# Environmental Product Declaration

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

## Steel billet

from

***PJSC "KAMET STEEL"***

***EPD of multiple products, based on average results***

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | EPD-IES-0023963 |
| Publication date: | 2025-06-02 |
| Valid until: | 2030-06-01 |

*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<br>Box 210 60<br>SE-100 31 Stockholm<br>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): PCR 2019:14 CONSTRUCTION PRODUCTS, version 1.3.4. |
| PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Claudia A. Peña. The review panel may be contacted via info@environdec.com |
| **Life Cycle Assessment (LCA)** |
| LCA accountability: LCA Studio s.r.o.<br>Mgr. Ivanna Harasymchuk, Ing. et Ing. Tatiana Trecáková, PhD., prof. Ing. Vladimír Kočí, Ph.D., MBA<br>Šárecká 1962/5, 16000 Prague 6, Czech Republic, www.lcastudio.cz<br>LCA Studio |
| **Third-party verification** |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br><br>☒ EPD verification by individual verifier<br><br>Third-party verifier: prof. Ing. Silvia Vilčeková, Ph.D., Silcert, s.r.o.<br><br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br><br>☐ 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 characterization 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: **PJSC "KAMET STEEL"**

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Tel.: +38 (067) 5100435
Visit our site: https://ks.metinvestholding.com/

Description of the organisation:

PJSC "Kamet Steel" is part of the Metallurgical division of the Metinvest Group and is one of the largest fully integrated metallurgical enterprises in Ukraine. The plant's production facilities enable the annual output of 5 million tons of sinter, 3 million tons of pig iron, 3.5 million tons of steel, and 1.8 million tons of finished rolled products.
PJSC "Kamet Steel" specializes in manufacturing continuously cast billets, shaped and bar sections for general and special purposes, as well as tube billets with diameters ranging from 120 mm to 330 mm for the production of general-purpose and oil and gas industry pipes. It is the only supplier in Ukraine of rolled axle billets for railway transport, Larsen-type sheet piles, metro system contact rails, and steel grinding balls.
The enterprise's production capacities include six sintering machines, three blast furnaces, two converters, two seven-strand billet continuous casting machines , and one six-strand bloom continuous casting machine. Its rolling mill department features a tube billet section, a bar rolling section with rebar and wire rod production lines, and an axle rolling section, which consists of a cross-spiral rolling mill and two ball rolling mills.

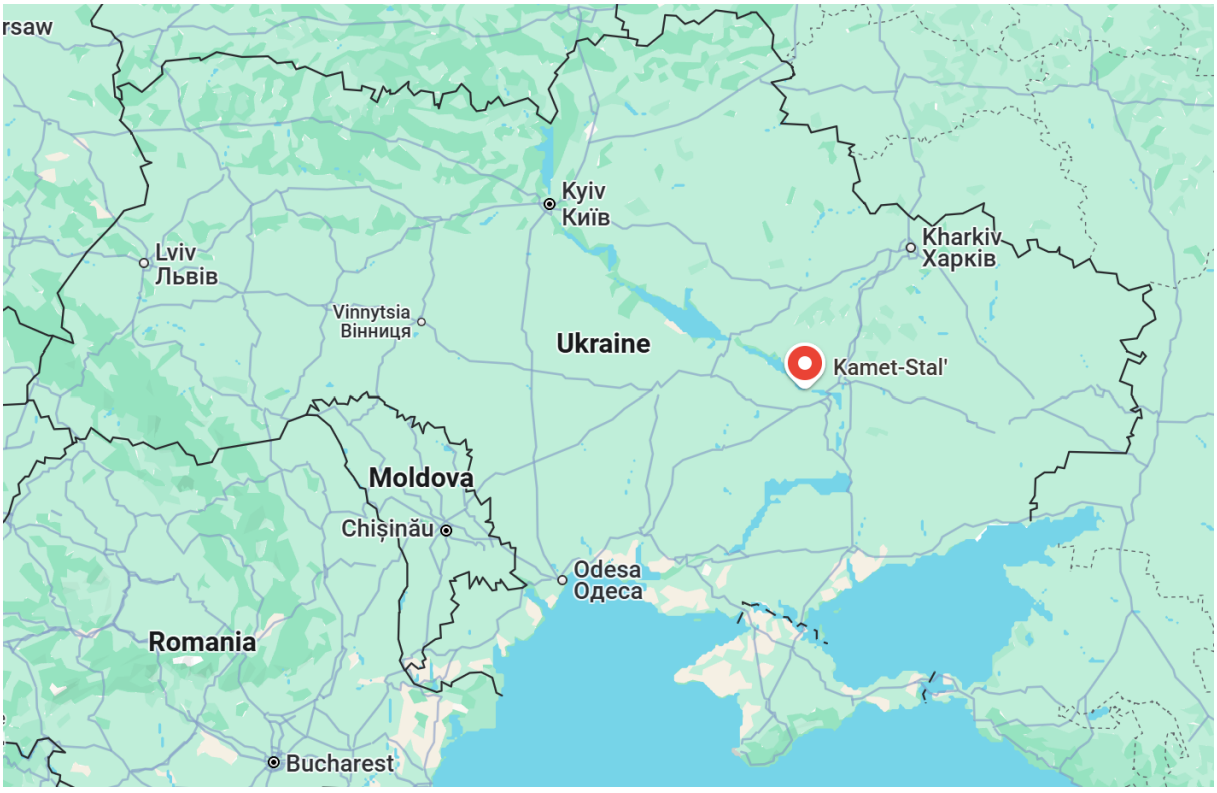
Founded on June 6, 2006, Metinvest is an international vertically integrated group of steel and mining companies. Metinvest Group comprises mining, coke and by-product and steel production facilities located in Ukraine, Europe and the US, as well as a sales network covering all key global markets. The company manages every link of the value chain, from mining and processing iron ore and coal to making semi-finished and finished steel products. With assets close to key railway lines and ports, Metinvest can supply raw materials and steel products anywhere in the world. Today, Metinvest exports its

