ENVIRONMENTAL-PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	voestalpine Grobblech GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-VOE-20230094-IBA1-EN
Issue date	14.04.2023
Valid to	13.04.2028

Heavy plates

voestalpine Grobblech GmbH

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

voestalpine Grobblech GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-VOE-20230094-IBA1-EN

This declaration is based on the product category rules:

Structural steels, 08.03.2023
(PCR checked and approved by the SVR)

Issue date

14.04.2023

Valid to

13.04.2028

Dipl.-Ing Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)

Dipl.-Ing. Hans Peters
(Managing Director Institut Bauen und Umwelt e.V.)

Heavy plates

Owner of the declaration

voestalpine AG
voestalpine-Straße 3
4020 Linz
Austria

Declared product / declared unit

1 tonne of average heavy plate

Scope:

This Environmental Product Declaration refers to a declared unit of 1 tonne of average heavy plate produced at the Linz site. The production of heads as well as roll-clad heavy plate is not included in the scope of the declaration.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804 bezeichnet*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr.-Ing. Andreas Ciroth,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Heavy plate made by voestalpine Grobblech GmbH consists of a slab produced in the blast furnace route that is rolled into heavy plate. Low and medium alloy steels and even higher-strength grades were included in the averages outlined in this Environmental Product Declaration.

Applicable national regulations regulate product use at any given site. In Austria, for example, the building regulations of individual provinces and the technical stipulations based on these regulations are applicable.

2.2 Application

Rolled plates by voestalpine Grobblech GmbH are found in the following applications:

- Piping for large oil and gas pipeline
- Manufacture of oil platforms (offshore industries)
- Boiler and apparatus construction
- Steel construction and bridge building
- Machinery (high-strength and wear-resistant steels)

The hot-rolled plate produced by voestalpine Grobblech GmbH is supplied in various grades. Additional treatment steps (heat treatment, tempering) are performed to meet customer-specific product requirements. The strength and processing properties of the declared product are defined by the selected chemical composition as well as the hot-rolling and heat treatment parameters.

2.3 Technical Data

The data listed in the declaration of performance are authoritative:

Structural data

Name	Value	Unit
Density	7850	kg/m^3
Modulus of elasticity	210000	N/mm^2
Thermal conductivity	48	W/mK
Melting point	1535	°C
Minimum yield strength (for plates)	165	N/mm^2
Minimum tensile strength (for plates)	270	N/mm^2
Minimum elongation (for plates)	14	%

Performance values of the product according to the declaration of performance in relation to essential characteristics in accordance with the following norms:

- *DIN EN 10025:2011, Parts 2–6: Hot rolled products of structural steels* and CE marking
- *DIN EN 10225:2019-11, Weldable structural steels for fixed offshore structures*
- *DIN EN 10028:2010, Parts 2-7: Flat products made of steels for pressure purposes*
- *ASTM (S)A 36*
- *ASTM (SA) 283 Grade C*
- *ASTM (S)A 572 Grade 50 Type 1*
- *ASTM (S)A 588 Grade A*
- *ASTM (SA) 516*
- *ASTM (SA) 537*
- *ASTM (SA) 841*
- *ASTM (SA) 709*
- *ISO 9001*: Quality management systems, requirements

2.4 Delivery status

In contrast to hot-rolled steel strip, the heavy plates of voestalpine Grobblech GmbH are not delivered as coils, but as plates. The maximum length and width dimensions are 18 by 4 meters.

2.5 Base materials/Ancillary materials

The starting material of the product is a steel slab produced at the Linz site of voestalpine Stahl GmbH. The basic material is produced of crude steel comprising roughly 75 % crude iron and 25 % scrap.

