

XISC

Environmental Product Declaration

Heavy Steel Plates

As PER ISO 14025

Programme holder:
EPD Programme for China Iron and Steel Industry,www.cisa-epd.com
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EPD Programme for
China Iron and Steel Industry

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1. General information

Programme owner	**EPD Programme for China Iron and Steel Industry** **www.cisa-epd.com**
Product Category Rules (PCR)	PCR 2022:01 Basic steel and special steel products UN CPC 4112，412 Version 1.0
PCR Review	Technical committee　Email: EPD@chinaisa.org.cn
Geographical Scope Production base	Applicable Worldwide Hunan Valin Xiangtan Iron and Steel Co., Ltd. Gangcheng Road, Yuetang District, Xiangtan City, Hunan Province
Independent verification of the declaration and data, according to ISO14025:2006	☑ EPD verification
Verification institution: **LCA Consultant** **Approver:**	**Inspection and Certification Co., Ltd, MCC** **Room 307, Building 55, No. 33 Xitucheng Road, Haidian District, Beijing.** **Accreditation agency: China National Accreditation Service for Conformity Assessment** **Registration Number: CNAS C162-P** **Validators: Wang Ya Xin , Yang Ze Chun** **Shanghai e-carbon Digital Technology Co., Ltd.** **EPD Programme for China Iron and Steel Industry**
Follow-up procedures during the validity period of the EPD as defined in the GPI, including independent verifiers:	☐ Yes　☑ No

The EPD holder has the sole ownership, responsibility and obligation for EPD.

2. Company information

Hunan Valin Xiangtan Iron and Steel Co., Ltd. (hereinafter referred to as Xiangtan Steel), founded in 1958, is located on Gangcheng Road in Yuetang District, Xiangtan City, Hunan Province. The company has technical equipment for the entire process of coking, sintering, iron-making, steel-making, and rolling, and its annual capacity reaches 12 million tons of steel. There are currently over 7000 employees.

Xiangtan Steel adopts processes such as blast furnace iron-making, converter steel-making, secondary refining, continuous casting and rolling. Its steel products cover more than 1000 varieties of heavy plates, wire rods, and bars. Among them, 33 products have won national, ministerial, and provincial-level high-quality product titles and 12 products have won the National Metallurgical Product Physical Quality Gold Cup Award. They are exported to countries such as South Korea, the United States and Japan, as well as Europe, South America, Southeast Asia, the Middle East, and other regions, occupying a place in the international high-end market.

Xiangtan Steel is a production base for heavy plates with a global production capacity ranking among the top three in the industry. Its comprehensive variety of plate manufacturing level is stable, and it enjoys a high reputation in multiple industries such as shipbuilding, engineering machinery, marine engineering, high-rise bridges, pressure vessels, energy and heavy industry.