products to more than 100 countries worldwide. The management company of Metinvest Group is METINVEST HOLDING LLC, a subsidiary of Metinvest B.V. The key shareholders of Metinvest B.V. are SCM and Smart Holding, which partner manages it.

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, a quality management system according to ISO 9001 and energy management system according to ISO 50001.

Name and location of production site(s):

18B Soborna St., Kamianske, Dnipropetrovsk Region, Ukraine, 51925




## Product information

Product name: Steel billet

Product identification:

The billet is a semi-processed steel product with multiple cross-sectional options, including square (starting from 130×130 mm) and rectangular (starting from 335×400 mm), manufactured by specific alloy standards, dimensions, and shapes for various applications, based on custom specifications.

The following table corresponds to the main characteristics of the steel billets manufactured by PJSC "KAMET -STEEL":

*Table 1 The identification of steel billets*

| **Steel billet** | |
|---|---|
| Product Type | Characteristics |
| Rectangular billet of continuously cast steel | Size (wide x high): 335 mm × 400 mm<br>Size (length) 3,7 - 7,9 m |
| Square billet of continuously cast steel | Size (wide x high): 130 mm × 130 mm, 150 mm × 150 mm, 160 mm× 160 mm, 180mm x 180mm , 200 mm × 200 mm<br>Size (length): 6,0 m - 12,0 m |

*Table 2 Commodity classifications of steel billets*

| **Steel billet** | SITC | HS code | CPC |
|---|---|---|---|
| Made of carbon steel, with a carbon content of less than 0.25%, and a cross-section not exceeding 130 mm | 672.61 | 720711 | 41121 |
| Made of carbon steel, with a carbon content of more than 0.25%, and a cross-section greater than 130 mm | | | |
| Made of carbon steel, with a carbon content of 0.25% or more but less than 0.6% | 672.7 | 720720 | |
| Made of carbon steel, with a carbon content of more than 0.6% | | | |
| Made of alloy steel, with a carbon content of 0.7% or less, manganese content between 0.5% and 1.2%, silicon content between 0.6% and 2.3%, and boron content of 0.0008% or more, provided that no other element reaches the minimum content | 672.49 | 722490 | 41122 |
| Made of other alloy steel | | | |

Product description:

The metallurgical production at PJSC "KAMET STEEL" operates a full cycle of ferrous metal production, which includes coking, sintering, blast furnace, steelmaking (converter), lime, and rolling processes, along with auxiliary processes. The primary raw materials for metallurgical production are coal concentrate, iron ore concentrate, and iron ore. The production process also uses auxiliary materials such as flux (dolomite, limestone), scale, blast furnace dust, metal additives, slag, and others.
Coal concentrate of various grades arrives by railcars at the coal preparation shop, where it undergoes unloading, thawing, storage, blending, and preparation of the coal charge for coking. The coal charge is then fed into coke ovens, where it undergoes coking under high temperatures without air access. The coking process produces the following products: blast furnace coke with 6% moisture, coke nut, coke breeze, and coke oven gas.

