

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 for:

**Yuantai Derun Steel hollow sections**

From

**Tianjin Yuantai Derun Pipe Manufacturing Group**



**Declared product:**



Programme operator:	EPD China
Registration number:	EPD-CN-00015
Issued date:	2024-12-16
Valid until:	2029-12-15

## Programme Information

EPD Owner	Tianjin Yuantai Derun Pipe Manufacturing Group
Product Name	Yuantai Derun Steel Hollow Sections
Production Site	NO.3 Hengtong Road, Da qiuzhuang Industrial Zone, Tianjin, China
Identification of product	UNCPC Code 412 Products of iron or steel
Field of Application	Yuantai Derun steel hollow sections are used in structures, transportation, and manufacturing. They can be circular (CHS), square (SHS) or rectangular (RHS). As well as welded steel frames RHS steel is commonly used for beams while SHS and CHS are more often used for columns.
Programme Operator	EPD China Address of Headquarter: Tianping Road, Xuhui District, Shanghai Website: <a href="http://www.epdchina.cn">www.epdchina.cn</a> Email: <a href="mailto:info@epdchina.cn">info@epdchina.cn</a>   <a href="mailto:secretary@epdchina.cn">secretary@epdchina.cn</a>
LCA Practitioner	Chao WANG <a href="mailto:wangchao@lmi1.cn">wangchao@lmi1.cn</a> Ecovane Environmental 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 2024-12-16 and valid to 2029-12-15
LCA Software (version)	Simapro 9.6
LCI Dataset (version)	Ecoinvent 3.10
Year(s) of Primary Data	01/2023-12/2023
PCR	EPDCN-PCR-202204: PCR for Construction Products and Construction Services to EN 15804 V2.1
Other Reference Document	N/A
Verification statement according EN15804	
<p>Independent verification of the declaration and data according to EN ISO 14025:2010</p> <p><input type="checkbox"/> internal      <input checked="" type="checkbox"/> external</p> <p>Third-party institution verification: &lt;Fang WANG, LRQA Industrial Technical Services (Shanghai) Co., Ltd&gt; is an approved certification body accountable for third-party verification</p> <p>Approved by: EPD China</p>	
<p>Procedure for follow-up of data during EPD validity involves a third-party certification body:</p> <p><input type="checkbox"/> Yes      <input checked="" type="checkbox"/> No</p>	

# General Information

## 1.1 Company information

Owner of the EPD: Tianjin Yuantai Derun Pipe Manufacturing Group

Address: NO.3 Hengtong Road, Da qiuzhuang Industrial Zone, Tianjin, China

Website: [www.ytdrintl.com](http://www.ytdrintl.com)

Contact: [sales2@ytdrgg.com](mailto:sales2@ytdrgg.com)

### Description of the Company:

Established in 2002, Tianjin Yuantai Derun Steel Pipe Group, known as YUANTAI, is a leading conglomerate in the steel pipe industry. Located in Tianjin Daqiuzhuang Industrial Zone, which is the largest steel pipe base in China, YUANTAI stands among China's top 500 private and manufacturing enterprises. The group operates at a 5A level for management and boasts a 3A credit rating, reflecting its high standards of operation and financial integrity. Equipped with 51 black high-frequency welded steel pipe production lines, 10 hot-dip galvanizing lines, 10 pre-galvanized steel pipe lines, 3 spiral welded pipe lines, and 1 JCOE line, YUANTAI specializes in a diverse range of steel products. YUANTAI Group's annual production capacity is an impressive 5 million tons, with a potential to reach 10 million tons at full capacity. Their products are extensively utilized in various sectors, including prefabricated steel structure residential buildings, glass curtain wall projects, steel structure engineering, large venues, airport construction, highways, decorative guardrails, tower crane manufacturing, photovoltaic projects, greenhouses, agricultural shantytowns, bridge building, and shipbuilding.

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

- ISO9001
- ISO14001
- OHSAS18001
- EU/CE10219/10210

## 1.2 Scope and type of EPD

Declare unit: One ton of Yuantai Derun steel hollow sections.

