

Environmental Product Declaration



EPD of multiple products, based on a representative product

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Road restraint system: CRTH1BL2 "CORTINA" (Orion series)

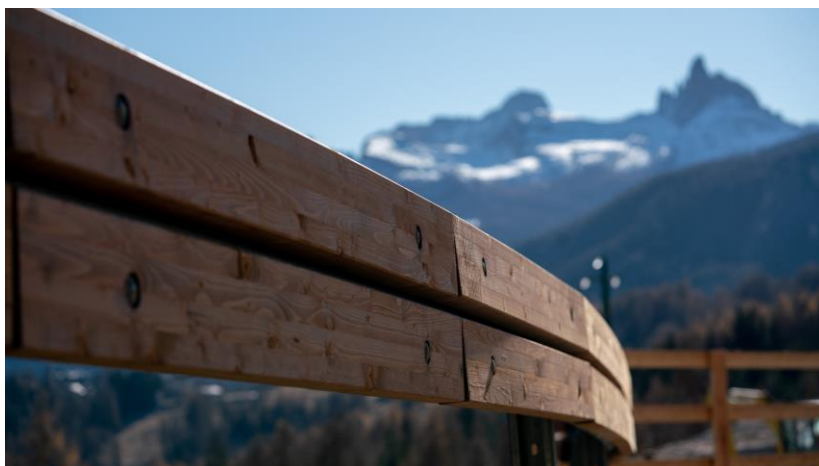
from

Vita International Srl



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0005135
Publication date:	2024-12-17
Valid until:	2029-12-17

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:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>PCR 2019:14 Construction products (EN 15804:A2)(1.3.2)</i> <i>PCR 2019:14-c-PCR-010 c-PCR-010 Guardrails and bridge parapets (2024-04-30)</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD System. See www.environdec.com for a list of members.</i>
Life Cycle Assessment (LCA)
LCA accountability: <i>Michela Gallo and Nicolò Silvestri, TETIS Institute Srl</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: <i>Guido Croce</i> Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No [Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

Vita International Srl

Via Averolda 28-30-32, 25039 Travagliato (BS) – Italy

Contact:

Geom. Matteo Possi

matteo.possi@vitainternational.it

Description of the organisation:

Vita, no name seemed closer to our philosophy. After 30 years and now in the second generation of professionals specializing in wooden and steel road safety barriers, we demonstrate daily our utmost commitment to excelling in our craft, thus rewarding our customers' trust.

A drive for evolution is a hallmark that sets us apart, reflecting a continuous improvement process that involves the entire company and its production approach. This is accompanied by consistent investments in human resources, facilities, new products, and patents.

The true wealth of Vita International, however, lies in the deep sense of belonging shared by its employees, united by enthusiasm for a common project of growth and constant refinement, pursued with courage, intellectual curiosity, and a passion for challenges.

We take an active role in the market through extensive work across territories, offering strategies that consistently carve out new opportunities.

Vita International operates in every region of Italy with professionals specialized in road safety who are deeply familiar with their local areas and the diverse needs of designers, contractors, and managers in the road infrastructure sector. Additionally, we have a presence in international markets through collaborations with 15 partners worldwide.

Product-related or management system-related certifications:

Certificate of Constancy of Performance CE in accordance with Regulation (EU) No 305/2011. Product Standard: EN 1317-5 for Road Restraint Systems. Certificate of Quality Management System in accordance with ISO 9001. Certificate of Environmental Management System in accordance with ISO 14001. Certificate of Occupational Health and Safety Management System in accordance with ISO 45001. Gender Equality Management System Certification according to UNI /PDR 125. Sustainability Rating Certification ESG (Environmental, Social e Governance).

Name and location of production site(s):

Vita International Operational Headquarters - Via Averolda 28/30/32, 25039 Travagliato (BS), Italy

Our operations in Italy are carried out in a company-owned facility covering a total area of 3,500 square meters, located in the municipality of Travagliato in the province of Brescia.

The production of wooden components is entrusted to a company with over thirty years of experience in the sector, while steel components are manufactured by external metalworking contractors.

All subcontractors and external production sites work on behalf of Vita International, adhering to international ISO standards and in compliance with our internal Factory Production Control (FPC) system.