The product for authorization contains substances on the *ECHA list* of substances of very high concern (SVHC) (14 July 2021) above 0.1 % by mass: **No.**

The product contains further carcinogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that not in the candidate list, above 0.1 mass % in at least one sub-product: **No.**

Biocides have been added to the construction product, or the product has been treated with biocides (a treated product pursuant to the *Biocidal Product Regulation* (EU) No. 528/2012): **No.**

2.6 Manufacture

The starting material for the production of hot-rolled heavy plates is a steel slab produced in the primary route (blast furnace, LD steelmaking plant). The molten crude steel is cast into slabs using a continuous casting method. The cast slabs are reheated to between 1100 and 1250 °C in a pusher-type furnace, chamber furnace or pit-type furnace and rolled in several rolling steps to form strips with a thickness ranging between 5 and 200 mm. As opposed to hot-rolled steel strips, a four-high rolling configuration, a type of reversing rolling, is used for heavy plates. The material is rolled back and forth until it reaches the desired width, length and thickness.

2.7 Environment and health during manufacturing

The Linz production site of the voestalpine Steel Division is certified according to *EMAS 2009*, *ISO 9001* and *ISO 14001*. In compliance with EMAS provisions, voestalpine continually publishes environment-related facts and figures pertaining to the production site. Investments are being made continually in the expansion of environmental protection measures at the Linz site in an effort to reduce air and water emissions to a minimum. Compliance with all statutory emission limits is verified. All production systems approved in accordance with applicable environmental impact analyses are inspected on a regular basis as part of environmental audits.

2.8 Product processing/Installation

Heavy plates produced by voestalpine can be further processed using conventional plate treatment methods such as roll forming drawing, edging, mechanical and thermal cutting, welding and sand-blasting. Protective measures (extraction, noise protection) prevent any emissions or other harmful effects from the declared product during such processing.

2.9 Packaging

The declared product is supplied as unpackaged plate.

2.10 Condition of use

No changes to the material grade are to be expected while heavy plates are being used. Maintenance and inspection requirements are dependent on the material design and its place of application.

2.11 Environment and health during use

No adverse effects are expected on human health or the environment during use, nor are any harmful emissions expected from the declared product.

2.12 Reference service life

Heavy plates produced by voestalpine Grobblech GmbH can be used in such a wide variety of applications that providing one specific duration for their useful life is not indicated. The useful life of the product is generally limited by the maintenance intervals of the end user.

2.13 Extraordinary effects

Fire

Not relevant.

Water

No negative effects are to be expected on the environment under the influence of water.

Mechanical destruction

Unforeseeable mechanical effects on the declared product would have no negative environmental impact because of the plasticity of steel.

2.14 Re-use phase

The declared product can be reused, recycled and reintroduced as a secondary raw material by recycling companies in the steel industry.

2.15 Disposal

The declared product can be entirely recycled. The waste code is in accordance with *European Waste Catalogue* (EWC): 17 04 05. The type of waste is to be equated with waste catalogue code 35103 pursuant to the Waste Catalogue Ordinance applicable on a national level.

2.16 Further information

Please find more information about the product on our web site at
https://www.voestalpine.com/stahl/en/Companies/voestalpine-Grobblech-GmbH.

3. LCA: Calculation rules

3.1 Declared Unit

This environmental product declaration refers to a declared unit of 1 tonne of average heavy plate. The production of heads as well as roll-clad heavy plate is not included in the scope of the declaration.

Declared unit

Name	Value	Unit
Declared unit	1	t
Conversion factor to 1 kg	0.001	

For the calculation of the declared average, all product variations produced were included in the form of an annual average. Input and production quantities for the entire calendar year 2019 were taken into account. The calculated results can thus be considered representative for the entire product portfolio heavy plates of voestalpine Grobblech GmbH.

3.2 System boundary

The life cycle assessment of average heavy plates refers to a cradle-to-gate analysis with modules (A1–A3 + C +D). The following life cycle phases are considered:

Module A1–A3 | Production stage

The production stage includes the upstream burdens of purchased raw materials (coal, iron ore, pellets etc.), their transports and the manufacturing at the production site in Linz. Material and energy flows for the sinter plant, the coking plant, the blast furnaces, the steelworks as well as the heavy plate rolling mill are considered. Electricity is provided at Linz from a power station where process gases are used as fuel. Since more energy is used than is supplied by this company-owned power station, natural gas and electricity is additionally procured from Austrian networks. voestalpine heavy plates are delivered without packaging.

