

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 for:

[Precision Steel Pipe]

From

[Jiaxin Yongli Precision Steel Pipe Co. Ltd.]



## Declared product: Precision Steel pipes

*This EPD covers multi-products. The average results of the product is reported.*



Programme operator:	EPD China
Registration number:	EPD-CN-00050
Issued date:	2026-01-12
Valid until:	2031-01-11

# Programme Information

EPD Owner	Jiaxin Yongli Precision Steel Pipe Co. Ltd. Address: No. 101, Taisheng Boulevard, Huimin Sub-district, Jiashan County, Jiaxing City, Zhejiang Province. Phone: 0573-84701818 Email Address: xingzheng@yx-tube.com
Product Name	Precision Steel Pipe
Production Site	No. 101, Taisheng Boulevard, Huimin Sub-district, Jiashan County, Jiaxing City, Zhejiang Province
Identification of product	Single Cylinder, Working Cylinder, Liquid Storage Cylinder, Electric Control Pipe, Spindle, Protective Pipe, Shaft Camshaft, Stabilizer Bar
Field of Application	Industrial Facilities
Programme Operator	EPD China Address of Headquarter: Tianping Road, Xuhui District, Shanghai Website: www.epdchina.cn Email: info@epdchina.cn   secretary@epdchina.cn
LCA Practitioner	Weidong Ming from Carbonease Co. Ltd.
Responsibility	The EPD owner has the sole ownership, liability, and responsibility for the EPD
Comparability	EPDs within same category of product in different programme operator are not suggested to be compared. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible even applying the same PCR.
Liability	The EPD owner has the sole ownership, liability, and responsibility for the EPD.
Validity	The EPD is published on 2026-01-12 and valid to 2031-01-11
LCA Software (version)	Simapro 9.5
LCI Dataset (version)	Ecoinvent 3.9.1
Year(s) of Primary Data	11/2024-10/2025
PCR	The PCR EPDCN-PCR-202204 version 2.1
Other Reference Document	EN15804+A2:2019
Verification statement according EN15804	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external   Third-party institution verification: <Michael ZHU Jiang, DQS AP LTD.> is an approved certification body accountable for third-party verification Approved by: EPD China	
Procedure for follow-up of data during EPD validity involves a third-party certification body: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

# General Information

## 1.1 Company information

Jiaxing Yongli Precision Steel Pipe Co., Ltd. (hereafter referred to as Yongli) was founded in 2006 in the National-level Jiashan Economic and Technological Development Zone, Zhejiang Province. It is a wholly-owned subsidiary of Zhejiang Yongli Precision Manufacturing Co., Ltd., a high-tech enterprise with a registered capital of RMB 180 million. The company engages in the R&D, production and sales of precision steel pipes and related components for industrial facilities and core automotive parts, with a complete production chain covering coil slitting, high-frequency welded pipe welding, heat treatment, surface treatment, cold drawing and short pipe processing. Its precision steel pipes are applied in automotive air conditioning systems, hydraulic circuits, as well as automotive shock absorption and steering systems. The company is a supporting supplier for a number of well-known domestic and foreign manufacturing enterprises, and some of its products are exported overseas. In recent years, the company has expanded its business into diversified application fields, with its welded and cold-drawn precision steel pipes supplied in large volumes with stable product quality in the Chinese market.

The steel pipe products covered by the EPD include a variety of the company's steel pipe products in different forms. All these products are manufactured at the company's production base located at No. 101, Taisheng Boulevard, Huimin Sub-district, Jiashan County, Jiaxing City, Zhejiang Province.

## 1.2 Scope and type of EPD

This study of Yongli steel pipe includes life cycle information from cradle-to-gate, modules C1-C4 and module D (A1-A3 + C + D).

- A1-A3: Product stage (raw material supply and processing, transport of raw material to the manufacturer and manufacturing of Yongli steel pipe);
- C1-C4: End-of-life stage (deconstruction, transport to waste processing, waste processing and disposal);
- D: Benefits and load beyond the system boundaries

Over through the life cycle stages of products, all energy and material inputs have been traced back to the extraction of resources, emissions from the whole system have been quantified and waste management scenarios have also been included.

Besides the system boundary, other boundaries set are also documented in this LCA study:

- Time boundary: The input and output data of Yongli steel pipe is based on the Yongli's production inventory from 2024.11.1~2025.10.31

➤ Geographical boundary: Data for the product stage is site-specific, which is based on where the production processes take place. Clients are located worldwide. Suppliers are located in China. C and D stages use Global as the geographical boundary.