Product information

Product name:
CRTH1BL2 "CORTINA"

Product identification:
EN 1317-5:2012

Model	Post distance	Containment level	Normalized dynamic deflection	Working width	Installed barrier length	Impact severity
H1 BL 2	2 m	H1	1,0 m	W4 (1,1 m)	44 m	ASI A

UN CPC code:
532 - Civil engineering works (safety installations for roads etc)

Geographical scope:
A1-A2 Global, A3 Italian, A4 - A5, C European

Product description:
Vertical posts in S355J0WP "CORTEN®" or hot dip galvanized S355JR steel, "C" section, of dimensions 120x80x25 mm, thickness 4 mm and length 1450 mm; driven in the ground for a depth of 775 mm and placed at centers of 2000 mm. A S355J0WP "CORTEN®" or hot dip galvanized S355JR steel W beam horizontal rail is fixed to the posts, with dimensions 4318x310 mm, thickness 2,5 mm. The horizontal rail is completed with the wooden cover of the steel rail; composed of laminated wooden beams 160x60 mm and length 1990 mm, suitably shaped and impregnated. The barrier can be repurposed by removing the wooden covering "kit" with the consequent redefinition of the device in a same class certified barrier. The coupling between the steel components is guaranteed by high resistance round head bolts Cl. 8.8 M16x40 (Beam-Post, with the addition of a slot cover plate), and M16x30 (Beam - Beam); nuts and washers. The fixing of the wooden beams to the steel rail is done with round head bolts Cl. 4.8 M16x60; nuts and washers.

This LCA study was conducted using the approach of identifying the representative average product for analysed series (Orion).

The selection of these representative products was based on sales volumes for the reference year and the weights per linear meter of each barrier. Specifically, for each series, the study aimed to identify a type of barrier with an average weight per linear meter among all products in the same series, while also having a sales volume considered significant compared to other products.

The following table shows the characteristic of the 12 products covered by this EPD.

Model	Weight per linear meter	Post distance	Containment level	Normalized dynamic deflection	Working width	Installed barrier length	Impact severity
Cortina H1 BL2	24,50 kg	2 m	H1	1,0 m	W4 (1,1 m)	44 m	ASI A
Cortina H1 BP2	24,50 kg	2 m	H1	1,1 m	W4 (1,1 m)	44 m	ASI A
Stelvio H2 BL1,33	45,00 kg	1,33 m	H2	1,1 m	W4 (1,3 m)	80 m	ASI B
Stelvio H2 BL2,66	37,15 kg	2,66 m	H2	1,5 m	W5 (1,5 m)	80 m	ASI B
Bormio H2 BP2	40,70 kg	2 m	H2	1,0 m	W4 (1,3 m)	64 m	ASI B
Lavaredo H2 BP2	52,50 kg	2 m	H2	1,0 m	W4 (1,2 m)	64 m	ASI B
Livigno H2 ST2	44,00 kg	2 m	H2	1,3 m	W5 (1,5 m)	56 m	ASI A
Guglielmo N1 BLA2	26,00 kg	2 m	N1	0,7 m	W2 (0,8 m)	36 m	ASI A
Cortina N2 BL2	24,50 kg	2 m	N2	0,7 m	W3 (1,0 m)	44 m	ASI A
Cortina N2 BL4	21,00 kg	4 m	N2	1,2 m	W4 (1,3 m)	44 m	ASI A
Cortina N2 BL6	20,00 kg	6 m	N2	1,2 m	W4 (1,3 m)	44 m	ASI A
Cortina N2 BP4	22,00 kg	4 m	N2	1,2 m	W4 (1,3 m)	44 m	ASI A

LCA information

Functional unit / declared unit:

1 m of guardrail/bridge parapet that meets the requirements in the applicable standard (EN 1317, NHRCP 350 or MASH).

Reference service life:

20 Years

Time representativeness:

The reference year for the data collection is 2023 (from January 1 to December 31).

