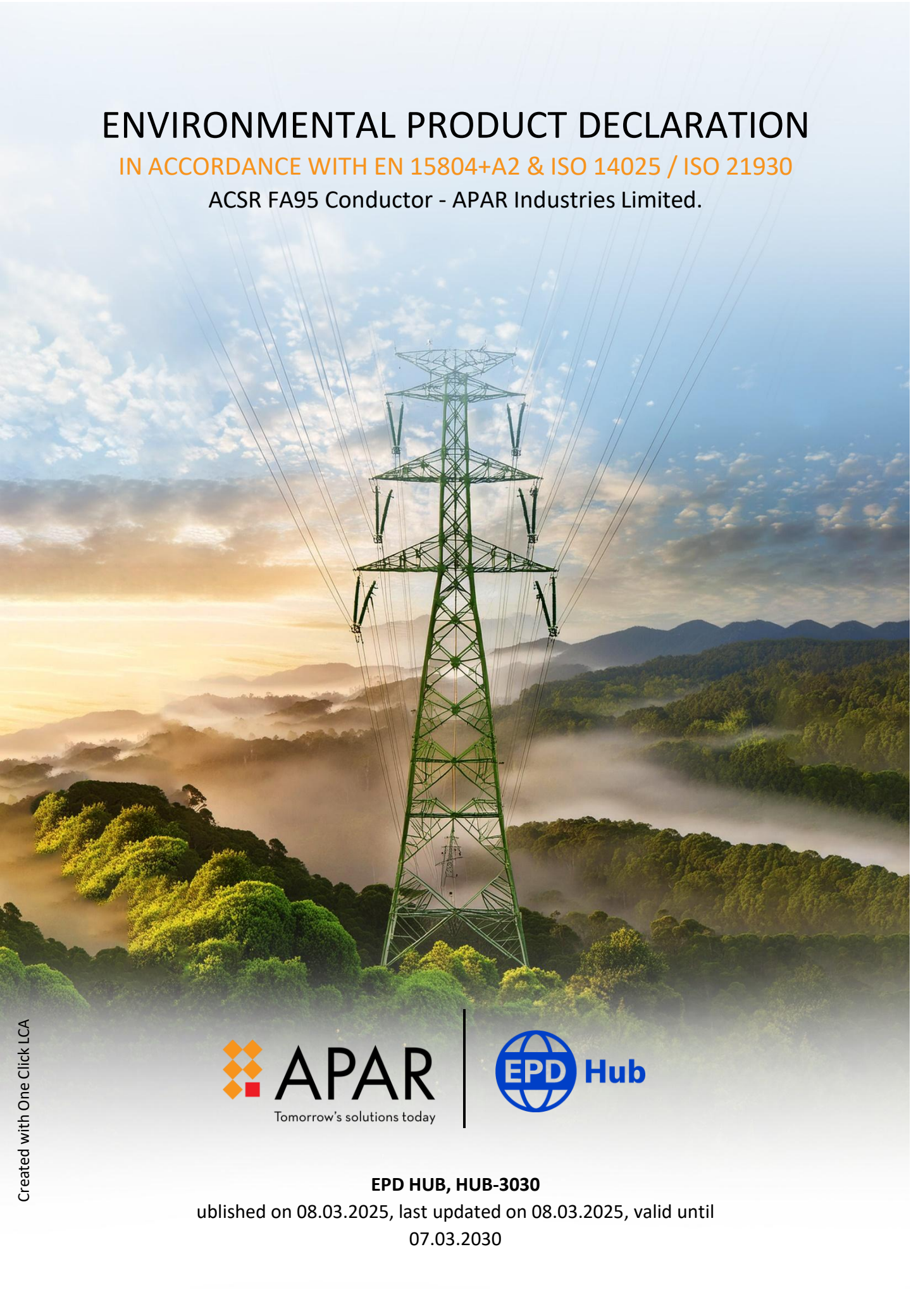


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

ACSR FA95 Conductor - APAR Industries Limited.



