

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 for:

Cold-formed light-gauge steel members

Profiled steel plate

From

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



Declared product



Programme operator:	EPD China
Registration number:	EPD-CN-00010
Issued date:	2024-08-20
Valid until:	2029-08-19



Programme Information

EPD Owner	ABC BUILDING SYSTEMS (CHINA) CO., LTD. No.2676 Bao'an Rd., Jiading District, Shanghai 201199, China. 021-62759000
Product Name	Cold-formed light-gauge steel members Profiled steel plate
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 2024-08-20 and valid to 2029-08-19
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





Programme operator EPD China
Registration number EPD-CN-00010

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: : < 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: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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 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-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. Cold-formed light-gauge steel members:

Cold-formed light-gauge steel members include pre-drilled C-section and Z-section steel, commonly made of low-carbon alloy with yield strength of 345MPA, and zinc coating of 275g/m². It features high yield strength and great anti-corrosion performance and is commonly used for roof purlin and walling support.

b. Profiled steel plate:

The coated or plated plate is rolled and cold bent to form a wave-shaped cross-section along the width of the moulded steel plate is called profiled steel panel. It can be widely used in the roof, wall and floor of steel structure buildings.

The declared unit is: 1 metric tonne (1000 kg) of product



Figure 1 Cold-formed light-gauge steel members



Figure 2 Profiled steel plate

Table 2 Description of the product

Product	Density	Type of steel ¹	Steel processing	Recycled content	Contents
Cold-formed light-gauge steel members	7850kg/m ³	Q345	Cold rolling	17.50%	Fe ≥85% C ≤0.18% Si ≤0.5% Mn ≤0.6% P ≤0.045% S ≤0.045% Zn ≤20% Al ≤5%
Profiled steel plate	7850kg/m ³	Q235/Q355/Q550	Cold rolling	17.50%	Fe >80% C ≤0.60% Mn ≤0.60% Zn ≤0.15%~9,10% Al ≤0.15%~3.04% P ≤0.15% S ≤0.035% Mg ≤0.01%~0.20%

The product is formed in the plant, consuming electricity and generating solid waste. Neither of the products have packaging material. The manufacture process is described as the figure:

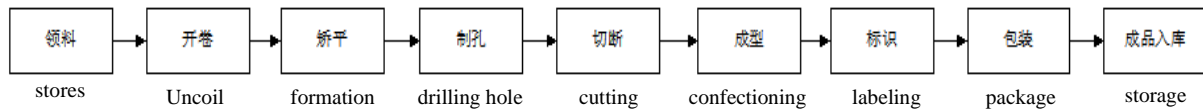


Figure 3 The production process in selected stages of Cold-formed light-gauge steel members

¹ Test stands: GB/T 2975-1998

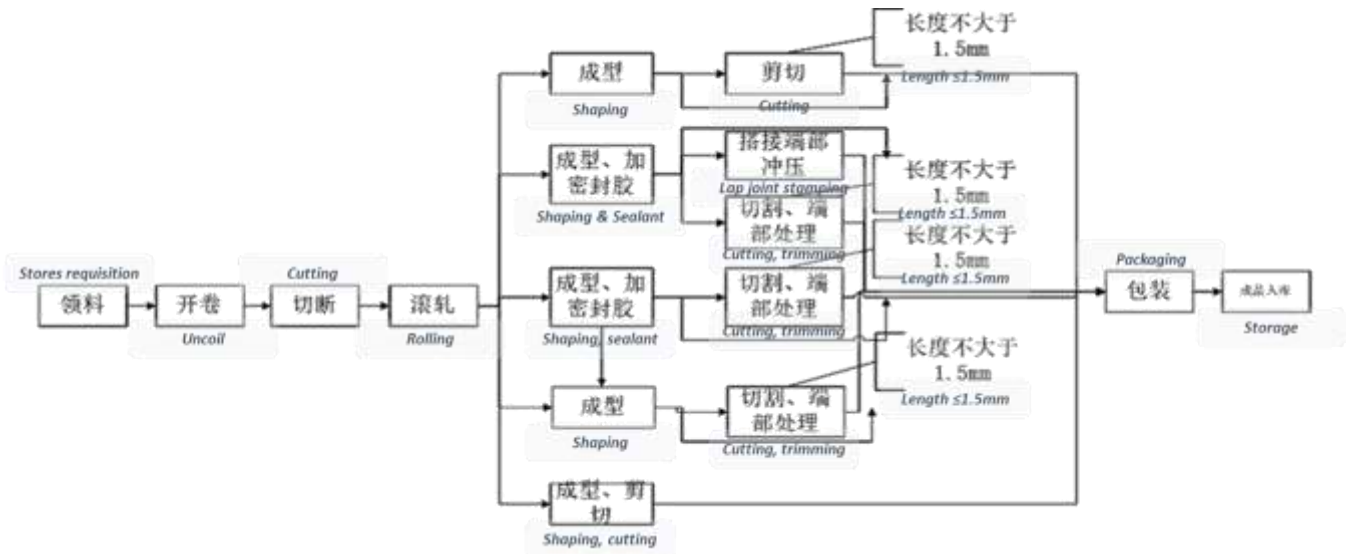


Figure 4 The production process in selected stages of Profiled steel plate

Table 3 Main product components of Cold-formed light-gauge steel members per unit.

