

Environmental Product Declaration

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

Aluminium Conductor Steel Reinforced (ACSR Panther)



EPD Program	Title	Details
International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom office@climateintell.com	Registration #	ICIS-202409-57
	Date of Publication	21.09.2024
	Validity	20.09.2029
	Date of Revision	-

The most recent data needs to be provided through an EPD, which may be updated when circumstances change. Thereby the claimed validity is contingent upon ongoing validation at www.climateintell.com



Oman Aluminium Processing Industries SPC

Sohar Industrial Estate
 P O Box 324, Sohar, PC 322,
 Sultanate of Oman



www.oapil.com

TABLE OF CONTENTS

1. Program Information	3
2. Introduction	3
3. Company Information	4
4. Product Information	5
4.1. Analyzed Product	5
4.2. Product Specifications	5
4.3. Product Applications	5
5. LCA Information	6
5.1. Declared Unit	6
5.2. Time Representativeness	6
5.3. LCA Software and Database	6
5.4. System Boundaries	6
5.5. Manufacturing Flow and Diagram	10
5.6. Content Declaration	11
5.7. Substances listed in the Candidate List of SVHC	11
5.8. More Information	11
6. Environmental Performance	12
6.1. Potential Environmental Impacts	12
6.2. Interpretation of LCA Results	16
7. Mandatory Statements	17
8. Additional Information	18
8.1. Action Plans	18
8.2. Information Related to Sector EPD	18
8.3. Differences versus previous versions	18
9. Verification	18
10. Contact Information	19
11. References	19

1.0 PROGRAM INFORMATION

Program	International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom office@climateintell.com
Product Group Classification	UN CPC 41532
Product Category Rules (PCR)	PCR 2020:17 Construction products (EN 15804:2021+A2:2019 /AC:2021) Version 1.2.5 dated 01.11.2022. EN standard EN 15804 serves as the Core Product Category Rules (PCR)
Registration Number	ICIS-202409-57
Date of Publication	21.09.2024
Validity Date	20.09.2029
Geographical Scope	Global

2.0 INTRODUCTION

This report contains the environmental performance of the manufacturing process of Aluminium Conductor Steel Reinforced (ACSR-Panther) by Oman Aluminium Processing Industries SPC. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to 1 ton of Aluminium Conductor Steel Reinforced (ACSR-Panther).

The assessed life cycle includes all phases in the manufacturing process of Aluminium Conductor Steel Reinforced (ACSR-Panther) in a “cradle to gate with options” scope. This LCA covers transportation of Raw materials, production, distribution of final product to the customer and end of life stages.

This EPD has been conducted according to the program operator regulations and it has been verified in accordance with the International Climate Intelligence System. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Not only the system, but also its applications, is described in the Programmer’s Product Category Rules (PCR). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019/AC:2021.

3.0 COMPANY INFORMATION

Oman Aluminium Processing Industries SPC (OAPIL) is Oman's leading Aluminium rod and overhead line conductor manufacturer. The company was established in 2008 as a joint venture between two of Oman's prestigious business groups, Oman Cables Industries (SAOG) and Takamul Investments Co (SAOC) OAPIL is fulfilling its role as an important player in the Sultanate's Aluminium and Electrical Transmission sector by contributing to Oman's industrialization and creating an incomparable and skilled international workforce within the organization.

OAPIL announced its very first commercial production in the month of July 2010 and since then has been instrumental in shaping the Power Transmission Industries not only in Oman but also in other GCC countries and in select international markets. Today OAPIL is 100% owned by Oman Cables Industry SAOG.

At OAPIL, the customer is the focal point, as the processes and decision making are aligned to anticipate and exceed the customer's needs. OAPIL is committed to continuously raise the bar in terms of product innovation and creating solutions that serve the precise requirement of the customers. OAPIL is fully geared to meet the specific requirements of the customers for Aluminium rods and overhead line conductors, while creating benchmarks in terms of quality, environment, health & safety

Certifications

OAPIL has achieved the below certifications:

- ISO 9001:2015 – Quality Management System (131837-2023-AQ-ARE-RvA)
- ISO 14001:2015 – Environmental Management System (131126-2023-AE-ARE-RvA)
- ISO 45001:2018 – Occupational Health & Safety Management System (131833-2013-AHSO-ARE-RvA)