Module C1 | Deconstruction and demolition

It is assumed that the product is not connected with other materials and can therefore be dismantled. Associated efforts are negligible, no environmental impacts from the deconstruction of the products are declared.

Module C2 | Transport to disposal

The transport to the disposal of the material is estimated to take 50 km, via truck.

Module C3 | Waste processing

Product flows that reach Module D for recycling leave the product system in C3. Environmental impacts resulting from the grinding and sorting of steel scrap are not included due to the negligible expected environmental impact.

Module C4 | Landfilling

Module C4 declares the environmental impacts incurred by landfilling (5 % of the product).

Module D | Credits and loads beyond the system boundary

The potential for substituting primary steel with a recycling scenario (95 % of the product) is contained in Module D.

3.3 Estimates and assumptions

All assumptions are verified through detailed documentation and correspond to the best possible representation of reality based on the available data. Regional applicability of the used background data refers to average data under European or German conditions taken from the *GaBi* database. German data were used for the Austrian market whenever European or Austrian average data were not available.

3.4 Cut-off criteria

All inputs and outputs for which data are available are included in the LCA model. Data gaps are filled with conservative assumptions from average data (when available) or with generic data and are documented accordingly. Only data with a contribution of less than 1 % were cut off. Ignoring such data is justified based on the irrelevance of the expected effect. Processes, materials, or emissions known to make a significant contribution to the environmental effects of the products under examination have not been neglected.

Data were collected from the models and recommendations developed by *worldsteel 2017* and tested using available comparable values. It is assumed that the data have been completely recorded and the overall total of ignored input flows do not amount to more than 5 % of total energy and mass flows. Environmental impacts of machines, plant and infrastructure were not included.

3.5 Background data

This study uses generic background data for the evaluation of upstream environmental impacts from *GaBi* database 2021.1 and is modelled in *GaBi* software version 10.

3.6 Data quality

The foreground data collected at voestalpine Grobblech GmbH are based on the quantities used and volumes produced annually. All process data were collected by voestalpine in the course of reporting to official agencies. Data on material and energy use originate from material-specific throughput measurements of various processes as well as from controlling. Data were collected in compliance with *worldsteel 2017* provisions and were subjected to a supplementary plausibility check using material flow analyses of individual process steps. The technological, geographical and time-related representativeness of the data base was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *GaBi* background datasets are not more than ten years old.

3.7 Period under review

Foreground data were collected in the 2019 production year, and the data are based on the volumes produced on an annual basis.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Austria

3.9 Allocation

The primary data are allocated using the partitioning approach developed by *worldsteel 2014* for calculating life cycle inventories of coproducts in steel production, which is in line with the provisions of *EN 15804.* The so-called partitioning approach provides for the allocation of environmental effects on the steelmaking process and the emerging byproducts based on physical relations. Material-inherent flow properties are thus taken into account.

Externally recycled iron and steel waste products were cut off as a result of their low contribution to company revenue. Economic allocation is not considered to be expedient because the byproducts and coproducts are not directly tradable goods. Furthermore, long-term contracts for the sale of the byproducts exist, and the negotiated prices are therefore not subject to market dynamics.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The *GaBi* background database was used to calculate the LCA (*GaBi* 10; 2021.1).

4. LCA: Scenarios and additional technical information

Characteristic product properties
Information on biogenic carbon

The declared product does not contain any biogenic carbon.

The product is delivered entirely unpackaged.

The end-of-life scenario used in this LCA study is based on the following assumptions and thus complies with the specifications published in *ökobaudat 2022*:

End-of-life (C1–C4)

Name	Value	Unit
Collected separately (Steel)	1000	kg
Recycling 95 %	950	kg
Landfilling 5 %	50	kg

Re-Use, recovery and recycling potential (D), relevant scenario information

Name	Value	Unit
Net flow of steel scrap	801	kg

This scenario contains a recycling rate of 95 %. Since voestalpine externally purchases scrap for steel production, this is offset against the steel scrap for recycling (net flow).

