

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 for:

Welded section steel

Hot-rolled section steel

From

[ABC BUILDING SYSTEMS (CHINA) ., LTD.]



Declared product



Programme operator:	EPD China
Registration number:	EPD-CN-00009
Issued date:	2024-07-25
Valid until:	2029-07-24



Programme Information

EPD Owner	ABC BUILDING SYSTEMS (CHINA) CO., LTD. No.2676 Bao'an Rd., Jiading District, Shanghai 201199, China. 021-62759000
Product Name	Welded section steel Hot-rolled section steel
Production Site	No.2676 Bao'an Rd., Jiading District, Shanghai 201199, China.
Identification of product	Manufacture of metal structures
Field of Application	Construction material
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	Shanghai Light Industry Engineering Consulting of China 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 2024-07-25 and valid to 2029-07-24
LCA Software (version)	EIME V6.2-6
LCI Dataset (version)	CODDE-2024-04
Year(s) of Primary Data	01/2023-12/2023
PCR	EPDCN-PCR-202204 PCR FOR CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES TO EN 15804 V2.0
Other Reference Document	15804:2012+A2:2019 Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products EIME Detailed handbook
Verification statement according EN15804	





Independent verification of the declaration and data according to EN ISO 14025:2010

internal external

Third-party institution verification: < Siyao CHEN > Bureau Veritas 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:

Yes No





General Information

Company information

ABC Building Systems (ABC) established in 1994 as a joint venture by American Buildings Company and China Renaissance Industries, is the pioneering manufacturer of Pre-Engineered Metal Building Systems ("PEMB") in China. In the ensuing years, ABC has developed a full range of capabilities, starting with the world-class know-how of American Buildings Company, to become a premier provider of fully integrated PEMB. Our scope covers architectural and site plans, overall structural designs, fabrication of steel members and components, on site erection and supervision. ABC has the five major Eastern, International, Southern, Western, North Division in Shanghai, Guangzhou, Shanxi, Tianjin. ABC also set up an Industry Division to provide specific industries with corresponding solutions.

ABC Manufacturing Center in Shanghai is equipped with 15 world-class automated production lines capable of producing full-set steel structure components, including main-frame, secondary structure, panel and full-set accessories. To supplement the main-frame manufacturing capacity of our Shanghai plant, ABC also has build a network of affiliated main-frame fabricators located in other provinces, including Zhejiang, Anhui, Guangdong and Hubei. ABC is now one of the largest metal building manufacturers in China, with a capacity of 100,000 metric tons of steel structure and 5,000,000 square meters of panel & cladding per annum.

Scope and type of EPD

Table 1 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	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-recovery-recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x



Detailed Product Description

Description of the product:

This report covers two type of products which produced by the same manufacture process, including:

- a. Welded section steel, including straight or tapered section, is composed of wide and thick flange and thin web welding, the cross section has excellent structural properties, and easy to combine and connect, so it is widely used in light structural systems and load-bearing structures of house and wall systems. The composition is described in below table.
- b. Hot rolled section steel: A type of steel produced by hot rolling process, with good strength and toughness. Hot-rolled section steel can be composed of different stress components according to the different needs of the structure and can also be used as a connection between the components. It is widely used in various building structures and engineering structures. The composition is described in below table.

The declared unit of is: **1 metric tonne (1000 kg) of Welded section steel OR Hot-rolled section steel.**