APAR

Tomorrow's solutions today



Hub

EPD HUB, HUB-3030

published on 08.03.2025, last updated on 08.03.2025, valid until
07.03.2030

GENERAL INFORMATION

MANUFACTURER

| | |
|-----------------|--|
| Manufacturer | APAR Industries Limited |
| Address | Factory -Unit -III , Survey no. 127/1/2 Village: Athola, Umarkoi Road, Silvassa – 396230, India Registered Office - 301, Panorama Complex, R.C. Dutt Road, Vadodara - 390007, India |
| Contact Details | epd.info@apar.com |
| Website | www.apar.com |

EPD STANDARDS, SCOPE AND VERIFICATION

| | |
|--------------------|---|
| Program operator | EPD Hub, hub@epdhub.com |
| Reference standard | EN 15804+A2:2019 and ISO 14025 |
| PCR | EPD Hub Core PCR version 1.0, 1 Feb 2022 |
| Sector | Electrical product |
| Category of EPD | Third party verified EPD |
| Parent EPD Number | EPD HUB, HUB – 1810 |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| EPD author | Mr. Rahul Galghate, Mr. Madanmohan Padhi |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification |
| EPD verifier | Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited |

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

| | |
|-----------------------------------|------------------------------------|
| Product name | ACSR FA95 Conductor |
| Additional labels | - |
| Product reference | WG23C240 |
| Place of production | Silvassa, DNH-396230 India |
| Period for data | Calendar year Aug 2023 to Jul 2024 |
| Averaging in EPD | No averaging |
| Variation in GWP-fossil for A1-A3 | Not Relevant |

ENVIRONMENTAL DATA SUMMARY

| | |
|---|---------------------------------------|
| Declared unit | 1 kg of ACSR manufactured conductors. |
| Declared unit mass | 1 kg |
| GWP-fossil, A1-A3 (kgCO ₂ e) | 6,71E+00 |
| GWP-total, A1-A3 (kgCO ₂ e) | 6,72E+00 |
| Secondary material, inputs (%) | 7.34 |
| Secondary material, outputs (%) | 78.5 |
| Total energy use, A1-A3 (kWh) | 25.5 |
| Total water use, A1-A3 (m ³ e) | 0.03 |

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

APAR Industries was started in 1958, in India. Over 66 years later, we have grown into a diversified billion dollar company, and expanded to over 140 countries as a highly trusted manufacturer and supplier of conductors, a wide variety of cables, specialty oils, polymers and lubricants. At APAR, we have been able to excel at what we do because of who we are: relentless innovators who are constantly pushing ourselves to discover, perfect and deliver tomorrow's solutions today

PRODUCT DESCRIPTION

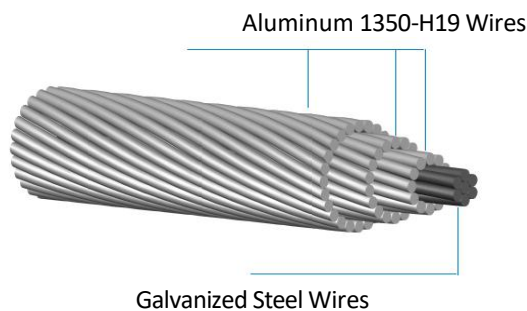


Fig. 1 ACSR Conductor

All Aluminum Conductors Steel reinforced (ACSR): These are concentrically stranded conductor with one or more layers of hard drawn Aluminum wire on galvanized steel wire core which are coated with zinc with Class A / Class B Coating. The core can be single wire or stranded depending on the size of the conductors. Compared to ACSR they have lighter in weight, has a comparable strength and current carrying capacity, lower electrical losses and superior corrosion resistance. Given these properties, this conductor has a wide acceptance as a transmission conductor within the market."

Feature:

- ❖ High tensile strength
- ❖ Better Sag properties.
- ❖ Economic Design
- ❖ Suitable for remote application involving long Span

Further information can be found at www.apar.com.