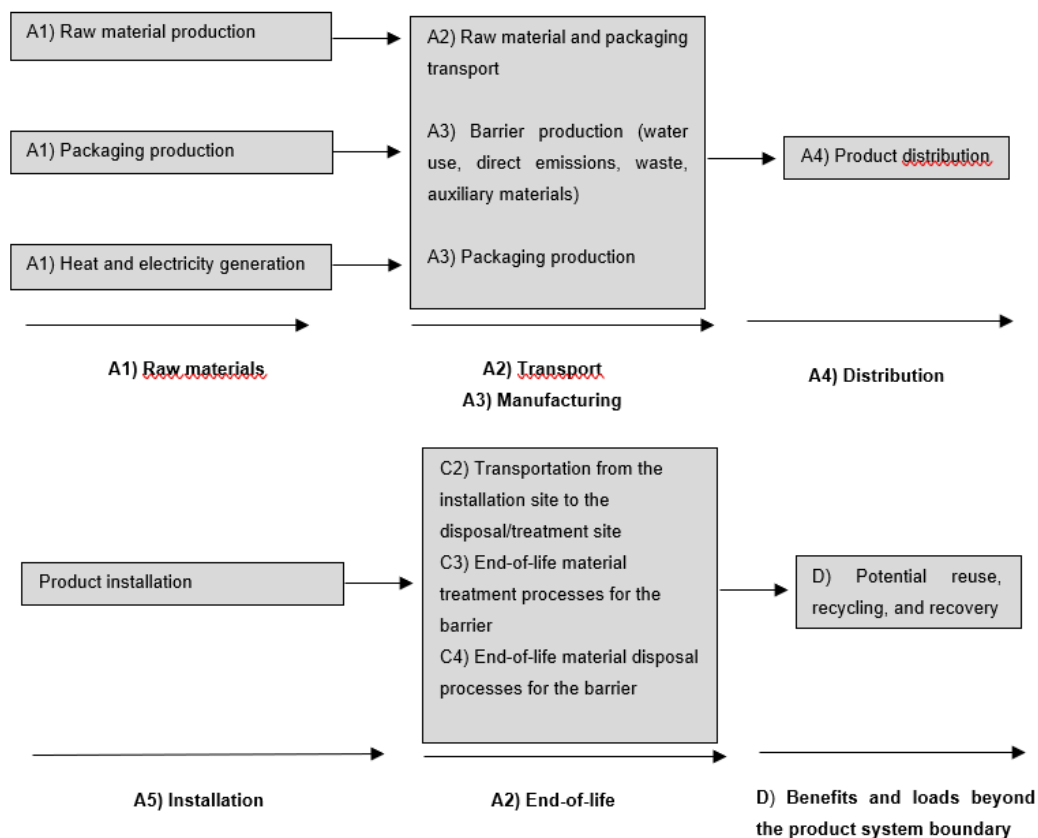
Database(s) and LCA software used:

The Ecoinvent database v.3.10 (www.ecoinvent.org) provides the life cycle inventory data for the raw and process materials obtained from the background system. LCA software used is SimaPro 9.6.

Description of system boundaries:

Cradle to grave and module D (A + B + C + D)

System diagram:



Geographical scope:

A1 Global, A2 European, A3 Italian, A4 - A5, C, D European

Electricity data:

Vita International purchases electricity from the grid.

The electricity is modelled as Italian residual mix. The environmental impact for the electricity mix related to the GWP-GHG indicator is 0,6511 kg CO₂ eq/kWh.

Allocation rules:

In accordance with the reference PCR: *"LCI data shall, according to EN 15804, include a minimum of 95% of total inflows (mass and energy) per module (e.g., A1-A3, A4-A5, B1-B5, B6-B7, C1-C4, and module D). In addition, this PCR applies the expanded cut-off rule of ISO 21930, which states that at least 95% of the environmental impact per module shall also be included."* Therefore, inventory data contributing less than 5% to the environmental impacts of each module may be excluded from the life cycle.

Cut-off rules:

In accordance with the reference PCR, given that the process under examination involves different products, it was necessary to apply an allocation procedure.

Where possible, the system was divided into subprocesses, and data were collected for each individual process. Where this was not feasible, allocation among different products and co-products was performed based on physical relationships, such as the mass (t) of the products or the number of pieces (units).

The specific allocation procedures used in the various life cycle stages are described and justified in the report.

Data quality:

For most of the processes carried out in the Upstream Processes, specific data were used.

Data related to production processes, consumption, and air emissions were collected from the company's internal accounting reports. The transportation of raw materials was modeled based on the type of transport used and the distance from the supplier/producer.

For the production of raw materials, fuels, and electricity, generic data were selected from the Ecoinvent v.3.10 database.

Environmental impact method:

EN 15804 + A2 based on EF 3.1 characterisation factors (JRC Website)

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

	Product stage			Construction process stage		Use stage							End of life 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	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	EU	IT	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-38%/+123%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X=Declared module, ND= Non declared, EU=European, GLO=Global, IT=Italy. Modules B are not applicable for safety barriers (according to c-PCR-010 guardrails and bridge parapets).

The table below describes in detail the processes included in each module.