Reference service life: N/A

Time representativeness: 2023.1-2023.12

### Description of system boundaries:

Cradle-to-gate with options, modules C1-C4 and module D (A1-A3 + C + D and additional modules: A4)

Excluded life cycle stages: A5 and B1-B7

**Table1 Process stages 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	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	reuse- recovery- recycling- potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
x	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	

### A1 Raw material supply:

Production starts with the material supply. This module includes the mining and pretreatment processes before production. Steel coils are the main raw material used for pipes and hollow sections production.

### A2 Transportation of raw materials to manufacturer

Transportation module includes the delivery of raw materials from suppliers to the gate of manufacturing plant. Steel coils are transported by lorry to YUANTAI plant from suppliers located in China.

### A3 Manufacturing

The manufacturing process of Yuantai Derun steel hollow sections mainly includes steel coil welding, accumulating, edge milling, forming, squeezing, shaping and testing, which involves raw materials, energy, water, and emissions during the process.

### A4 Transportation of products

According to YUANTAI, all steel hollow sections are consumed to Dubai.

### C1 De-construction and demolition

The impact of the dismantling phase was considered negligible.

### C2 Transportation to waste processing

The discarded product is transported either to the recycling site or to landfills for final disposal. As a conservative assumption, a distance of 100 km to waste processing sites is assumed.

### C3 Waste processing for reuse, recovery and/or recycling

According to World Steel Association, the average recycling rate of steel after its life cycle is 85%. The rest is assumed to be landfilled. Recycling includes sorting and pressing.

### C4 Disposal

Usually, a small amount of the waste remains either at the deconstruction site or during the separation. This small portion will be landfilled. In relation to the C3 stage explained above, 15% of steel after its life cycle will be landfilled.

### D Reuse-Recovery-Recycling-potential

Module D consists of avoided burdens related to the potential reuse and/or recycling of the product after its end-of-life stage. The reuse/recycling rates of steel is 85%.

## 2 Detailed Product Description

### 2.1 Description of the product

Product name: Yuantai Derun Steel Hollow Sections

Product identification: UNCPC Code 412 Products of iron or steel

**Table 2 Product specification and technical performance:**

Yield strength (MPa)	Product code
275	S275 JOH/S275J2H
355	S355JOH/ J2H/ S355NH/ S355MLH/ A500GR.B/ A500GR.B/ A501GR.B/ Q355B/ Q355GJB /C /D
420	S420NH/ S420NLH
460	Q460D/ Q460NE/ S460NH/ S460NLH



Figure 1 Picture of the declared product.

