ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Salzgitter AG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	29.01.2029

Heavy plate from scrap-based electric steel

Salzgitter Mannesmann Grobblech GmbH
Ilsenburger Grobblech GmbH

Institut Bauen und Umwelt e.V.

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1. General Information

Salzgitter Mannesmann Grobblech GmbH
Ilsenburger Grobblech GmbH

Programme holder

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

Declaration number

EPD-SAL-20230562-IBD1-EN

This declaration is based on the product category rules:

Structural steels, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

30.01.2024

Valid to

29.01.2029

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

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Heavy plate from scrap-based electric steel

Owner of the declaration

Salzgitter AG
Eisenhüttenstraße 99
38239 Salzgitter
Germany

Declared product / declared unit

1 tonne heavy plate

Scope:

This Environmental Product Declaration refers to one tonne average heavy plate (average EPD) from the rolling mills of Ilsenburger Grobblech GmbH in Ilsenburg and Salzgitter Mannesmann Grobblech GmbH in Mülheim an der Ruhr. Both are members of the Salzgitter Group. The heavy plate products are rolled from slabs produced via the scrap-based electric steel route.
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*.

Verification

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

Prof. Dr. Birgit Grahl,
(Independent verifier)

2. Product

2.1 Product description/Product definition

This EPD describes all heavy plate products from Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH that are rolled from slabs from the scrap-based electric steel route.

(EU) Directive No. 305/2011 (CPR) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a Declaration of Performance taking into account DIN EN 10025, Parts 2-6:2019 (+A1:2022), Hot rolled products of structural steels and CE marking.

2.2 Application

The areas of application for heavy plate products from Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH include the following:

- Wind power plants (on- and offshore)
- Steel and bridge construction
- Tank and plant construction
- Pipelines
- Yellow goods (high-strength and wear-resistant steels for vehicle and crane construction)
- Mechanical engineering and metal construction
- Shipbuilding

2.3 Technical Data

This EPD covers all heavy plate products in various steel grades, dimensions, shapes and delivery states. The grade-specific information on tolerances can be found in the relevant standards (e.g. EN 10029 and EN 10025). Furthermore, the respective information in the Declaration of Performance applies:

Technical construction data

Name	Value	Unit
Density	7850	kg/m^3
Modulus of elasticity	210000	N/mm^2
Coefficient of thermal expansion	11	$10^{-6}K^{-1}$
Thermal conductivity	48	W/(mK)
Melting point	1535	°C
Minimum yield strength (for sheet steel)	165	N/mm^2
Minimum tensile strength (for sheet steel)	270	N/mm^2
Minimum elongation (for sheet steel)	14	%

The product's performance values correspond with the Declaration of Performance in terms of its essential properties in accordance with:

- DIN EN 10025, Parts 2-6:2019 (+A1:2022), Hot rolled products of structural steels
- DIN EN 10225:2019, Weldable structural steels for fixed offshore structures
- DIN EN 10028, Parts 2-6:2017, Flat products made from pressure vessel steels
- and other (non-)European standards in accordance with the delivery ranges of Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH.

The technical parameters from the standards are ensured on the basis of ISO 9001.

2.4 Delivery status

The products of Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH are delivered as rolled sheets. The dimensions vary depending on the application. The maximum deliverable dimensions for the lengths and widths are 24 metres x 4.8 metres.

2.5 Base materials/Ancillary materials

The heavy plate products declared here consist of 100% hot-rolled secondary steel slabs, which are produced via the scrap-based electric steel route. The specific composition depends on the steel grade and the area of application and can be found in the material data sheets at:
www.ilsenburgergrobblech.de/de/medien/service/downloads/werkstoffb

The product / At least one partial product contains substances from the ECHA list of candidates of Substances of Very High Concern (SVHC) (January 2022) exceeding 0.1% by mass: **no**

The product / At least one partial product contains other CMR substances in categories 1A or 1B, which are not on the candidate list, exceeding 0.1% by mass in at least one partial product: **no**

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **no**

2.6 Manufacture

The starting material for the declared heavy plate products from the rolling mills of Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH are slabs produced via the scrap-based electric steel route. The slabs are reheated in the rolling mills' heating furnaces to temperatures between 1,000 °C and 1,250 °C and rolled out in a reversing rolling process to produce heavy plate in the lengths and widths individually defined by the customer. The rolling stands of Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH are so-called quarto rolling stands, consisting of four rolls: two work rolls and two back-up rolls.

