

# CERTIFICATE

## EPD REGISTRATION

This document confirms that

**YIEH PHUI (CHINA)  
TECHNOMATERIAL CO., LTD.**

has registered an Environmental Product Declaration (EPD) for

**HOT DIP 55% AL-ZN COATED STEEL  
IN COIL (GL)**

under **EPD-IES-0022764**  
in the International EPD System

The EPD has been developed in accordance with ISO 14025, the General Programme Instructions, and the Product Category Rules 2019:14 of the International EPD System.

The verification was carried out by Thomas P. Gloria.

This document remains valid until 2030/5/27, unless the EPD is deregistered from the International EPD System prior to that date.



---

Sebastiaan Stiller  
CEO of the International EPD System  
Stockholm, Sweden  
2025-05-28

# Environmental Product Declaration



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

## Hot Dip 55% Al-Zn Coated Steel In Coil (GL)

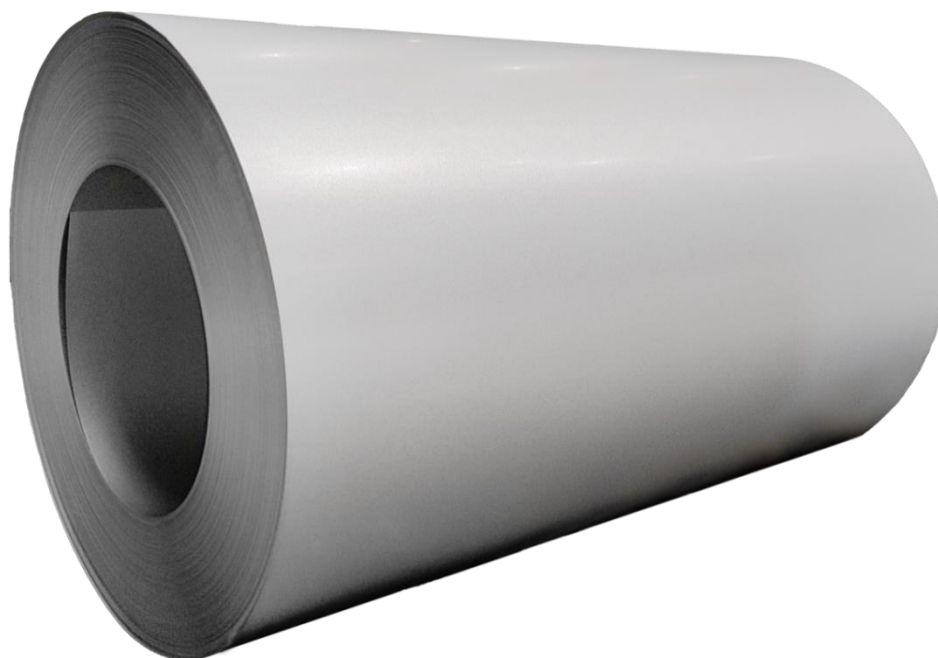
from

**Yieh Phui (China) Technomaterial Co., Ltd.**



|                          |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| 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-0022764:001                                                                       |
| Publication date:        | 2025-05-28                                                                                |
| Valid until:             | 2030-05-27                                                                                |

*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)*



## 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 |
| <b>Website:</b>   | <a href="http://www.environdec.com">www.environdec.com</a>          |
| <b>E-mail:</b>    | <a href="mailto:info@environdec.com">info@environdec.com</a>        |

|                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accountabilities for PCR, LCA and independent, third-party verification</b>                                                                                                                                                                                                                                                                                                                       |
| <b>Product Category Rules (PCR)</b>                                                                                                                                                                                                                                                                                                                                                                  |
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR)                                                                                                                                                                                                                                                                                                                                |
| Product Category Rules (PCR): <i>PCR 2019:14 Construction products (EN 15804: A2) Version 1.3.4, UN CPC code: 41231</i>                                                                                                                                                                                                                                                                              |
| PCR review was conducted by: <i>The Technical Committee of the International EPD<sup>®</sup>System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a></i> |
| <b>Life Cycle Assessment (LCA)</b>                                                                                                                                                                                                                                                                                                                                                                   |
| LCA accountability: <i>AnKang, CECEP Eco Product Development Research Center</i>                                                                                                                                                                                                                                                                                                                     |
| <b>Third-party verification</b>                                                                                                                                                                                                                                                                                                                                                                      |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br><br><input checked="" type="checkbox"/> EPD verification by individual verifier<br><br>Third-party verifier: <i>&lt;Thomas Gloria, Industrial Ecology Consultants &gt;</i><br><br>Approved by: The International EPD <sup>®</sup> System                                                      |

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:

Yieh Phui (China) Technomaterial Co., Ltd.