Table 1: Process stages and and EPD modules.

PRODUCT STAGE					CONSTRUCTION PROCESS STAGE	USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Production	Transport from the gate to the	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	reuse-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	MND	MND	MND	MND	MND	x	x	x	x	x	

## 2 Detailed Product Description

These specially engineered steel pipes are meticulously designed for a wide range of critical applications, including advanced air conditioning systems and high-performance hydraulic circuits. The fundamental purpose and core function of these durable pipes is to efficiently and reliably transport various types of industrial fluid media, ensuring smooth and uninterrupted operations across multiple sectors. It can also be applied in the automotive industry for vibration absorption and steering.

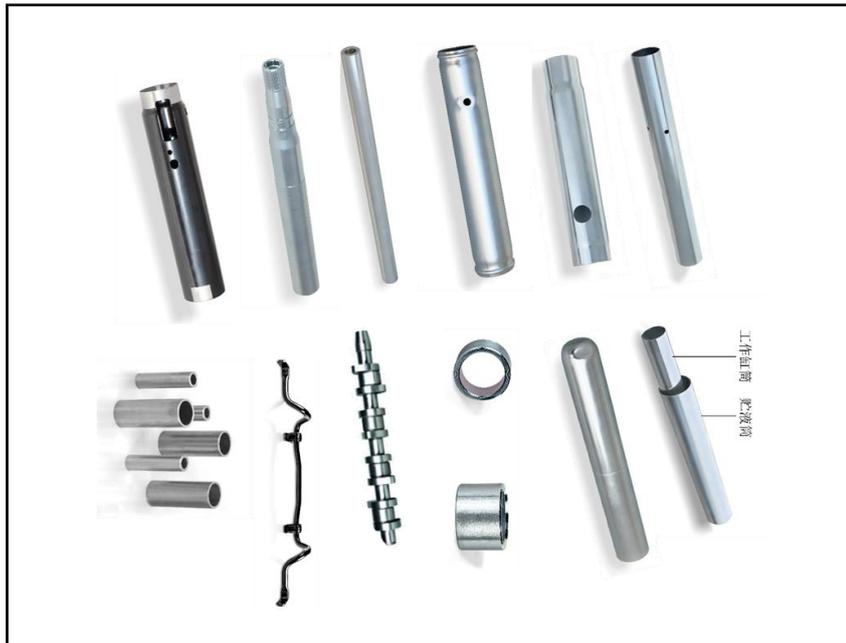


Figure 1: Picture of the declared product.

The manufacture of precision steel pipes begins with slicing wide steel strips into designated narrow strips, then proceeds with cutting, butt welding, and roll-forming into cylindrical tubes through high-frequency welding. After welding, burrs are eliminated, and the welds undergo heat treatment to boost strength.

Next, the pipes go through eddy current testing, sizing, straightening, and synchronized cutting; faulty ones are weeded out, and some pipes move on to additional processing. The following steps involve degreasing, drying, heat treatment at 650 - 800°C (with protective gas), surface treatment (pickling, neutralization, phosphating, lubrication), cold drawing, precision straightening, non - destructive testing, optional machining/rust - proofing, and ultimately warehousing.

