Environmental Product Declaration

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

HOT-DIP GALVANIZED STEEL POSTS

from

Ferro Bulloni Italia S.p.A.

EPD of average product

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0017274
Publication date:	2024-09-16
Valid until:	2029-09-16

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): Construction products 2019:14, version 1.3.3 and UN CPC code 412
PCR review was conducted by:
Life Cycle Assessment (LCA)
LCA accountability: Rete Clima – Corso Brianza 9 – 22066 Mariano Comense (CO) web: www.reteclima.it | email: info@reteclima.it
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: RINA Services S.p.A.- ACCREDIA (Registration number 0002VV) is an approved certification body accountable for the third-party verification The certification body is accredited by: ACCREDIA
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 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:
Ferro Bulloni Italia S.p.A.

Contact:
Maurizio Atzei
Address: Via Calvenzana Inf. 1, 23849 Rogeno (LC) – Italy
Phone: +39 031865212
Contact: maurizioatzei@ferrobulloni.it

Description of the organisation:
The Ferro Bulloni S.p.A. specializes in designing and manufacturing metal fencing establishing itself among the leaders in the European market. Our core business consists of electro-welded panels, mesh rolls, "T" and "Ø" posts, residential and industrial gates, temporary fencing for construction sites and security fences. Our products that we manufacture are made with high quality raw materials.
The Company policy has always been to invest in the professional expertise of its human resources, in continuous technological improvement, in reducing environmental impact and in the safety and health of its workers. The quality of its products as well as services, safeguarding the environment and risk reduction to ensure employee safety in manufacturing sites have always been pursued by the management as top priority objectives.

Product-related or management system-related certifications:
UNI EN ISO 9001:2015, UNI EN ISO 14001:2015 and UNI EN ISO 45001:2018

Name and location of production site(s):
Via Calvenzana Inf. 1, 23849 Rogeno (LC) – Italia

Product information

Product name:
HOT-DIP GALVANIZED STEEL POSTS

Product identification:
PTZ1-PTZ6, SZ12-SZ14 etc

Product description:
The product under study refers to 1 kg of hot-dip galvanized steel posts, which represents a range of products called “T” and “L” posts that vary in thickness and height and are used to support wire meshes. Hot-dip galvanized steel posts are produced from steel sections that are cut and drilled to shape their profile. Subsequently, the semi-finished product undergoes the process of sandblasting through metal grit, acid pickling process and preheating to 60°C to prepare for immersion in the hot dip galvanizing tank at 450°C. Once galvanized, they are cooled with water and packed in groups of 20 with plastic strapping. Finally, they are packed onto wooden pallets.

Further information is available on https://www.ferrobulloni.com/prodotto/telinea---t-posts.aspx

UN CPC code:
CPC 412

Geographical scope:
Modules A1-A2-A3: EU 27
Modules C1-C4 and D: Global

LCA information

Functional unit / declared unit:
This study was used declared unit for 1 kg of hot-dip galvanized steel posts

Reference service life:
not applicable

Time representativeness:
Primary on-site data were collected during fiscal year (FY) 2023.

Database(s) and LCA software used:
Simapro v. 9.6.

Description of system boundaries:
The system boundary on the products adapted Cradle to gate with modules C1–C4 and module D
according to EN 15804 Section 5.2.
The detailed information for manufacturing process from Module A3 is described in the product information above.