The blast furnace coke is fed into the blast furnaces for pig iron production. The coke nut and coke breeze are sent to the sintering shop or agglomerate production. Coke oven gas is extracted from the coke ovens and directed to the coking chemical products recovery shop, where gas condensate, ammonia, and benzene hydrocarbons are extracted. From the gas condensate, coal tar and naphthalene are produced. The coal tar is used as a raw material for producing electrode pitch, coal tar oils, phenolates, and other products. The captured ammonia is used to produce agricultural fertilizer - ammonium sulfate. Benzene hydrocarbons are used for benzene production. Finally, the coke oven gas is sent to the sulfur removal plant, where hydrogen sulfide is extracted. The purified coke oven gas is then used to heat the coke batteries' walls and for the CHP plant's steam boilers.

Iron-containing materials (iron ore concentrates, agglomerated ore, sludge, blast furnace dust, etc.), fluxes (limestone, dolomite, lime), and energy materials (coke breeze, coal) are delivered to the sintering plant. Here, they are received, stored, crushed, and formed into sinter mix. The materials are crushed using hammer crushers, coke crushers, and vibrating screens. The sinter mix is then fed into sintering machines, where it is sintered to produce agglomerate. The finished agglomerate is cooled by the supply of cold air and is then crushed and sorted before being sent to the blast furnace shop for pig iron production.The primary purpose of the blast furnace shop is the smelting of pig iron in blast furnaces. The raw materials for the blast furnaces include agglomerate, blast furnace coke, iron ore, pellets, fluxes, and metal additives. Pulverized coal fuel is also injected into the blast furnaces, which is prepared in the pulverized coal preparation and injection section of the blast furnace shop by crushing coal and then drying it. Pig iron smelting occurs in the blast furnace at temperatures of 1450-1500°C. A by-product of smelting is blast furnace slag. Pig iron and slag are tapped through the taphole into pig iron and slag ladles. The pig iron is transported in ladles to the converter shop, where it serves as the main raw material for producing various grades of steel. Some of the pig iron is sent to the bottling machines section, where it is cast into special molds, solidified, and treated with lime milk. The resulting product, pig iron ingots, serves as a semi-finished product for steel production.In the converter shop, pig iron is first poured into an industrial mixer for averaging. From the mixer, the pig iron is transferred to pouring ladles, which are then fed into the pig iron desulfurization unit. At this unit, sulfur is removed from the pig iron by injecting lime and magnesium in a nitrogen stream. After desulfurization, the slag formed during the process is removed using a slag skimming machine. The desulfurized pig iron is then poured into the converter. Along with the pig iron, scrap metal, lime, limestone, and other materials are added to the converter. Lime is produced in the lime-burning shop by calcining limestone in rotary kilns using natural gas or pulverized coal fuel. The resulting metal mixture is blown with oxygen in the converter at temperatures of 1500-1600°C. This process produces steel, which is then poured into a steel casting ladle with the addition of alloying and deoxidizing additives (ferroalloys, aluminum, etc.), depending on the specified steel grade. A by-product of steel production is converter slag.In the steel casting ladle, the steel undergoes out-of-furnace processing before being sent to the continuous casting machine section. Here, the steel is crystallized, formed, cooled, and labeled. The final product is a concast steel billet.The continuous cast billet is manufactured according to approved technological instructions. The raw material for billet production is steel of various grades. The steel grade for billet production depends on consumer requirements and meets DSTU standards. The product range includes billets of

various sizes (thickness × width): 130 mm × 130 mm, 150 mm × 150 mm, 160 mm × 160 mm, 200 mm × 200 mm, and 335 mm × 400 mm. The lengths for billets of 130 mm × 130 mm, 150 mm × 150 mm, 160 mm × 160 mm, and 200 mm × 200 mm are 6.0 m and 12.0 m; for billets of 335 mm × 400 mm, the lengths range from 3.7 m to 7.9 m. Steel billets are used in various industries such as rolling production. It is designed for the production of bar long, shaped, periodic, and other types of rolled products. The billet can serve as a standalone product or as raw material for rolling production. Billets intended for sale are inspected, cleaned, and grouped into batches for shipment. The rolling production at PJSC "KAMET-STAL" manufactures and sells a wide range of products: wire rods, hot-rolled channels, axles, grinding balls, hot-rolled angles, reinforcing bars, hot-rolled rounds, and more.