Figure 1 Welded section steel

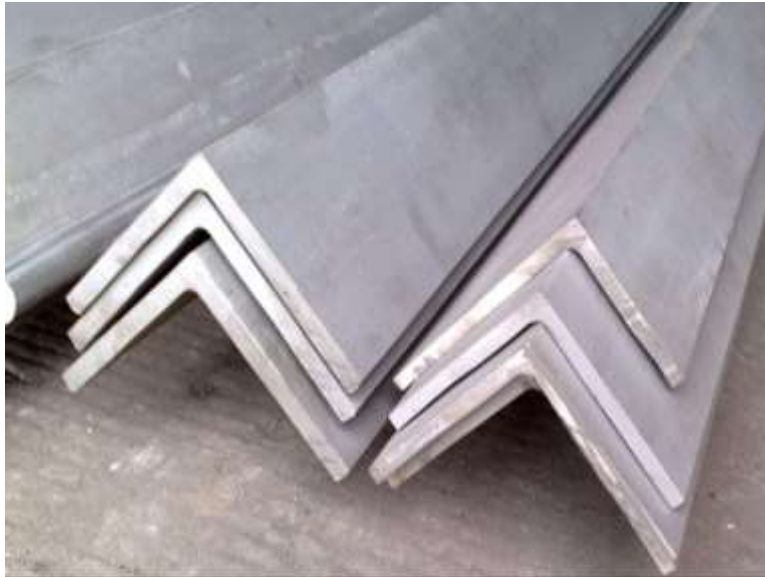


Figure 2 Hot-rolled section steel

Table 2 Description of the product

Product	Density	Type of steel	Steel processing	Recycled content	Contents
Welded section steel	7850kg/m ³	Q235/Q355	Hot rolling	17.5%	Fe >97% C ≤0.24% Si ≤0.55% Mn ≤1.6% P ≤0.035% S ≤0.035%
Hot-rolled section steel	7850kg/m ³	Q235/Q355	Hot rolling	17.5%	Fe >97% C 0.15~0.19% Si 0.08~0.2% Mn 0.3~0.45% P ≤0.04% S ≤0.04%

The products are welded and painted in the plant, consuming electricity and generating solid waste. Neither of the products have packaging material. The manufacture process is described in the below figure:

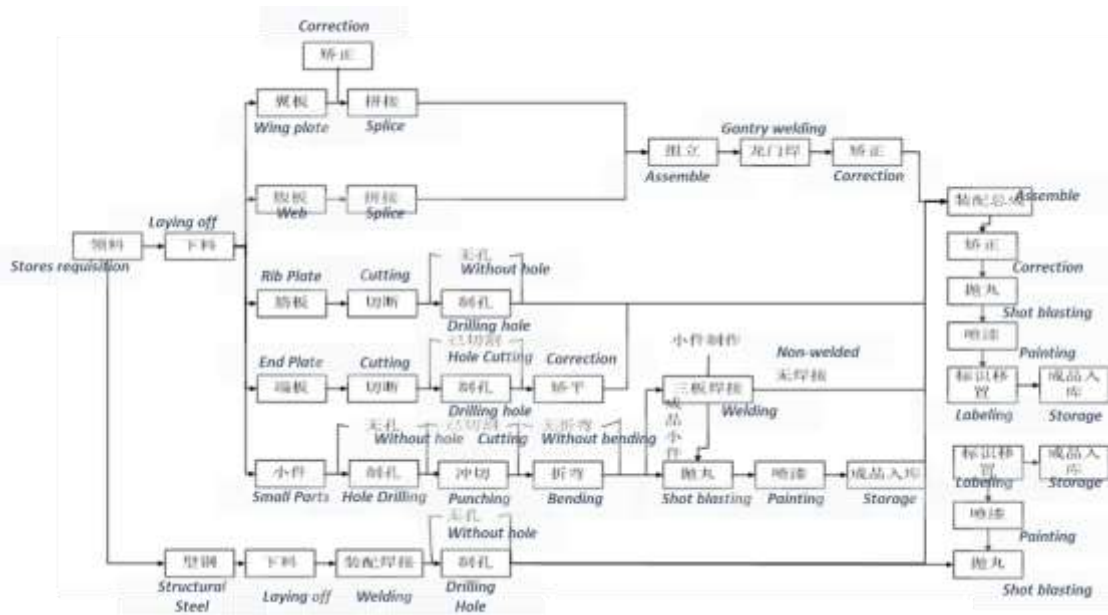


Figure 3 The production process in the factory scope

Table 3 Main product components of Welded section steel per unit.

Product components	Weight, kg	Weight-% (versus the product)
Steel plate	1072.08	97%
Anti-rusting paint	14.84	1%
Welding materials	20.84	2%
TOTAL	1107.76	100%

Table 4 Table 1 Main product components of Hot-rolled section steel per unit.

Product components	Weight, kg	Weight-% (versus the product)
Steel plate	1016.05	98%
Anti-rusting paint	14.84	1%
Welding materials	6.48	1%
TOTAL ¹	1037.37	100%

Dangerous substances

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

¹ The total mass does not include the liquid gas.



LCA results according to EN 15804

The LCA result of Welded section steel per declared unit is listed as the table. The result for 1kg product should be the listed results divided by 1000.

Table 5 LCA result of Welded section steel per declared unit.