### Contact information:

Qiu Yijia;

E-Mail: 16903@yiehphuichina.com

### Description of the organisation:

Founded in January 2002, Yieh Phui (China) is committed to the professional manufacture of full-process coated steel products, which are exported to all over the world as well as to all provinces, cities and autonomous regions in China, and has become a model in the industry by virtue of its high-value-added, diversified and high-end products and the best services. Our products include pickled and oiled coils, cold rolled coils, various coated coils, color coated coils, color coated printed coils and other related products, which are widely used in a variety of fields, such as roofing and walling of new buildings, high-end decorative materials, animal husbandry, photovoltaic mounting materials, 3C products, and automotive and home appliance materials.

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

- Management system-related:  
ISO 9001, IECQ QC 080000, IATF 16949, ISO 14001, ISO 45001, ISO 50001.
- Product system-related:  
JIS Mark (Korean Standards Association; JIS G 3302, JIS G 3321, JIS G 3312, JIS G 3322, JIS G 3323);  
MS (SIRIM QAS International Sdn; MS 1196, MS 2657, MS 2651, etc.);  
BC 1: 2012 (Det Norske Veritas; JIS, EN, ASTM, AS).

### Name and location of production site:

Yieh Phui (China) Technomaterial Co., Ltd.

1, Yieh Phui Road, Riverside Industrial Park, Changshu Economic Development Zone,  
Suzhou, Jiangsu, People's Republic of China ZIP:215536

### More information:

<http://www.yiehphuichina.com>

## Product information

### Product name:

Hot Dip 55% Al-Zn Coated Steel In Coil (GL)

**Product identification:**

PhuizerLume® are the registered name of Hot Dip 55% Al-Zn Coated Steel In Coil (GL)

**Product description:**

- Hot Dip 55% Al-Zn Coated Steel In Coil (GL) are produced by coating the surface of cold-rolled steel coils with 55% Al-Zn coating. This process utilizes the principle of the potential difference between 55% Al-Zn and iron to provide corrosion resistance to the steel product. The 55% Al-Zn coating acts as sacrificial protection, corroding first to shield the underlying steel or iron. According to the potential difference principle, when two different metals come into contact, the metal with lower potential will corrode faster, while the one with higher potential will be protected.
- Due to the 55% Al-Zn coating with sacrificial anode protection mechanism, the product's lifespan is extended, offering excellent characteristics such as weather or corrosion resistance, adhesion, and formability. Additionally, it presents advantages like lower maintenance costs and reduced environmental pollution.
- Our products comply with the following standards: JIS G 3321 \ AS 1397 \ EN 10346 \ ASTM A792(M) \ GB/T 2518.
- The general service life time of Yieh Phui (China) Hot Dip 55% Al-Zn Coated Steel In Coil (GL) is about 10 years or above depend on coating mass

**UN CPC code:**

41231

**Geographical scope:**

The product is produced at the Jiangsu province, China. Product use was excluded from the scope of environmental impact calculations in this study. For the end-of-life stage, the environmental impact was calculated based on product disposal statistics from the World Steel Association, 2020.

**LCA information****Functional unit / declared unit:**

1 metric ton (1,000 kg)

**Reference service life:**

Not applicable

**Time representativeness:**

The production foreground data are from 2023.11~2024.10, and the database background data are from 2024.

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

Database used is mainly Ecoinvent 3.11. The LCA software used is openLCA 2.3.1

The reference package used for impact indicator is based on EF 3.1.

