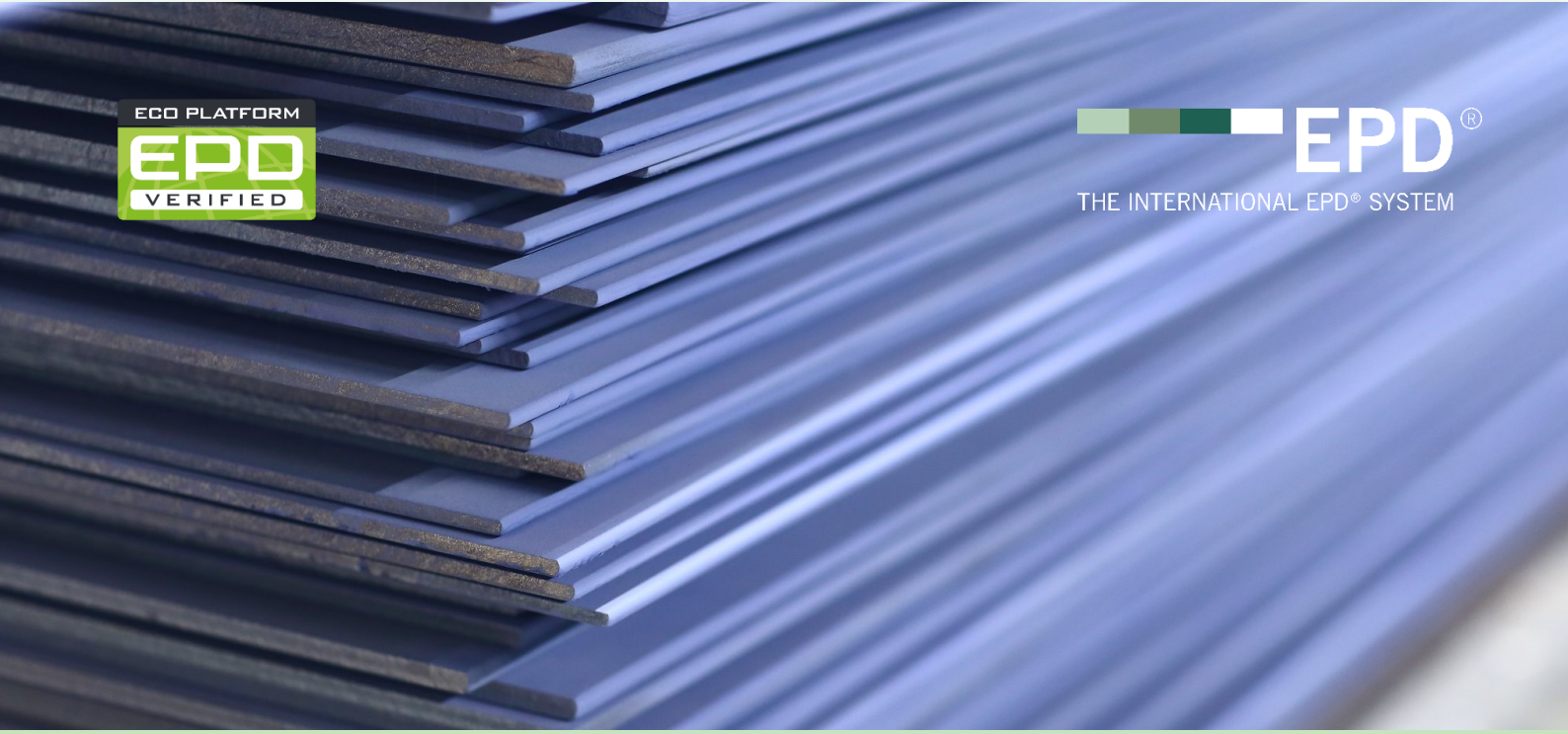

METINVEST TRAMETAL S.p.A.

Hot rolled steel plate
Environmental Product Declaration

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

Programme:	**The International EPD® System, www.environdec.com**
Programme operator:	EPD International AB
EPD registration number:	S-P- 08033
Publication date:	2023-03-10
Revision date	2024-10-30
Valid until:	2028-03-09

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:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	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, PCR 2019:14, VERSION 1.2.5
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se
Life Cycle Assessment (LCA)
LCA accountability: METINVEST TRAMETAL S.p.A.
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: *DNV Business Assurance* 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
METINVEST TRAMETAL S.p.A.