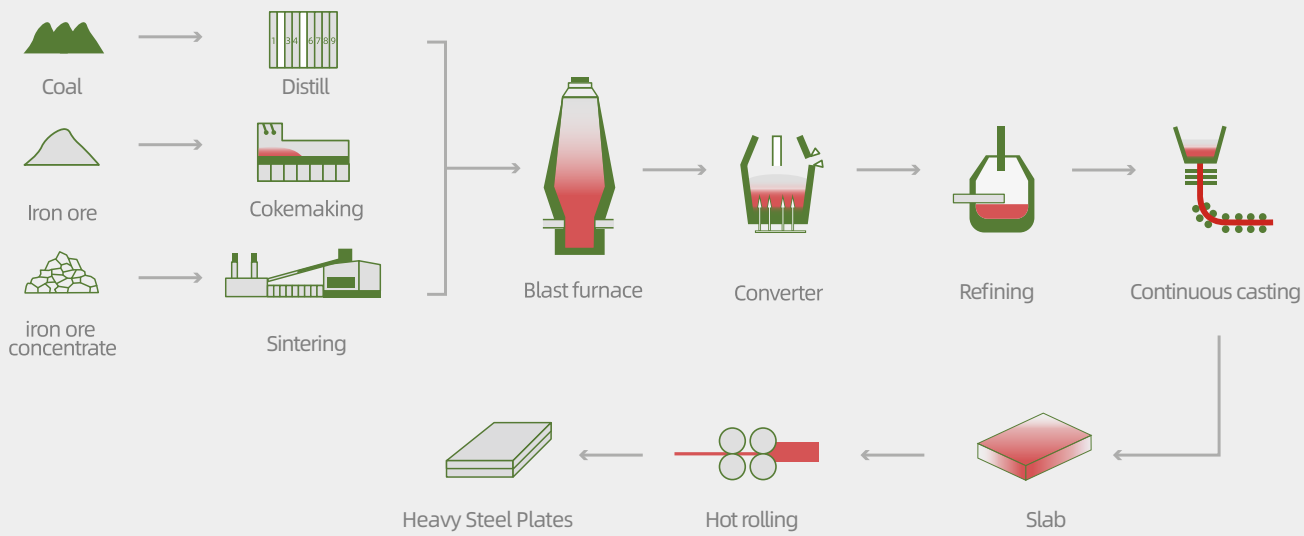
Xiangtan Steel will always hold high the great banner of Xi Jinping's thought of socialism with Chinese characteristics for a new era, adhere to the original intention of "building the chairman's hometown and building a strong steel country", take "enriching employees, repaying the society, and building a strong steel country with high-quality products" as its mission, adhere to the style of "mean what you say, do what you decide ", vigorously promote the enterprise spirit of "persist in studying, stick to innovation, try to be the best", practice the core values of "being hardworking", take the road of high-quality development, commit to building a steel and iron demonstration enterprise with high-quality products, fine management, complementary industries, intelligent, efficient, green and low-carbon, and make every effort to realize the enterprise vision of "building a respected world-class steel enterprise".

3. Product information

Xiangtan Steel's heavy steel plate products include low alloy plates, ship plates, bridge plates, pressure vessel plates, high-strength wear-resistant plates, plates for marine platforms, pipeline plates, and plates for wind power, hydropower, nuclear power, etc. They are widely used in steel structures, equipment manufacturing, new energy, energy storage and transportation, ships and containers, pressure vessels, high-rise buildings, hydropower engineering, bridges, etc.

4. Production information

Production process flow chart



Packaging and labeling

The packaging method for Xiangtan Steel heavy steel plate products is usually determined at the time of ordering. In order to ensure that the product receives appropriate protection under different logistics conditions (such as rail, water, and road transportation), we recommend using economical and environmentally friendly packaging methods based on the product form, transportation logistics conditions, and distance. Usually, strapping is used for direct packaging, or packaging components (plastic film, thin wood pieces, wooden blocks, etc.), wooden brackets, tarpaulins, steel strips (straps), ropes, rubber strips, etc. can be combined according to customer needs for bundling. The product identification is clear, easy to identify and trace.

Procurement and transportation

The main sources of imported iron ore for Xiangtan Steel are South Africa, Australia, and Brazil, while domestic iron ore mainly comes from Hubei, Hunan, Jiangxi, and other regions. Coal mainly comes from Shanxi, Shandong and other places. Coke mainly comes from Shanxi and other regions. Xiangtan Steel focuses on green procurement of raw materials and integrates the concept of green, low-carbon, and sustainable development throughout the entire supply chain. Strictly implement supplier and logistics audit standards, while ensuring stable and efficient supply of resources, and preventing potential environmental risks; promote the green development of the supply chain.

The main mode of transportation for raw materials and products of Xiangtan Steel is water transportation, with a small portion being railway and automobile transportation. Adopting a low-carbon and environmentally friendly concept to reduce backhaul and delays. According to the requirements, the ultra-low emission clean mode transportation project has been completed, and the proportion of national VI level emission vehicle transportation is over 80%, significantly reducing the emissions caused by transportation.