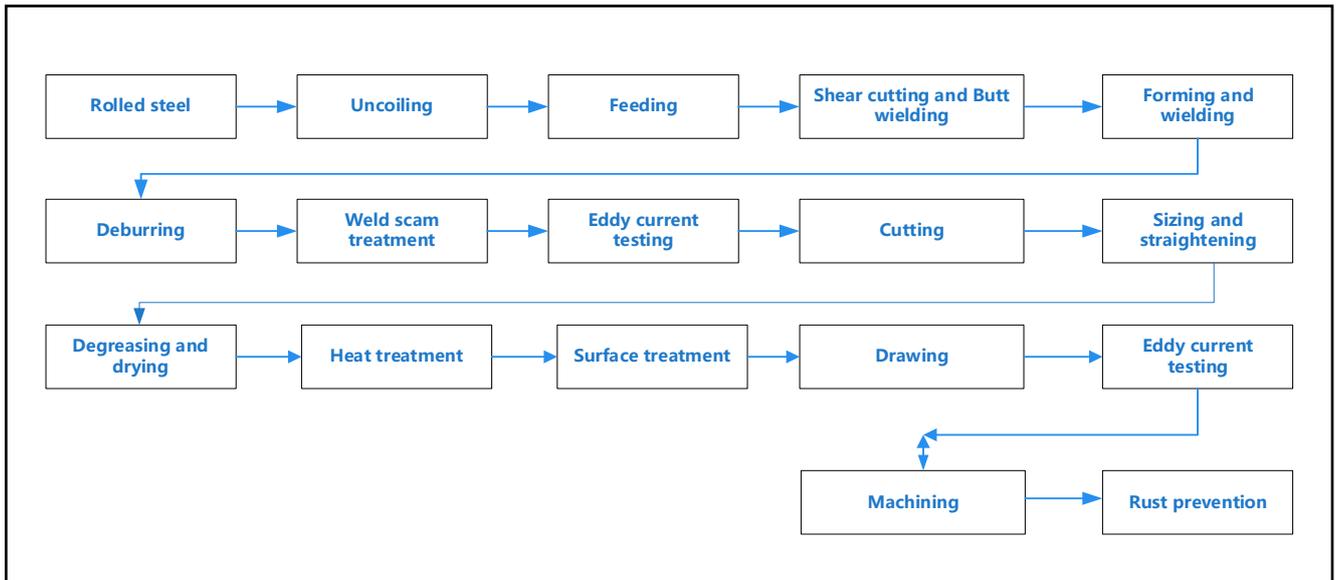


Figure 2: The production process in selected stages.

Declared unit: The declared unit for these products is per kg precision steel pipes.

Representativeness of the average EPD: The average EPD for the pipes demonstrates strong representativeness. Despite variations in pipe shapes, all products share identical raw material inputs (rolled steel) and follow the same production process. Based on the mass-allocation methodology, each declared unit mass of different pipes generates equivalent environmental impacts, ensuring the average EPD can reliably reflect the environmental performance of the entire pipe product range. All these steel pipes are provided in the single production site presented before.

RSL: Not applicable

Use of the EPD: The EPD is used for business-to-business communications. Meanwhile this EPD can also be used to present the government agency the environmental performance of the

Table 2: Main product components and packaging materials per unit.

Product components	Weight, kg*	Weight-% (versus the product)
Steel	1	100%
TOTAL	1	100%
Packaging materials	Weight, kg	Weight-% (versus the product)
Woven tube	0.00046	0.046%
Rust-proof film	0.00062	0.062%
Plastic bag	0.00025	0.025%
Hollow board	0.00314	0.314%
TOTAL	0.00526	0.526%

\*As mentioned before, the variation for the per declared unit steel pipes does not exist in the average EPD.

The product contain no substance that are listed in the “Candidate List of Substances of Very High Concern for authorisation” when their content exceeds the limits for registration with the European Chemicals Agency

Description of the relative production volume covered by the EPD:

Name	Volume (tons)	Fraction
Single Cylinder	7,525	15.61%
Working Cylinder	15,181	31.49%
Liquid Storage Cylinder	21,964	45.55%
Electric Control Pipe	1,430	2.97%
Spindle	145	0.30%
Protective Pipe	714	1.48%
Shaft	708	1.46%
Camshaft	462	0.96%
Stabilizer Bar	86	0.18%

Geographical coverage: The EPD covers the geography of China for A1-A3, and Global for C1-C4 and D.

## 3 LCA results according to EN 15804

### 3.1 Environmental Impacts

The results of the underlying LCA is provided in this section as environmental impacts, resource use, output flows and additional information on biogenic carbon. All pre-set parameters of EN 15804 are required.

Table 3: Environmental impacts according to EN 15804 per declared unit with EF3.1

Core indicator	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	2.75E+00	3.97E-04	1.57E-02	2.64E-02	9.39E-04	-1.59E+00
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	2.75E+00	3.97E-04	1.57E-02	2.63E-02	9.38E-04	-1.59E+00
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	1.73E-03	3.53E-08	2.77E-06	6.90E-05	2.54E-07	-1.87E-04
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO2 eq.]	1.11E-03	3.45E-08	6.40E-06	3.06E-05	4.83E-07	-3.73E-04
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.99E-08	6.07E-12	2.23E-10	2.97E-10	2.71E-11	-4.64E-09
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	1.11E-02	3.58E-06	5.25E-05	2.64E-04	6.65E-06	-5.48E-03
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	9.44E-04	1.16E-08	1.26E-06	1.29E-05	7.79E-08	-4.26E-04
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	2.42E-03	1.66E-06	1.69E-05	6.11E-05	2.53E-06	-1.26E-03
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	2.55E-02	1.82E-05	1.84E-04	6.86E-04	2.77E-05	-1.36E-02
Formation potential of tropospheric ozone (POCP)	[kg NMVOC eq.]	8.42E-03	5.42E-06	7.42E-05	2.04E-04	9.91E-06	-4.62E-03

Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	1.78E-05	1.42E-10	4.92E-08	1.37E-06	1.47E-09	-8.25E-07
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	2.74E+01	5.19E-03	2.22E-01	3.16E-01	2.30E-02	-1.54E+01
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	4.84E-01	1.12E-05	1.07E-03	4.10E-03	1.01E-03	-9.96E-02

\*:The biogenic carbon has been balanced in A3 by adding a virtual emissions

### 3.2 Resource use and waste categories

Table 4: Resource use and waste categories according to EN 15804 per declared unit

Core indicator	Unit	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.46E+00	3.10E-05	2.93E-03	3.84E-02	2.07E-04	-3.03E-01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	2.46E+00	3.10E-05	2.93E-03	3.84E-02	2.07E-04	-3.03E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	2.74E+01	5.19E-03	2.22E-01	3.16E-01	2.30E-02	-1.54E+01
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	2.74E+01	5.19E-03	2.22E-01	3.16E-01	2.30E-02	-1.54E+01
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m3	1.51E-02	3.71E-07	3.14E-05	1.25E-04	2.39E-05	-3.27E-03
Hazardous waste disposed (HWD)	kg	8.21E-01	4.46E-06	2.67E-04	1.60E-03	1.70E-05	-2.01E-02
Non-hazardous waste disposed (NHWD)	kg	5.29E+00	3.37E-05	2.09E-03	1.15E-02	1.50E-01	-9.18E-01
Radioactive waste disposed (RWD)	kg	1.94E-05	5.70E-10	4.75E-08	2.58E-07	3.58E-09	-2.90E-06
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling(MR)	kg	0.00E+00	0.00E+00	0.00E+00	8.50E-01	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy (EE)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### 3.3 Information on biogenic carbon content

Information on biogenic carbon content which shall be included in the EPD as follows:

Biogenic carbon content	Unit (expressed per declared unit)
Biogenic carbon content in product	0 kg C
Biogenic carbon content in accompanying packaging	4.14E-07 kg C

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>.



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### 3.4 Additional impact indicators

No optional impact categories are declared in the LCA



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## 4 Supplementary information

### 4.1 Calculation rules

#### Declared Unit:

The LCA is a quantitative assessment based on a standard selection of declared unit for EPD according to PCR for this construction product. In this study the declared unit is defined as one kg of Yongli steel pipe. No mass reference is needed in this study.

#### Key assumptions:

The key assumptions of this LCA study are as follows:

- The raw input steel is assumed by produced via the converter technology and electric technology at a fraction 85%/15%<sup>1</sup>.
- The steel pipe will be treated at 85% recycling and 15% landfill

#### Cut-off rules:

No specific cut-off criteria has been applied in this study. All inputs related to the steel pipe production are taken into considerable. However, The following steps/stages are not included in the system boundary due to the reason that the elements below are considered irrelevant or not within the boundary to the LCA study of Yongli steel pipe systems:

- Production and disposal of the infrastructure and capital equipment (buildings, machines, transport media, roads, etc.) and their maintenance during product assembly and installation.
- Storage phases and sales of steel pipe due to minor contribution.
- Product losses due to abnormal damage such as natural disasters or fire accidents. These losses would mostly be accidental.
- Handling operations at the distribution center and retail outlet due to small contribution and negligible impact.
- Transport from distribution warehouse to retail outlet and from retail outlet to consumer household or commercial center.

#### Data quality:

A data quality assessment compliant with EN 15941 section 7.3.3 shall be conducted. The Environmental Product Declaration (EPD) for steel pipe is based on data collected by Yongli Company from its Jiaxin Manufacturing Plant over the period 2024.11.1~2025.10.31. This EPD is representative of steel pipe at Yongli's Jiaxin site and for all steel pipe under study are manufactured from the manufacturing site. The datasets cover the geographical boundary (China) for the life cycle stages of the steel pipe. The EPD utilizes background data from Ecoinvent 3.10.1 database. Data quality—evaluated for *time*, *geographical*, and *technological representativeness* per EN 15804:2012+A2:2019, Annex E, E1 shows Fair to Good in most cases. The EPD uses electricity consumption mix to improve its geographical representativeness and the manufacturing electricity consumption contributes to a fraction of 11.3% climate change-total category over A-C life cycles. Poor rating and Fair ratings for 30% contributions are identified for the Steel, low-alloyed {RoW}| steel production, converter, low-alloyed | Cut-off, U.