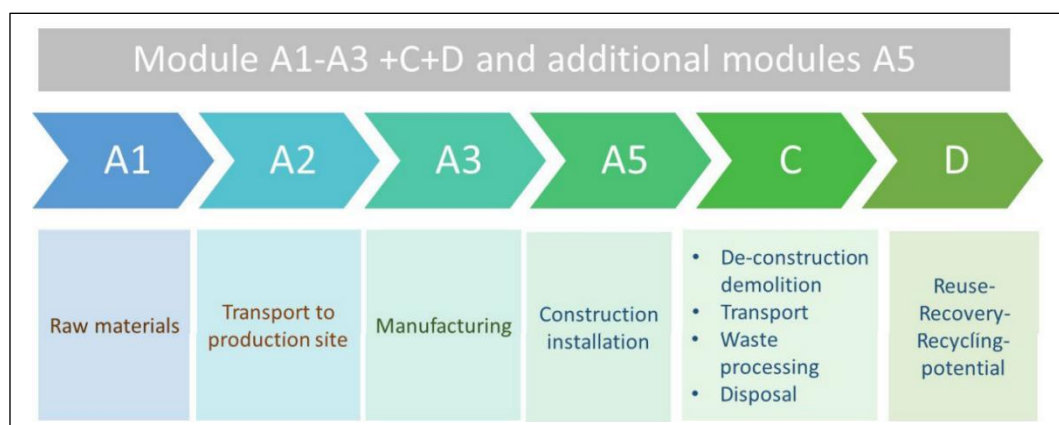
Characterization factors for GWP-GHG refer to IPCC 2021.

### **Description of system boundaries:**

Cradle to gate with modules A5, C1–C4 and module D (A1–A3 + A5 + C + D). The life cycle stages A4, B1-B7 were excluded from the LCA study.

### **System diagram:**

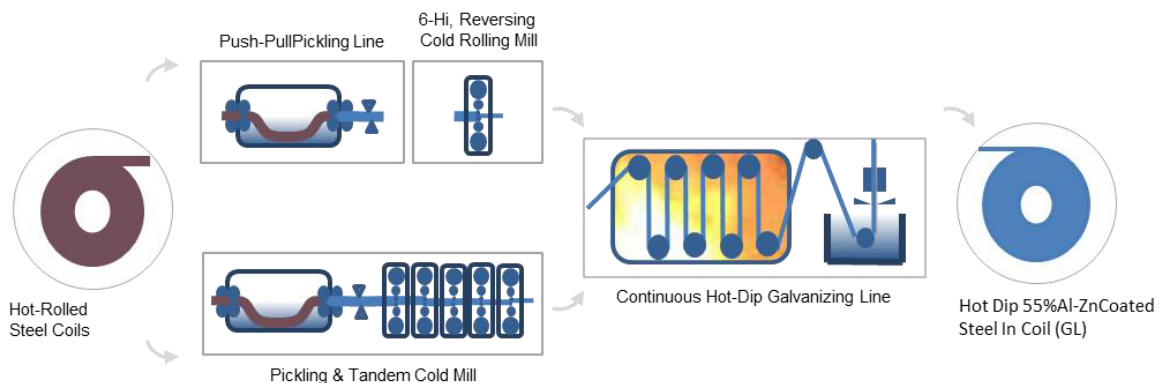
According to PCR 2019:14 (Version 1.3.4), cradle to gate with options, modules C1-C4, module D and with optional module A5 is selected for the LCA study. As the packaging contains more than 5% biogenic carbon module A5 shall be included at least for balancing out the emission of this carbon.



### **Manufacturing process:**

- Pickling:  
Pickling of hot rolled steel coils to clean the surface of oil, oxides and other impurities.
- Rolling  
Rolling the pickled steel coil through a rolling mill to a target thickness.
- Pre-treatment and Annealing:  
Residual oil on the surface of the cold rolled or pickled strip from last process is cleaned off in the non-oxidizing direct flame furnace (NOF) or in electrolytic cleaning. The strip is then softened through recrystallization in the annealing furnace.
- Metallic coating:  
The thickness of the coating layer is precisely controlled by the air knife. Zinc and aluminium powder or atomized fog are blown on to the metallic coating layer. The surface spangle can be controlled through adjust the coating bath composition and cooling rate before it solidifies to produce normal, minimized or zero spangle.
- Skin-pass and Tension Levelling:  
To ensures the flatness of the strip and improves the surface uniformity.
- Surface Treatment:

The surface of the coated strip is treated with passivation (Chromic acid) or anti-fingerprint chemicals to extend product's lifespan and to assist forming, stamping or drawing process.



