

# Environmental Product Declaration



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

## DN400 to DN5080 steel pipe products

from

**Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd.**



上海佳方钢管  
JIAFANG STEEL PIPE

|                          |   |
|--------------------------|---|
| Programme:               | The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a> |
| Programme operator:      | EPD International AB  |
| EPD registration number: | EPD-IES-0023863   |
| Publication date:        | 2025-06-19  |
| Valid until:             | 2030-06-19  |

*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](http://www.environdec.com)*

**Statement:** EPD of multiple products, based on a representative product. The product covered are pipe pile(DN1000 to DN5080), steel pipe products (DN400 to DN5080). The result is based on average products.



## General information

### Programme information

|                   |   |
|-------------------|---|
| <b>Programme:</b> | The International EPD <sup>®</sup> System                           |
| <b>Address:</b>   | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
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### 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 Published on 2024.04.30. Based on CEN standard EN 15804. CEN standard EN 15804 serve as the core PCR. UN CPC code 412.*

PCR review was conducted by: *The Technical Committee of the International EPD<sup>®</sup>System. See <https://www.environdec.com/about-us/the-international-epd-system-about-the-system> for a list of members.*


#### Life Cycle Assessment (LCA)

LCA accountability: Bing Mei, *Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd.*

#### Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier: <  Michael ZHU Jiang, freelancer when commissioned with verification task >

Approved by: The International EPD<sup>®</sup> System

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☐ EPD verification by accredited certification body

Third-party verification: <name, organisation> is an approved certification body accountable for the third-party verification

The certification body is accredited by: <name of accreditation body & accreditation number, where applicable>

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006 via:

☐ EPD verification by EPD Process Certification\*

Internal auditor: <name, organisation>

Third-party verification: <name, organisation> is an approved certification body accountable for third-party verification

Third-party verifier is accredited by: <name of accreditation body & accreditation number, where applicable>

\*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI.

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

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 characterisation 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:

Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd.

### Contact:

Bing Mei

### Description of the organisation:

Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd. Was founded in 2008 and has become a famous steel pipe manufacturer at home and abroad. Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd. 's own brand "JIFANG" has been listed as an internationally renowned brand that Jiangsu Province focuses on cultivating and developing.

### Product-related or management system-related certifications:

Jiafang has obtained a series of certifications including ISO14001 Environmental Management System Certification, ISO 9001 Quality Management System Certification, ISO45001 Occupational Health and Safety Management System. In addition, they also obtained ISO 3834 Welding System Certification, and Special Equipment Production License. The production process complies with standards such as API 2B、EN 1090、EN 10210、EN 10219、API 5L.

### Name and location of production site(s):

Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd.

No.188 Binjiang Avenue, Taicang Port Development Zone, Taicang City, Jiangsu Province, China

## Product information

### Product name:

DN400 to DN5080 steel pipe products

### Product identification:

Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd. produces steel pipe products ranging from DN400 to DN5080. Steel pipe products are produced in accordance with API 2B, EN 1090, EN 10210, EN 10219 and API 5L standards. The product thickness ranges from 6.35mm to 150mm.

### Product description:

Steel pipes are produced according to standards such as API, EN, ISO, etc. Pipeline products are used for oil and gas pipelines, including three-layer polyethylene coated pipes, molten epoxy resin coated pipes, etc; Pipe pile products can be used as foundation materials for spiral steel pipe piles in highways, bridges, buildings, and other areas. They can withstand heavy loads, resist vibrations, and adapt to different engineering environments.