2.7 Environment and health during manufacturing

The integrated management systems of both Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH include the quality management systems according to ISO 9001 and ISO 14001. The occupational safety and energy management systems meet the requirements of the international standards ISO 45001 and ISO 50001. Supported by continuous investment in environmental protection measures, emissions to air and water are kept to a minimum. Legal requirements are complied with and in many cases significantly undercut. All operating facilities are periodically inspected by the authorities to ensure environmental compatibility.

2.8 Product processing/Installation

Depending on the area of application, the further processing of heavy plate includes all common sheet metal processing methods, such as roll forming, edging, welding, cutting or sandblasting.

2.9 Packaging

Heavy plate is delivered unpacked and in compliance with legally prescribed transport safety measures.

2.10 Condition of use

If used for its intended purpose, no change is to be expected with regard to the material quality during use. Maintenance and inspection times depend on the design of the material and the

place of use.

2.11 Environment and health during use

In connection with the intended use of the heavy plates, there are no known effects on human and animal health or harmful emissions to air, soil or water.

2.12 Reference service life

A general reference service life is not declared for heavy plate products, as the service life of the products differs greatly due to the variety of applications. As a rule, the service life is limited by the user's maintenance intervals.

2.13 Extraordinary effects

Fire

Heavy plate is non-flammable according to EN 13501-1. No flammable gases or vapours escape. The fire resistance depends strongly on the area of application and the load.

Fire protection

Name	Value
Building material class	A1
Burning droplets	d0
Smoke gas development	s1

Water

Under the influence of water, no negative consequences for the environment are to be expected due to the low solubility of steel in water. In combination with oxygen and water, steel can corrode.

Mechanical destruction

Unforeseeable mechanical impacts on the declared product have no consequences for the environment due to the plastic deformability of steel.

2.14 Re-use phase

Heavy plate is 100% recyclable and can either be reused directly or fed back into the steel industry as a valuable secondary raw material via recycling companies. Steel is a permanent material that can be recycled as often as desired.

2.15 Disposal

The declared product can be fully returned to the life cycle as a secondary raw material.
The waste code according to the European Waste List is: 17 04 05. The type of waste is to be equated with the code number 35103 according to the nationally valid Waste Catalogue Ordinance (AVV).

2.16 Further information

Further information is available at:
www.ilsenburger-grobblech.de and www.smgb.de.

3. LCA: Calculation rules

3.1 Declared Unit

This Environmental Product Declaration refers to the declared unit of one tonne heavy plate.

Declared unit and mass reference

Name	Value	Unit
Declared unit (heavy plate)	1	t
Sheet thickness from	5	mm
to	175	mm
Density	7850	kg/m^3

The average analysis in this EPD includes all input and production quantities of heavy plate production from the entire calendar year 2021. The calculated results are therefore representative of the entire declared product portfolio of Ilsenburger Grobblech GmbH (ILG) and Salzgitter Mannesmann Grobblech GmbH (MGB).

3.2 System boundary

This Environmental Product Declaration is a 'Cradle to gate' EPD with modules C1-C4 and module D. The life cycle phases are as follows:

Module A1 | Raw material supply

The module covers slab production according to the scrap-based electric steel route, including raw material upstream chains. ILG and MGB procure scrap-based electric steel slabs for the production of heavy plate from different steelworks. To take this into account, a database data set for German electric arc furnace (EAF) steel is being implemented to model slab production. This contains average material and energy flows of a scrap-based electric steel plant based on data from several German steel manufacturers.

Module A2 | Transport

The slabs are transported by electric goods trains from the production site to the plants in Ilsenburg and Duisburg, with an average distance of 100 kilometres assumed as representative.

Module A3 | Manufacture

Heavy plate production balances all energy and material flows in the production of Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH and forms weighted average values according to the total production volume shares.

Module C1 | Deconstruction / Demolition

At the beginning of the disposal stage, heavy plate is generally not combined with other materials and can be dismantled by type, which is why the costs incurred are so low compared to the production stage that they are assumed to be negligible.