DATA SHEET ACSR FA95 Conductor

| # | PARTICULARS | UNIT | DATA | |
|----|---|-----------------|---------------------------------|-----|
| 1 | Specification according to which the conductor will be manufactured and tested. | - | SS EN 50182 | |
| 2 | Code Name | - | ACSR FS 95 (151-AL1/25-ST1A) | |
| 3 | Nominal area Conductor | mm ² | 175.8 | |
| 4 | Stranding (Aluminum & Steel wires - Number/Diameter) | mm | Al 26/2.72 mm+ St 7/2.12 mm | |
| 5 | Nominal O.D. of Conductor | mm | 17.20 | |
| 6 | Nominal Mass of Conductor without grease | Kg/km | 610.5 | |
| 7 | Minimum Rated Strength of Conductor | KN | 54.59 | |
| 8 | Maximum DC resistance of Conductor at 20 deg.C | Ω/Km | 0.1912 | |
| 9 | Lay ratio of Conductor | - | Max | Min |
| 10 | (a) 1+6 wire layer | - | 26 | 16 |
| 11 | (b) 10 wire layer | - | 16 | 10 |
| 12 | (c) 16 wire layer | - | 14 | 10 |
| 13 | (d) 24 wire layer | - | - | - |
| 14 | Direction of lay for outside layer | - | Right Hand (Z) | |
| 15 | Maximum length of conductor | M | 2400 | |

PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass- % | Material origin |
|-----------------------|-----------------|-----------------|
| Metals | 100% | Asia |
| Minerals | - | - |
| Fossil materials | - | - |
| Bio-based materials | - | - |

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|--|------|
| Biogenic carbon content in product, kg C | 0 |
| Biogenic carbon content in packaging, kg C | 1.25 |

FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|------------------------|-------------------------------|
| Declared unit | 1 kg of ACSR FA 95 conductor. |
| Mass per declared unit | 1 kg |
| Functional unit | - |
| Reference service life | 50 Years |

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries |
|---------------|-----------|---------------|----------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|-------------------|-----------|------------------|----------|------------------------------|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| x | x | x | x | x | MND | MND | MND | MND | MND | MND | MND | x | x | x | x | x |
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstr./demol. | Transport | Waste processing | Disposal | Reuse |

Modules not declared = MND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The conductor is made of aluminum and Galvanized steel wires. The raw materials in the form of aluminum ingots and High tension galvanized steel wire in coil form are transported to company as production facility, where aluminum is drawn into wires to the required dimension, Al drawn wire and steel wires are combined on the wire stranding machine to conduct electricity better. There is no insulation materials present in the product. The manufacturing processes require electricity and fuels for the different equipment as well as heating. Certain ancillary materials are also included. The study considers the losses of main raw materials occurring during the manufacturing process. The finished product is packed in a steel drum and the exposed outer surface of conductor is covered with a polypropylene sheet before being sent to the installation site. The impacts associated with the packaging are included in this life-cycle assessment model.

PRODUCT LIFE-CYCLE

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Environmental impacts from installation in the construction site (A5) product loss during installation has been assume less than 0.5%. These were not considered in the present life-cycle assessment model, as mentioned in (EN 15804+A2:2019 Chapter 6.3.6, & 6.4.4). Environmental impact from waste packaging materials (A5) and release of biogenic carbon dioxide from waste processing of wood ubet has been included in life-cycle assessment model. Electricity consumption for installation is considered to be 0.0307 MJ of product for stringing the conductors using a crane, puller etc. Average distance of transportation from production plant to building site is 13180 km and the transportation method is lorry and container ship. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product are packaged properly. Also, volume capacity utilization factor is assumed to be 100 % for the nested packaged products.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