### UN CPC code:

412 Products of iron or steel.

### Geographical scope:

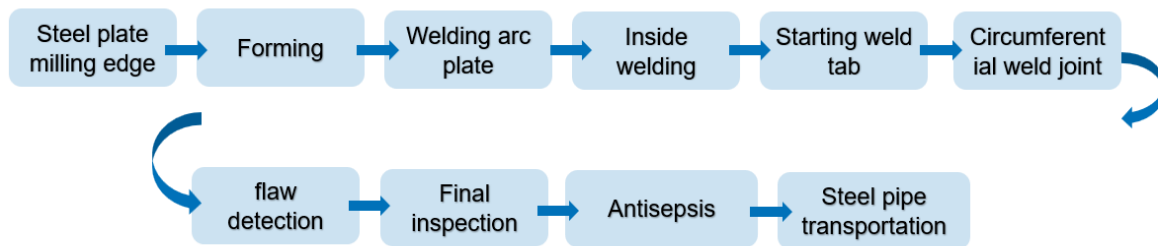
China for A1-A3

Global for A4

Global for C1-C4

### Production Process and Manufacturing Process Flow:

Figure 2 shows the manufacturing process of the LCA.



## LCA information

### Declared unit:

1 tonne of DN400 to DN5080 steel pipe products.

### Reference service life:

Not applicable

### Time representativeness:

2024-01-01~2024-12-31

### Database(s) and LCA software used:

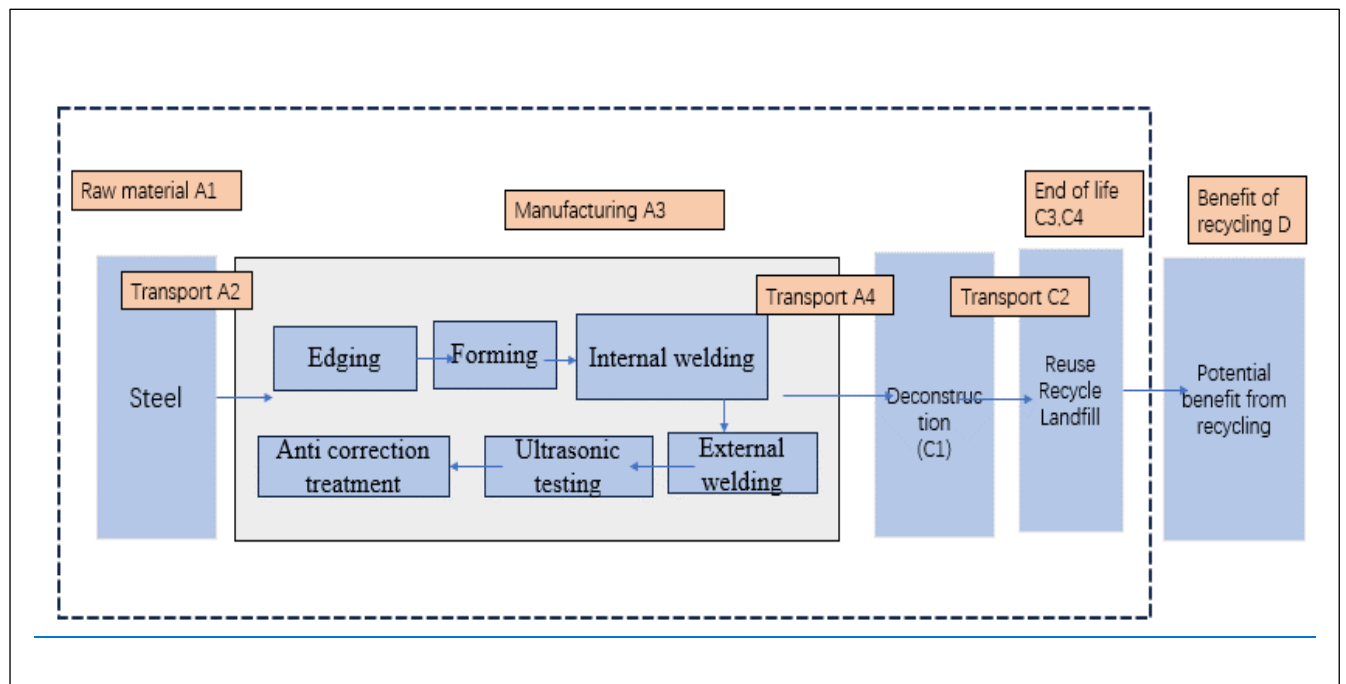
The software Simapro 9.6.0.1 and database Ecoinvent 3 are used for modelling for the steel pipe product.

