



EPD Programme for
China Iron and Steel Industry

Environmental Product Declaration

As PER ISO 14025



Heavy Steel Plates

Programme holder:

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

Registration number:

CISA-EPD-NGGF-20240022

Owner of the declaration:

Nanjing Iron and Steel Co., Ltd.

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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 Nanjing Iron and Steel Co., Ltd. No.8, Xingfu Road, Liuhe District, Nanjing City, Jiangsu Province	
Independent verification of the declaration and data, according to ISO14025:2006		☒ EPD verification
Verification Institution	LRQA Industrial Technical Services (Shanghai) Co. Ltd., Ltd. Room 1229, No. 288, West Nanjing Road, Huangpu District, Shanghai Accreditation agency: United Kingdom Accreditation Service, UKAS Registration Number: No.6445 Validators: Wang Fang , Liu Zhongman	
LCA Consultant	Ouyeel Co.,Ltd.	
Approver	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

Nanjing Iron & Steel Co., Ltd. (hereinafter referred to as NISCO) (stock code: 600282.SH) is an industry-leading iron and steel conglomerates with high-efficiency and full-process. NISCO has a complete production process from ore extraction, coking, sintering, ironmaking, steelmaking to steel rolling, and the advanced main equipment has realized large-scale, automation and informatization, with a comprehensive production capacity of 10 million tonnes of iron and steel per annum. Year 2000, NISCO got listed on the Shanghai Stock Exchange.

NISCO is one of the world's leading single medium and heavy plate production bases with advanced scale efficiency, and a competitive special steel long products production base in China. Aiming at the opportunities of manufacturing industry upgrading and the import substitution in China, NISCO focuses on the research and promotion iron and steel materials of high-strength, high-toughness, high-fatigue, high abrasion-resistant, corrosion-resistant and easy-to-weld, taking the special-purpose plate and special steel long products as the leading products, which are widely used in the fields of oil and gas equipment, new energy, shipbuilding and offshore industry, automobile bearing and spring, engineering machinery and railway, bridge and high-constructed structure, etc., offering the solutions for the key projects and the upgrading of the high-end manufacturing industry of the country.

NISCO actively responds to the requirements of the national "14th Five-Year Plan" for high-quality development, adheres to the corporate vision of "creating an international first-class and respected enterprise wisdom life form", implements the new development concept, and focuses on "green, intelligent, humanistic and high-tech", aiming at the opportunities of manufacturing industry upgrading and import substitution, grasping the wave of industrial Internet development, mastering the core technology of intelligent manufacturing, constructing a composite industry chain ecosystem of mutual empowerment with steel as the core and strategic emerging industries, and building NISCO into a globally competitive, advanced material manufacturer.

NISCO actively practices the development concept of "green, low-carbon and sustainable", focuses on the "Greening of Industry & Green Industrialization", plans ahead, takes the initiative, and unswervingly takes the road of green, low-carbon and high-quality development. NISCO has passed ISO 14001:2015 environmental management system certification, ISO 50001:2018 energy management system certification and RB/T103-2013 energy management system certification for iron and steel enterprises. NISCO insists on promoting green technological innovation, and is the first "National Circular Economy Standardization Pilot Unit" in the industry, and the first subcritical power generation technology to be applied to steel mill gas generator sets. NISCO has been awarded the titles of "China Steel Industry Clean Production and Environmentally Friendly Enterprise" by China Iron and Steel Association, "Green Development Benchmarking Enterprise" by China Metallurgical Newspaper, "Leader in Energy Efficiency of Converting Furnace Process" by Ministry of Industry and Information Technology, and "Nanjing Ecological Civilization Education Base" by Nanjing Municipal Government. "etc. The company has successfully passed the inspection and acceptance of ultra-low emission for all processes and upgraded the plant environmental landscape according to the industrial tourism standard. The company has set up a leading group for green and low-carbon development, determined the "3050" carbon peak carbon neutral timetable and roadmap, and created the "N-ZERO" systems of green products, low-carbon process technology and zero-carbon clean energy to achieve the goals of "Carbon Processes to Carbon-Free Processes, Carbon Metallurgy to Zero-Carbon Metallurgy", and to be the forerunner of green steel in the world.