Product stage (A1 – A3)	A1 – Raw material supply	➤ Extraction and processing of raw materials; ➤ Generation of electricity and energy from primary energy sources (electricity, natural gas, diesel, etc.); ➤ Production of raw material packaging.
	A2 – Transport	➤ Transportation of raw materials and their packaging to the facility;
	A3 – Manufacturing	➤ Manufacturing of products at the facility; ➤ Production of finished product packaging (straps, film, pallets); ➤ Treatment and transportation of waste generated by production processes; ➤ Water consumption and discharges.
Construction process Stage (A4 – A5)	A4 – Transport	➤ Transportation of the finished product to the installation site.
	A5 – Installation	➤ Energy consumption during the installation phase; ➤ Treatment and transportation of waste generated during the installation process.
End-of-life stage (C1 – C4)	C1 – Deconstruction	➤ Energy consumption during the uninstallation phase (assumed to be the same as during the installation phase, in accordance with the reference PCR).
	C2 – Transport	➤ Transportation of the product at the end of its life.
	C3 – Waste processing	➤ Waste processing (reuse, recycling, recovery).
	C4 – Waste disposal	➤ Waste processing (disposal).
Benefits and loads beyond the system boundary (D)	D – Reuse, recovery, recycling, potential	➤ The information module D aims to provide transparency regarding the environmental benefits or impacts arising from reusable products, recyclable materials, and/or useful energy carriers that exit a product system, for example, in the form of secondary materials or fuels.

Content information

Product components	Weight, kg/m	Total recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material, kg C/m
Steel "Corten"	17,19	83,9%	0%	0
Steel	0.7505	0%	0%	0
Laminated wood	7,5	0%	41,0%	3,31
TOTAL	25,44	53,2%	12,1%	3,31
Packaging materials	Weight, kg/m	Weight-% (versus the product)	Biogenic material, kg C/m	
Wood	0,333	1,31%	0,1571	
Polyethylene	0,033	0,13%	0	
Steel	0,001	0,00%	0	
Jute	0,0001	0,00%	0	
TOTAL	0,43862	1,44%	0,1571	

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	5,83E+01	1,47E+00	6,43E+00	ND	6,42E+00	2,42E-01	0	0	-1,13E+01
GWP-biogenic	kg CO ₂ eq.	-8,54E+00	1,02E-03	7,81E-04	ND	7,02E-04	1,67E-04	1,91E+01	0	-7,16E+00
GWP-luluc	kg CO ₂ eq.	6,80E-02	4,88E-04	5,59E-04	ND	5,58E-04	8,02E-05	0	0	-1,20E-02
GWP-total	kg CO ₂ eq.	4,98E+01	1,47E+00	6,43E+00	ND	6,42E+00	2,42E-01	1,91E+01	0	-1,84E+01
ODP	kg CFC 11 eq.	1,02E-06	2,92E-08	9,83E-08	ND	9,83E-08	4,81E-09	0	0	-7,89E-08
AP	mol H ⁺ eq.	2,46E-01	3,06E-03	5,80E-02	ND	5,80E-02	5,03E-04	0	0	-4,87E-02
EP-freshwater	kg P eq.	2,47E-02	9,97E-05	1,88E-04	ND	1,88E-04	1,64E-05	0	0	-5,01E-03
EP-marine	kg N eq.	6,08E-02	7,36E-04	2,69E-02	ND	2,69E-02	1,21E-04	0	0	-1,17E-02
EP-terrestrial	mol N eq.	5,60E-01	7,94E-03	2,94E-01	ND	2,94E-01	1,31E-03	0	0	-1,27E-01
POCP	kg NMVOC eq.	1,95E-01	5,09E-03	8,78E-02	ND	8,78E-02	8,37E-04	0	0	-4,36E-02
ADP-minerals&metals*	kg Sb eq.	3,53E-04	4,79E-06	2,30E-06	ND	2,29E-06	7,87E-07	0	0	-8,54E-05
ADP-fossil*	MJ	3,99E+02	1,72E+00	3,41E+00	ND	3,40E+00	2,83E-01	0	0	-8,44E+01
WDP*	m ³	1,38E+01	8,59E-02	1,82E-01	ND	1,82E-01	1,41E-02	0	0	-2,48E+00
Acronyms	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									