Product components	Weight, kg	Weight-% (versus the product)
Galvanized steel coil	1007.20	100%
TOTAL	1007.20	100%

Table 4 Main product components of Profiled steel plate per unit.

Product components	Weight, kg	Weight-% (versus the product)
Galvanized steel coil	998.3784	99.99997%
Sealant	0.0003	0.00003%
TOTAL	998.38	100.00000%

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.



LCA results according to EN 15804

The LCA result of Cold-formed light-gauge 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 Cold-formed light-gauge steel members 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 CO ₂ eq.	2.11E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-2.98E+03
Global warming potential - fossil fuels (GWP-fossil)	kg CO ₂ eq.	2.11E+03	0.00E+00	0.00E+00	2.62E+03	0.00E+00	-2.98E+03
Global warming potential - biogenic (GWP-biogenic)	kg CO ₂ eq.	1.84E-03	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-lluc)	kg CO ₂ eq.	9.09E+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.	2.66E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidification potential, accumulated exceedance (AP)	mol H ⁺ eq.	9.69E+00	0.00E+00	0.00E+00	1.27E+01	0.00E+00	-1.32E+01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	1.02E-03	0.00E+00	0.00E+00	4.54E-04	0.00E+00	-7.86E-04
Eutrophication potential - marine (EP-marine)	kg N eq.	1.10E+00	0.00E+00	0.00E+00	1.51E+00	0.00E+00	-1.45E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.20E+01	0.00E+00	0.00E+00	1.65E+01	0.00E+00	-1.58E+01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	4.41E+00	0.00E+00	0.00E+00	6.24E+00	0.00E+00	-6.02E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	4.73E-02	0.00E+00	0.00E+00	1.06E-04	0.00E+00	-9.05E-05
Abiotic depletion potential - fossil resources (ADPF)	MJ, net calorific value	2.32E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.28E+05
Water (user) deprivation potential (WDP)	m ³ world eq. deprived	1.66E+03	0.00E+00	0.00E+00	1.08E+03	0.00E+00	-1.35E+03

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	6.17E+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	6.17E+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	2.32E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.28E+05
Use of non renewable primary energy resources used as raw materials (PENRM)	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 non renewable primary energy resource (PENRT)	MJ, net calorific value	2.32E+04	0.00E+00	0.00E+00	2.09E+05	0.00E+00	-1.28E+05
Use of secondary material (SM)	kg	1.76E+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)	m ³	3.86E+01	0.00E+00	0.00E+00	2.52E+01	0.00E+00	-3.15E+01
Hazardous waste disposed (HWD)	kg	1.54E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed (NHWD)	kg	4.53E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed (RWD)	kg	3.20E-01	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	2.91E+00	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	8.12E-05	0.00E+00	0.00E+00	4.33E-05	0.00E+00	-4.53E-05
Ionizing radiation, human health (IRP)	kBq U235 eq.	3.11E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Eco-toxicity - freshwater (ETP-fw)	CTUc	5.66E+03	0.00E+00	0.00E+00	1.21E+03	0.00E+00	-8.03E+03
Human toxicity, cancer effect (HTP-c)	CTUh	1.61E-07	0.00E+00	0.00E+00	2.68E-07	0.00E+00	-2.05E-07
Human toxicity, non-cancer effects (HTP-nc)	CTUh	1.49E-05	0.00E+00	0.00E+00	2.30E-05	0.00E+00	-2.07E-05
Land use related impacts/Soil quality (SQP)	dimensionless	3.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 6 LCA result of Profiled steel plate 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.	2.33E+03	0.00E+00	0.00E+00	2.62E+03	1.88E-04	-2.98E+03
Global warming potential - fossil fuels (GWP-fossil)	kg CO2 eq.	2.33E+03	0.00E+00	0.00E+00	2.62E+03	1.86E-04	-2.98E+03
Global warming potential - biogenic (GWP-biogenic)	kg CO2 eq.	2.24E-03	0.00E+00	0.00E+00	0.00E+00	2.16E-06	0.00E+00
Global warming potential - land use and land use change (GWP-luluc)	kg CO2 eq.	9.09E+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.	4.27E-05	0.00E+00	0.00E+00	0.00E+00	4.60E-11	0.00E+00
Acidification potential, accumulated exceedance (AP)	mol H+ eq.	1.11E+01	0.00E+00	0.00E+00	1.27E+01	1.07E-06	-1.32E+01
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	1.01E-03	0.00E+00	0.00E+00	4.54E-04	6.22E-10	-7.86E-04
Eutrophication potential - marine (EP-marine)	kg N eq.	1.31E+00	0.00E+00	0.00E+00	1.51E+00	2.12E-07	-1.45E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	1.42E+01	0.00E+00	0.00E+00	1.65E+01	2.76E-06	-1.58E+01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	5.20E+00	0.00E+00	0.00E+00	6.24E+00	6.89E-07	-6.02E+00
Abiotic depletion potential - non-fossil resources (ADPE)	kg Sb eq.	4.69E-02	0.00E+00	0.00E+00	1.06E-04	1.10E-11	-9.05E-05
Abiotic depletion potential - fossil resources (ADPF)	MJ, net calorific value	2.50E+04	0.00E+00	0.00E+00	2.09E+05	3.43E-03	-1.28E+05
Water (user) deprivation potential (WDP)	m3 world eq. deprived	1.67E+03	0.00E+00	0.00E+00	1.08E+03	6.14E-05	-1.35E+03