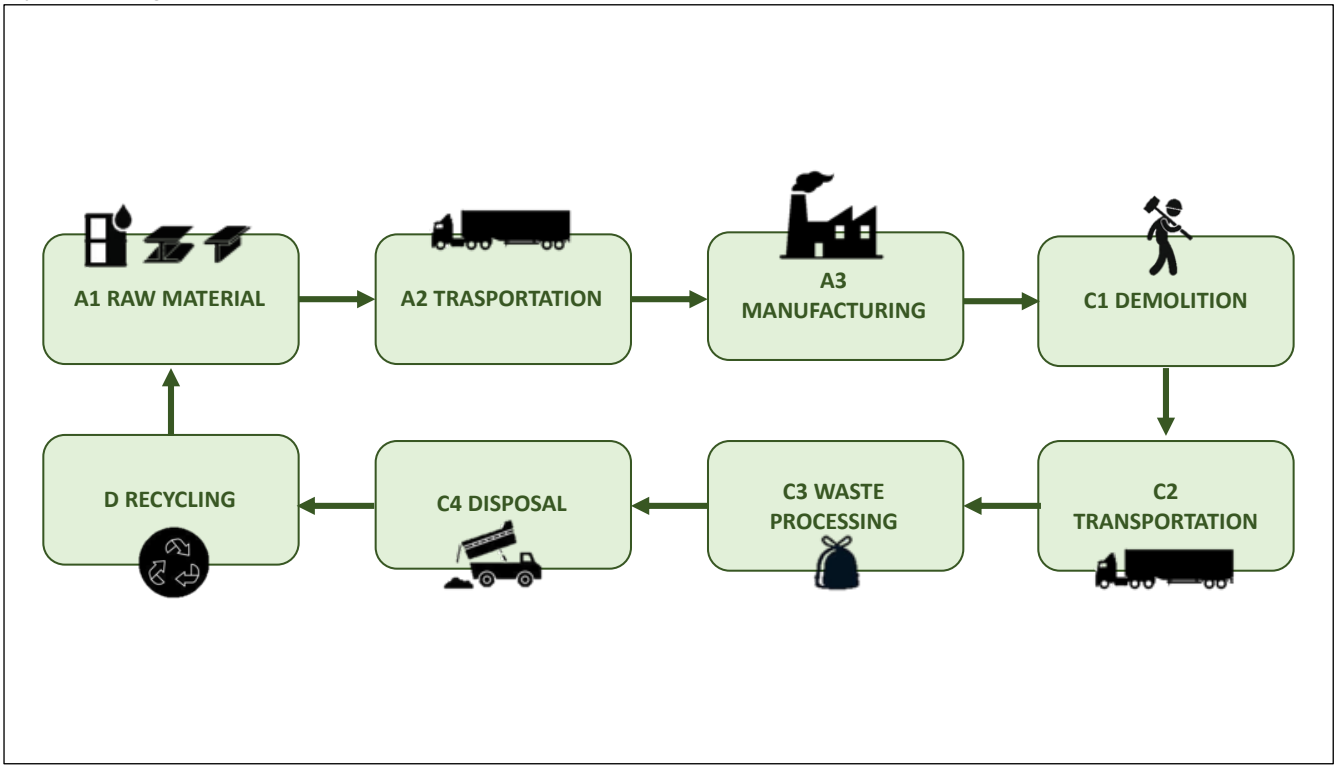
1. Module A1 (Raw materials supply)
   - Extraction and processing of raw materials used in the production of the product and packaging of the finished product.

2. Module A2 (Transport)
   - Transportation of raw/auxiliary materials from the supplier to manufacturing plant

3. Module A3 (Manufacturing)
   - Manufacturing of finish product
   - Production of electricity from electricity mix in Italy from Ecoinvent Database
   - Treatment of process wastes and emissions
   - Direct emission to the environment

4. Module C1-C4, D (End-of-Life and Resource recovery)
   - Deconstruction & Demolition
   - Transport to waste processing unit
   - Disposal
   - Reuse/Recovery/Recycling of the end of life of the products

System diagram:



More information:

Consideration was not given to module A4 and A5 (i.e., transportation to the building site and the construction process, respectively), module B1-B7 (i.e., use stages following the PCR).

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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU 27	EU 27	EU 27	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

X: Module declared
ND: Module not declared (such a declaration shall not be regarded as an indicator of a zero result).