### **Product characteristics:**

- **Excellent Weathering Resistance:**  
The 55% Al-Zn coated layer performs the coverage and sacrificial protection mechanism to protect base steel. The passivation or anti-fingerprint chemical treatment is extend product's lifespan.
- **Good Adhesion:**  
The thickness of brittle zinc-iron alloy layer at the interface of the steel base metal and the zinc layer is minimized, thereby improving the adhesion of the zinc coating. The strip can be used for various usages.
- **Superb Paintability:**  
The normal spangle and skinpassed surface are smooth and homogeneous, providing superb paintability. The galvannealing process produces a spongy surface structure which is ideal for paint adhesion

### **Data quality:**

Data quality represents the difference between the target representativeness of LCA research and the actual representativeness of data. In order to meet the requirements of data quality, the following aspects are mainly considered in this study:

#### **1. Precision:**

Precision estimates the degree of reliability of primary data. In this study, all relevant foreground data is primary data, which is collected from on-site reviewing and supported by professional data input document.

#### **2. Completeness:**

All relevant, specific processes are considered to represent each specific situation in order to make sure LCA model can accurately represent each production process and characterize respective process' s associated environmental burden in detail. All components need to meet the principle of cut-offs.

#### **3. Consistency:**

In order to figure out that the LCA methodology can be uniformly applied or not, various components' qualitative assessment is conducted. The primary data input provided by manufacturers is re-checked and recalculated.

#### 4. Representativeness:

Representativeness means the referenced data and on-site data input must match the local geographical, temporal, and technological requirements. In this study, for all background processes representative primary data input based on specific industry averages which derived from various reliable databases and the data input for foreground processes all obtained from on-site product related precise investigation.

#### **Treatment of missing data:**

The report will record in which cases the data is not available or missing, Ecoinvent 3.11 database and some other relevant data were referred to.

#### **Cut-off rules:**

The standard ISO 14025 and the PCR -"2019:14 CONSTRUCTION PRODUCTS" indicate that the life cycle inventory data should include a minimum of 95% of the total inputs (materials and energy) for each stage. This cut-off rule does not apply for hazardous materials and substances. No such cut-off criteria have been taken into account in this study. No known flows were deliberately excluded that may cause significant change in the results in this study. The consumption and emissions of road and infrastructure of the manufacturing site and personnel related activities (travel, office operations and supplies are excluded from the study.

#### **Allocation:**

- Multi-input processes
- Yieh Phui (China) also produce other steel product in addition to target product included in this report. The manufacturer does not track its energy consumption or process materials in sufficient granularity to allow for a direct correlation to a particular product; therefore, onsite energy, emissions, waste, and process materials were allocated by mass of production.

#### **Co-product allocation**

The production process of the target product generates waste with some economic value(also considered as a co-product) with a small weight amount of less than 2.3% of the main product in all cases, but it is neglected in this study due to "cut-off" allocation method is adopted.

#### **End-of-Life Allocation**

The recovered steel scrap generated during the C1-C4 stage that is not looped back to the manufacture (leaving product system that assumes have passed the end-of-waste state), goes to module D. To be conservative, the further downstream processes such as steel scrap be sorted and pressed into blocks and ready to be used for other specific purposes be included as burden in the module D. After that the recycled steel has been modelled to avoid use of primary materials (pig iron), the quality correction factor is assumed to be 0.7.

### **Power mix during production stage:**

The data for the generation of electricity applied in A3 is electricity mixes on the market, namely the China East Power Grid Mix, medium voltage in the Ecoinvent 3.11 (cut-off) database. Its GWP-GHG impact is 0.7634 kgCO<sub>2</sub>eq/kWh. The reference year of electricity dataset is 2021-2024.

### **LCA Scenarios and additional technical information:**

#### – Production(A1-A3)

The indirect material chromic acid was used in the production process in an amount of approximately 0.00003% which was not in the background database, so they were substituted with 'market for chemical, inorganic' from Ecoinvent database.

#### – Construction (A5):

It has been assumed that for the construction phase for a steel product the use of the following machines is possible: lattice boom crane, forklift, hydraulic crane and crawler loader with construction machinery operation specific use that varies from 17 to 21 minutes per ton. This study assumes that half an hour of crane operation is performed per functional unit with a diesel mobile crane.

The packaging that accompanies the target product is assumed to be classified as municipal waste and incinerated.

#### – Dismantling/demolition (C1):

It has been assumed that for the demolition phase for a steel product is the same diesel consumption of construction stage (A5).