5. Life cycle assessment information

Declared unit: 1000kg Heavy Steel Plates

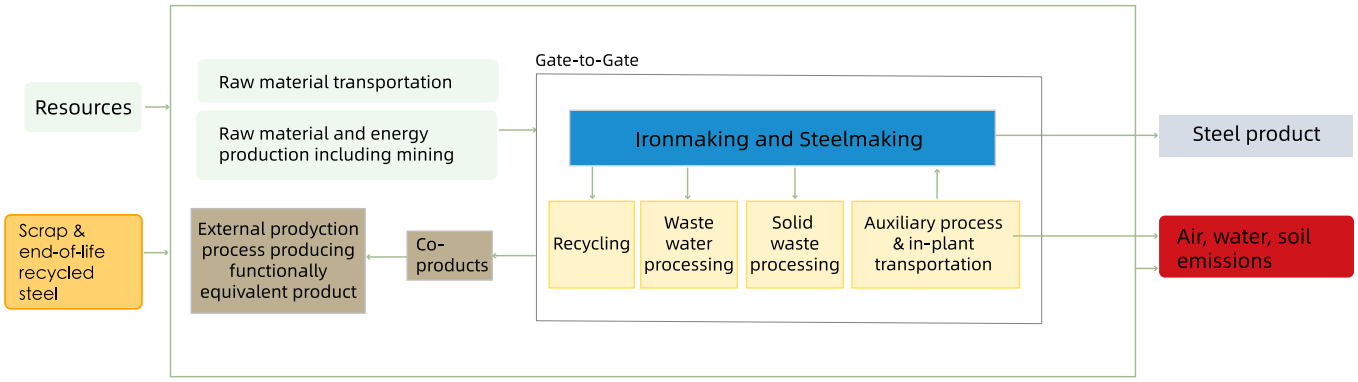
Time representation: 2023 field data

Life cycle assessment software: EPD Tool 1.0

Comprehensive database : "Cradle to Gate background data cited in Ecoinvent 3.8 database

LCIA Environmental Impact Assessment Methodology : CML-2016、IPCC 2021 GWP100 V1.01、Cumulative Energy Demand V1.11

System boundary:



Description of system boundary: Cradle-to-Gate

Excluded life cycle stages: Downstream processes

More information:

Trade-off criteria: all inputs of energy are listed; all inputs of raw materials are listed; inputs of items where the mass of auxiliary materials is less than 1% of the total consumption of raw materials are ignored; all emissions to the atmosphere and water are listed; general solid waste less than 1% of the total emissions of solid waste is ignored; consumption and emissions from road and plant infrastructure, equipment for each process, and personnel and amenities in the plant area are ignored; the trade-off criteria does not apply to toxic and hazardous substances. Does not apply to toxic and hazardous substances, any toxic and hazardous materials and substances are included in the list; the total amount of ignored materials in the system does not exceed 5% of the mass, energy or environmental emissions.

Data quality: Field and background data followed PCR-related data quality requirements, such as representativeness, completeness, and accuracy.

Allocation principles: The systematic extension method was used for the allocation of co-products. The environmental impacts of all co-products within the boundary were considered and calculated in this study.

Waste Disposal: Materials that are landfilled and incinerated both internally and externally at the steel plant are categorized as solid waste. All internal solid wastes were disposed and included in the model for calculation.

Scrap recycling: Considering the recyclability of steel products, end users of steel LCI data can consider all aspects of steel production, as well as the contribution to future resource availability as part of a more comprehensive evaluation.

6. Content declaration

Heavy Steel Plates are mainly composed of elements such as iron and carbon, and contain small amounts of other alloying elements to obtain physical or chemical properties that meet the requirements, such as tensile strength, elongation, toughness, etc. The typical ingredients of Heavy Steel Plates are shown in the table below:

355MPa medium thick plate

Product	Total mass percentage (%)	Elements	Wt (%)	CAS Number
355MPa medium thick plate	100	Fe	> 98	7439-89-6
		C	≤0.14	7440-44-0
		Si	≤0.50	7440-21-3
		Mn	≤1.60	7439-96-5
		P	≤0.020	7723-14-0
		S	≤0.010	7704-34-9

Note: Physical state: Solid Odor: None Color: Metallic gray Melting point: 1,500℃-1,525℃ Density: 7,850 kg/m³

For detailed information of different grades, please refer to relevant standards. For example: Chinese National Standards (GB), European Union Standards (EN), American Standards (ASTM/ASME), Japanese Working Standards (JIS), etc.