#### Allocations

In the production of steel pipes, special production is used because all the inputs and outputs are clearly

corresponding to the products. Steel scraps bear economic costs and thus treated as reaching EoW at the Yongli's factory gate.

For the allocation of residuals, the model "allocation cut-off by classification" (ISO standard) is used. The underlying philosophy of this approach is that primary (first) production of materials is always allocated to the primary user of a material. If material is recycled, the primary producer does not receive any credit for the provision of any recyclable materials. Consequently, recyclable materials are available burden-free for recycling processes, and secondary (recycled) materials bear only the impacts of the recycling processes.

As for the end-of-life stage of the steel pipes, following the PCR's recommendation on end-of-life scenario of reuse, recycling, and recovery. Along with the benefit, the load from waste treatment for recycling purposes such as crushing and melting, etc., is also allocated to the next life cycle of substituted products, but not the primary producers, hence no burden or benefit will be allocated to the primary producer of the steel (cut-off approach).

## 4.2 Scenarios and additional technical information

### A1-A3 stages

The main raw material of the Yongli steel pipe products is steel. The type and amount of raw materials are listed in Table 3 below. Over the period of 2024/11/01~2025/10/31, Yongli has produced 48215000 kg steel pipe. Thus, this number is used to normalized the total inputs produce per kg inputs. For the raw materials transport, a total of 103.54 kgkm is calculated under the dataset of Transport, freight, lorry, unspecified {RoW}| transport, freight, lorry, all sizes, EURO5 to generic market for transport, freight, lorry, unspecified | Cut-off, S.

In A3, electricity is based on grid mixes of the State Grid Eastern China Branch (ECGC). Electricity mix has been modelled from Ecoinvent database 3.9. The electricity inventory is based on the year of 2021 for Chinese electricity generation (China Energy Statistics). According to the dataset in Ecoinvent, the main part of electricity is produced by hard coal, followed by natural gas, oil and wind in China. Meanwhile, the company also applied some fraction of roof-top PV. The details for the electricity mix is 84.3% grid mix and 14.7% PV electricity.

The biogenic carbon is balanced at A3 stage by adding a virtual emission of the embodied carbon in A1. Thus, the total A1-A3 GWP-biogenic corresponds to the emissions of biogenic methane.

### C1-C4

The end-of-life stages begin with the deconstruction and demolition from the installation site, and then they are transferred for recycling and disposal. The specific diesel consumption at 1.1 kWh/per ton steel is applied according to the default value from the PCR of from EPD international system (PCR 2019:014 version 2.0.1, valid until 2030-04-07) The discarded product is transported either to the recycling site or to landfills for final disposal (C2). As a conservative assumption, a distance of 100 km to waste processing sites is applied according to the PCR from EPD China. Waste treatment: The average recycling rate of steel after its life cycle is 85%1. The rest is assumed to be landfilled. 15% of steel after its life cycle will be landfilled. The complete waste disposal process is shown in Table 7 and modeled based on generic dataset from Ecoinvent dataset. The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

### D stage

Module D aims at transparency for the environmental benefits or loads resulting from reusable products, recyclable materials and/or useful energy carriers leaving a product system. All declared net benefits and loads

from net flows leaving the product system that have passed the end-of-waste state shall be included in module D.

In this LCA study, the recycling of steel from C3 are considered as avoided products in module D, which is 0.85kg. The recycled material will be modelled as the avoided product via “Pig iron {RoW}| market for pig iron | Cut-off, S” dataset.

### 4.3 Dangerous substances

No dangerous substances is involved.

### 4.4 Other optional additional environmental information

None

## References

- [1] Global Recycling Day: Analysing the role of scrap in steelmaking through the years | ResponsibleSteel
- [2] Ecoinvent, 2023. Swiss Centre for Life Cycle Assessment, v3.9 (www.ecoinvent.ch).
- [3] EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products.
- [4] ISO 14025:2006, Environmental labels and declarations-Type III environmental declarations-Principles and procedures.
- [5] ISO 14040: 2006/Amd 1:2020 Environmental management - Life cycle assessment - Principles and framework Amendment 1 (ISO 2020).
- [6] ISO 14044: 2006/Amd 2:2020 Environmental management - Life cycle assessment - Requirements and guidelines Amendment 2 (ISO 2020).
- [7] EPD China, The PCR EPDCN-PCR-202204 version 2.1



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# Revision history

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# Annex

This EPD contains no Annex



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