

Environmental Product Declaration



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

Hot-rolled steel plate

from

Fabbrica Italiana Lamiera S.r.l.



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-08994
Publication date:	2023-05-02
Valid until:	2028-04-28

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» v1.11, UN CPC code: 412</i>
Life Cycle Assessment (LCA)
LCA accountability: <i>Maria Chiara Caruso, Vincenzo Lariccia, Andrea Leoncini, RINA-Consulting S.p.A.</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by accredited certification body Third-party verification: <i>RINA Services S.p.A.</i> , is an approved certification body accountable for the third-party verification The certification body is accredited by: <i>ACCREDIA (Registration number 001H)</i>
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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: F.I.L. Fabbrica Italiana Lamiera S.r.l.

Contact: Stefano Sarandrea, stefanos@siatspa.it

Description of the organisation: F.I.L. Fabbrica Italiana Lamiera was founded in 1960, producing a type of metal plates that were available only on the foreign market. In the following years, the typology of formats produced has changed until reaching the current characteristics of the plates, used for the construction of mechanical parts and plant components, as well as for shipbuilding. The production flexibility also allows the production of high carbon plates for moulds, low silicon plates used by the most modern laser cutting systems, corten steel plates and boiler plants. The production plant is about 15000 m²; it stands on an industrial area in Genova, Italy.

Product-related or management system-related certifications: ISO 9001, ISO 14001, ISO 45001

Name and location of production site(s): F.I.L. Plant, Genova (IT)

Product information

Product name: Hot-rolled Steel Plate, manufactured at F.I.L. plant in Genova (IT)

Product identification: Hot-rolled Steel Plate

Product description: The hot-rolled steel plate is a product that can be used for multiple applications, such as in the railway and construction industry, in naval industry, as tempered steel, for boilers construction, and others. The plate is manufactured at F.I.L. plant in Genova, Italy. The production process starts from the purchase of steel slab, which is then subjected to three main processes, namely 1) oxy-fuel cutting, 2) pre-heating and 3) descaling, hot-rolling until the desired width is reached, surface levelling and edge trimming. The product is then stored unpacked, ready for sale. The steel plates are produced in different surface dimensions and widths.

UN CPC code: 412 "Products of iron or steel"

Geographical scope: Global

LCA information

Functional unit / declared unit: 1 ton of hot-rolled steel plate

Reference service life: Not applicable

Time representativeness: Data input was collected in November 2022-February 2023, based on data related to the year 2022. All generic data refer to the Ecoinvent v3.8 database and GaBi database including updated datasets

Database(s) and LCA software used: Ecoinvent v3.8, GaBi database, GaBi Software v.10.6

Description of system boundaries:

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

Module A1-A3 includes the supply of steel slab, which is the only material input of the production process of the F.I.L. hot-rolled steel plate. The data input has been provided by the EPD of the steel slab that F.I.L. purchases from its supplier, available online¹. The modules also include the data on transportation of raw materials to the manufacturing site, in terms of type of transport (trucks or ship, etc.), the distances and the overview of the trucks. In particular, the steel slabs are bought and sent to the manufacturing site via ship and via truck. For the ship transportation, a container ship with 5,000 to 200,000 dead weight tonnage payload capacity and a distance equal to 2530 km are considered. For the truck transportation, a EURO5, 28 - 34t gross weight truck and a distance equal to 507 km are considered. The modules A1-A3 also include the inputs and outputs related to the processes taking place in the manufacturing site and modelled through specific data provided by F.I.L. The data collected

¹ Environmental Product Declaration in accordance with ISO 14025 and EN 15804:2012+A2:2019. EPD registration number: S-P-06442, valid until 2027-09-19, available at <https://www.environdec.com/library/epd6442>

from the producer include: the list of material inputs needed for the production process and their transport to the manufacturing site; the electricity and fuel consumption; the water consumption, which is mainly used in the machine cooling system; the production waste, including the disposal code, the transport to waste treatment in terms of truck capacity and distances and their disposal. The entire process has been modelled by including energy consumptions, involved materials, wastes, water and emissions. Machines, infrastructure, construction, production equipment, and tools have not been included in the system boundary. All the machines are powered by electrical and thermal energy. Regarding the electrical energy consumption, in 2022 F.I.L. has purchased electricity with Renewable Energy Guarantee of Origin (REGOs) electronic certificate from A2A. Therefore, the energy mix has been modelled considering the renewable sources and respective percentages according to Terna (GSE)². Regarding the data on the waste produced during the manufacturing process, F.I.L. provided information specifying the types and amount of waste produced. In particular, metal scraps coming from the oxy-fuel cutting, the descaling and the final cut processes are fully recycled. All other waste produced during the process is identified by their specific CER code and then are processed according to specific treatment in compliance with Italian waste regulation.

