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 is filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub cannot 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.

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: Sarah Curpen
Tool verification validity: 27 March 2025 - 26 March 2028

Sarah Curpen, an authorized verifier acting for EPD Hub Limited.
08.08.2025