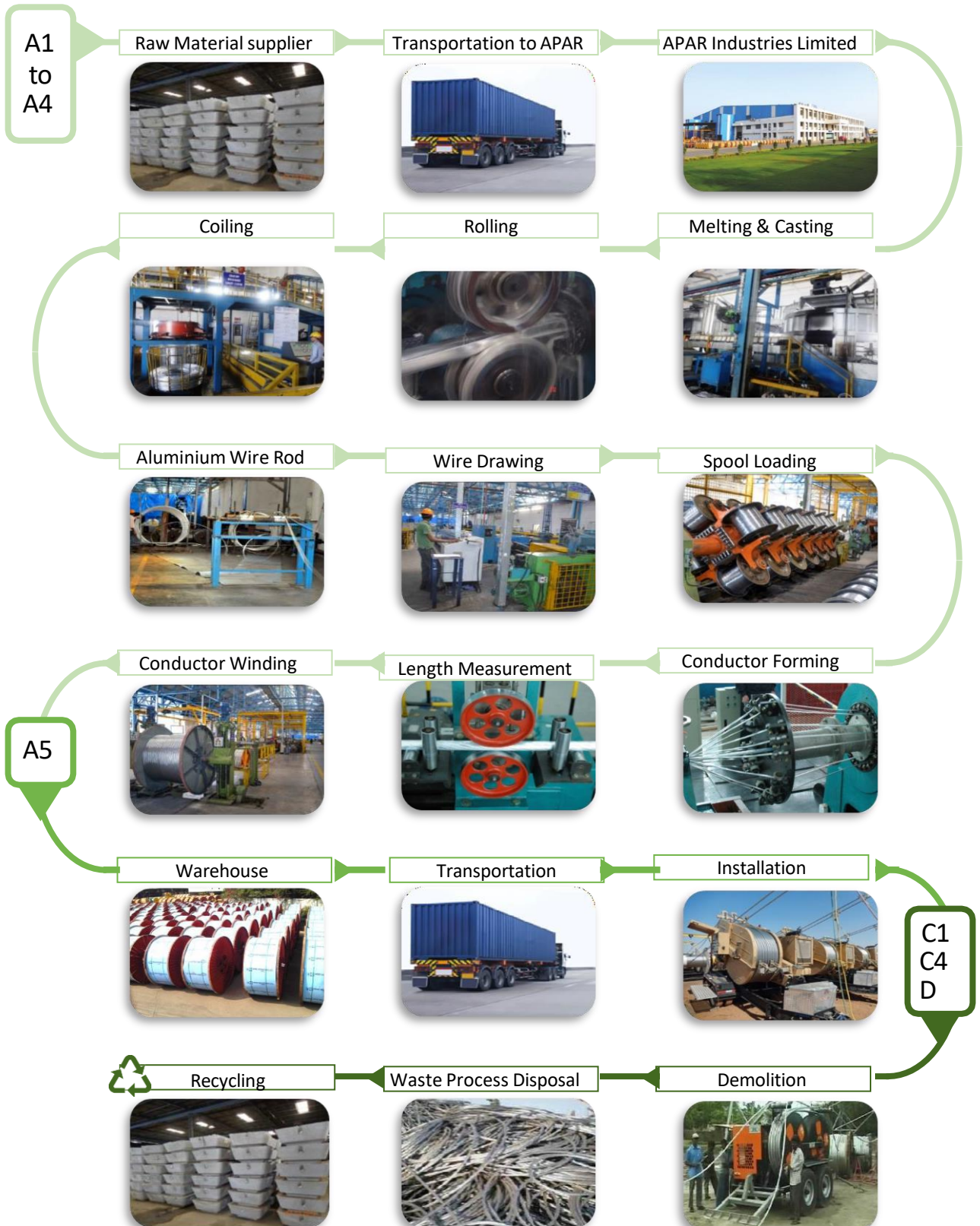
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Energy consumption is assumed to be 0.0307 MJ of diesel to be deconstructed. It is assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 100 km and the transportation method is assumed to be lorry (C2). Module C3 accounts for energy and resource inputs for sorting and treating. According to the International Aluminum Association (2020), approximately 76% of aluminum is recycled globally, which we have used as a conservative assumption in our LCA modeling. However, our product is designed to achieve a recyclability rate of up to 99%. Due to the material and energy recovery potential of aluminum, a part of the end-of-life product is converted into recycled raw materials.

MANUFACTURING PROCESS

Description of system boundaries: Cradle to gate with options, Modules C1–C4, Module D and with optional module A4–A5



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The packaging was excluded from the model according to EPD Hub PCR Rule. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| Data type | Allocation |
|--------------------------------|-----------------|
| Raw materials | Mass allocation |
| Packaging materials | Mass allocation |
| Ancillary materials | Mass allocation |
| Manufacturing energy and waste | Mass allocation |

AVERAGES AND VARIABILITY

| | |
|-----------------------------------|----------------|
| Type of average | No averaging |
| Averaging method | Not applicable |
| Variation in GWP-fossil for A1-A3 | Not Relevant |
| Type of average | No averaging |
| Averaging method | Not applicable |