Modules A4 and A5 have not been considered, together with module B.

Module C1 concerns the deconstruction phase of the product after its industrial application. The product can have multiple applications (i.e., ships, trains, and others), but it is generally removed by using a gas torch. Therefore, this stage is modelled considering the amount of propane and oxygen used to cut the steel plate. Consumptions are referred to the most representative plate width, equal to 20mm. Data have been provided by a company working in the steel products dismantling sector.

Module C2 includes the data on transportation of dismantled product to the waste treatment site. Considering what previously described, the transports to waste processing or disposal are different for each use. Therefore, C2 stage is modelled considering that 1 ton of steel plate is sent to waste processing site, which is assumed to be 100km far.

Module C3 is included in the system boundary. Waste treatment of steel basically consists in steel sorting and shredding, before sending the steel scrap to further recycling treatments. For this reason, even if this is an activity F.I.L. has no control over it, energy consumptions related to steel sorting and shredding have been considered. In particular, a value of electric consumption equal to 75 kWh/ton of treated steel has been assumed according to Norgate T. (2013)³.

Regarding the disposal and the recycling potential, the proportion of the steel material in the product that is recycled in a subsequent system is assumed to be equal to 95% on a weight basis⁴. Therefore, **Module C4** is modelled according to this recyclable percentage, i.e., considering that 5% w/w of steel waste is sent to landfill as inert material, whilst the remaining 95% w/w of the hot-rolled steel plate is potentially recovered at the end-of-life.

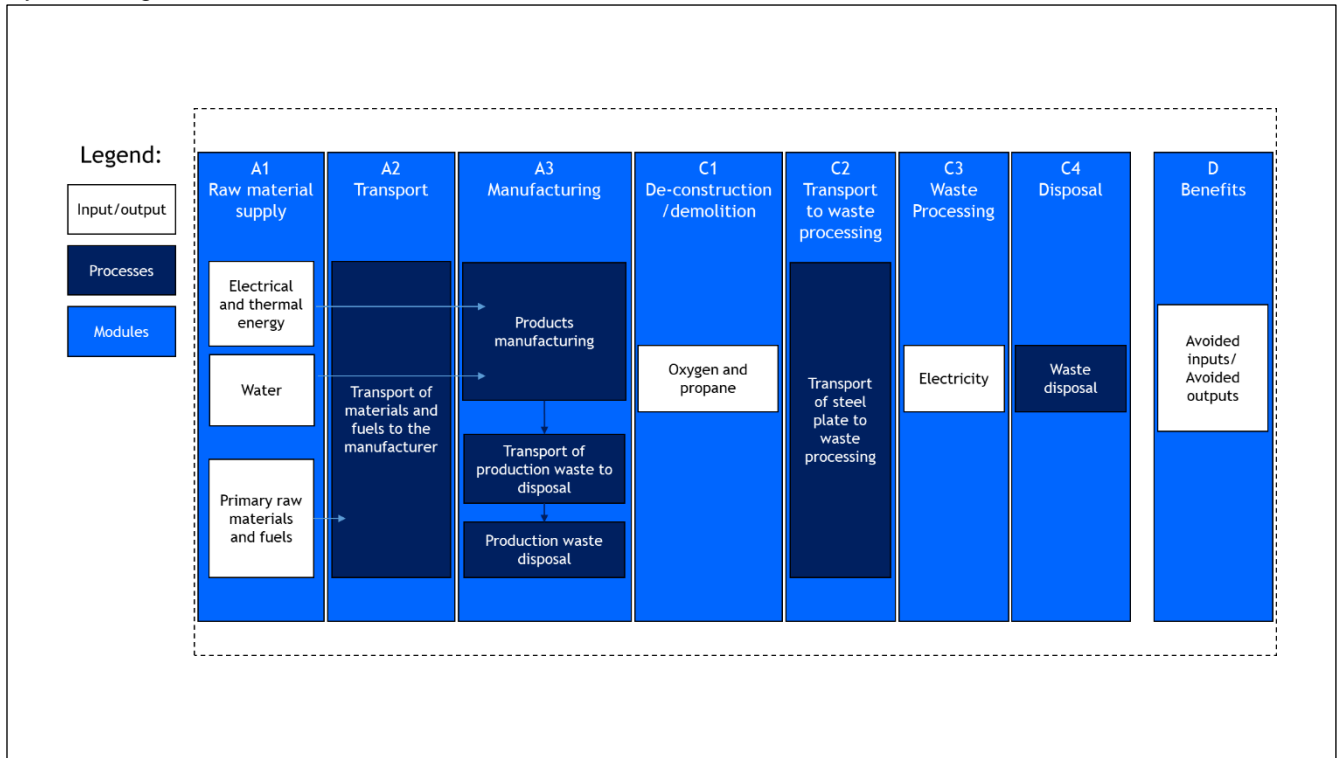
Module D is included in the analysis, but no net benefits are considered due to the content of the recycled material in the steel slab declared in the present EPD.