3. Product information

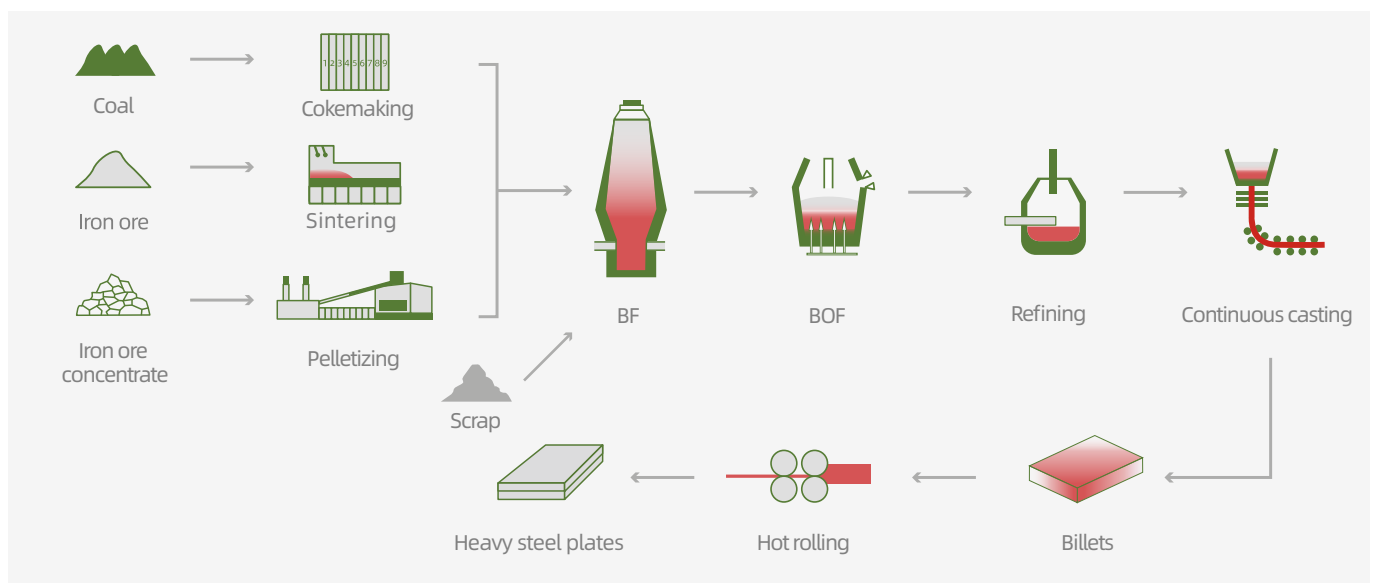
Nanjing Iron & Steel Co., Ltd. (stock code: 600282.SH) is an industry-leading iron and steel conglomerates with high-efficiency and full-process. NISCO has a complete production process from ore extraction, coking, sintering, ironmaking, steel-making to steel rolling, and the advanced main equipment has realized large-scale, automation and informatization, with a comprehensive production capacity of 10 million tonnes of iron and steel per annum. NISCO is one of the world's leading single medium and h plate production bases with advanced scale efficiency, and a competitive special steel long products production base in China.

NISCO has three medium and heavy plate production lines, the 5000mm mill with the world's largest rolling force, the 3500mm furnace mill producing extremely thin and wide heavy plates, and the 2800mm mill with the highest production efficiency. The products cover a wide range: thickness 4mm-300mm, width 1600mm-4700mm, length up to 24m, the production capacity and quality are in the advanced level of the industry, well meeting the requirements of customers on the product thickness tolerance, surface quality, unevenness and so on.

NISCO's heavy steel plate products are widely used in the fields of shipbuilding and offshore, engineering machinery, mining machinery, bridges, wind power, pipelines, construction, petrochemical and pressure vessels. The products include: marine steel, bridge steel, wind tower steel, high-strength steel, pipeline steel, mould steel, container steel, wear-resistant steel, high-construction steel, structural steel, construction machinery steel, rail transportation steel and so on. NISCO's products can be individually designed according to the customer's required dimensions and technical agreements.

4. Production information

Production process flow chart



Packaging and labeling

The products are signed by spray printing, with clear markings for easy identification and traceability.

Procurement and transportation

NISCO's iron ore concentrate, pelletized ore, bituminous coal, anthracite, coke and scrap are mainly sourced domestically, and iron ore fines procured from abroad are mainly from Brazil and Australia.

With the goal of establishing a green procurement management system of "sunshine, cost reduction, safety and efficiency", the company is committed to building a fair, transparent and efficient responsible supply chain. We have established and improved the "Supplier Management Implementation Measures" and "Supplier Performance Management Assessment Measures" to regulate the management of suppliers in terms of systems and processes. In addition, the Company has built a supplier dynamic evaluation system for the systematic management of the entire life cycle of suppliers to achieve visual real-time analysis of supplier evaluation results. We do not purchase raw and auxiliary materials containing conflict minerals such as 3TG (metallic minerals such as tantalum, tin, tungsten and gold) from conflict-affected and high-risk regions. The Company has listed information on the investigation of conflict minerals in the supplier access audit form, requiring suppliers to provide certification of responsible minerals, and we will not co-operate with suppliers if they have conflict minerals disputes. At present, the company has conducted research on the ability of some core suppliers to respond to climate change and the current status of their carbon management foundation.