Allocations

The allocation of energy consumption, packaging-finished product, secondary material involved in production, and stack emissions refers to the total production of T and L poles, while for Productions Waste, secondary materials, and methane consumption, the allocation refers to the total production of the entire plant.

Cut-off criteria

- production of buildings, machinery, equipment.
- production and disposal of raw material packaging.
- production waste fed back into the process.

Assumptions and Limitations

- Module Upstream (A1-A2)
  In modeling of raw materials (steel and zinc), the % of zinc calculated from the average grams of the same present in all T and L poles produced in the plant was considered while,

for the packaging of the finished product, the weight was reported to the declared unit by referring to the total volume produced of T and L poles.
The transport distance was calculated based on the addresses of the companies corresponding to each item. In cases where there are multiple suppliers for a single item, the distance was considered the supplier mainly used. The transportation distance for each item was calculated by multiplying the corresponding distance by the stated unit.

- Module Core (A3)
  The electrical mix used for production is derived from the Ecoinvent dataset on the Italian residual mix. The movement of raw materials and finished product is done by diesel-powered forklifts whose consumption was spread over the products belonging to the pole line. The emission factor related to the residual mix used for modeling the plant's electricity consumption is 0.630 kgCO2e/kWh.

- Module Downstream (C1-C4, D)
  The environmental impact related to the pile removal process was not considered in this study because removal without the use of any machinery was assumed.
  For transportation to the treatment site as a precautionary measure, an average distance of 100 km from the treatment center was assumed.
  Regarding modules C3 and C4, which deal with the final treatment and disposal of the product, it was assumed that about 85% of the steel is recycled according to the World Steel Association, 2020 while the remaining 15% is disposed in landfills.
  Finally, in Module D, the environmental benefit of recovering 5% of recycled steel was taken into consideration.

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel	>0.99	55%	0%
Zinc	<0.01	0%	0%
TOTAL	1.00	55%	0%
Packaging materials	**Weight, kg**	**Weight-% (versus the product) ***	**Weight biogenic carbon, kg C/kg**
Plastic film	4,86E-03	0,5%	0,00E+00
Plastic strapping	5,50E-04	0,1%	0,00E+00
Pallet	1,36E-02	1,4%	6,42E-03
TOTAL	1,90E-02	1,9%	6,42E-03

**Based on 1 Kg of product*

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
None			

**Upon thorough review for the SVHC substance declaration, it has been confirmed that none of the substances listed as SVHCs are present in hot-dip galvanized steel pole*

Results of the environmental performance indicators

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. Environmental indicator results for all declared modules are shown in tables on the following pages for the declared unit of 1 kg of hot-dip galvanized steel posts.
the A1 - A3 modules are shown on an aggregated basis as mandated by PCR 2019:14§5.4.5. the results of modules A1-A3 should not be used without considering the results of module C.

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP- fossil	kg CO_2 eq.	8,02E-01	0,00E+00	1,55E-02	0,00E+00	1,34E-03	-8,55E-02
GWP- biogenic	kg CO_2 eq.	5,91E-03	0,00E+00	5,30E-07	0,00E+00	2,25E-06	-1,43E-05
GWP- luluc	kg CO_2 eq.	6,11E-04	0,00E+00	3,81E-07	0,00E+00	1,86E-07	-1,59E-05
GWP- total	kg CO_2 eq.	8,08E-01	0,00E+00	1,55E-02	0,00E+00	1,34E-03	-8,55E-02
ODP	kg CFC 11 eq.	5,63E-08	0,00E+00	3,17E-10	0,00E+00	4,49E-11	-2,21E-10
AP	mol H^+ eq.	2,03E-03	0,00E+00	3,87E-05	0,00E+00	1,57E-05	-2,74E-04
EP-freshwater	kg P eq.	2,37E-04	0,00E+00	1,12E-07	0,00E+00	2,46E-06	-1,73E-05
EP- marine	kg N eq.	5,26E-04	0,00E+00	1,48E-05	0,00E+00	3,93E-06	-6,43E-05
EP- terrestrial	mol N eq.	5,38E-03	0,00E+00	1,62E-04	0,00E+00	4,21E-05	-7,07E-04
POCP	kg NMVOC eq.	2,16E-03	0,00E+00	6,74E-05	0,00E+00	1,55E-05	-2,38E-04
ADP-minerals&metals[2]	kg Sb eq.	8,59E-05	0,00E+00	5,13E-10	0,00E+00	3,85E-10	-2,18E-08
ADP-fossil[2]	MJ	1,21E+01	0,00E+00	2,05E-01	0,00E+00	3,29E-02	-5,03E-01
WDP[2]	m^3	1,88E-01	0,00E+00	8,71E-05	0,00E+00	-1,97E-02	-4,00E-03
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						