Module C2 | Transport

An average distance of 50 km by truck is assumed as a representative scenario for waste management transport.

Module C3 | Waste treatment

Dismantled heavy plate hardly needs to undergo any further processing steps, as its use generally already fulfils the requirements of the recycling processes in terms of purity, environmental and health regulations. No environmental impact is therefore anticipated.

Module C4 | Disposal

The environmental impact of all mass fractions that are not reused or recycled (3.1%) and are therefore landfilled is declared in module C4.

Module D | Benefits and loads beyond the system boundary

Module D presents the environmental impacts according to the selected end-of-life scenario (91.6% recycling, 5.3% reuse, 3.1% landfill).

3.3 Estimates and assumptions

All assumptions are supported by detailed documentation and are based on real production data. Where no primary data was available, the data sets were supplemented using the GaBi

LCA software database. The transport costs are modelled using conservative scenarios and the disposal scenarios are based on the results of a study by Helmus 2019. Possible credits or burdens of steel recycling at the end of the life cycle are modelled in accordance with the World Steel 2017 methodology and ISO 14040.

3.4 Cut-off criteria

All production data collected was included in the assessment and modelled using the best available LCA data. No processes, materials or emissions were omitted that are known to make a significant contribution to the environmental impacts of the product under review. Consequently, it can be assumed that no material flows that contribute more than 1% to the total mass or energy of the system or that are significant for the environmental impact have been omitted. The sum of the neglected material flows is well below 5% of the total mass or energy.
The production of capital goods, equipment and infrastructure required for manufacturing was not taken into account.

3.5 Background data

The LCA results were calculated using the life cycle assessment software LCA for Experts (GaBi) from Sphera. The primary heavy plate production data used for modelling came from process data collected by Ilsenburger Grobblech GmbH and Salzgitter Mannesmann Grobblech GmbH as well as audited operating reports. Additional data required was taken from the LCI database of the GaBi software.

3.6 Data quality

All primary production data for slab and heavy plate production relates to the 2021 financial year and is primarily based on data collected for official or commercial reporting obligations. The annual volumes were checked for plausibility. In general, the evaluation model of the EU's PEF approach is used to assess the quality of the primary data of this EPD. Accordingly, the overall quality of the primary data is rated as 'very good'.
The evaluation of the secondary data sets from the GaBi database, on the other hand, is carried out by Sphera and can be viewed on its website. When selecting the background data, attention is paid to the technological, geographical and time-related representativeness of the data basis.

3.7 Period under review

The period under review is the 2021 financial year.

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: Germany

3.9 Allocation

Allocations are avoided as far as possible in accordance with EN 15804and PCR, Part A. Instead, the environmental impact of co-products and by-products is modelled in accordance with the ISO 14044 recommendation using system space expansion. The allocation procedures for reuse and recycling are based on the quantitative assumptions on recycling, reutilisation and loss of steel scrap from Helmus 2019. Steel scrap generated during the production stage is returned to module A1 unencumbered, whereby the environmental impact of the entire secondary raw material results from the calculation of the net scrap quantity used according to the methodology of World Steel 2017 and ISO 14040.

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 underlying database used involves the GaBi software package from Sphera.

The factor tables depicted below are intended to differentiate the environmental impact for the respective heavy plate production of ILG and MGB. The site-specific core indicators are calculated by multiplying the factor with the corresponding value from section 5.

LCA FACTOR TABLE - ILG

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP total	kg CO_2 equiv.	1.06	1.00	1.00	1.00	1.00	0.95
ODP	kg CFC11 equiv.	1.05	1.00	1.00	1.00	1.00	0.98
AP	mol H^+ equiv.	1.21	1.00	1.00	1.00	1.00	0.95
EP freshwater	kg P equiv.	1.04	1.00	1.00	1.00	1.00	1.07
POCP	kg NMVOC equiv.	1.23	1.00	1.00	1.00	1.00	0.94
ADPE	kg Sb equiv.	0.84	1.00	1.00	1.00	1.00	0.96
ADPF	MJ	0.88	1.00	1.00	1.00	1.00	0.96
WDP	m^3 world equiv., extracted	1.01	1.00	1.00	1.00	1.00	0.96