### Description of system boundaries:

The system boundary includes cradle to gate with options, modules C1–C4, module D and with optional module A4.

### **System diagram:**

The system boundary: It includes cradle to gate stage (A1-A3), modules C1-C4, module D with additional module A4.



#### More information:

#### **Module A1 to A3:**

The product stage includes provision of all materials, products and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the product stage. The electricity used in the manufacturing plant of Jiafang has been sourced from grid electricity. The emission factor of the electricity mix for the GWP-GHG indicator is 0.828 kg CO<sub>2</sub>eq/kWh from Ecoinvent 3 *Electricity, medium voltage {CN-ECGC}*. There is no packaging considered in the present assessment.

#### **Module A4:**

There is distribution considered in the present assessment. Calculate according to the transportation ratio of products to different destinations.

#### **Module C1 to C4:**

Within this EPD, the modules C1-C4 are included. These modules consider the dismantling of the considered product (C1), the transportation of the dismantled components to their End-of-Life (EoL) destination (C2), the waste processing for recovery or recycling (C3) as well as the disposal (C4), if given. At EoL, the steel material leaves the product system in C3 for recycling in Module D. The EoL scenario for the steel material is considered as 50% is recycled and 50% is landfilled.

#### **Benefits and loads**

According to the PCR, Module D assesses the impact of the net flows of recovered materials (recycled or reused) from the life cycle stages A to C, the net flow can be described by the difference between M MR in and M MR out, taking the material yield (here designated with Y) into account.

$$\text{Netflow} = \Sigma (\text{MMR}_{\text{out}} - Y \cdot \text{MMR}_{\text{in}})$$

In this LCA study, no secondary material was used in the production stage, so the M MR in is zero. As it is referred above, 50 % of waste steel is recycled. Thus, per 1ton steel sheet pile produced, 500 kg steel was considered as net flow to assess the impacts.

#### **Excluded Processes**

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

- Personnel activities
- Production and disposal of the infrastructure and capital equipment (buildings, machines, transport media, roads, etc.)
- Due to the cut-off approach, the load and benefit of recycling pre-consumer steel scrap (or internally recycled scraps) are excluded from the analysis.
- Storage phases and sales of steel sheet piles due to no observable impact.
- Product losses due to abnormal damage such as natural disasters or fire accidents. These losses would mostly be accidental.
- The recycling process of defective products is reused internally for the manufacturing process.
- Handling operations at the distribution center and retail outlet due to small contribution and negligible impact.

#### **Key assumptions**

The key assumptions of this LCA study are as follows:

- The Ecoinvent datasets of steel pipe is selected: “steel, unalloyed {RoW}|steel production converter, unalloyed”.
- It is assumed that the energy consumption of C1 disassembly process is 60% of the energy consumption of product production and processing, the energy consumption of C3 waste treatment stage is 20% of the energy consumption of levelling production and processing.

- During the end-of-life stage, the transportation of the waste steel sheet pile to treatment facilities including recycling and landfill was assumed to be 200 km for simplification purposes.
- The EoL of the steel is assumed to be recycling and landfill. The ratio is applied is 50%/50%.

**Allocation**

Allocation refers to the partitioning of input or output flows of a process or a product system between the product systems under study and one or more other product systems.

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                          | ND                        | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | X                          | X         | X                | X        | X                                  |
| Geography            | CN                  | CN        | CN            | GLO                        |                           |           |             |        |             |               |                        |                       | GLO                        | GLO       | GLO              | GLO      | GLO                                |
| Specific data used   | 16.22%              |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – products | Less than 10%       |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – sites    | Not Relevant        |           |               |                            |                           | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |

## Content information

| Product components  | Weight, kg | Post-consumer material, weight-% | Biogenic material, weight-% and kg C/kg |
|---------------------|------------|----------------------------------|---|
| Steel               | 1.00E+03   | 0                                | 0                                       |
| TOTAL               | 1.00E+03   | 0                                | 0                                       |
| Packaging materials | Weight, kg | Weight-% (versus the product)    | Weight biogenic carbon, kg C/kg         |
| -                   | -          | -                                | -                                       |

The products do not contain any of the substances of very high concern (SVHC) regulated by the Regulation (EC) No 1907/2006 (REACH) or the Regulation (EC) No 1272/2008 of European parliament.