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	4,07E+01	1,46E+00	6,42E+00	ND	6,41E+00	2,40E-01	0	0	-2,06E+00
Particulate Matter emissions	Disease incidence	4,55E-06	1,17E-07	1,65E-06	ND	1,65E-06	1,78E-08	0	0	-1,24E-06
Ionizing radiation, human health**	kBq U235 eq	9,28E+00	2,90E-02	3,77E-02	ND	3,76E-02	4,41E-03	0	0	-5,86E-01
Eco-toxicity (freshwater)*	CTUe	1,01E+03	6,08E+00	1,19E+01	ND	1,19E+01	9,25E-01	0	0	-6,00E+02
Human toxicity, cancer effects*	CTUh	2,90E-06	1,13E-08	2,51E-08	ND	2,51E-08	1,72E-09	0	0	-2,21E-06
Human toxicity, non-cancer effects*	CTUh	4,97E-06	1,40E-08	1,04E-08	ND	1,04E-08	2,14E-09	0	0	-1,06E-07
Land use related impacts/Soil quality*	-	2,50E+03	1,35E+01	5,94E+00	ND	5,91E+00	2,05E+00	0	0	-1,16E+03

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource use indicators

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	3,36E+02	3,56E-01	5,17E-01	ND	5,16E-01	5,85E-02	0	0	-1,91E+02
PERM	MJ	1,07E+02	0	0	ND	0	0	0	0	0
PERT	MJ	4,43E+02	3,56E-01	5,17E-01	ND	5,16E-01	5,85E-02	0	0	-1,91E+02
PENRE	MJ	3,95E+02	1,72E+00	3,41E+00	ND	3,40E+00	2,83E-01	0	0	-8,44E+01
PENRM	MJ	3,35E+00	0	0	ND	0	0	0	0	0
PENRT	MJ	3,98E+02	1,72E+00	3,41E+00	ND	3,40E+00	2,83E-01	0	0	-8,44E+01
SM	kg	1,35E+01	0	0	ND	0	0	0	0	0
RSF	MJ	0	0	0	ND	0	0	0	0	0
NRSF	MJ	0	0	0	ND	0	0	0	0	0
FW	m ³	5,34E-01	2,73E-03	5,47E-03	ND	5,46E-03	4,48E-04	0	0	-7,52E-02

Waste indicators

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	6,82E-01	5,18E-04	7,69E-04	ND	7,66E-04	8,52E-05	0	0	-5,70E-03
Non-hazardous waste disposed	kg	8,45E+00	9,99E-01	5,38E-02	ND	5,14E-02	1,64E-01	0	0	-7,46E-01
Radioactive waste disposed	kg	2,38E-03	6,67E-06	9,25E-06	ND	9,23E-06	1,10E-06	0	0	-1,49E-04

Output flow indicators

Results per functional or declared unit										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	ND	0	0	0	0	0
Materials for recycling	kg	6,02E+01	0	3,67E-01	ND	0	0	2,54E+01	0	0
Materials for energy recovery	kg	0	0	3,50E-05	ND	0	0	0	0	0
Exported electricity	MJ	0	0	1,04E-04	ND	0	0	0	0	0
Exported thermal energy	MJ	0	0	2,08E-04	ND	0	0	0	0	0

Additional information

The majority of barriers leaving the Vita International plant are made of Corten steel, but a smaller proportion (quantified at 5%) is made with a galvanized finish. If this process is also considered, the environmental impact associated with the GWP-GHG indicator in phases A1-A3 increases by 10,1%.

References

- [1] Association of Issuing Bodies (AIB), “European Residual Mixes - Results of the calculation of Residual Mixes for the calendar year 2023”, Version 1.0, 2024-05-30.
<https://www.aib-net.org/facts/european-residual-mix/2023>
- [2] BSI, BS EN 15804:2012+A2:2019 “Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products”
<https://knowledge.bsigroup.com/products/sustainability-of-construction-works-environmental-product-declarations-core-rules-for-the-product-category-of-construction-products-1?version=standard>
- [3] EC-JRC, “EF reference package – Annex C”, rev.3.1, July 2022.
<https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>
- [4] Ecoinvent 3.10, reference database
<https://ecoinvent.org/ecoinvent-v3-10/>
- [5] EPD International, PCR 2019:14 “Construction product (EN 15804+A2)” v. 1.3.4
<https://www.environdec.com/pcr-library>
- [6] UNI EN ISO 14040 Environmental management - Life cycle assessment - Principles and framework.
- [7] UNI EN ISO 14044 Environmental Management – Life Cycle Assessment – Requirements and Guidelines.