LCA FACTOR TABLE - MGB

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP total	kg CO_2 equiv.	0.87	1.00	1.00	1.00	1.00	1.08
ODP	kg CFC11 equiv.	0.90	1.00	1.00	1.00	1.00	1.03
AP	mol H^+ equiv.	0.54	1.00	1.00	1.00	1.00	1.08
EP freshwater	kg P equiv.	0.92	1.00	1.00	1.00	1.00	0.88
POCP	kg NMVOC equiv.	0.50	1.00	1.00	1.00	1.00	1.10
ADPE	kg Sb equiv.	1.33	1.00	1.00	1.00	1.00	1.06
ADPF	MJ	1.26	1.00	1.00	1.00	1.00	1.06
WDP	m^3 world equiv., extracted	0.98	1.00	1.00	1.00	1.00	1.06

In addition, the following table serves to compare some core indicators of the declared product in the event that wind power is used entirely in heavy plate production. A complete list of all indicators can be found in the Annex to this EPD.

LCA RESULTS - GREEN ELECTRICITY SCENARIO							
Indicator	**Unit**	**A1**	**C2**	**C3**	**C4**	**D**	**D**
GWP total	kg CO_2 equiv.	523.6	0	3.664	0	0.423	230.6
ODP	kg CFC11 equiv.	0	0	0	0	0	0
AP	mol H^+ equiv.	1.202	0	0.003	0	0.003	0.572
EP freshwater	kg P equiv.	0.002	0	0	0	0	-4.3E-05
POCP	kg NMVOC equiv.	1.270	0	0.003	0	0.003	0.347
ADPE	kg Sb equiv.	8.6E-05	0	0	0	0	0.001
ADPF	MJ	6345	0	49.94	0	5.775	2247
WDP	m^3 world equiv., extracted	3.296	0	0.019	0	-0.749	17.36

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The declared product does not contain any biogenic carbon.

Information describing the biogenic carbon content at the plant gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	-	kg C

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

The mass fractions for the waste treatment, disposal and reuse scenario are based on data from Helmus 2019 for steel products in structural engineering. The collection losses are considered landfilled in module C4.

End of Life (C1–C4)

Name	Value	Unit
Collected separately waste type heavy plate	1000	kg
Reuse	53	kg
Recycling	916	kg
Landfilling	31	kg

Reuse, recovery and recycling potential (D), relevant scenario information

Name	Value	Unit
Net scrap quantity	-151	kg

Material losses in the life cycle (e.g. iron loss due to slagging) mean that the amount of recycled scrap is less than the amount of secondary raw materials required. For this reason, the net scrap quantity for the system under consideration is negative and results in an environmental impact that is modelled in accordance with the World Steel 2017 methodology and ISO 14040.

5. LCA: Results

The following table shows the results of the Life Cycle Assessment for the declared product: 1 tonne heavy plate.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = 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 t Grobblech

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	590.9	0	3.664	0	0.423	228.9
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	586.6	0	3.658	0	0.42	230.6
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	4.155	0	-0.017	0	0.004	-1.763
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	0.109	0	0.022	0	0	0.029
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	7.3E-09	0	9.06E-13	0	2.82E-12	-7.385
Acidification potential of land and water (AP)	mol H^+ eq	1.28	0	0.003	0	0.003	0.572
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	0.002	0	8.66E-06	0	7.99E-06	-4.27E-05
Eutrophication potential aquatic marine (EP-marine)	kg N eq	0.395	0	0.001	0	0.001	0.082
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	4.224	0	0.011	0	0.01	0.698
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	1.344	0	0.003	0	0.003	0.346
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	0.0001	0	2.66E-07	0	2.08E-08	0.001
Abiotic depletion potential for fossil resources (ADPF)	MJ	7.38E+03	0	49.94	0	5.775	2.21E+03
Water use (WDP)	m^3 world eq deprived	3.355	0	0.019	0	-0.749	17.48