UN **CPC code**:

41121 - Non-alloy steel in ingots or other primary forms, and semi-finished products of non-alloy steel
41122 - Alloy steel in ingots or other primary forms and semi-finished products of alloy steel

Geographical scope: Global, Ukraine

## LCA information

Functional unit / declared unit:

The declared unit refers to 1 ton of steel billet.

Time representativeness:

Site specific data from producer are based on 1 year average for process data (reference year 2023). Time scope less than 10-years was applied for background data. Time scope less than 2-years was applied for specific data.

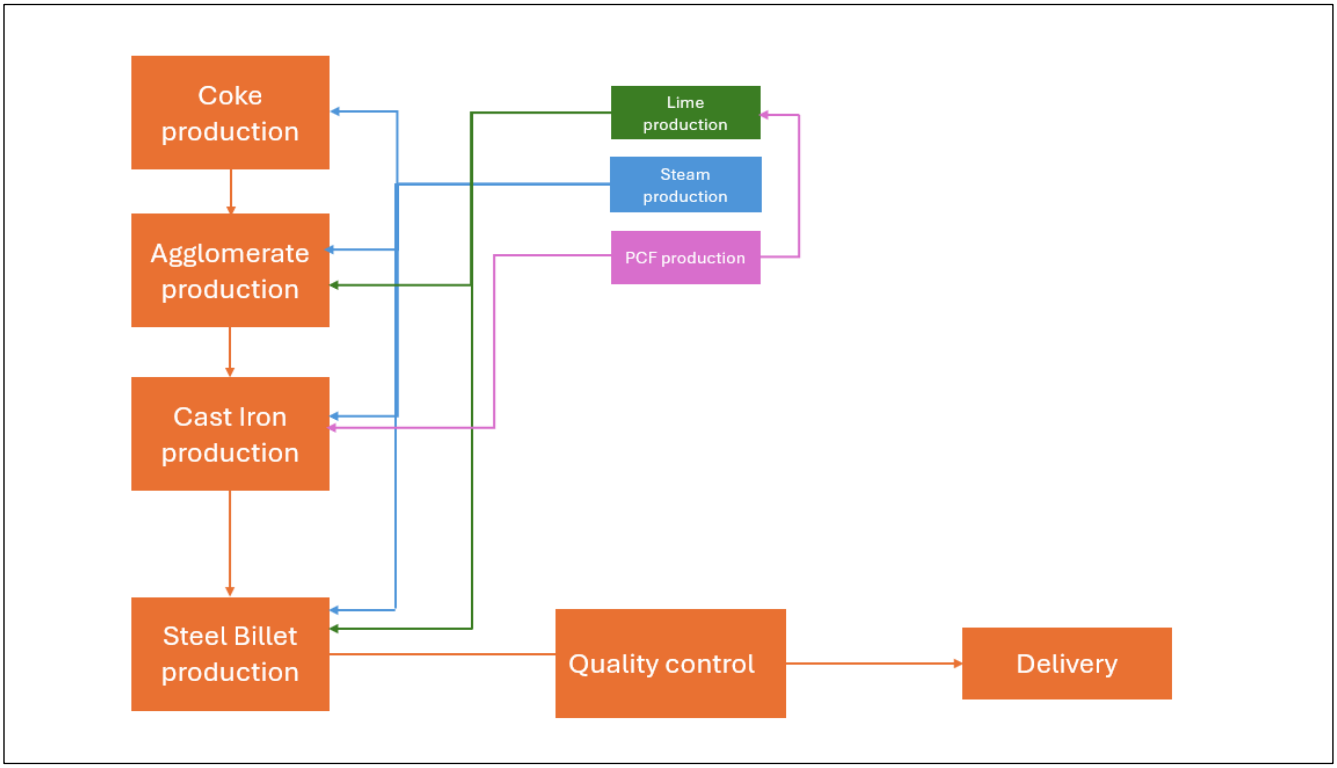
Database(s) and LCA software used:

LCA for Experts (Sphera), Sphera database and Ecoinvent database.

Description of system boundaries:

This EPD is based on the system boundary cradle to gate, modules C1–C4, module D and with optional modules A4-A5.
The system boundary covers the production of raw materials, all relevant transport down to factory gate, manufacturing by PJSC “KAMET STEEL”, transport from the by PJSC “KAMET STEEL” to the site and installation of construction product based at steel billets, including product unpacking, deconstruction, transport of used construction product based at steel billets, sorting of used construction product based at steel billets, treatment of produced waste (recycling and landfill of fractions not entering the recycling treatment).