Contact
Emilia Goldshteyn
Tel. +39 045 7133311
emilia.goldshteyn@metinvestholding.com

Description of the organisation
METINVEST TRAMETAL S.p.A., part of the Metinvest group, is a steel company that produces steel plates, with production site in San Giorgio di Nogaro (UD). The plant has a production capacity of 600,000 t/year of heavy-duty plates and enjoys a strategic location in San Giorgio di Nogaro, a locality located in the Aussa - Corno industrial area.

Product-related or management system-related certifications
The company has implemented an environmental management system certified according to ISO 14001, a health and safety management system according to ISO 45001 and a quality management system according to ISO 9001.

Name and location of production site
METINVEST TRAMETAL S.p.A. - Via Enrico Fermi 44 – San Giorgio di Nogaro – 33058 Udine - Italy

Product information

Product name
Hot rolled steel plate.

Product description
The reference product is hot rolled steel plate, manufactured in a reversing hot-rolling quarto mill from semi-finished steel product (steel slab). Chemical composition of the slab and rolling parameters are set to guarantee the quality and characteristics of the final product. The study includes both low alloy and non-alloy steel products.

Product identification
Dimensions of the plate range from 4mm to 180mm thickness, maximum width of 3200mm width, maximum length of 25.000mm and maximum piece weight of 15t. The product is manufactured according to several European and international standards, in particular, EN 10025 (Non-alloyed structural steels), EN 10149 (Hot-rolled flat products made of high yield strength), EN 10028 (Steels for pressure purposes), EN 10083 (Steels for quenching and tempering), ASTM A131 (Standard specification for structural steel for ships), ASTM A516.
The products are CE marked according to the Regulation CE 305/2011 “laying down harmonised conditions for the marketing of construction products”.

Application
Metinvest Trametal S.p.A. plates are processed by customers to shape them into the final product in various industrial sectors, such as:

- construction and infrastructure (e.g., construction of bridges) machine building by being processed into steel details
- ship building and offshore structures (manufacturing of cruise ships, specialized and military vessels, offshore platforms)
- machine building (e.g., lifting equipment, plant machinery)
- renewable and conventional energy (manufacturing of wind towers, equipment for gas transportation and storage)

UN CPC code: 41211 Flat-rolled products of non-alloy steel, not further worked than hot-rolled, of a width of 600 mm or more.

Geographical scope:
Modules A1, A2: Global
Module A3: Italy
Modules A4, C1, C2, C3, C4, D: Europe.

LCA information

Functional unit
The functional unit is 1 ton of product.
Within the production range, the declared product, to which the EPD results refer, is the product with the highest environmental impact of the entire production range; it is a low-alloy steel plate, with the highest energetic processing in the factory (4 mm thickness).

Time representativeness:
the reference year for the data collection is 2023.

Database and LCA software used:
Ecoinvent 3.10 cut-off e Sima Pro 9.6
The reference package used for impact indicator is based on EF 3.1.
Characterization factors for GWP-GHG refer to IPCC 2021.

Description of system boundaries
Cradle to gate with options, modules A1-A3 + module A4 + modules C1–C4 and module D.

The system boundaries are from cradle to gate with options and analyse:

- production of semi-finished steel product and auxiliary materials (Module A1)
- transport of semi-finished steel product and auxiliary materials to the production site (Module A2)
- manufacturing of steel plates, waste disposal of production residues, on-site emissions (Module A3)
- transport to customers (module A4)
- end-of-life of products (modules C1-C4)
- module D which calculates the net benefits of product recycling.

System diagram

A1

Raw material and energy production

- production semi-finished steel products (steel slabs)
- energy production (electricity, natural gas extraction)

A2

Transport of materials

- slabs
- other raw materials to the factory

A3

Manufacturing

- production process of plates; air emissions, waste production
- consumption of auxiliary and maintenance materials; packaging production

A4

Transport to customers

C1

De-construction demolition

C2

Transport to recycling/disposal plant

C3

Waste processing

C4

Disposal

D

Reuse-Recovery-Recycling-potential

This module evaluates the benefits and loads associated with the potential recycling of materials at the end of the product's life, beyond the system boundary

More information on the LCA study

Within the production range for each indicator, it's declared the highest result of the included products (i.e., the results of a "worst-case product")

To model the steel slabs in the LCA model, the Ecoinvent process of non-alloyed steel from blast furnaces was modified by inserting the specific content of scrap declared by the supplier, the energy mix and water of the country of production. The data thus obtained were compared with the suppliers' EPDs (relating not to slabs, but to more processed products).