² Ministero della transizione ecologica – Dipartimento energia, Direzione generale infrastrutture e sicurezza: La situazione energetica nazionale nel 2021, available at https://dgsaie.mise.gov.it/pub/sen/relazioni/relazione_annuale_situazione_energetica_nazionale_dati_2021.pdf in italian

³ Norgate T. (2013) Metal recycling: The need for a life cycle approach. EP135565, CSIRO, Australia

⁴ Product Environmental Footprint Guidance: Annex C – List of Default Values for A, R1, R2, R3 and Qs/Qp

System diagram:



More information: <https://fabbricaitalianalamiere.com/en>

Electricity modelling: Electricity is modelled considering the renewable sources and respective percentages according to Terna (GSE)², which corresponds to 16,8% biomass and waste electricity, 40,7% hydroelectricity, 16,1% Wind electricity, 21,3% solar electricity and 5,1% geothermal electricity.

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

	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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	X	X	X	X	X
Geography	GLO	GLO, EU, IT	GLO, EU, IT	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

MNA: Module not Assessed

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel slab	1000	97% ⁵	0

No packaging materials are here presented because the hot-rolled steel plate is sold unpacked.

The list of components does not include products included in the “Candidate List of Substances of Very High Concern for Authorizations” by European Chemicals Agency (ECHA).

⁵ This information is provided considering that in the manufacturing of the steel slabs more than 97% of the raw materials are recycled, according to [20].

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804:2012 + A2:2019

Results per 1 ton of Hot-rolled steel plate							
Indicator	Unit	Tot A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	7,03E+02	2,18E+00	6,56E+00	3,04E+01	2,63E-01	0,00E+00
GWP-biogenic	kg CO ₂ eq.	2,79E+00	1,96E-02	-6,39E-02	4,49E-01	1,57E-03	0,00E+00
GWP-luluc	kg CO ₂ eq.	1,12E+00	4,59E-04	4,40E-02	1,08E-02	2,54E-04	0,00E+00
GWP-total	kg CO ₂ eq.	7,07E+02	2,20E+00	6,54E+00	3,08E+01	2,65E-01	0,00E+00
ODP	kg CFC 11 eq.	3,71E-05	3,18E-11	6,42E-13	6,22E-10	1,07E-07	0,00E+00
AP	mol H ⁺ eq.	3,68E+00	4,78E-03	2,12E-02	4,21E-02	2,48E-03	0,00E+00
EP-freshwater	kg PO ₄ ³⁻ eq.	1,03E+00	1,95E-05	7,18E-05	4,54E-04	7,40E-05	0,00E+00
EP-freshwater	kg P eq.	3,36E-01	6,35E-06	2,34E-05	1,48E-04	2,41E-05	0,00E+00
EP-marine	kg N eq.	8,84E-01	1,07E-03	9,65E-03	1,24E-02	8,62E-04	0,00E+00
EP-terrestrial	mol N eq.	9,07E+00	1,13E-02	1,08E-01	1,33E-01	9,42E-03	0,00E+00
POCP	kg NMVOC eq.	2,42E+00	2,90E-03	1,90E-02	3,28E-02	2,74E-03	0,00E+00
ADP-minerals&metals*	kg Sb eq.	1,36E-03	5,92E-07	6,59E-07	8,83E-06	6,01E-07	0,00E+00
ADP-fossil*	MJ	1,14E+04	3,95E+01	8,58E+01	4,30E+02	7,38E+00	0,00E+00
WDP	m ³	3,79E+02	5,09E-01	7,31E-02	1,23E+01	3,39E-01	0,00E+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 impact category indicators

Results per 1 ton of Hot-rolled steel plate							
Indicator	Unit	Tot A1-A3	C1	C2	C3	C4	D
GWP-GHG ⁶	kg CO ₂ eq.	6,73E+02	2,20E+00	6,56E+00	3,07E+01	2,61E-01	0,00E+00