System diagram:




Cut-off rules: The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 99 % of flows were included.

Allocations: Specific inputs and outputs were measured or calculated for specific products. In regards to input scrap, economic allocation is used. The allocation of common inputs and outputs is based on the general allocation rule which represents the proportion of production of every specific product in overall production expressed in tonnes.

Electricity mix: Generation of electricity consumed within steel billets production was based on the Ukrainian product electricity mix. GWP-GHG indicator of the used Ukrainian product electricity mix is 0,47 kg CO2eq./kWh.

Characterization factors: factors are based on Environmental Footprint 3.1. (EF 3.1).

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

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| Modules declared | x | x | x | x | x | ND | ND | ND | ND | ND | ND | ND | x | x | x | x | x |
| Geography | GLO | GLO | UA | GLO | GLO | NR | NR | NR | NR | NR | NR | NR | GLO | GLO | GLO | GLO | GLO |
| Specific data used | 88,2% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | <10% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | 0% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |

## Content information

| Product components | Weight, kg | Post-consumer material, weight-% | Biogenic material, weight-% and kg C/kg |
|---|---|---|---|
| Steel billet | 1000 | 18,05% | 0% |
| TOTAL | 1000 | 18,05% | 0% |
| **Packaging materials** | **Weight, kg** | **Weight-% (versus the product)** | **Weight biogenic carbon, kg C/kg** |
| Metal packaging | 0,0013 | 0,00013% | 0% |
| Plastic packaging | 0,0020 | 0,00020% | 0% |
| TOTAL | 0,0034 | 0,00034% | 0% |

| Dangerous substances from the candidate list of SVHC for Authorisation | EC No. | CAS No. | Weight-% per functional or declared unit |
|---|---|---|---|
| No substances from the SVHC list to report. | | | |

# Results of the environmental performance indicators

## Mandatory impact category indicators according to EN 15804

| Results per 1 t of steel billet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-fossil | kg $CO_2$ eq. | 2,87E+03 | 1,80E+01 | 5,21E+00 | 6,29E+01 | 1,01E+01 | 2,08E+01 | 7,65E-01 | -4,04E+02 |
| GWP-biogenic | kg $CO_2$ eq. | 1,32E+01 | 5,11E-02 | 1,68E-04 | 2,10E-02 | 1,22E-01 | 9,81E-03 | 0,00E+00 | 9,16E-02 |
| GWP-luluc | kg $CO_2$ eq. | 9,88E-01 | 6,27E-02 | 3,76E-04 | 6,23E-03 | 1,67E-01 | 2,47E-03 | 3,13E-03 | -1,96E-01 |
| GWP-total | kg $CO_2$ eq. | 2,89E+03 | 1,81E+01 | 5,21E+00 | 6,29E+01 | 1,04E+01 | 2,08E+01 | 7,68E-01 | -4,04E+02 |
| ODP | kg CFC 11 eq. | 6,48E-07 | 1,50E-10 | 1,12E-12 | 1,35E-05 | 1,00E-12 | 1,66E-10 | 2,15E-12 | -2,19E-10 |
| AP | mol $H^+$ eq. | 8,77E+00 | 8,04E-02 | 6,73E-04 | 3,93E-01 | 1,29E-02 | 4,83E-02 | 5,40E-03 | -9,27E-01 |
| EP-freshwater | kg P eq. | 3,60E-02 | 2,27E-05 | 1,57E-07 | 1,95E-03 | 4,24E-05 | 8,91E-06 | 1,14E-06 | -1,41E-04 |
| EP-marine | kg N eq. | 1,45E+00 | 2,88E-02 | 1,86E-04 | 1,64E-01 | 4,58E-03 | 1,11E-02 | 1,41E-03 | -2,23E-01 |
| EP-terrestrial | mol N eq. | 1,52E+01 | 3,16E-01 | 3,10E-03 | 1,79E+00 | 5,50E-02 | 1,21E-01 | 1,54E-02 | -2,40E+00 |
| POCP | kg NMVOC eq. | 5,28E+00 | 1,32E-02 | 5,31E-04 | 5,03E-01 | 1,28E-02 | 3,32E-02 | 4,23E-03 | -7,48E-01 |
| ADP-minerals&metals* | kg Sb eq. | 2,54E-02 | 9,67E-07 | 1,22E-08 | 3,24E-05 | 8,46E-07 | 8,71E-07 | 4,74E-08 | -4,06E-06 |
| ADP-fossil* | MJ | 3,37E+04 | 3,07E+02 | 2,32E+00 | 8,60E+02 | 1,30E+02 | 3,53E+02 | 1,00E+01 | -3,09E+03 |
| WDP* | $m^3$ | 2,50E+03 | 8,31E-01 | 4,94E-01 | 2,12E+00 | 1,48E-01 | 8,75E-01 | 8,24E-02 | -2,90E+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 and voluntary impact category indicators