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|-------------------------------------|-------------------------|----------|----------|-----------|----------|----------|-----------|-----|-----|-----|
| GWP – total ¹⁾ | kg CO ₂ e | 5,92E+00 | 1,33E-01 | 6,65E-01 | 6,72E+00 | 3,49E-01 | 1,44E-02 | MND | MND | MND |
| GWP – fossil | kg CO ₂ e | 5,91E+00 | 1,33E-01 | 6,67E-01 | 6,71E+00 | 3,49E-01 | 1,57E-02 | MND | MND | MND |
| GWP – biogenic | kg CO ₂ e | 5,23E-03 | 5,10E-05 | -1,56E-03 | 3,72E-03 | 1,53E-05 | -1,24E-03 | MND | MND | MND |
| GWP – LULUC | kg CO ₂ e | 1,27E-03 | 4,98E-05 | 2,19E-04 | 1,54E-03 | 2,28E-04 | 3,85E-06 | MND | MND | MND |
| Ozone depletion pot. | kg CFC ₋₁₁ e | 3,88E-07 | 3,04E-08 | 3,07E-08 | 4,49E-07 | 7,10E-08 | 3,11E-09 | MND | MND | MND |
| Acidification potential | mol H ⁺ e | 3,61E-02 | 5,62E-04 | 3,10E-03 | 3,97E-02 | 9,82E-03 | 1,48E-04 | MND | MND | MND |
| EP-freshwater ²⁾ | kg Pe | 9,74E-05 | 1,09E-06 | 3,67E-05 | 1,35E-04 | 3,82E-06 | 9,89E-08 | MND | MND | MND |
| EP-marine | kg Ne | 4,41E-03 | 1,67E-04 | 6,58E-04 | 5,24E-03 | 2,45E-03 | 6,40E-05 | MND | MND | MND |
| EP-terrestrial | mol Ne | 8,22E-02 | 1,84E-03 | 6,28E-03 | 9,03E-02 | 2,72E-02 | 7,00E-04 | MND | MND | MND |
| POCP (“smog”) ³⁾ | kg NMVOCe | 1,61E-02 | 5,84E-04 | 2,89E-03 | 1,96E-02 | 7,08E-03 | 1,94E-04 | MND | MND | MND |
| ADP-minerals & metals ⁴⁾ | kg Sbe | 4,85E-05 | 3,34E-07 | 1,05E-06 | 4,99E-05 | 2,31E-06 | 2,10E-08 | MND | MND | MND |
| ADP-fossil resources | MJ | 7,82E+01 | 1,99E+00 | 9,33E+00 | 8,96E+01 | 4,56E+00 | 2,04E-01 | MND | MND | MND |
| Water use ⁵⁾ | m ³ e depr. | 9,61E-01 | 8,87E-03 | 2,60E-01 | 1,23E+00 | 1,28E-02 | 9,83E-04 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|-------------------------------------|-------------------------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| GWP – total ¹⁾ | kg CO ₂ e | MND | MND | MND | MND | 2,82E-03 | 9,34E-03 | 1,20E-01 | 6,65E-03 | -1,05E+01 |
| GWP – fossil | kg CO ₂ e | MND | MND | MND | MND | 2,82E-03 | 9,34E-03 | 1,19E-01 | 6,62E-03 | -1,05E+01 |
| GWP – biogenic | kg CO ₂ e | MND | MND | MND | MND | 5,17E-07 | 3,61E-06 | 1,03E-03 | 2,50E-05 | 3,27E-04 |
| GWP – LULUC | kg CO ₂ e | MND | MND | MND | MND | 2,81E-07 | 3,44E-06 | 8,17E-05 | 7,35E-06 | -2,73E-04 |
| Ozone depletion pot. | kg CFC ₋₁₁ e | MND | MND | MND | MND | 6,03E-10 | 2,15E-09 | 3,87E-09 | 7,95E-10 | -2,86E-07 |
| Acidification potential | mol H ⁺ e | MND | MND | MND | MND | 2,93E-05 | 3,95E-05 | 5,18E-04 | 4,46E-05 | -1,03E-01 |
| EP-freshwater ²⁾ | kg Pe | MND | MND | MND | MND | 9,35E-09 | 7,64E-08 | 2,75E-06 | 2,11E-07 | -6,56E-04 |
| EP-marine | kg Ne | MND | MND | MND | MND | 1,30E-05 | 1,18E-05 | 7,05E-05 | 1,09E-05 | -1,16E-02 |
| EP-terrestrial | mol Ne | MND | MND | MND | MND | 1,42E-04 | 1,30E-04 | 8,31E-04 | 1,22E-04 | -1,34E-01 |
| POCP (“smog”) ³⁾ | kg NMVOCe | MND | MND | MND | MND | 3,91E-05 | 4,15E-05 | 2,37E-04 | 3,61E-05 | -4,09E-02 |
| ADP-minerals & metals ⁴⁾ | kg Sbe | MND | MND | MND | MND | 1,43E-09 | 2,19E-08 | 5,88E-06 | 1,55E-08 | -8,07E-06 |
| ADP-fossil resources | MJ | MND | MND | MND | MND | 3,80E-02 | 1,40E-01 | 7,01E-01 | 9,65E-02 | -1,04E+02 |
| Water use ⁵⁾ | m ³ e depr. | MND | MND | MND | MND | 1,02E-04 | 6,28E-04 | 1,68E-02 | 1,19E-03 | -6,03E-01 |