With the advantages of the riverfront wharf and railway transport, The company's raw materials and products are transported by road, railway and waterway, which has increased the proportion of clean logistics to more than 80%. The company has constructed a pipe belt with a length of 2.3 km to transport blast furnace water slag to the ultra-fine powder processing plant in a confined manner. In addition, the company has replaced the emission standard of bulk raw fuel logistics vehicles from National Class 5 to Class 6, and also introduced electric heavy trucks and developed its own electric locomotives, which are used for the transport of materials within the plant to reduce transportation emissions.

5. Life cycle assessment information

Declared unit: 1000kg Heavy Steel Plates

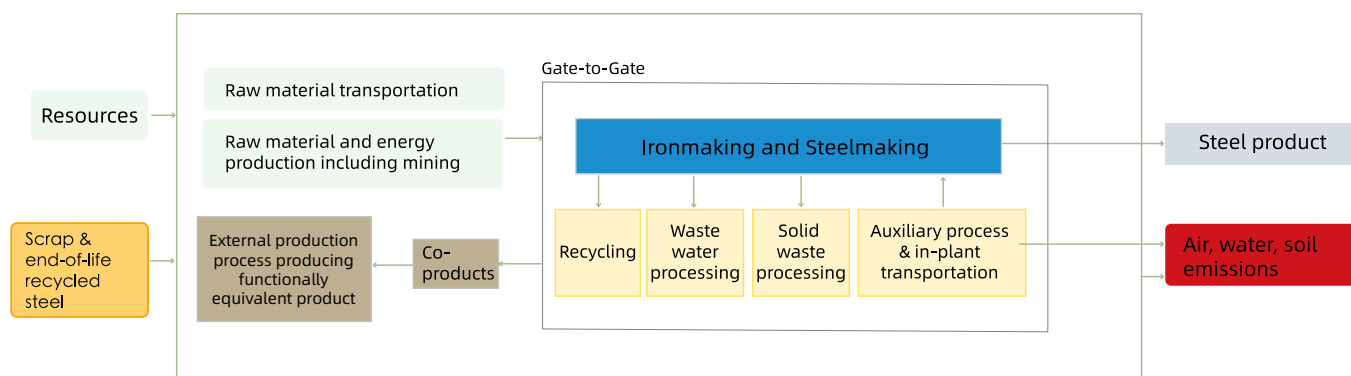
Time representation: 2023 field data

Life cycle assessment software: EPD Tool 1.0

Background database : "Cradle to Gate" background data cited from 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:

Cut-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 cut-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 the element iron, and contain small amounts of other alloying elements to obtain the required physical or chemical properties. Typical ingredients of heavy steel plates are shown in the table below:

Heavy Steel Plate (Q355B)

Product	Total mass percentage (%)	Elements	Wt (%)	CAS Number
Heavy Steel Plate (Q355B)	100	Fe	> 97	7439-89-6
		C	≤0.24	7440-44-0
		Si	≤0.55	7440-21-3
		Mn	≤1.60	7439-96-5
		P	≤0.035	7723-14-0
		S	≤0.035	7704-34-9

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

For detailed information of different grades, please refer to relevant standards. For example: GB/T 1591, 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 elements may include: Ti, Nb, Ni, Cr, Cu, Mo, As, etc.

7. Environmental performance

1000kg Heavy Steel Plates life cycle impact assessment indicators

Parameter	Unit	Cradle-to-Gate
Global warming potential (GWP100)	Fossil fuels	kg CO ₂ eq.
	Biomass	kg CO ₂ eq.
	Land use and land-use change	kg CO ₂ eq.
	Subtotal	kg CO ₂ eq.
Acidification potential (AP)	kg SO ₂ eq.	
Eutrophication potential (EP)	kg PO ₄ ³⁻ eq.	
Photochemical ozone creation potentials (POCP)	kg C ₂ H ₄ eq.	
Abiotic depletion potential (ADP) - minerals	kg Sb eq.	
Abiotic depletion potential (ADP) - fossil fuels	MJ, net calorific value	
Ozone depletion potential (ODP)	kg CFC-11 eq	

1000kg Heavy Steel Plates resource use indicators

Parameter	Unit	Cradle-to-Gate
Renewable primary energy	as energy carrier	MJ, net calorific value
	as material utilization	MJ, net calorific value
	total use of renewable primary energy	MJ, net calorific value
Non-renewable primary energy	as energy carrier	MJ, net calorific value
	as material utilization	MJ, net calorific value
	total use of non-renewable primary energy	MJ, net calorific value
Use of secondary material	kg	
Use of renewable secondary fuels	MJ, net calorific value	
Use of non-renewable secondary fuels	MJ, net calorific value	
Use of net fresh water	m ³	

1000kg Heavy Steel Plates solid waste disposal indicators

Parameter	Unit	Steel product manufacturing
Hazardous waste disposed	kg	
Non-hazardous waste disposed	kg	
Radioactive waste disposed	kg	

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 programmes.

The currently valid version of the EPD is based on the release of the Programme (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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