#### – Transport to waste processing (C2):

This step includes the transport of waste product. The average distance was assumed 100 km by truck from demolition site to a waste or recycling area.

#### – Waste processing for reuse, recovery and/or recycling (C3):

It is assumed that the product has reached the end-of-waste state without waste treatment after arriving at the waste disposal site. Recycling has already been calculated in module D.

#### – Disposal (C4):

Based on the figures of World Steel Association (WSA), the recycling rate of steel is around 95%. Based on this, 5% of the steel is assumed to be landfilled and this landfilling impact is considered at this stage.

#### – Module D:

The credit includes the recycling burden and the credit of replacing virgin pig iron.

Scenario assumptions are provided in Table 2 and Table 3.

**Table 2. End of life (C1-C4) scenario assumptions**

| NAME                                                                                                                       |                                                   | VALUE | UNIT               |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------|--------------------|
| Assumptions for scenario development (description of demolition, collection, recovery, disposal method and transportation) |                                                   |       |                    |
| Demolition process (use diesel mobile Crane)                                                                               | Fuel Consumption                                  | 8     | liters/hour        |
|                                                                                                                            | Working Time                                      | 0.5   | hour/t             |
|                                                                                                                            | Lorry                                             | /     | /                  |
| Waste transport                                                                                                            | Distance                                          | 100   | km                 |
|                                                                                                                            | Collected separately                              | 1000  | kg                 |
| Collection process                                                                                                         | Collected with mixed construction waste           | 0     | kg                 |
|                                                                                                                            | Reuse                                             | 0     | kg                 |
|                                                                                                                            | Recycling                                         | 950   | kg                 |
| Disposal                                                                                                                   | Landfill                                          | 50    | kg                 |
|                                                                                                                            | Incineration                                      | 0     | kg                 |
|                                                                                                                            | Incineration with energy recovery                 | 0     | kg                 |
|                                                                                                                            | Energy conversion efficiency rate                 | /     | %                  |
|                                                                                                                            | Removals of biogenic carbon (excluding packaging) | 0     | kg CO <sub>2</sub> |

**Table 3. Reuse, recovery and/or recycling potentials (D), relevant scenario information**

| NAME                                                         | VALUE | UNIT |
|--------------------------------------------------------------|-------|------|
| Scraps from waste treatment of waste steel structure from C3 | 950   | kg   |
| Replaced virgin pig iron in the next life cycle              | 665   | kg   |

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             | ND                         | X                         | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | X                          | X         | X                | X        | X                                  |
| Geography            | CN                  | CN        | CN            | ND                         | GLO                       | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | GLO                        | GLO       | GLO              | GLO      | GLO                                |
| Specific data used   | >90%                |           |               | -                          | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – products | <10%                |           |               | -                          | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |
| Variation – sites    | 0%                  |           |               | -                          | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                  |

## Content information

| Product components    | Per 1 ton  |                                  |                                                |
|-----------------------|------------|----------------------------------|------------------------------------------------|
|                       | Weight, kg | Post-consumer material, weight-% | Biogenic material, weight-% and kg C/per 1 ton |
| Hot rolled steel coil | 9.79E+02   | 0.00%                            | 0.00%                                          |
| Zinc ingot            | 7.90E+00   | 0.00%                            | 0.00%                                          |
| Aluminum ingot        | 1.35E+01   | 0.00%                            | 0.00%                                          |
| TOTAL                 | 1.00E+03   | 0.00%                            | 0.00%                                          |
| Packaging materials   | Weight, kg | Weight-% (versus the product)    | Weight biogenic carbon, kg C/per 1 ton         |
| EVA                   | 1.72E-01   | 0.017%                           | ND                                             |
| PE board              | 1.43E-01   | 0.014%                           | ND                                             |
| Wrapping paper        | 2.45E-01   | 0.025%                           | 9.64E-02                                       |
| Paper angle bead      | 1.30E-01   | 0.013%                           | 3.44E-02                                       |
| Pallet                | 3.93E-01   | 0.039%                           | 1.94E-01                                       |
| Paper sleeve          | 4.23E-01   | 0.042%                           | 1.67E-01                                       |
| Steel strip           | 8.93E-01   | 0.089%                           | ND                                             |
| TOTAL                 | 2.40E+00   | 0.240%                           | 4.92E-01                                       |