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT or declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Climate change – total (GWP-total)	kg CO2 eq.	3.75E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-3.04E+03
Global warming potential - fossil fuels (GWP-fossil)	kg CO2 eq.	3.75E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-3.04E+03
Global warming potential - biogenic (GWP-biogenic)	kg CO2 eq.	8.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Global warming potential - land use and land use change (GWP-luluc)	kg CO2 eq.	6.40E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	8.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	1.66E+01	0.00E+00	0.00E+00	1.27E+01	0.00E+00	-1.36E+01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	2.51E-03	0.00E+00	0.00E+00	4.54E-04	0.00E+00	-3.32E-04
Eutrophication potential - marine (EP-marine)	kg N eq.	2.01E+00	0.00E+00	0.00E+00	1.51E+00	0.00E+00	-1.63E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	2.20E+01	0.00E+00	0.00E+00	1.65E+01	0.00E+00	-1.78E+01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	8.41E+00	0.00E+00	0.00E+00	6.24E+00	0.00E+00	-6.93E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	6.39E-04	0.00E+00	0.00E+00	1.06E-04	0.00E+00	-1.06E-04
Abiotic depletion potential - fossil resources (ADPF)	MJ, net calorific value	3.40E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.83E+04
Water (user) deprivation potential (WDP)	m3 world eq. deprived	9.03E+02	0.00E+00	0.00E+00	1.08E+03	0.00E+00	-7.47E+02

RESULTS OF THE LCA - Resource use and waste categories per declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	1.88E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	1.88E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	3.39E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.83E+04
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	1.34E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	3.40E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.83E+04
Use of secondary material (SM)	kg	1.88E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	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, net calorific value	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	2.10E+01	0.00E+00	0.00E+00	2.52E+01	0.00E+00	-1.74E+01
Hazardous waste disposed (HWD)	kg	1.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed (NHWD)	kg	3.86E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed (RWD)	kg	5.12E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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 (MFR)	kg	6.23E+01	0.00E+00	0.00E+00	1.00E+03	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 electrical energy (EEE) / Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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RESULTS OF THE LCA - ADDITIONAL ENVIRONMENTAL IMPACT per functional or declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	5.95E-05	0.00E+00	0.00E+00	4.33E-05	0.00E+00	-4.62E-05
Ionizing radiation, human health (IRP)	kBq U235 eq.	2.92E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Eco-toxicity - freshwater (ETP-fw)	CTUe	3.11E+03	0.00E+00	0.00E+00	1.21E+03	0.00E+00	-1.96E+03
Human toxicity, cancer effect (HTP-c)	CTUh	5.72E-06	0.00E+00	0.00E+00	2.68E-07	0.00E+00	-2.40E-07
Human toxicity, non-cancer effects (HTP-nc)	CTUh	2.79E-05	0.00E+00	0.00E+00	2.30E-05	0.00E+00	-2.31E-05
Land use related impacts/Soil quality (SQP)	dimensionless	8.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

The LCA result of Hot-rolled section steel is (The result for 1kg product should be the listed results divided by 1000):

Table 6 LCA result of Hot-rolled section steel per declared unit.

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT or declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Climate change – total (GWP-total)	kg CO2 eq.	4.38E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-3.95E+03
Global warming potential - fossil fuels (GWP-fossil)	kg CO2 eq.	4.38E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-3.95E+03
Global warming potential - biogenic (GWP-biogenic)	kg CO2 eq.	6.61E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Global warming potential - land use and land use change (GWP-luluc)	kg CO2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	1.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	9.82E+00	0.00E+00	0.00E+00	1.27E+01	0.00E+00	-8.62E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	5.64E-03	0.00E+00	0.00E+00	4.54E-04	0.00E+00	-1.53E-03
Eutrophication potential - marine (EP-marine)	kg N eq.	2.25E+00	0.00E+00	0.00E+00	1.51E+00	0.00E+00	-2.06E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	2.15E+01	0.00E+00	0.00E+00	1.65E+01	0.00E+00	-1.95E+01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	7.96E+00	0.00E+00	0.00E+00	6.24E+00	0.00E+00	-7.29E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	6.87E-04	0.00E+00	0.00E+00	1.06E-04	0.00E+00	-1.66E-04
Abiotic depletion potential - fossil resources (ADPF)	MJ, net calorific value	4.65E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-3.64E+04
Water (user) deprivation potential (WDP)	m3 world eq. deprived	9.10E+02	0.00E+00	0.00E+00	1.08E+03	0.00E+00	-8.30E+02