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[3]	kg CO_2 eq.	8,08E-01	0,00E+00	1,55E-02	0,00E+00	1,34E-03	-8,55E-02

Resource use indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	5,08E-01	0,00E+00	7,12E-04	0,00E+00	5,47E-04	-8,78E-03
PERM	MJ	1,64E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,72E-01	0,00E+00	7,12E-04	0,00E+00	5,47E-04	-8,78E-03
PENRE	MJ	1,19E+01	0,00E+00	2,05E-01	0,00E+00	3,29E-02	-5,03E-01
PENRM	MJ	2,24E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,21E+01	0,00E+00	2,05E-01	0,00E+00	3,29E-02	-5,03E-01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	5,64E-03	0,00E+00	5,26E-06	0,00E+00	-4,24E-04	-1,42E-04
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						

1 This impact category is primarily concerned with the possible impact of a low dose of ionizing radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure, or related to disposal of radioactive waste in underground facilities. This indicator also does not consider potential ionizing radiation from soil, radon, or some building materials.
2 The results of this environmental impact indicator should be used with caution because the uncertainty of these results is high and experience in using this indicator is limited.
3 The GWP-GHG indicator is identical to GWP-total except that the characterisation factor (CF) for biogenic CO2 is set to zero as per the requirements of the PCR.

Waste indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	9,62E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	2,96E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	3,93E-02	0,00E+00	0,00E+00	0,00E+00	1,00E+00	-1,00E+00
Materials for energy recovery	kg	0,00E+00	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	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional environmental impact indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PM	disease inc.	2,26E-08	0,00E+00	1,02E-09	0,00E+00	2,36E-10	-6,10E-09
IRP [1]	kBq U-235 eq	4,20E-02	0,00E+00	7,81E-05	0,00E+00	3,85E-05	-6,08E-04

Acronyms	PM= Particulate Matter emissions, Potential incidence of disease due to PM emissions (PM); IRP = Ionizing radiation, human health, Potential Human exposure efficiency relative to U235 (IRP).

Information on biogenic carbon content

Results per declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**Quantity**
Biogenic carbon content in product	Kg C	0,00E+00
Biogenic carbon content in packaging	Kg C	6,42E-03

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

References

- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14020:2000 Environmental labels and declarations -- General principles
- UNI EN ISO 14025:2010, Etichette e dichiarazioni ambientali - Dichiarazioni ambientali di Tipo III - Principi e procedure
- UNI EN 15804:2012+A1:2013+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- General Programme Instructions for the International EPD® System, v. 4.0. (29/03/2021)
- Product Category Rules dei prodotti da costruzione – PCR 2019:14, Version 1.3.3 (01/03/2024)
- LCA technical report_EPD FerroBulloni rev 1_ August 2024
- SimaPro, https://simapro,com/
- EPD- Merchant bars – Acciaierie Beltrame S.P.A._15/04/2020
- Ferrosad graniglia metallica (EN ISO 11124-4) - Scheda Dati di Sicurezza in accordo con 1907/2006/EC, Allegato II - (Edition 06/2015)

EPD®

www.environdec.com