## Results of the environmental performance 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.

### Mandatory impact category indicators according to EN 15804

| Results per declared unit |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |          |          |          |          |           |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A1-A3     | A5*      | C1       | C2       | C4       | D         |
| GWP-total                 | kg CO <sub>2</sub> eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.33E+03  | 1.84E+01 | 1.36E+01 | 1.61E+01 | 3.13E-01 | -1.12E+03 |
| GWP-luluc                 | kg CO <sub>2</sub> eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2.54E+00  | 7.54E-04 | 6.96E-04 | 7.45E-03 | 1.79E-04 | -2.39E-01 |
| GWP-biogenic              | kg CO <sub>2</sub> eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -8.64E-01 | 3.55E+00 | 1.46E-03 | 5.51E-03 | 1.40E-04 | 5.65E+00  |
| GWP-fossil                | kg CO <sub>2</sub> eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.33E+03  | 1.49E+01 | 1.36E+01 | 1.61E+01 | 3.13E-01 | -1.13E+03 |
| ADP-fossil                | MJ, net calorific value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.70E+04  | 3.01E+01 | 2.93E+01 | 2.26E+02 | 7.66E+00 | -1.15E+04 |
| ADP-minerals&metals       | kg Sb eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.74E-02  | 2.04E-06 | 1.79E-06 | 5.29E-05 | 4.66E-07 | -5.60E-04 |
| EP-freshwater             | kg P eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.60E+00  | 2.51E-04 | 1.40E-04 | 1.78E-03 | 2.74E-05 | -3.14E-01 |
| POCP                      | kg NMVOC eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.18E+01  | 2.52E-02 | 2.43E-02 | 1.02E-01 | 3.32E-03 | -3.28E+00 |
| AP                        | mol H <sup>+</sup> eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.50E+01  | 1.18E-02 | 1.11E-02 | 7.38E-02 | 2.19E-03 | -4.00E+00 |
| EP-terrestrial            | mol N eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.47E+01  | 1.98E-02 | 1.64E-02 | 2.96E-01 | 9.19E-03 | -9.61E+00 |
| EP-marine                 | kg N eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3.35E+00  | 1.94E-03 | 1.55E-03 | 2.72E-02 | 8.41E-04 | -8.87E-01 |
| ODP                       | kg CFC 11 eq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1.89E-05  | 1.69E-07 | 1.68E-07 | 2.14E-07 | 8.71E-09 | -2.96E-06 |
| WDP                       | m3 world eq, deprived                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.33E+03  | 3.87E-01 | 2.16E-01 | 1.27E+00 | 3.37E-01 | -1.04E+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.

\* Discouraging the use of the results of modules A1-A3 without considering the results of module C.

\* As the packaging contains more than 5% biogenic carbon, module A5 shall be disclosed to balance the emission of this carbon.

## Potential environmental impact - Additional mandatory indicator

| Results per declared unit |                                                                                                                                                                                                                                                                                                                                                                   |          |          |          |          |          |           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|-----------|
| Indicator                 | Unit                                                                                                                                                                                                                                                                                                                                                              | A1-A3    | A5       | C1       | C2       | C4       | D         |
| GWP-GHG <sup>1</sup>      | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                            | 3.33E+03 | 1.49E+01 | 1.36E+01 | 1.61E+01 | 3.13E-01 | -1.13E+03 |
| ETP-fw                    | CTUe                                                                                                                                                                                                                                                                                                                                                              | 2.34E+04 | 1.09E+01 | 6.51E+00 | 4.11E+01 | 5.54E-01 | -3.83E+03 |
| HTP-c                     | CTUh                                                                                                                                                                                                                                                                                                                                                              | 4.05E-06 | 9.58E-10 | 4.15E-10 | 3.88E-09 | 5.67E-11 | -1.50E-06 |
| HTP-nc                    | CTUh                                                                                                                                                                                                                                                                                                                                                              | 1.76E-04 | 2.75E-08 | 1.36E-08 | 1.55E-07 | 1.28E-09 | -3.34E-06 |
| SQP                       | Dimensionless                                                                                                                                                                                                                                                                                                                                                     | 1.13E+04 | 9.79E+00 | 9.27E+00 | 1.67E+02 | 1.51E+01 | -2.51E+03 |
| PM                        | Disease incidence                                                                                                                                                                                                                                                                                                                                                 | 2.99E-04 | 1.10E-07 | 1.03E-07 | 1.51E-06 | 5.04E-08 | -1.15E-04 |
| IRP                       | kBq U235 <sub>eq</sub>                                                                                                                                                                                                                                                                                                                                            | 1.23E+02 | 3.39E-02 | 3.27E-02 | 1.92E-01 | 4.59E-03 | -8.58E+00 |
| Acronyms                  | PM = Potential incidence of disease due to PM emissions; IRP = Potential Human exposure efficiency relative to U235; Potential Comparative Toxic Unit for ecosystems; HTP-c = Potential Comparative Toxic Unit for humans; HTP-nc = Potential Comparative Toxic Unit for humans; SQP = Potential Soil quality index; ETP-fw= Ecotoxicity potential for freshwater |          |          |          |          |          |           |