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 t Grobblech

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	3.57E+03	0	3.349	0	0.477	-292
Renewable primary energy resources as material utilization (PERM)	MJ	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	3.57E+03	0	3.349	0	0.477	-292
Non renewable primary energy as energy carrier (PENRE)	MJ	7.38E+03	0	50.04	0	5.777	2.21E+03
Non renewable primary energy as material utilization (PENRM)	MJ	-3.05E-11	0	0	0	0	6.4E-10
Total use of non renewable primary energy resources (PENRT)	MJ	7.38E+03	0	50.04	0	5.777	2.21E+03
Use of secondary material (SM)	kg	1.22E+03	0	0	0	31	-98
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	1.872	0	0.003	0	-0.017	26.36

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 t Grobblech

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	0.043	0	8.43E-11	0	0.0003	-0.002
Non hazardous waste disposed (NHWD)	kg	16.47	0	0.008	0	31.04	-32.36
Radioactive waste disposed (RWD)	kg	0.466	0	0.0001	0	0.0001	-0.025
Components for re-use (CRU)	kg	0	0	0	0	0	53
Materials for recycling (MFR)	kg	150	0	0	916	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 t Grobblech

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

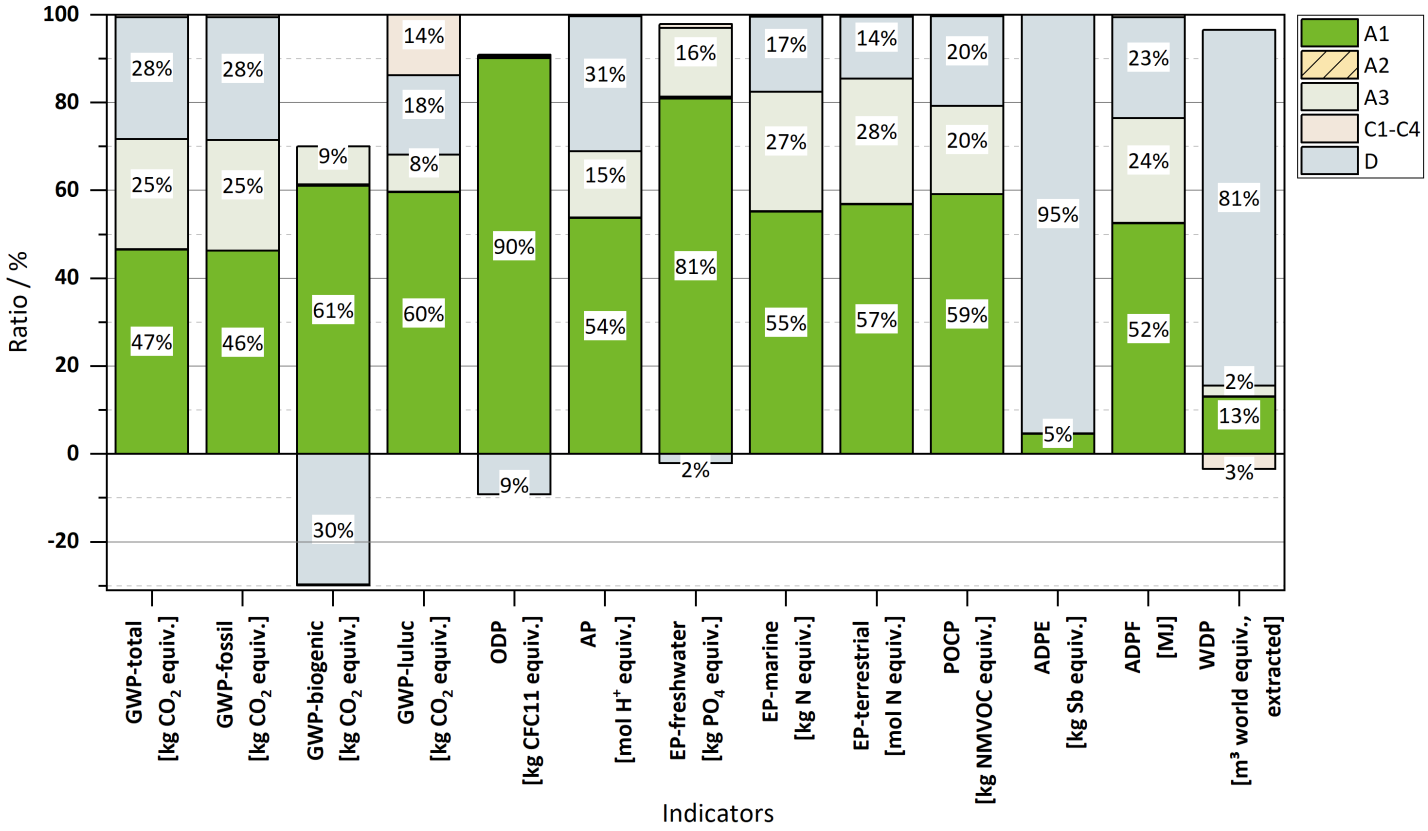
The additional and optional impact categories according to EN 15804 are not declared.