ENVIRONMENTAL IMPACT DATA

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|----------------------------------|-----------|----------|----------|----------|----------|----------|----------|-----|-----|-----|
| Particulate matter | Incidence | 4,19E-07 | 1,48E-08 | 4,09E-08 | 4,75E-07 | 1,50E-08 | 4,25E-09 | MND | MND | MND |
| Ionizing radiation ⁶⁾ | kBq U235e | 1,05E-01 | 9,44E-03 | 1,15E-02 | 1,26E-01 | 2,02E-02 | 9,88E-04 | MND | MND | MND |
| Ecotoxicity (freshwater) | CTUe | 1,18E+02 | 1,79E+00 | 2,46E+01 | 1,44E+02 | 3,07E+00 | 1,66E-01 | MND | MND | MND |
| Human toxicity, cancer | CTUh | 1,16E-08 | 4,50E-11 | 3,73E-09 | 1,54E-08 | 1,98E-10 | 8,88E-12 | MND | MND | MND |
| Human tox. non-cancer | CTUh | 1,41E-07 | 1,76E-09 | 7,27E-08 | 2,16E-07 | 2,55E-09 | 1,24E-10 | MND | MND | MND |
| SQP ⁷⁾ | - | 6,45E+00 | 2,16E+00 | 1,69E+00 | 1,03E+01 | 1,10E+00 | 5,24E-02 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|----------------------------------|-----------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Particulate matter | Incidence | MND | MND | MND | MND | 7,86E-10 | 1,08E-09 | 8,69E-09 | 6,80E-10 | -5,77E-07 |
| Ionizing radiation ⁶⁾ | kBq U235e | MND | MND | MND | MND | 1,74E-04 | 6,68E-04 | 3,93E-03 | 5,59E-04 | -5,73E-01 |
| Ecotoxicity (freshwater) | CTUe | MND | MND | MND | MND | 2,28E-02 | 1,26E-01 | 3,83E+00 | 1,01E+02 | -1,92E+02 |
| Human toxicity, cancer | CTUh | MND | MND | MND | MND | 8,75E-13 | 3,10E-12 | 8,95E-11 | 6,06E-12 | 2,10E-09 |
| Human tox. non-cancer | CTUh | MND | MND | MND | MND | 1,65E-11 | 1,25E-10 | 3,79E-09 | 1,61E-10 | -1,58E-07 |
| SQP ⁷⁾ | - | MND | MND | MND | MND | 4,94E-03 | 1,62E-01 | 8,55E-01 | 1,30E-01 | -1,89E+01 |

USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|------------------------------------|----------------|----------|----------|----------|----------|----------|-----------|-----|-----|-----|
| Renew. PER as energy ⁸⁾ | MJ | 1,70E+00 | 2,25E-02 | 7,62E-01 | 2,48E+00 | 3,47E-02 | 2,50E-03 | MND | MND | MND |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 1,75E-02 | 1,75E-02 | 0,00E+00 | -1,75E-02 | MND | MND | MND |
| Total use of renew. PER | MJ | 1,70E+00 | 2,25E-02 | 7,79E-01 | 2,50E+00 | 3,47E-02 | -1,50E-02 | MND | MND | MND |
| Non-re. PER as energy | MJ | 7,82E+01 | 1,99E+00 | 9,00E+00 | 8,92E+01 | 4,56E+00 | 2,04E-01 | MND | MND | MND |
| Non-re. PER as material | MJ | 1,58E-03 | 0,00E+00 | 3,31E-01 | 3,33E-01 | 0,00E+00 | -3,31E-01 | MND | MND | MND |
| Total use of non-re. PER | MJ | 7,82E+01 | 1,99E+00 | 9,33E+00 | 8,96E+01 | 4,56E+00 | -1,27E-01 | MND | MND | MND |
| Secondary materials | kg | 7,34E-02 | 5,66E-04 | 2,93E-02 | 1,03E-01 | 9,23E-04 | 1,07E-04 | MND | MND | MND |
| Renew. secondary fuels | MJ | 8,95E-05 | 5,97E-06 | 1,42E-05 | 1,10E-04 | 3,09E-06 | 5,35E-07 | MND | MND | MND |
| Non-ren. secondary fuels | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND |
| Use of net fresh water | m ³ | 2,85E-02 | 2,54E-04 | 6,22E-03 | 3,49E-02 | 4,27E-04 | 1,94E-05 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|------------------------------------|----------------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Renew. PER as energy ⁸⁾ | MJ | MND | MND | MND | MND | 2,17E-04 | 1,58E-03 | 1,01E-01 | 5,92E-03 | -1,12E+00 |
| Renew. PER as material | MJ | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renew. PER | MJ | MND | MND | MND | MND | 2,17E-04 | 1,58E-03 | 1,01E-01 | 5,92E-03 | -1,12E+00 |
| Non-re. PER as energy | MJ | MND | MND | MND | MND | 3,80E-02 | 1,40E-01 | 7,01E-01 | 9,65E-02 | -1,04E+02 |
| Non-re. PER as material | MJ | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,70E-01 |
| Total use of non-re. PER | MJ | MND | MND | MND | MND | 3,80E-02 | 1,40E-01 | 7,01E-01 | 9,65E-02 | -1,03E+02 |
| Secondary materials | kg | MND | MND | MND | MND | 1,49E-05 | 3,89E-05 | 6,30E-04 | 2,35E-05 | 7,26E-01 |
| Renew. secondary fuels | MJ | MND | MND | MND | MND | 4,86E-08 | 3,93E-07 | 2,31E-05 | 1,45E-06 | -1,09E-04 |
| Non-ren. secondary fuels | MJ | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | m ³ | MND | MND | MND | MND | 2,31E-06 | 1,82E-05 | 4,61E-04 | 7,68E-05 | -4,43E-02 |

ENVIRONMENTAL IMPACT DATA

END OF LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|---------------------|------|----------|----------|----------|----------|----------|----------|-----|-----|-----|
| Hazardous waste | kg | 1,20E+00 | 2,67E-03 | 1,62E-01 | 1,37E+00 | 5,80E-03 | 3,98E-04 | MND | MND | MND |
| Non-hazardous waste | kg | 4,09E+00 | 4,37E-02 | 1,22E+00 | 5,35E+00 | 9,45E-02 | 6,04E-03 | MND | MND | MND |
| Radioactive waste | kg | 8,89E-05 | 1,33E-05 | 5,97E-06 | 1,08E-04 | 3,18E-05 | 1,39E-06 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---------------------|------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Hazardous waste | kg | MND | MND | MND | MND | 5,08E-05 | 1,86E-04 | 1,21E-02 | 0,00E+00 | -1,80E+00 |
| Non-hazardous waste | kg | MND | MND | MND | MND | 3,57E-04 | 3,06E-03 | 2,50E-01 | 2,10E-01 | -2,95E+01 |
| Radioactive waste | kg | MND | MND | MND | MND | 2,67E-07 | 9,38E-07 | 1,69E-06 | 0,00E+00 | -2,12E-04 |