| Results per 1 t of steel billet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-GHG[1] | kg $CO_2$ eq. | 2,88E+03 | 1,81E+01 | 5,21E+00 | 6,29E+01 | 1,03E+01 | 2,08E+01 | 7,70E-01 | -4,04E+02 |
| Particulate matter | Disease incidences | 1,21E-04 | 1,02E-06 | 8,16E-09 | 6,77E-06 | 1,16E-07 | 4,03E-07 | 6,73E-08 | -1,36E-05 |
| Ionising radiation, human health | kBq U235 eq. | 8,22E+01 | 4,87E+00 | 1,05E-02 | 3,89E+00 | 2,34E-02 | 5,39E+00 | 1,14E-02 | 4,81E+00 |
| Ecotoxicity fresh water | CTUe | 7,39E+03 | 6,58E+01 | 1,55E+00 | 2,30E+02 | 9,55E+01 | 8,24E+01 | 8,62E+00 | -4,78E+02 |
| Human toxicity, cancer | CTUh | 4,33E-07 | 2,12E-09 | 7,34E-11 | 8,05E-08 | 1,91E-09 | 2,74E-09 | 1,33E-10 | -6,40E-07 |
| Human toxicity, non-cancer | CTUh | 1,10E-05 | 8,10E-08 | 5,90E-09 | 1,98E-07 | 8,53E-08 | 6,74E-08 | 4,99E-09 | 4,80E-07 |
| Land Use | Pt | 1,79E+03 | 4,14E+01 | 5,43E-01 | 1,08E+02 | 4,75E+01 | 2,69E+01 | 2,57E+00 | 2,44E+02 |

## Resource use indicators

| Results per 1 t of steel billet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | MJ | 2,16E+03 | 3,99E+01 | 5,64E-01 | 4,87E+00 | 1,10E+01 | 4,01E+01 | 1,94E+00 | 4,76E+02 |
| PERM | 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 |
| PERT | MJ | 2,16E+03 | 3,99E+01 | 5,64E-01 | 4,87E+00 | 1,10E+01 | 4,01E+01 | 1,94E+00 | 4,76E+02 |
| PENRE | MJ | 3,37E+04 | 3,07E+02 | 2,32E+00 | 8,60E+02 | 1,30E+02 | 3,53E+02 | 1,00E+01 | -3,09E+03 |
| PENRM | 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 |
| PENRT | MJ | 3,37E+04 | 3,07E+02 | 2,32E+00 | 8,60E+02 | 1,30E+02 | 3,53E+02 | 1,00E+01 | -3,09E+03 |
| SM | kg | 3,21E+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 |

[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.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 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 | $m^3$ | 6,41E+01 | 5,51E-02 | 1,18E-02 | 4,93E-02 | 1,23E-02 | 5,66E-02 | 2,42E-03 | -2,38E-01 |
| 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 | | | | | | | | |

## Waste indicators

| Results per 1 t of steel billet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **C1** | **C2** | **C3** | **C4** | **D** |
| Hazardous waste disposed | kg | 3,61E-06 | 3,75E-08 | 1,15E-09 | 0,00E+00 | 4,20E-09 | 4,21E-08 | 2,21E-09 | 1,14E-06 |
| Non-hazardous waste disposed | kg | 4,38E+01 | 7,04E-02 | 4,73E-01 | 0,00E+00 | 2,02E-02 | 8,35E-02 | 5,00E+01 | -6,19E+00 |
| Radioactive waste disposed | kg | 7,54E-01 | 3,26E-02 | 7,81E-05 | 0,00E+00 | 1,68E-04 | 3,61E-02 | 1,05E-04 | 4,74E-02 |

## Output flow indicators

| Results per 1 t of steel billet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **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 | 0,00E+00 |
| Material for recycling | kg | 0,00E+00 | 0,00E+00 | 1,26E+00 | 0,00E+00 | 0,00E+00 | 1,00E+03 | 0,00E+00 | 0,00E+00 |
| Materials for energy recovery | kg | 0,00E+00 | 0,00E+00 | 2,09E+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 | -9,46E+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 | -1,69E+01 |

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