5. LCA: Results

The following table contains the LCA results for a declared unit of 1 tonne average heavy plate.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 tonne heavy plate

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	2.43E+03	0	3.02E+00	0	2.42E+00	-1.36E+03
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	2.42E+03	0	3E+00	0	2.44E+00	-1.36E+03
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	5.29E+00	0	-3.56E-03	0	-2.5E-02	-8.8E-01
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	8.03E-01	0	2.44E-02	0	2.44E-03	1.97E-01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	4.86E-11	0	5.9E-16	0	5.77E-15	-2.26E-12
Acidification potential of land and water (AP)	mol H^+ eq	5.17E+00	0	9.92E-03	0	7.78E-03	-2.44E+00
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.76E-03	0	8.88E-06	0	1.86E-06	-2.78E-04
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.09E+00	0	4.55E-03	0	1.93E-03	-3.63E-01
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.19E+01	0	5.08E-02	0	2.12E-02	-3.54E+00
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	3.76E+00	0	8.94E-03	0	6.08E-03	-1.86E+00
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	2.1E-03	0	2.65E-07	0	1.68E-07	-2.96E-03
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.97E+04	0	3.98E+01	0	3.56E+01	-1.18E+04
Water use (WDP)	m^3 world eq deprived	7.91E+01	0	2.77E-02	0	-2.89E-02	-2.67E+02

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 tonne heavy plate

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.07E+03	0	2.29E+00	0	2.57E+00	1.09E+03
Renewable primary energy resources as material utilization (PERM)	MJ	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.07E+03	0	2.29E+00	0	2.57E+00	1.09E+03
Non renewable primary energy as energy carrier (PENRE)	MJ	1.99E+04	0	4E+01	0	3.56E+01	-1.18E+04
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.99E+04	0	4E+01	0	3.56E+01	-1.18E+04
Use of secondary material (SM)	kg	1.5E+02	0	0	0	0	8.01E+02
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	8.97E+00	0	2.62E-03	0	3.67E-04	-5.99E+00

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 tonne heavy plate

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	5.82E-06	0	2.11E-09	0	6.3E-09	3.3E-06
Non hazardous waste disposed (NHWD)	kg	2.8E+01	0	6.27E-03	0	5.01E+01	1.42E+02
Radioactive waste disposed (RWD)	kg	1.35E-01	0	7.25E-05	0	4.05E-04	4.28E-04
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	9.5E+02	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 tonne heavy plate