RESULTS OF THE LCA - Resource use and waste categories per declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	4.43E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	4.43E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	4.64E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-3.64E+04
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	1.23E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	4.65E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-3.64E+04
Use of secondary material (SM)	kg	1.78E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	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, net calorific value	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	2.12E+01	0.00E+00	0.00E+00	2.52E+01	0.00E+00	-1.93E+01
Hazardous waste disposed (HWD)	kg	1.08E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed (NHWD)	kg	4.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed (RWD)	kg	5.75E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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 (MFR)	kg	3.70E+01	0.00E+00	0.00E+00	1.00E+03	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 electrical energy (EEE) / Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

RESULTS OF THE LCA - ADDITIONAL ENVIRONMENTAL IMPACT per functional or declared unit							
Core indicator	Unit	Total A1-A3	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	4.56E-05	0.00E+00	0.00E+00	4.33E-05	0.00E+00	-3.93E-05
Ionizing radiation, human health (IRP)	kBq U235 eq.	7.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Eco-toxicity - freshwater (ETP-fw)	CTUe	4.10E+03	0.00E+00	0.00E+00	1.21E+03	0.00E+00	-3.44E+03
Human toxicity, cancer effect (HTP-c)	CTUh	1.30E-06	0.00E+00	0.00E+00	2.68E-07	0.00E+00	-1.06E-06
Human toxicity, non-cancer effects (HTP-nc)	CTUh	2.99E-05	0.00E+00	0.00E+00	2.30E-05	0.00E+00	-2.51E-05
Land use related impacts/Soil quality (SQP)	dimensionless	2.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 7 Biogenic carbon content

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 CO₂.





Supplementary information

Calculation rules

In this section, it is suggested to include but not limited to following information:

- Declared or functional unit: 1 metric tonne (1000 kg) of Welded section steel or Hot-rolled section steel.
- Time representativeness: The data represents the period between 1st January 2023 and 31st December 2023.
- Cut-off rules: On the input side all flows entering the system and comprising more than 1% in total mass or contributing more than 1% to primary energy consumption are considered.
- Data quality: The evaluation of the quality of the modules used in the database is available in the appendix of the report.
- Allocation: All sites relevant have provided site specific data for the different products for storing and processing for the period 01-01-2023 and 31-12-2023. The plant produces multiple products and the total quantities used on the sites have been allocated to the products by dividing the amount of the product in question with the total amount of all products produced at the site.

Scenarios and additional technical information

In this section, the A1-A3 is divided into 3 parts in the LCA model, including A1 raw material supply, A2 transport, and A3 manufacture. It is suggested to include but not limited to following information:

Firstly, the raw material supply part covers the raw material for welding, painting, and the packaging material for the raw materials. The recycled content is 17.5%.

Secondly, the upstream transport of each material is modelled in the A2 part; the transport type, mass and distance are modelled according to the primary data and the loading rate and empty return rate is respectively set as 64% and 0% according to the PEF recommendations.

Table 8 A2 transport

Product	Quantity (kg)	Type of transport	Departure	Destination	Distance (km)
Welded section steel	1072.08	35t lorry	Shanghai	Shanghai	35.00
	14.84	10t lorry	Hangzhou	Shanghai	160.00
	20.84	31t lorry	Suzhou	Shanghai	70.00
	8.71	14t lorry	Shanghai	Shanghai	82.00
	15.38	22t lorry	Shanghai	Shanghai	82.00
	2.02	5t lorry	Suzhou	Shanghai	30.00
	1.99	5t lorry	Suzhou	Shanghai	5.00
Hot-rolled section steel	1016.05	35t lorry	Shanghai	Shanghai	35.00
	14.84	10t lorry	Hangzhou	Shanghai	160.00
	6.48	31t lorry	Suzhou	Shanghai	70.00
	9.85	14t lorry	Shanghai	Shanghai	82.00
	17.38	22t lorry	Shanghai	Shanghai	82.00
	2.29	5t lorry	Suzhou	Shanghai	30.00
	2.25	5t lorry	Suzhou	Shanghai	5.00



Thirdly, the A3 manufacture process includes the resources input in production, the end-of-life of the raw material packaging, and the manufacture wastes. First, the production process consumes electricity and diesel according to the primary data. The GWP impacts for producing 1 MJ of low voltage electricity is:

Table 9 GWP impacts for producing 1 MJ of low voltage electricity

GWP impacts	kg CO2 eq./ 1MJ	kg CO2 eq./ 1kWh
GWP	2.29E-01	8.24E-01
GWP-b	4.87E-05	1.75E-04
GWP-f	2.29E-01	8.24E-01
GWP-lu	0.00E+00	0.00E+00

In addition, the EOL transport of the raw material packaging is assumed as 9t lorry (the average load capacity of Chinese refuse truck), and the mass and distance are from the primary data. Meanwhile, the EOL treatment of the plastic packaging material is modelled according to the EOL scenarios in the EN 15804+A2, and hazardous and non-hazardous are respectively modelled.