## Results of the environmental performance indicators

The environmental performance of the functional unit of 1 tonne of DN400 to DN5080 steel pipe products is reported below using the parameters and units as specified in PCR 2019:14 v1.3.4.

### Mandatory impact category indicators according to EN 15804

| Results per declared unit |   |          |          |          |          |          |          |           |
|---------------------------|---|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit  | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |
| GWP-fossil                | kg CO <sub>2</sub> eq.  | 2.00E+03 | 2.04E+02 | 2.60E+01 | 2.08E+01 | 8.66E+00 | 1.48E+00 | -9.22E+02 |
| GWP-biogenic              | kg CO <sub>2</sub> eq.  | 9.63E-01 | 6.50E-02 | 5.94E-03 | 7.86E-03 | 1.98E-03 | 3.24E-04 | 2.34E+00  |
| GWP-luluc                 | kg CO <sub>2</sub> eq.  | 9.52E-01 | 1.57E-01 | 2.15E-03 | 1.05E-02 | 7.17E-04 | 1.71E-04 | -4.12E-01 |
| GWP-total                 | kg CO <sub>2</sub> eq.  | 2.00E+03 | 2.04E+02 | 2.60E+01 | 2.08E+01 | 8.66E+00 | 1.48E+00 | -9.20E+02 |
| ODP                       | kg CFC 11 eq.   | 3.93E-05 | 3.16E-06 | 2.00E-07 | 3.45E-07 | 6.68E-08 | 2.15E-08 | -1.81E-05 |
| AP                        | mol H <sup>+</sup> eq.  | 7.88E+00 | 3.44E+00 | 2.13E-01 | 5.57E-02 | 7.10E-02 | 1.29E-02 | -3.39E+00 |
| EP-freshwater             | kg P eq.  | 8.42E-02 | 1.32E-03 | 7.37E-04 | 1.96E-04 | 2.46E-04 | 8.60E-06 | -3.99E-02 |
| EP-marine                 | kg N eq.  | 1.71E+00 | 7.93E-01 | 2.88E-02 | 1.43E-02 | 9.59E-03 | 5.79E-03 | -7.42E-01 |
| EP-terrestrial            | mol N eq.   | 1.95E+01 | 8.77E+00 | 3.16E-01 | 1.52E-01 | 1.05E-01 | 6.30E-02 | -8.46E+00 |
| POCP                      | kg NMVOC eq.  | 9.57E+00 | 2.58E+00 | 9.66E-02 | 8.02E-02 | 3.22E-02 | 1.90E-02 | -4.38E+00 |
| ADP-minerals&metals*      | kg Sb eq.   | 6.64E-03 | 3.62E-04 | 1.66E-05 | 5.69E-05 | 5.55E-06 | 5.13E-07 | -7.80E-04 |
| ADP-fossil*               | MJ  | 1.94E+04 | 2.66E+03 | 2.88E+02 | 3.07E+02 | 9.60E+01 | 1.83E+01 | -8.72E+03 |
| WDP*                      | m <sup>3</sup>  | 2.83E+02 | 9.91E+00 | 1.83E+00 | 1.58E+00 | 6.09E-01 | 4.18E-02 | -1.28E+02 |
| 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 declared unit |                        |          |          |          |          |          |          |           |
|---------------------------|------------------------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                   | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |
| GWP-GHG <sup>1</sup>      | kg CO <sub>2</sub> eq. | 2.00E+03 | 2.04E+02 | 2.60E+01 | 2.08E+01 | 8.66E+00 | 1.48E+00 | -9.22E+02 |