END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|--------------------------|------|----------|----------|----------|----------|----------|----------|-----|-----|-----|
| Components for re-use | kg | 0,00E+00 | 0,00E+00 | 1,37E-01 | 1,37E-01 | 0,00E+00 | 0,00E+00 | MND | MND | MND |
| Materials for recycling | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,92E-01 | MND | MND | MND |
| Materials for energy rec | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND |
| Exported energy | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,36E-02 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|--------------------------|------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Components for re-use | kg | MND | MND | MND | MND | 3,07E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 7,85E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,10E-01 | 0,00E+00 |
| Exported energy | MJ | MND | MND | MND | MND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -2,36E-02 |

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|----------------------|------------|----------|----------|----------|----------|----------|----------|-----|-----|-----|
| Global Warming Pot. | kg CO2e | 5,88E+00 | 1,32E-01 | 6,38E-01 | 6,65E+00 | 3,46E-01 | 1,55E-02 | MND | MND | MND |
| Ozone depletion Pot. | kg CFC-11e | 3,36E-07 | 2,41E-08 | 3,04E-08 | 3,91E-07 | 5,63E-08 | 2,46E-09 | MND | MND | MND |
| Acidification | kg SO2e | 2,74E-02 | 4,37E-04 | 2,56E-03 | 3,04E-02 | 7,83E-03 | 1,06E-04 | MND | MND | MND |
| Eutrophication | kg PO43e | 6,29E-03 | 9,95E-05 | 1,73E-03 | 8,13E-03 | 9,01E-04 | 3,62E-05 | MND | MND | MND |
| POCP ("smog") | kg C2H4e | 2,07E-03 | 1,71E-05 | 3,22E-04 | 2,41E-03 | 2,05E-04 | 2,69E-06 | MND | MND | MND |
| ADP-elements | kg Sbe | 4,84E-05 | 3,24E-07 | 1,01E-06 | 4,97E-05 | 2,31E-06 | 2,08E-08 | MND | MND | MND |
| ADP-fossil | MJ | 7,82E+01 | 1,99E+00 | 9,33E+00 | 8,96E+01 | 4,56E+00 | 2,04E-01 | MND | MND | MND |

| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|----------------------|------------|-----|-----|-----|-----|----------|----------|----------|----------|-----------|
| Global Warming Pot. | kg CO2e | MND | MND | MND | MND | 2,79E-03 | 9,24E-03 | 1,18E-01 | 6,43E-03 | -1,02E+01 |
| Ozone depletion Pot. | kg CFC-11e | MND | MND | MND | MND | 4,78E-10 | 1,70E-09 | 3,25E-09 | 6,37E-10 | -2,54E-07 |
| Acidification | kg SO2e | MND | MND | MND | MND | 2,09E-05 | 3,07E-05 | 4,36E-04 | 3,56E-05 | -8,88E-02 |
| Eutrophication | kg PO43e | MND | MND | MND | MND | 4,85E-06 | 7,00E-06 | 1,53E-04 | 1,04E-05 | -2,67E-02 |
| POCP ("smog") | kg C2H4e | MND | MND | MND | MND | 4,57E-07 | 1,20E-06 | 2,01E-05 | 2,43E-06 | -4,86E-03 |
| ADP-elements | kg Sbe | MND | MND | MND | MND | 1,41E-09 | 2,12E-08 | 5,86E-06 | 1,46E-08 | -7,08E-06 |
| ADP-fossil | MJ | MND | MND | MND | MND | 3,80E-02 | 1,40E-01 | 7,01E-01 | 9,65E-02 | -1,04E+02 |

ENVIRONMENTAL IMPACT – GWP - GHG - THE INTERNATIONAL EPD SYSTEM

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|-----------------------|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-GHG ⁹⁾ | kg CO ₂ e | 5,91E+00 | 1,33E-01 | 6,67E-01 | 6,71E+00 | 3,49E-01 | 1,57E-02 | MND | MND | MND |
| Impact category | Unit | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| GWP-GHG ⁹⁾ | kg CO ₂ e | MND | MND | MND | MND | 2,82E-03 | 9,34E-03 | 1,19E-01 | 6,63E-03 | -1,05E+01 |

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
07.03.2025