## Resource use indicators

| Results per declared unit |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |          |          |          |           |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|----------|----------|----------|-----------|
| Indicator                 | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | A1-A3    | A5        | C1       | C2       | C4       | D         |
| PENRE                     | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.59E+04 | 1.73E+01  | 3.10E+01 | 2.26E+02 | 7.66E+00 | -1.15E+04 |
| PERE                      | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.08E+03 | -2.16E+01 | 4.05E-01 | 3.25E+00 | 7.16E-02 | -2.60E+02 |
| PENRM                     | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.11E+03 | 1.60E+02  | 1.46E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERM                      | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1.62E+01 | 2.21E+01  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT                     | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.70E+04 | 1.77E+02  | 1.77E+02 | 2.26E+02 | 7.66E+00 | -1.15E+04 |
| PERT                      | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.09E+03 | 4.31E-01  | 4.05E-01 | 3.25E+00 | 7.16E-02 | -2.60E+02 |
| FW                        | m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.01E+01 | 7.28E-03  | 4.69E-03 | 3.20E-02 | 7.92E-03 | -2.48E+00 |
| SM                        | kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4.10E+02 | 1.53E-02  | 1.44E-02 | 9.91E-02 | 1.91E-03 | 9.49E+02  |
| RSF                       | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.86E-01 | 4.06E-05  | 2.45E-05 | 1.28E-03 | 3.98E-05 | -1.41E-02 |
| NRSF                      | MJ, LHV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+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 |          |           |          |          |          |           |

<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.

## Waste indicators

| Results per declared unit    |      |          |          |          |          |          |           |
|------------------------------|------|----------|----------|----------|----------|----------|-----------|
| Indicator                    | Unit | A1-A3    | A5       | C1       | C2       | C4       | D         |
| Hazardous waste disposed     | kg   | 1.05E+03 | 1.58E-01 | 6.05E-02 | 5.14E-01 | 8.72E-03 | -9.50E+01 |
| Non-hazardous waste disposed | kg   | 1.33E+04 | 3.87E+00 | 8.02E-01 | 9.91E+00 | 2.02E-01 | -2.18E+03 |
| Radioactive waste disposed   | kg   | 3.07E-02 | 8.23E-06 | 7.94E-06 | 4.69E-05 | 1.12E-06 | -2.09E-03 |

## Output flow indicators

| Results per declared unit     |      |          |          |          |          |          |           |
|-------------------------------|------|----------|----------|----------|----------|----------|-----------|
| Indicator                     | Unit | A1-A3    | A5       | C1       | C2       | 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  |
| Material for recycling        | kg   | 3.65E+00 | 2.77E-02 | 3.09E-04 | 2.64E-03 | 8.30E-05 | -5.21E-01 |
| Materials for energy recovery | kg   | 1.00E-02 | 1.17E-06 | 1.10E-06 | 1.46E-05 | 1.47E-07 | -4.97E-04 |
| Exported energy, electricity  | MJ   | 1.08E+01 | 2.59E-03 | 2.47E-03 | 2.00E-02 | 4.97E-04 | -7.73E-01 |
| Exported energy, thermal      | MJ   | 1.30E+01 | 1.09E-03 | 9.54E-04 | 2.74E-02 | 2.64E-04 | -8.97E-01 |

## Information on biogenic carbon content

| Results per declared unit                         |      |          |
|---------------------------------------------------|------|----------|
| Biogenic carbon content                           | Unit | Quantity |
| Biogenic carbon content in accompanying packaging | kg C | 4.92E-01 |

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

## Additional environmental information

### Product Application:

For building materials, home appliances, decoration, agriculture, photovoltaics, automobiles, and 3C.