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	6.17E+02	0.00E+00	0.00E+00	0.00E+00	2.53E-04	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	6.17E+02	0.00E+00	0.00E+00	0.00E+00	2.53E-04	0.00E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	2.50E+04	0.00E+00	0.00E+00	2.09E+05	3.43E-03	-1.28E+05
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	6.05E-03	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	2.50E+04	0.00E+00	0.00E+00	2.09E+05	3.43E-03	-1.28E+05
Use of secondary material (SM)	kg	1.75E+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	3.88E+01	0.00E+00	0.00E+00	2.52E+01	1.50E-06	-3.15E+01
Hazardous waste disposed (HWD)	kg	1.57E+02	0.00E+00	0.00E+00	0.00E+00	1.25E-04	0.00E+00
Non-hazardous waste disposed (NHWD)	kg	4.51E+03	0.00E+00	0.00E+00	0.00E+00	3.05E-05	0.00E+00
Radioactive waste disposed (RWD)	kg	3.22E-01	0.00E+00	0.00E+00	0.00E+00	1.47E-08	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	4.70E+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	8.83E-05	0.00E+00	0.00E+00	4.33E-05	6.58E-12	-4.53E-05
Ionizing radiation, human health (IRP)	kBq U235 eq.	3.60E+01	0.00E+00	0.00E+00	0.00E+00	9.08E-05	0.00E+00
Eco-toxicity - freshwater (ETP-fw)	CTUe	6.04E+03	0.00E+00	0.00E+00	1.21E+03	3.75E-03	-8.04E+03
Human toxicity, cancer effect (HTP-c)	CTUh	5.07E-07	0.00E+00	0.00E+00	2.68E-07	4.06E-14	-2.05E-07
Human toxicity, non-cancer effects (HTP-nc)	CTUh	4.97E-05	0.00E+00	0.00E+00	2.30E-05	2.07E-12	-2.07E-05
Land use related impacts/Soil quality (SQP)	dimensionless	3.26E-02	0.00E+00	0.00E+00	0.00E+00	1.79E-05	0.00E+00

Table 8 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.	

N.B.: Although construction sector allocates limited significance to the indicator: Global warming potential - land use and land use change (GWP-luluc), the risk of underestimation of the impact to this indicator is mitigated in this study by benchmarking another steel product EPD recently published by EPD China: Steel fiber (EPD-CN□00003), which is cited in reference section. Such risk is caused by the fact that all datasets in CODDE-2024-04 (updated April 2024) is not inventoried correctly with flows contributing to GWP-luluc indicator, in fact, an update of CODDE database is ongoing according to latest communication.

The mitigation is done in such a way that for both products, the value of “Total A1-A3” for GWP-luluc is replaced by that from Steel fiber (EPD-CN-00003), a conversion rate of 1000 is applied (1000kg = 1t) and the manually updated value if marked in red in above tables



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 product.
- 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 97 A2 transport

Product	Quantity (kg)	Type of transport	Departure	Destination	Distance (km)
Cold-formed light-gauge steel members	1007.1965	33t lorry	Shanghai	Shanghai	80
Profiled steel plate	998.3784	32t lorry	Suzhou	Shanghai	60
	0.0003	31t lorry	Suzhou	Shanghai	70

Thirdly, the A3 manufacture process includes the resources input in production, EOL of 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 10 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 waste are 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 metal packaging material is suggested as 100% recycled according to the field data.