In San Giorgio di Nogaro plant the energy consumption is specific to each production line, as are the emissions into the atmosphere; the Italian residual mix was used for electricity consumption.

Waste common to all productions has been allocated on a mass basis, as well as wastewater and auxiliary and maintenance products.

A cut-off of 1% in terms of environmental significance was used.

For transport A4, average values for the transport from factory gate to the customers are assumed, based on data of 2023:

Transport to customers	Unit	Value
Vehicle used for transportation Usage capacity Density of the product transported	n.a.	12% by train, 79% by truck (Transport, freight, lorry >32 metric ton, EURO5), 9% by ship
Weighted average distance to the customer	km	623 km
Average load factor	t	15,96 t (GVW 29,96 t)
Density of the transported product	kg/m	7500 kg/mc

End of life scenario:

C1

De-construction demolition

It is assumed a diesel consumption
for the dismantling operations of 239 MJ/t.

C2

Transport

An average distance of 50 km has been
assumed for the transport to recycling facility.

C3

Waste processing

94% recycling rate derived from weighted
average recycling rates of country sales was used –
Eurostat data for demolition waste in Europe in 2020.

C4

Disposal

A landfill percentage of 6% was assumed

D

Benefits and loads beyond the system boundary

Module D considers the potential environmental benefit of putting recycled steel back on the market. The advantage is considered as the difference between the impacts of a blast furnace, in which virgin ores are used, and an EAF steel mill, using scraps. In calculating the environmental advantage, the melting yield is considered, and the content of recycled material already present in the purchased slabs is deducted.

The LCA study was carried out with the methodological support of “e3 – studio associato di consulenza ”

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

		Module	Modules declared	Geography	Specific data used	Variation – products	Variation – sites
Product stage	Raw material supply	**A1**	X	GLO	13%	24% (the worst case is declared)	N.A.
	Transport	**A2**	X	GLO			
	Manufacturing	**A3**	X	IT			
Construction process stage	Transport	**A4**	X				
	Construction installation	**A5**	ND				
Use stage	Use	**B1**	ND		-	-	-
	Maintenance	**B2**	ND		-	-	-
	Repair	**B3**	ND		-	-	-
	Replacement	**B4**	ND		-	-	-
	Refurbishment	**B5**	ND		-	-	-
	Operational energy use	**B6**	ND		-	-	-
	Operational water use	**B7**	ND		-	-	-
End of life stage	De-construction demolition	**C1**	X	EU	-	-	-
	Transport	**C2**	X	EU	-	-	-
	Waste processing	**C3**	X	EU	-	-	-
	Disposal	**C4**	X	EU	-	-	-
Resource recovery stage	Reuse-Recovery-Recycling-potential	**D**	X	EU	-	-	-

According to the PCR, only the electricity and natural gas consumption data of the plant and the transport data of incoming semi-finished products were considered specific data. The production data of the slabs are not considered specific data, as well as the data of the other auxiliary materials used.

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Unalloyed steel, low alloyed steel	1000	0	0

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon kg C/t declared unit
Steel handle	0,02	<0,1%	n.a.
Plastic labels	0,1	<0,1%	n.a.
Wooden slats	3,8	0,38%	1,9

The product does not contain SVHC substances above 0.1%.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional unit (1t)

Indicatoe	Unità	A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	3,05E+03	5,14E+01	2,39E+01	5,36E+00	2,38E+01	5,63E-01	-1,09E+03
GWP-biogenic	kg CO2 eq.	-7,06E-01	7,60E-02	2,62E-03	2,77E-03	0,00E0	6,25E-01	3,19E+00
GWP-luluc	kg CO2 eq.	1,03E+00	2,57E-02	2,08E-03	1,84E-03	3,36E-02	2,90E-04	-3,42E-02
GWP-total	kg CO2 eq.	3,05E+03	5,15E+01	2,40E+01	5,37E+00	2,35E+01	1,19E+00	-1,08E+03
ODP	kg CFC 11 eq.	3,11E-05	9,62E-07	3,66E-07	1,08E-07	3,27E-07	1,63E-08	-3,42E-06
AP	mol H+ eq.	1,26E+01	3,28E-01	2,16E-01	1,73E-02	2,61E-01	3,99E-03	-4,19E+00
EP-freshwater	kg P eq.	1,07E+00	5,26E-03	6,99E-04	3,65E-04	1,36E-02	4,67E-05	-4,64E-01
EP-marine	kg N eq.	2,91E+00	1,01E-01	1,00E-01	5,88E-03	6,07E-02	1,52E-03	-9,28E-01
EP-terrestrial	mol N eq.	3,13E+01	1,10E+00	1,10E+00	6,40E-02	6,82E-01	1,66E-02	-1,02E+01
POCP	kg NMVOC eq.	1,06E+01	3,82E-01	3,27E-01	2,82E-02	2,04E-01	5,94E-03	-3,48E+00
ADP-minerals&metals*	kg Sb eq.	1,98E-02	1,32E-04	8,54E-06	1,45E-05	1,46E-03	8,79E-07	-9,69E-03
ADP-fossil*	MJ	3,37E+04	7,34E+02	3,13E+02	7,77E+01	3,21E+02	1,38E+01	-9,81E+03
WDP*	m3	2,58E+02	3,96E+00	6,79E-01	3,70E-01	3,98E+00	6,03E-01	-8,99E+01