Table 10 EOL transport of manufacture waste

Product	Quantity (kg)	Type of transport	Departure	Destination	Distance (km)	EOL
Welded section steel	7.27E-01	9t lorry	Shanghai	Shanghai	40	100% Recycling
	3.66E-01	9t lorry	Shanghai	Shanghai	50	79% Incineration, 21% Recycling
	3.97E-04	9t lorry	Shanghai	Shanghai	40	100% Incineration
	5.25E+01	9t lorry	Shanghai	Shanghai	20	100% Recycling
	1.86E+01	9t lorry	Shanghai	Shanghai	40	100% Incineration
Profiled steel plate	7.27E-01	9t lorry	Shanghai	Shanghai	40	100% Recycling
	1.14E-01	9t lorry	Shanghai	Shanghai	50	79% Incineration, 21% Recycling
	4.49E-04	9t lorry	Shanghai	Shanghai	40	100% Incineration
	3.69E+01	9t lorry	Shanghai	Shanghai	20	100% Recycling
	5.78E+00	9t lorry	Shanghai	Shanghai	40	100% Incineration

The LCA study also covers the C1-C4 end of life stage of the product and D benefits and loads beyond the system boundary. Because the product is part of the structural support system of a construction project, the C1 deconstruction cannot be distinguished from the building. The EOL transport can significantly vary according to the installation location, which cannot be predicted. Therefore, the C2 EOL transport is not covered by the study.

According to EN 15804 the steel structural elements is proposed to be 100% recycling and material recovery. Meanwhile, the CISA-EPD-BGGF-20230051 suggest that the steel material can be 100% recycled. Therefore, the 1t





product is modelled as 100% recycled.

Module D refers to the possible benefits and loads from the EOL of structural steel. Firstly, because the raw material includes 17.5% recycled content, it is modelled as the load beyond the system boundary. In addition, the product is suggested to be 100% recycled at the end of life, and it is considered as the benefit modelled in the module D.

Assumptions of the LCA model is listed as the table below:

Table 11 Assumptions of the LCA model

Phase	Parameter	Data used or hypothesis	Source
A1	Recycled content of steel	17.50%	CISA-EPD-BGGF-20230051
A2	Loading rate	64%	(EU) 2021/2279
	Empty return rate	0%	(EU) 2021/2279
A3	EOL of raw material	Plaster 79% incineration, 21%	EN 15804+A2
	packaging	Recycling and material recovery	
	EOL transport of raw material packaging	9t truck	Average weight of waste transport truck in China (myautomachine.com)
C3- C4	End-of-life processing	Steel structural elements 100% Recycling and material recovery	EN 15804+A2





References

The main references supporting this study are:

- ISO 14040: Environmental management -- Life cycle assessment -- Principles and framework (2006)
- ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines (2006)
- ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures (2006)
- EPD CHINA GENERAL PROGRAMME INSTRUCTIONS Version3.1
- EPDCN-PCR-202204 PCR FOR CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES TO EN 15804.
- EPD International PCR - Construction products (2019:14, Version 1.3.1)
- NF EN 15804+A2: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction.
- Detailed handbook of EIME version 6
- Recommendations commission recommendation (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations. Official Journal of the European Union, 30.12.2021.
- National Hazardous Waste List, 2021, Regulations of the Ministry of Ecology and Environment of China.
- CISA-EPD-BGGF-20230051

Revision history

Any revision has been made after the EPD registration shall be clearly updated in this section.

Revised on 11.10.2024:

Modified content: (on p.2) “The EPD is published on 2024-07-25 and valid to 2029-07-24”