Resource use indicators

Results per 1 ton of Hot-rolled steel plate							
Indicator	Unit	Tot A1-A3	C1	C2	C3	C4	D
PERE	MJ	1,99E+03	2,19E+01	5,95E+00	3,68E+02	6,40E-02	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,99E+03	2,19E+01	5,95E+00	3,68E+02	6,40E-02	0,00E+00
PENRE	MJ	1,14E+04	3,95E+01	8,61E+01	4,30E+02	7,38E+00	0,00E+00
PENRM	MJ.	4,49E-01	0,00E+00	4,55E-02	1,00E-11	1,00E-02	0,00E+00
PENRT	MJ	1,14E+04	3,95E+01	8,61E+01	4,30E+02	7,39E+00	0,00E+00
SM	kg	1,17E+03	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	8,85E+00	2,12E-02	6,87E-03	3,25E-01	7,88E-03	0,00E+00
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						

⁶ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste indicators

Results per 1 ton of Hot-rolled steel plate							
Indicator	Unit	Tot A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5,98E-03	3,41E-09	4,56E-10	9,09E-08	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	1,27E+02	2,98E-02	1,40E-02	4,77E-01	5,00E+01	0,00E+00
Radioactive waste disposed	kg	5,78E-02	6,29E-03	1,60E-04	1,93E-02	0,00E+00	0,00E+00

Output flow indicators

Results per 1 ton of Hot-rolled steel plate							
Indicator	Unit	Tot 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	4,65E+01	0,00E+00	0,00E+00	9,50E+02	0,00E+00	0,00E+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

Information on biogenic carbon content

Results per 1 ton of Hot-rolled steel plate		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	-
Biogenic carbon content in packaging	kg C	-

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

References

- [1] General Programme Instructions of the International EPD® System
- [2] BS EN 15804:2012+A2:2019 “Sustainability of construction works — Environmental product declarations Core rules for the product category of construction products”
- [3] PCR 2019:14 Construction products, v1.11
- [4] ISO 14040:2021 “Environmental management -- Life cycle assessment -- Principles and framework”
- [5] ISO 14044:2021 “Environmental management -- Life cycle assessment -- Requirements and guidelines”
- [6] ISO 14025:2010, Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- [7] DG JRC/IES, ILCD Handbook, 2011
- [8] EU Commission, Product Environmental Footprint Pilot Guidance, Guidance for the implementation of the EU Product Environmental Footprint (PEF) during the Environmental Footprint (EF) pilot phase, 2016
- [9] EU Recommendations 2013/179, Commission Recommendation on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations, 2013
- [10] ISO and SETAC Europe (modified from Heijungs & Hofstetter), Terminology used in life cycle assessment as defined by (ISO, 1997a; 1997b; 1997d), 1996.
- [11] Institute of Environmental Sciences, Leiden University, The Netherlands: Handbook on impact categories "CML 2001 ", 2001.
- [12] Institute of Environmental Sciences, Leiden University, The Netherlands: "Life Cycle Assessment, An operational guide to the ISO standards, Volume 1, 2 and 3", 2001.
- [13] IPCC, Climate change 2007. Impacts, adaptations and mitigation of climate change: Scientific and technical analysis. Intergovernmental Panel on Climate Change, Cambridge, University Press, New York, 2008.
- [14] ReCiPe 2008 A life cycle impact assessment method which comprises harmonised category indicators at the midpoint and the endpoint level Mark Goedkoop, 6 January 2009.
- [15] GaBi software, version 10 (Sphera) < <http://www.gabi-software.com/>>
- [16] GaBi database < <http://www.gabi-software.com/international/databases/>>
- [17] Ecoinvent Version 3 - Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>>
- [18] Description of life cycle impact assessment methods Supplementary information for tenders, ESU-services Ltd, 2020
- [19] Ministero della transizione ecologica – Dipartimento energia, Direzione generale infrastrutture e sicurezza: La situazione energetica nazionale nel 2021, available at https://dgsaie.mise.gov.it/pub/sen/relazioni/relazione_annuale_situazione_energetica_nazionale_dati_2021.pdf in italian
- [20] Environmental Product Declaration in accordance with ISO 14025 and EN 15804:2012+A2:2019. EPD registration number: S-P-06442, valid until 2027-09-19, available at <https://www.environdec.com/library/epd6442>
- [21] Product Environmental Footprint Guidance: Annex C – List of Default Values for A, R1, R2, R3 and Qs/Qp available at https://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_guidance_v6.3.pdf
https://ec.europa.eu/environment/eussd/smgp/pdf/2019-06-28_PEFCR_Metal_Sheets_final.pdf
- [22] Norgate T. (2013) Metal recycling: The need for a life cycle approach. EP135565, CSIRO, Australia