Table 11 EOL transport of manufacture waste

Product	Quantity (kg)	Type of transport	Departure	Destination	Distance (km)	EOL
Cold-formed light-gauge steel members	2.91E+00	9t lorry	Shanghai	Shanghai	20	100% Recycling
Profiled steel plate	1.31E+00	9t lorry	Shanghai	Shanghai	20	100% Recycling
	4.57E+01	9t lorry	Shanghai	Shanghai	20	100% Recycling
	1.49E-05	9t lorry	Shanghai	Shanghai	50	79% Incineration, 21% Recycling

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 12 Assumptions of the LCA model

Environmental aspects	Parameter	Method of data production	Type of data
Material production	Mass and material	Manufacturer data + CODDE dataset	Primary data + secondary data
Processes	Nature and quantity	Manufacturer data	Primary data
Upstream transport	Distances and transport means	Manufacturer data	Primary data
End of life	end-of-life processing	default data	secondary data



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)
- 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.
- EPDCN-PCR-202204 PCR FOR CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES TO EN 15804.
- EPD CHINA GENERAL PROGRAMME INSTRUCTIONS Version3
- National Hazardous Waste List, 2021, Regulations of the Ministry of Ecology and Environment of China.
- CISA-EPD-BGGF-20230051
- Yutian Zhitai Steel Fiber Manufacturing Co. Ltd. (2024). Steel fiber. In EPD China (EPD-CN-00003). Retrieved August 15, 2024, from <http://www.epdchina.cn/files/EPD-CN-00003%E6%8A%A5%E5%91%8A.pdf>

Revision history

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



Annex

Table 8 Analysis of data quality - Cold-formed light-gauge steel members

Name	Ecobilan	Completeness	Methodologica	Time	Technological	Geographical	Parameter	Data Quality	Year of dataset
Articulated lorry transport; for freight transport; sup. 32t; Europe, RER	CODDE-0324	3	5	3	5	5	5	4.3	20 24
Steel; [0:100] secondary production; at plant	CODDE-2372	1	1	1	1	1	1	1.0	20 24
Recycling of steel; [0:100] production mix, at plant; Europe, RER	CODDE-2400	3	4	5	4	5	5	4.3	20 24
Steel finished cold rolled coil; primary production; thickness 0,3 to 3 mm, width 600 to 2100 mm; GLO	CODDE-2492	3	5	5	5	5	5	4.7	20 24
Steel hot dip galvanized; primary production; production mix, at plant; GLO	CODDE-2494	5	5	5	5	5	5	5.0	20 24
Electricity Mix; Low voltage; 2020; China, CN	CODDE-2572	1	1	2	3	1	2	1.7	20 24

Table 9 Analysis of data quality - Profiled steel plate

Name	Ecobian	Completeness	Methodologica	Time	Technological	Geographical	Parameter	Data Quality	Year of dataset
Articulated lorry transport; for freight transport; sup. 32t; Europe, RER	CODDE-0324	3	5	3	5	5	5	4.3	20 24
Recycling of Polypropylene (PP) granulate; [0:100] production mix, at plant; Europe, RER	CODDE-2340	1	1	2	1	1	3	1.5	20 24
Steel; [0:100] secondary production; at plant	CODDE-2372	1	1	1	1	1	1	1.0	20 24
Recycling of cast iron; [0:100] production mix, at plant; Europe, RER	CODDE-2381	3	5	5	5	5	5	4.7	20 24
Recycling of steel; [0:100] production mix, at plant; Europe, RER	CODDE-2400	3	4	5	4	5	5	4.3	20 24
Cast iron; primary production; RER	CODDE-2444	3	5	5	5	5	5	4.7	20 24
Polypropylene, PP, granulate; primary production; RER	CODDE-2480	3	5	5	5	5	5	4.7	20 24
Steel finished cold rolled coil; primary production; thickness 0,3 to 3 mm, width 600 to 2100 mm; GLO	CODDE-2492	3	5	5	5	5	5	4.7	20 24
Steel hot dip galvanized; primary production; production mix, at plant; GLO	CODDE-2494	5	5	5	5	5	5	5.0	20 24
Electricity Mix; Low voltage; 2020; China, CN	CODDE-2572	1	1	2	3	1	2	1.7	20 24
Waste incineration of plastics (PE, PP, PS) in a municipal solid waste plant (MSW); Europe, RER	CODDE-2797	1	1	2	1	1	3	1.5	20 24
Waste incineration of all solid in a municipal solid waste plant (MSW); Europe, RER	CODDE-2802	1	1	2	1	1	3	1.5	20 24
Medium truck (3,5t-12t); technology mix; diesel, EURO 6; RER	CODDE-2847	2	1	1	1	1	2	1.3	20 24
Silicone rubber; US	ECO-027-	3	5	5	5	5	5	4.7	20 24



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