Annex

Table 12 Analysis of data quality - Welded section steel

Name	Ecobian	Completeness	Methodological appropriateness	Time representativeness	Technological representativeness	Geographical representativeness	Parameter uncertainty	Data Quality Rating (DQR)	Year of dataset update
Diesel oil combustion; in engine, RER	CODDE-0082	4	5	5	5	5	5	4.8	2024
Small lorry transport; for freight transport; 3,5-7,5t; RER; *Prefer the use of ELCD module*	CODDE-0323	3	5	3	5	5	5	4.3	2024
Articulated lorry transport; for freight transport; sup. 32t; RER; *Prefer the use of ELCD module*	CODDE-0324	3	5	3	5	5	5	4.3	2024
Unspecified organic substances; RER	CODDE-0348	3	5	5	5	5	5	4.7	2024
Argon; liquid; China, CN	CODDE-0442	1	1	4	1	4	5	2.7	2024
Oxygen, liquid; China, CN	CODDE-0457	1	1	4	1	3	5	2.5	2024
Anti-corrosion epoxy primary paint; RER	CODDE-2138	2	5	5	5	5	5	4.5	2024
Carbon dioxide; liquid; Europe; RER	CODDE-2204	2	1	5	5	4	5	3.7	2024
Recycling of Polypropylene (PP) granulate; [0:100] production mix, at plant; Europe, RER	CODDE-2340	2	1	2	1	1	2	1.5	2024
Steel; [0:100] secondary production; at plant	CODDE-2372	1	1	1	1	1	1	1.0	2024
Recycling of steel; [0:100] production mix, at plant; Europe, RER	CODDE-2400	3	4	5	4	5	5	4.3	2024
Polypropylene, PP, granulate; primary production; RER	CODDE-2480	3	5	5	5	5	5	4.7	2024
Stainless steel; primary production; 15% Cr; Europe, RER	CODDE-2484	3	5	5	5	5	5	4.7	2024
Steel plate; primary production; thickness 2 to 20 mm, maximum width 1860 mm; GLO	CODDE-2508	1	1	3	1	1	4	1.8	2024
Electricity Mix; Low voltage; 2018; China, CN	CODDE-2572	1	1	2	3	1	2	1.7	2024



[configurable] Thermoforming of PP; technology mix, at plant	CODDE-2606	1	1	2	1	5	2	2.0	2024
[configurable] Painting of steel parts; not including paint production; technology mix, at plant	CODDE-2607	1	1	2	1	5	2	2.0	2024
Articulated lorry transport; for freight transport; 16-32t; RER; *Prefer ELCD-0122 module*	ECO-149-	3	5	3	5	5	5	4.3	2024

Table 13 Analysis of data quality - Hot-rolled section steel

Name	Ecobilan	Completeness	Methodological appropriateness and Time representativeness	Technological representativeness	Geographical representativeness	Parameter uncertainty	Data Quality Rating (DQR)	Year of dataset update
Diesel oil combustion; in engine, RER	CODDE-0082	4	5	5	5	5	4.8	2024
Small lorry transport; for freight transport; 3,5-7,5t; RER; *Prefer the use of ELCD module*	CODDE-0323	3	5	3	5	5	4.3	2024
Articulated lorry transport; for freight transport; sup. 32t; RER; *Prefer the use of ELCD module*	CODDE-0324	3	5	3	5	5	4.3	2024
Unspecified organic substances; RER	CODDE-0348	3	5	5	5	5	4.7	2024
Argon; liquid; China, CN	CODDE-0442	1	1	4	1	4	2.7	2024
Oxygen, liquid; China, CN	CODDE-0457	1	1	4	1	3	2.5	2024
Anti-corrosion epoxy primary paint; RER	CODDE-2138	2	5	5	5	5	4.5	2024
Carbon dioxide; liquid; Europe; RER	CODDE-2204	2	1	5	5	4	3.7	2024
Recycling of Polypropylene (PP) granulate; [0:100] production mix, at plant; Europe, RER	CODDE-2340	2	1	2	1	1	1.5	2024
Steel; [0:100] secondary production; at plant	CODDE-2372	1	1	1	1	1	1.0	2024
Recycling of steel; [0:100] production mix, at plant; Europe, RER	CODDE-2400	3	4	5	4	5	4.3	2024
Polypropylene, PP, granulate; primary production; RER	CODDE-	3	5	5	5	5	4.7	2024





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	2480								
Stainless steel; primary production; 15% Cr; Europe, RER	CODDE-2484	3	5	5	5	5	5	4.7	2024
Steel hot rolled section; primary production; GLO	CODDE-2501	3	5	5	5	5	5	4.7	2024
Electricity Mix; Low voltage; 2018; China, CN	CODDE-2572	1	1	2	3	1	2	1.7	2024
[configurable] Thermoforming of PP; technology mix, at plant	CODDE-2606	1	1	2	1	5	2	2.0	2024
[configurable] Painting of steel parts; not including paint production; technology mix, at plant	CODDE-2607	1	1	2	1	5	2	2.0	2024
Articulated lorry transport; for freight transport; 16-32t; RER; *Prefer ELCD-0122 module*	ECO-149-	3	5	3	5	5	5	4.3	2024





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