### Environment and health during manufacturing:

The waste gas, waste water, solid waste and noise generated in the production process are handled in accordance with the requirements of relevant national and local industrial policies, and all kinds of pollutants can be stabilized and discharged according to standards after treatment;

- Waste gas emissions - various types of organized waste gas, dust, etc. were supporting the corresponding treatment facilities, waste gas after treatment to meet the standards discharged by the

chimney pipeline; in addition to strengthening the production process and the environmental management of chemical storage areas, in order to effectively reduce the emission of unorganized waste gas;

- Wastewater discharge - the company's wastewater treatment using automated control to ensure that the wastewater is stable to take over the standard; and according to the “rain and sewage diversion, sewage diversion, quality treatment, recycling and reuse,” the principle of construction and completion of the workshop, the plant rain, sewage drainage network; do a good job of the car asked, sewage network, treatment facilities and storage tanks in the area of seepage prevention, anticorrosion treatment; wastewater treatment and part of the reuse, and the rest of the treatment to meet the standards of the urban areas connected to the sewage treatment company centralized treatment. Waste water is partially reused after treatment, and the rest is connected to the urban area after meeting the standard after treatment;
- Solid waste - strictly in accordance with environmental protection requirements for treatment and disposal; domestic garbage is collected and treated by the sanitation department, hazardous waste is entrusted to qualified treatment units for unified treatment and the implementation of hazardous waste transfer approval and joint billing procedures, and zero discharge of solid waste is implemented. Other solid wastes are stored, disposed and utilized according to specifications;
- Noise - Choose low-noise equipment, take effective noise elimination, sound insulation and vibration prevention measures to ensure that the noise at the plant boundary reaches the standard.
- Energy use - fully implement the concept of circular economy and the principle of clean production, choose advanced production technology and equipment, adopt water-saving and energy-saving measures such as “multi-use of water, waste heat utilization” , strengthen the recycling of waste acid and other materials, reduce the amount of pollutants and emissions, and ensure that the clean production indexes reach the international and domestic advanced level;

#### **Product Condition of use:**

The product should not apply to sheets exposed at any time to corrosive or aggressive atmospheric conditions, including but not limited to:

- Areas subject to salt-water marine atmosphere or to repeated spraying of either salt or fresh water.
- Areas subject to fallout of or exposure to corrosive chemicals, acid rain, ash, fumes, cement dust or animal waste.
- Areas subject to water run-off from lead or copper flashing or areas in metallic contact with lead, stainless steel, monel or copper.
- Conditions or circumstances where corrosive fumes or condensates are generated or released inside the building.
- Areas subject to contact with the incorporation of concrete add mixtures which are regarded as corrosive and lead to accelerated corrosion.
- Areas subject to contact with the concrete formwork timber and supports which may contain water.
- Areas subject to immersion as a result of flood or substandard site drainage.

- External storage, leading to wet packs and wet stacks
- Other: Yieh Phui (China) can produce Hot Dip 55% Al-Zn Coated Steel In Coil (GL) free of ten hazardous substances stipulated by ROHS and SVHC, in accordance with 2011/65/EU and 1907/2006/EC.

## Additional social and economic information

Not applicable.

## Information related to Sector EPD

This is an individual EPD®.

## Differences versus previous versions

This is the first version of the EPD®.

## References

General Programme Instructions of the International EPD® System. Version 4.0.

IPCC. (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Geneva, Switzerland: IPCC.

IPCC. (2019). Climate Change 2019: The Physical Science Basis. Geneva, Switzerland: IPCC.

ISO. (2006). ISO 14040: Environmental management – Life cycle assessment – Principles and framework. Geneva: International Organization for Standardization.

ISO. (2006). ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines. Geneva: International Organization for Standardization.

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

JRC. (2010). ILCD Handbook: General guide for Life Cycle Assessment – Detailed guidance. EUR 24708

EN (1st ed.). Luxembourg: Joint Research Centre.

Ecoinvent database v3.11 (2024) <http://www.ecoinvent.org/> Ecoinvent, Switzerland.

CML LCA methodology, Institute of Environmental Sciences (CML), Faculty of Science, University of Leiden, Netherlands

PCR 2019:14 Construction products (EN 15804: A2) version 1.3.4