## Resource use indicators

| Results per declared unit |  |          |          |          |          |          |          |           |
|---------------------------|--|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit   | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |
| PERE                      | MJ   | 3.08E+02 | 1.28E+01 | 4.03E+00 | 1.72E+00 | 1.34E+00 | 8.51E-02 | -1.37E+02 |
| PERM                      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT                      | MJ   | 3.08E+02 | 1.28E+01 | 4.03E+00 | 1.72E+00 | 1.34E+00 | 8.51E-02 | -1.37E+02 |
| PENRE                     | MJ   | 1.94E+04 | 2.66E+03 | 2.88E+02 | 3.07E+02 | 9.60E+01 | 1.83E+01 | -8.72E+03 |
| PENRM                     | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT                     | MJ   | 1.94E+04 | 2.66E+03 | 2.88E+02 | 3.07E+02 | 9.60E+01 | 1.83E+01 | -8.72E+03 |
| SM                        | kg   | 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  |
| NRSF                      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW                        | m <sup>3</sup>   | 8.03E+00 | 3.21E-01 | 1.19E-01 | 4.90E-02 | 3.95E-02 | 1.47E-03 | -3.67E+00 |
| 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 declared unit |      |       |    |    |    |    |    |   |
|---------------------------|------|-------|----|----|----|----|----|---|
| Indicator                 | Unit | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |

<sup>1</sup> 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<sub>2</sub> is set to zero.

|                              |    |          |          |          |          |          |          |           |
|------------------------------|----|----------|----------|----------|----------|----------|----------|-----------|
| Hazardous waste disposed     | kg | 1.77E-01 | 1.48E-02 | 7.53E-04 | 1.94E-03 | 2.51E-04 | 1.19E-04 | -8.32E-02 |
| Non-hazardous waste disposed | kg | 3.72E+02 | 1.07E+02 | 1.42E+00 | 2.67E+01 | 4.75E-01 | 5.00E+02 | -1.64E+02 |
| Radioactive waste disposed   | kg | 9.68E-03 | 4.53E-04 | 1.31E-05 | 6.69E-05 | 4.37E-06 | 2.16E-06 | -3.32E-03 |

## Output flow indicators

| Results per declared unit     |      |          |          |          |          |          |          |          |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|----------|
| Indicator                     | Unit | A1-A3    | A4       | 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 |
| Material for recycling        | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E+02 | 0.00E+00 | 0.00E+00 |
| Materials for energy recovery | kg   | 0.00E+00 | 0.00E+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 |
| 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 |

## Other environmental indicators

| Results per declared unit |              |          |          |          |          |          |          |           |
|---------------------------|--------------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit         | A1-A3    | A4       | C1       | C2       | C3       | C4       | D         |
| Particulate matter        | disease inc. | 1.50E-04 | 1.12E-05 | 8.23E-07 | 2.00E-06 | 2.74E-07 | 3.54E-07 | -6.93E-05 |
| Ionising radiation        | kBq U 235 eq | 1.46E+01 | 8.00E-01 | 2.83E-02 | 1.15E-01 | 9.43E-03 | 3.98E-03 | -5.44E+00 |
| ETP-fw                    | CTUe         | 7.44E+03 | 1.46E+03 | 6.75E+01 | 1.77E+02 | 2.25E+01 | 9.10E+00 | -3.14E+03 |
| HTP-c                     | CTUh         | 4.77E-05 | 1.89E-06 | 1.86E-07 | 2.89E-07 | 6.19E-08 | 1.64E-08 | -2.06E-05 |
| Land use                  | Pt           | 5.13E+03 | 1.31E+03 | 3.26E+01 | 3.10E+02 | 1.09E+01 | 2.18E+01 | -2.15E+03 |

## Additional environmental information

ISO 9001: Quality Management System

ISO14001: Environmental Management System

ISO45001: Occupational Health and Safety Management System

## **Additional social and economic information**

None

## **Information related to Sector EPD**

It is not sector EPD

## **Differences versus previous versions**

This is a new submission

## References

General Programme Instructions of the International EPD® System. Version 5.0.

PCR 2019:14. *Construction products, version 1.3.4 (2024-04-30)*

EN 15804:2012 +A2:2019/AC:2021 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent 3 database.

LCA report for steel pipe of Shanghai Jiafang Steel Pipe Group(Taicang) Co., Ltd.