## 2.2 Description of the production process

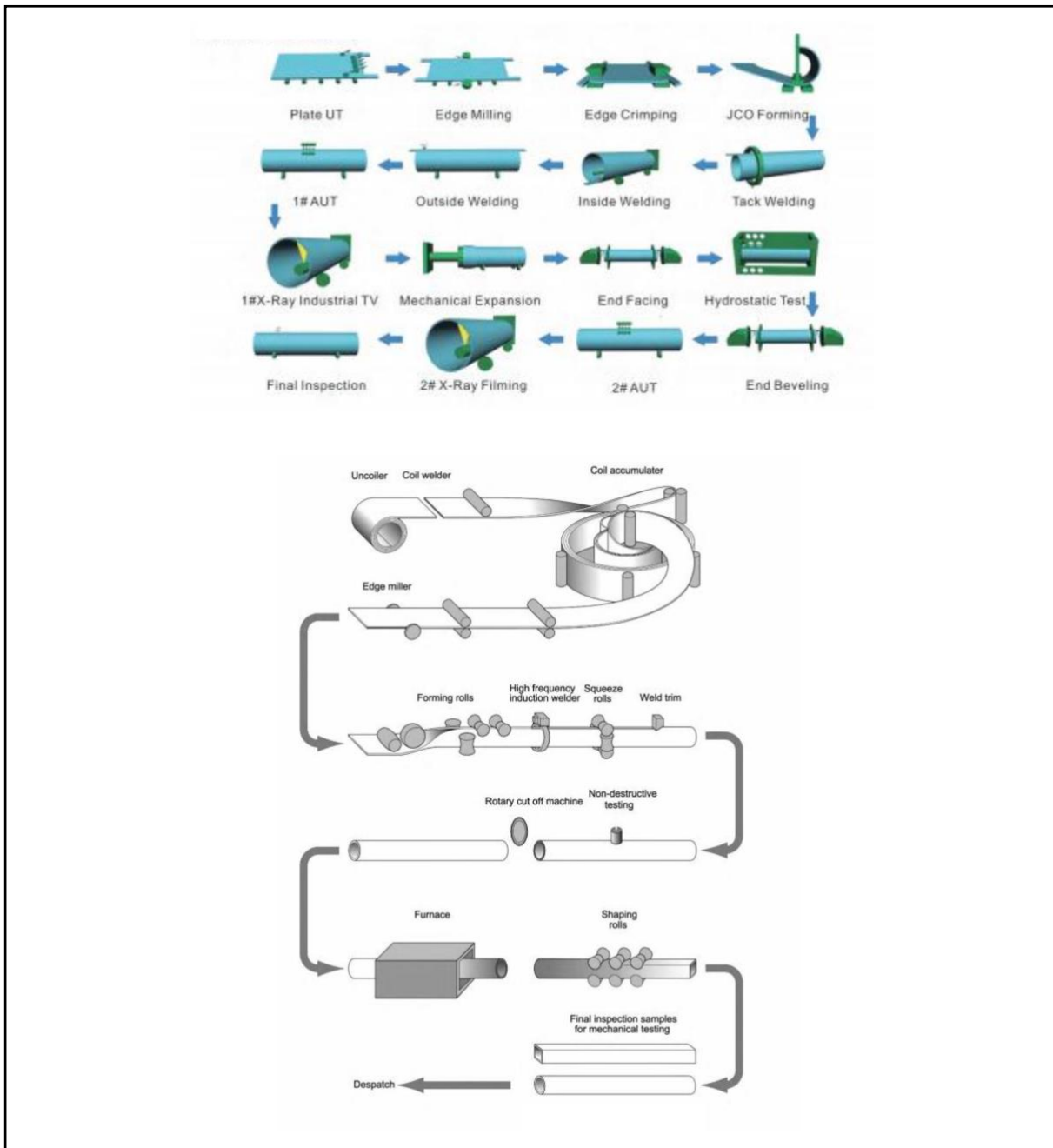


Figure 2 Manufacturing process of Yuantai Derun steel hollow section product

Table 3 Main product components per unit

Product components	Weight, t	Weight-% (versus the product)	Pre-consumer content	Post-consumer content
Steel coil	1.02	102	3% by weight	96% by weight
Auxiliary materials	Weight, t	Weight-% (versus the product)		
Welding wire	0.055	5.5		
Solder flux	0.076	7.6		

The included product contains no substances in the “Candidate List of Substances of Very High Concern for authorization” registration with the European Chemicals Agency.

## 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. Note that the results are calculated based on the worst-case: 355 series.

**Table 4 Environmental impacts according to EN 15804**

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT per declared unit								
Core indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	2.50E+03	2.44E+01	0.00E+00	1.94E+01	7.86E+01	9.39E-01	-6.30E+02
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	2.50E+03	2.44E+01	0.00E+00	1.94E+01	5.23E+01	9.38E-01	-6.32E+02
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	1.34E+00	3.69E-03	0.00E+00	3.05E-03	2.61E+01	2.30E-04	4.71E-01
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO2 eq.]	1.24E+00	1.06E-02	0.00E+00	7.80E-03	1.16E-01	4.83E-04	1.02E+00
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.31E-05	3.60E-07	0.00E+00	2.89E-07	6.27E-07	2.71E-08	2.60E-06
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	1.04E+01	2.57E-01	0.00E+00	8.10E-02	3.47E-01	6.65E-03	-2.75E-01
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	9.83E-01	1.63E-03	0.00E+00	1.52E-03	1.12E-02	7.79E-05	2.68E-02
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	2.34E+00	7.29E-02	0.00E+00	2.95E-02	1.37E-01	2.53E-03	-2.25E-01
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	2.42E+01	8.03E-01	0.00E+00	3.22E-01	1.22E+00	2.77E-02	-3.16E+00
Formation potential of tropospheric ozone (POCP)	[kg NMVOC eq.]	8.48E+00	2.41E-01	0.00E+00	1.12E-01	3.90E-01	9.91E-03	-1.47E+00
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	1.63E-02	6.48E-05	0.00E+00	6.27E-05	4.41E-04	1.47E-06	4.54E-03
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	2.62E+04	3.33E+02	0.00E+00	2.74E+02	6.21E+02	2.30E+01	-2.55E+03
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	7.63E+02	1.33E+00	0.00E+00	1.23E+00	5.01E+00	1.01E+00	5.25E+01