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease	ND	ND	ND	ND	ND	ND

	incidence						
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

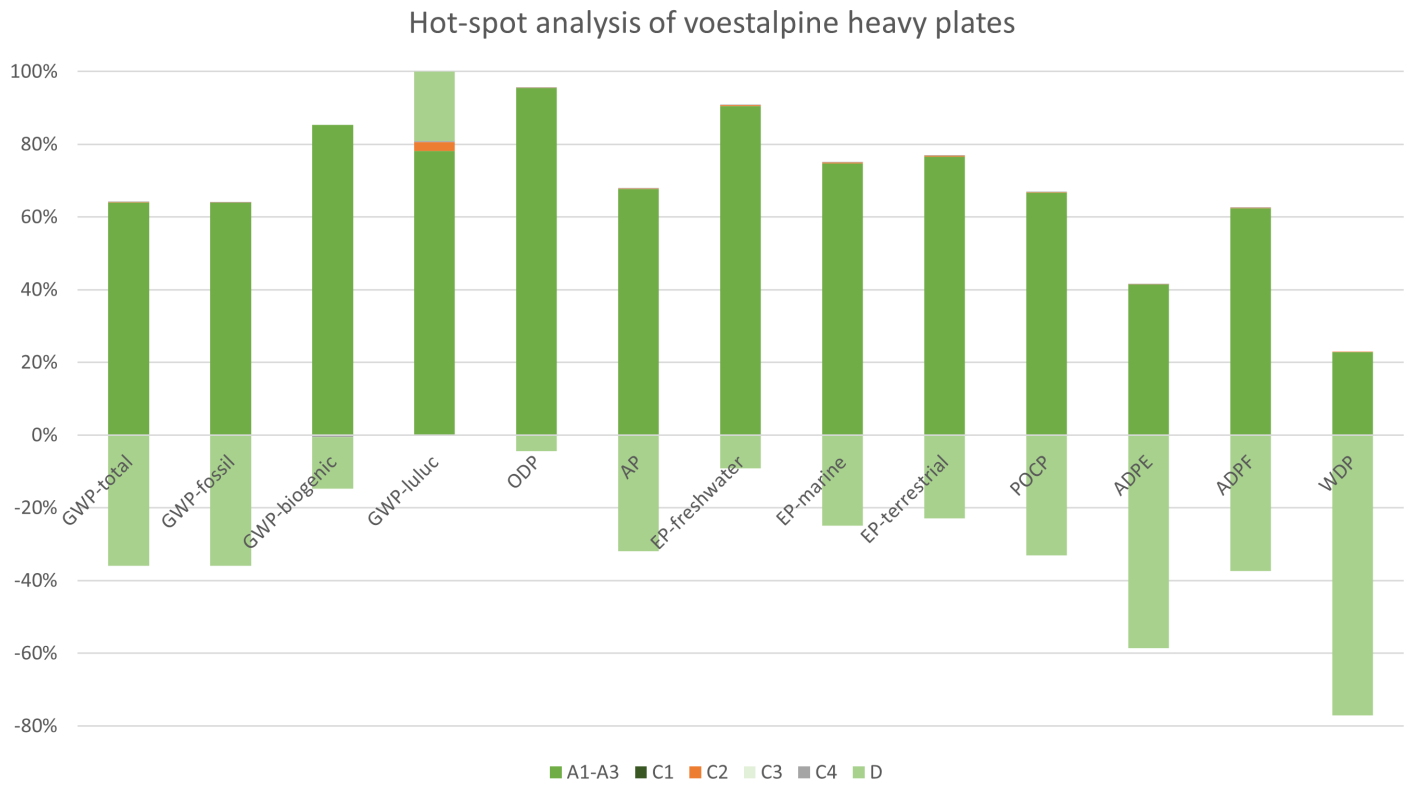
The additional and optional impact categories according to *EN 15804*+A2 are not declared, as the uncertainty of these indicators is to be classified as high.

Disclaimer 1 – for the indicator potential human exposure efficiency relative to U235:
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 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.

Disclaimer 2 – for the indicators abiotic depletion potential for non-fossil resources, abiotic depletion potential for fossil resources, water (user) deprivation potential, deprivation weighted water consumption, eutrophication fraction of nutrients reaching freshwater end compartment, potential comparative toxic unit for humans cancerogenic, potential comparative toxic unit for humans not-cancerogenic, potential soil quality index:
The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results referenced to a declared unit of 1 tonne heavy plate.



A comparison of the individual lifecycle phases results in a clear dominance of the production phase (Modules A1–A3). The environmental effects in the production phase are mainly dominated by the direct process emissions of steel production and the supply chain of purchased raw materials and energy carriers.

As a result of product recyclability, the material removed at the end of life can substitute primary steel. Module D shows the recycling potential of steel at the end of its product life. This results in credits from the substitution of primary steel.

The environmental impact of the transport of the products to recycling (C2) as well as landfilling of the losses at the end of life (C4) represents a minor contribution to the overall environmental impact of the product.

In summary, raw material input and energy carriers required in the production phase as well as direct emissions at the site can be identified as important factors in the environmental impact of heavy plates. The greenhouse gases directly emitted from the processes at the Linz production site, especially from the blast furnaces and the energetic treatment of the metallurgical gases in the network, contribute to a large share to potential global warming.

The heavy plate rolling mill contributes about 4-8 % to the environmental profile of heavy plates. Global warming potential (GWP) is dominated by the use of natural gas with its associated emissions.