Except as specified in the table above, all Heavy Steel Plates may contain trace amounts of other elements. These individual micro elements (mass percentage less than 0.1%) or residual micro elements are related to the material of the raw material itself, and most of them are brought in by the raw material. These single elements may include: zirconium, magnesium, cobalt, antimony, boron, copper, cadmium, niobium, lead, tin, molybdenum, arsenic, zinc, etc.

7. Environmental performance

1000kg Heavy Steel Plates life cycle impact assessment indicators

Parameter		Unit	Upstream	Steel Product Manufacturing	Total
Global warming potential (GWP100)	Fossil fuels	kg CO_2eq.	7.75E+02	1.66E+03	2.43E+03
	Biomass	kg CO_2eq.	2.60E-01	4.80E-03	2.65E-01
	Land use and land-use change	kg CO_2eq.	-4.36E+00	5.39E-03	-4.35E+00
	Subtotal	kg CO_2eq.	7.71E+02	1.66E+03	2.43E+03
Acidification potential (AP)		kg SO_2eq.	1.02E+01	5.71E-01	1.08E+01
Eutrophication potential (EP)		kg PO_4^{3-}eq.	6.45E+00	1.57E-01	6.60E+00
Photochemical ozone creation potentials (POCP)		kg C_2H_4eq.	3.17E-01	8.01E-03	3.25E-01
Abiotic depletion potential (ADP) - minerals		kg Sb eq.	2.96E-02	1.72E-05	2.97E-02
Abiotic depletion potential (ADP) - fossil fuels		MJ, Net Calorific Value	1.14E+04	1.37E+04	2.51E+04
Ozone depletion potential (ODP)		kg CFC-11 eq	1.01E-04	3.74E-06	1.05E-04

1000Kg Heavy Steel Plates resource use indicators

Parameter		Unit	Upstream	Steel Product Manufacturing	Total
Renewable primary energy	as energy carrier	MJ, net calorific value	7.18E+00	7.53E+02	7.60E+02
	as material utilization	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
	Total use of renewable primary energy	MJ, net calorific value	7.18E+00	7.53E+02	7.60E+02
Non-renewable primary energy	as energy carrier	MJ, net calorific value	1.45E+04	1.23E+04	2.69E+04
	as material utilization	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
	Total use of non-renewable primary energy	MJ, net calorific value	1.45E+04	1.23E+04	2.69E+04
Use of secondary material		kg	0.00E+00	1.94E+02	1.94E+02
Use of renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water		m^3	1.40E+00	2.44E+00	3.84E+00

1000kg Heavy Steel Plates solid waste disposal indicators

Parameter	Unit	Steel product manufacturing
Hazardous waste disposed	kg	3.00E-02
Non-hazardous waste disposed	kg	2.95E+02
Radioactive waste disposed	kg	0.00E+00

8. Other environmental impact

None.

9. Additional environmental information

Recycling

All steel products are valuable recyclable materials that can be recycled 100%.

Final disposal

No waste disposal is required.

Declaration

For the calculation of the data, please refer to the PCR and GPI of the EPD Programme for China Iron and Steel Industry.

When different PCRs and GPIs are used, the data published in this EPD are not comparable to EPD data from other platforms.

The currently valid version of the EPD is based on the release of the Platform (www.cisa-epd.com). The EPD shall only be used with a reference to the registration number and the website of the EPD Programme for China Iron and Steel Industry.

10. References

- General Programme Instructions (GPI) version 2.00 for the EPD Programme for China Iron and Steel Industry
- Product Category Rules (PCR) for the EPD Programme for China Iron and Steel Industry 2022:01 Basic Steel Products and Special Steel Products Version 1.0
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 14040:2006+A1:2020 Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006+A1:2018+A2:2020 Environmental management – Life cycle assessment – requirements and guidelines
- ISO 14067:2018 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification



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recommended to be used in scenarios such as product quality certificates, product labels, trading platforms, and websites.

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