*\*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.*

*\*\*For all environmental impact indicators, the estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.*

### 3.2 Resource use and waste categories

**Table 5 Resource use and waste categories according to EN 15804**

RESULTS OF THE LCA - Resource use and waste categories per declared unit								
Core indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.21E+03	3.95E+00	0.00E+00	3.61E+00	2.92E+01	2.16E-01	1.40E+03
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	0.00E+00
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	2.21E+03	3.95E+00	0.00E+00	3.61E+00	2.92E+01	2.16E-01	1.40E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	1.77E+04	2.84E+01	0.00E+00	2.66E+01	1.38E+02	1.42E+00	-4.19E+03
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	0.00E+00
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	1.77E+04	2.84E+01	0.00E+00	2.66E+01	1.38E+02	1.42E+00	-4.19E+03
Use of secondary material (SM)	kg	0.00E+00	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	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	0.00E+00
Net use of fresh water (FW)	m <sup>3</sup>	2.39E+01	4.05E-02	0.00E+00	3.72E-02	1.53E-01	2.39E-02	3.28E+00
Hazardous waste disposed (HWD)	kg	1.73E-01	2.17E-03	0.00E+00	1.89E-03	3.80E-03	1.45E-04	-1.43E-01
Non-hazardous waste disposed (NHWD)	kg	2.15E+02	1.22E+01	0.00E+00	1.29E+01	2.79E+01	1.50E+02	-3.15E+00
Radioactive waste disposed (RWD)	kg	1.97E-02	6.00E-05	0.00E+00	5.50E-05	3.26E-04	3.58E-06	2.88E-02
Components for re-use (CRU)	kg	0.00E+00	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	0.00E+00	0.00E+00	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	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	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 functional unit or per declared unit)
Biogenic carbon content in product	0 kg C
Biogenic carbon content in accompanying packaging	0 kg C
NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub> .	



## 4 Supplementary information

### 4.1 Calculation rules

All inputs and outputs of the production by YUANTAI were considered in the calculation. Generic data was used for the considered raw materials from the supplier due to the fact that these materials are not produced by YUANTAI.

Data was collected from primary sources including the manufacturer, suppliers and their publications on standards locations, logistics, technology, market share, management system, and commitment to improved environmental performance.

Transport assumptions are made where it is not possible to obtain the specific data. When this occurs, it is clearly stated in the report and a sensitivity analysis is conducted;

The cut-off criteria adopted are as stated in “EN 15804:2012+A2:2019”. Where there are insufficient data or data gaps for a unit process, the cut-off criteria are 1% of the total mass of input of that process. The total of neglected input flows per module is a maximum of 5% of energy usage and mass. In this case, no cut-off was applied in any stream.

Needed machines, plants and further infrastructure for the production at YUANTAI are not considered in the calculation.

No allocations are applied in the product stage because there are no co-products.

In this LCA, the grid mix data on electricity of for the site in Tianjin is based on grid mixes of the State Grid North China Branch (NCGC). Electricity mix has been modelled from Ecoinvent database 3.10. 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.

Moreover, the electricity consumption of YUANTAI’s offices has not been considered in the LCA report.

### 4.2 Scenarios and additional technical information

**Table 6 Transportation of raw materials**

Raw materials	Source	Distance/km	Vehicle
Steel coil	Tianjin	50	Lorry
Solder flux	Tianjin	50	Lorry
Welding wire	Tianjin	50	Lorry

**Table 7 Transportation of products**

Market location	Ratio	Distance (km)	Vehicle
China	93.98%	100	Lorry
Overseas	6.02%	10000	Ship

## References

1. ISO 14040 (2006): Environmental Management - Life Cycle Assessment - Principles and Framework
2. ISO 14044 (2006): Environmental Management - Life Cycle Assessment - Requirements and Guidelines
3. EPDCN-PCR-202204: PCR for Construction Products and Construction Services to EN 15804 V2.1
4. China Statistical Yearbook, 2021. National Bureau of Statistics of China.
5. EN15804:2012+A2:2019/AC: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
6. World Steel Association



Programme operator EPD China  
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DECLARATION