Disclaimer 1 – applies to the indicator "Potential impact of human exposure to U235': This impact category mainly addresses the potential impact of low-dose ionising radiation on human health in the nuclear fuel cycle. This does not consider impacts due to possible nuclear accidents and occupational exposure, nor to the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

Disclaimer 2 – applies to the indicators 'Abiotic depletion potential – non-fossil resources'; 'Abiotic depletion potential – fossil fuels'; 'Water depletion potential (user)', 'Potential ecosystem toxicity comparison unit', 'Potential human toxicity comparison unit – carcinogenic effect', 'Potential human toxicity comparison unit – non-carcinogenic effect'; 'Potential soil quality index': The results of this environmental impact indicator must be used with caution, as the uncertainties in these results are high or there is only limited experience with the indicator.

6. LCA: Interpretation

All core indicators are analysed graphically below according to the percentage contribution of the declared modules.



In general, it can be seen that the production stage (A1-A3) and the credits and loads in module D contribute more than 80% to the environmental impact for all core indicators. In most categories, more than half of the environmental impact is attributable to the raw material supply A1, which was to be expected due to the raw material and energy-intensive secondary steel production.

For the declared product, 47% of the total greenhouse gas emissions (GWP total) result from raw material supply, 25% from heavy plate production, and 27% from the load in module D. This arises because electric steel production requires more steel scrap than new secondary steel is produced, which means that the gap has to be closed by emission-intensive primary steel.
For the other two modules, the data shows that almost all emissions during the production stage are attributable to fossil fuels (cf. GWP fossil indicator). These are coal for electricity generation and as an additive in the EAF as well as natural gas as an energy source for the heating processes in the process chain. Greenhouse gas emissions from biogenic carbon sources amount to approx. 0.1% of total emissions. Emissions from land use and land change (GWP luluc) account for a negligible 0.01% of the GWP total.
The ozone depletion potential (ODP) is mainly determined by the use of certain alloying elements in secondary steel production. These materials release an above-average amount of ozone-depleting chemicals during their production. Sulphur dioxide emissions contribute to acidification potential (AP). As the combustion of coal produces SO2 as well as CO2, (coal-)electricity-intensive secondary steel production also has the greatest environmental impact for this indicator. The companies included in the analysis hardly have any direct water emissions, which is why their eutrophication potential (EP) is largely due to the air emissions of nitrogen oxides from the combustion processes or the EAF. For the remaining impact indicators, the production of raw materials – contained in modules A1 and D – has the greatest impact on the absolute

values of the impact indicators. The production of iron ore, coal, alloying agents and lime influence the indicators for the scarcity of abiotic resources.

7. Requisite evidence

Not of relevance for this EPD.

8. References

Standards

DIN 4102-1
DIN 4102-1:1998-05, Fire behaviour of building materials and components – Part 1: Building materials; concepts, requirements and tests

EN 1993
DIN EN 1993-1-1 to EN 1993-1-12, European application standards for steel construction

EN 10025
DIN EN 10025, Parts 2-6:2019 (+A1:2022), Hot rolled products of structural steels

EN 10028
DIN EN 10028, Parts 2-6:2017, Flat products made from pressure vessel steels

EN 10029
DIN EN 10029:2010, Hot-rolled steel sheet of 3 mm thickness – Tolerances on dimensions and form

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

EN 13501-1
DIN EN 13501-1:2010-01, Fire classification of construction products and building elements – Part 1: Classification with the results of tests on reaction to fire of construction products

EN 15804
EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

EN 15978
DIN EN 15978-1:2021-09, Sustainability of construction works – Methodology for the assessment of quality of buildings

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