In the declared average of this EPD, all produced grades were included in the form of a representative average. The analysis of different specifications of heavy plates identifies a variation of the product-related carbon footprint of about 2 % of the representative products and from -5 % to +18 % for the more extreme variants.

Elemental resource use and water scarcity vary greatly depending on the alloying elements used and their proportion in the product. Therefore, depending on the respective product specification, much larger deviations in these indicators are to be expected.

Due to the homogeneous structure of the products, the environmental impact of the products correlates directly with their mass.

The results of the previous EPD (EPD-VOE-20170157-IBC1-EN) are not directly comparable with the present updated version due to the update of the underlying methodology according to *EN 15804+A2*.

7. Requisite evidence

Not relevant for this EPD.

8. References

Standards

ASTM (S)A 36
Standard specification for carbon structural steel.

ASTM (SA) 283 Grade C
Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

ASTM (SA) 516
Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.

ASTM (SA) 537
Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel.

ASTM (S)A 572 Grade 50, Type 1
Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

ASTM (S)A 588 Grade A
Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPA] Minimum Yield Point, with atmospheric Corrosion Resistance.

ASTM (SA) 709
Standard Specification for Structural Steel for Bridges.

ASTM (SA) 841
Standard Specification for Steel Plates for Pressure Vessels, Produced by Thermo-Mechanical Control Process (TMCP).

EN 10025
DIN EN 10025:2011, Hot rolled products of structural steels.

EN 10028
DIN EN 10028:2010, Flat products made of steels for pressure purposes.

EN 10225
DIN EN 10225:2019-11, Weldable structural steels for fixed offshore structures.

EN 15804
DIN EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works Environmental Product Declarations Core rules for the product category of construction products.

ISO 9001
DIN EN ISO 9001:2015, Quality management systems Requirements.

ISO 14001
DIN EN ISO 14001:2015, Environmental management systems Requirements with guidance for use.

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations Type III environmental declarations Principles and procedures.

ISO 14044
DIN EN ISO 14044:2006-10. Environmental management Life cycle assessment Requirements
and guidelines.

Further references

Biocidal Product Regulation
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

Candidate List
Candidate List of Substances of Very High Concern (ECHA Candidate List) of 02.12.2020, published in accordance with Article 59 (10) of the REACH Regulation Helsinki: European Chemicals Agency.

EMAS 2009
Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a community ecomanagement and audit scheme (EMAS).

European Waste Catalogue (EWC)
Guidance on classification of waste according to EWC Stat categories. Supplement to the Manual for the Implementation of the Regulation (EC) No 2150/2002 on Waste Statistics. Commission of the European Communities, EUROSTAT.

GaBi
GaBi 10, Software-System and Database for Life Cycle Engineering. DB 2021.1. Sphera, 1992-2021. Available at: http://documentation.gabisoftware.com.

IBU 2021
Institut Bauen und Umwelt e.V.: General Programme Instructions for the preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 2.0 Institut Bauen und Umwelt e.V.,2021, Berlin. www.ibuepd. com.

ökobaudat 2022
ökobaudat 2022. EN 15804 and BNB compliant data for more than 700 building products. Federal Ministry of the Interior, Building and Community.

PCR Part A
Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements on the project report according to EN 15804+A2:2019. Version 1.3. Berlin: Institut Bauen und Umwelt e.V. (ed.), 2022.

PCR: Structural steels
Product category rules for building-related products and services. Part B: Requirements of the EPD for Structural steels. Berlin: Institut Bauen und Umwelt e.V., 08.03.2023.

Waste Catalog Ordinance
BMLFUW 2003. Ordinance of the Federal Minister for Agriculture and Forestry, the Environment and Water Resources (Federal Legal Gazette II No. 570/2003) regarding a waste catalog (Waste Catalogue Ordinance).

worldsteel 2014
World Steel Association, 14. Februar 2014: A methodology to determine the LCI of steel industry co-products.

worldsteel 2017
World Steel Association, 2017: Life cycle inventory methodology report.

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