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.

Negative values in module D indicate a potential environmental benefit.

Potential environmental impact – additional mandatory and voluntary indicators

Results per functional unit (1t)

Indicatore	Unità	A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	3,05E+03	5,15E+01	2,40E+01	5,37E+00	2,38E+01	5,63E-01	-1,09E+03

Use of resources

Results per functional unit (1t)

Indicatore	Unità	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,46E+03	2,25E+01	0,00E+00	1,87E+00	1,20E+00	4,79E+01	1,23E-01	-6,21E+02
PERM	MJ	5,69E+01	0,00E+00	-5,96E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,51E+03	2,25E+01	-5,96E+01	1,87E+00	1,20E+00	4,79E+01	1,23E-01	-6,21E+02
PENRE	MJ	3,37E+04	7,34E+02	0,00E+00	3,13E+02	7,77E+01	3,21E+02	1,38E+01	-9,81E+03
PENRM	MJ	4,60E+00	0,00E+00	-4,60E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,37E+04	7,34E+02	-4,60E+00	3,13E+02	7,77E+01	3,21E+02	1,38E+01	-9,81E+03
SM	kg	2,04E+02	0,00E+00	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	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	0,00E+00	0,00E+00
FW	m3	1,46E+01	1,50E-01	0,00E+00	2,24E-02	1,16E-02	1,57E-01	1,44E-02	-2,29E+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

* The module A5 was added for the sole purpose of balancing the energy stored in the packing material.

[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 CO_2 is set to zero.

Waste production and output flows

Waste production

Results per functional unit (1t)

Indicatore	Unità	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,64E-01	4,51E-03	2,17E-03	5,10E-04	1,96E-03	8,72E-05	-1,12E-01
Non-hazardous waste disposed	kg	3,23E+02	4,93E+01	1,92E-01	6,64E+00	9,18E+02	9,00E+01	-3,09E+01
Radioactive waste disposed	kg	2,01E-02	5,00E-04	3,44E-05	2,34E-05	6,14E-04	2,15E-06	1,11E-02

Output flows

Results per functional unit (1t)

Indicator	Unit	A1-A3	A4	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	0,00E+00
Material for recycling	kg	1,04E+02	0,00E+00	0,00E+00	0,00E+00	9,10E+02	0,00E+00	0,00E+00
Materials for energy recovery	kg	6,21E-02	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	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	0,00E+00

Differences versus previous versions

Compared to last year the main changes are:

- The mix of incoming slab suppliers, so the slabs arrive not only from Europe, but also from the Far East; however, these are always blast furnaces; this has led to a worsening of Global warming
- Plant energy consumption, both electricity and gas, has decreased (phase A3)
- Outgoing transport distances to customers have decreased (phase A4)
- The mix of sales countries has changed, and the % of waste sent for recovery at the end of its life has slightly decreased (phases C3-C4);
- The database used from Ecoinvent 3.9 to Ecoinvent 3.10 has been updated. For example, the data relating to phases C1 and C2 remained unchanged so the changes in impact recorded are linked solely to the updating of the database.

Additional environmental information

The Metinvest Trametal S.p.A. factory has implemented an environmental management system certified according to the ISO 14001 standard.

References

General Programme Instructions of the International EPD® System. Version 4.0.
PCR CONSTRUCTION PRODUCTS, PCR 2019:14 VERSION 1.2.5 del 01/11/2022 - EPD®
Studio LCA di coil e lamiere in acciaio – METINVEST TRAMETAL Spa – rev1 26/09/2024

METINVEST TRAMETAL S.p.A.

METIVEST GROUP

metinvestholding.com