4.0 PRODUCT INFORMATION

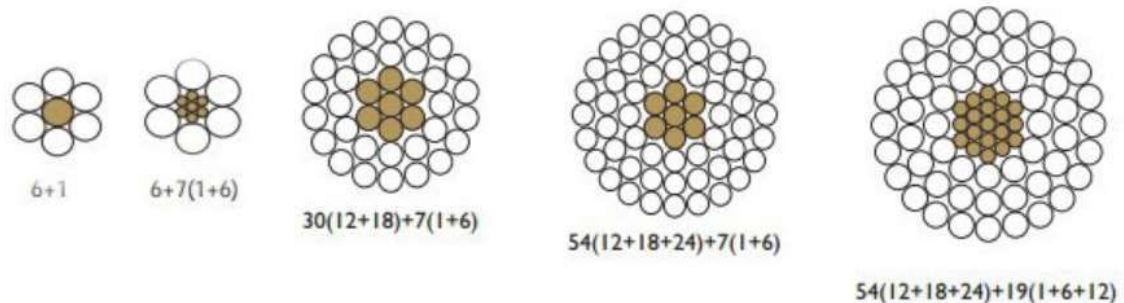
4.1 Analyzed Product

The assessed system in this Environmental Product Declaration (EPD) comprises the full life cycle of Aluminium Conductor Steel Reinforced (ACSR-Panther).

4.2 Product Specifications

ACSR, a non-homogenous conductor, is a concentric-lay stranded conductor made from round Aluminium EC wires and round, coated steel core wire(s). Several combinations of Aluminium and steel strands and layers are available when designing ACSR conductors for overhead lines. Commonly used sizes are included here. Class A zinc coating (ACSR/GA2) is usually adequate for ordinary environments to protect the steel core wires from corrosion.

ACSR conductors due to their steel core, has higher strength and used in electricity distribution network .



ACSR are manufactured in accordance with the following Standards:			
British Sizes	BS EN 50182, 215	Canadian Sizes	CSA C 49
IEC Sizes	IEC 61089	German Sizes	DIN 48 204
American Sizes	ASTM B 232		
For more details https://www.oapil.com/index.php?option=content&id=196%20&mid=278&itemid=309			

4.3 Product Application

ACSR Panther Conductor is suitable for use in all practical spans on wood poles, distribution network and other structures. Applications range from short power distribution lines to sub-service spans at distribution or utilization voltages on private premises.

5.0 LCA INFORMATION

5.1 Declared Unit

The Declared Unit of the Life Cycle Assessments is One-Ton of Aluminium Conductor Steel Reinforced (ACSR-Panther). Conversion factor is used to get One Kilometer of All Aluminium Conductor Steel Reinforced (Conversion details are given in clause 6.1). This EPD presents the environmental impacts associated to the LCA of Aluminium Conductor Steel Reinforced (ACSR-Panther).

5.2 Time representativeness

Manufacturing facility specific data from Oman Aluminium Processing Industries are based on 1 year average for process data (Reference year January to December 2023). The following rules for time scope of data were applied - < 10 years for background data and < 2 years for manufacturer's data.

5.3 LCA Software and Database

Version 3.16.3.4 of software Air.e LCA™ with Ecoinvent™ 3.9.1 database has been used for LCA modeling and impacts calculations.

5.4 System Boundaries

This EPD covers all product stages from “cradle to gate with options”, i.e this LCA covers Production stage A1-A3, Transportation A4, End of life stages C1-C4 and Resource recovery stage D according to EN 15804 + A2/AC:2021.

The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels and electricity.
- The production of the machinery, buildings, and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

Upstream Processes (A1: Raw Material Supply): Production of the product starts with mainly raw material production in-house. Raw material supply' includes raw material extraction before production.

Core Processes (A2: Transportation): Transport is relevant for delivery of raw materials to the plant. The wire rod is produced in OAPIL. Steel Core, Grease, Overhead Conductor Protection - Non-drop is transported from different part of the region.

Manufacturing (module A3): The processes that are included in the manufacturing phase are wire drawing and stranding. Electricity, Natural Gas and Diesel are consumed in the production process. During the manufacturing process, 100% process scrap is consumed in-house (re-melted).



Transport (module A4): To create a scenario of the A4 phase, all the products sold from January to December 2023 has been analyzed as representative of the international transport. The transport means 3.5-7.5t & >32t trucks, Euro 6.

Scenario Details	Description
Vehicle used for transport	3.5-7.5t & >32t trucks, Euro 6.
Vehicle capacity	3.5 -7.5 tons and >32 tons
Fuel type and consumption	Diesel, 0.38 liters per km
Capacity utilization	100% as assumed in Ecoinvent
Bulk transportation	Mass of the transported product.

Dismantling/demolition (module C1)

95% of the Aluminium is removed (as per The Aluminium Association) during demolition with diesel consumption of machineries: 60.8 liters/hour; capacity approx. 15 m³/h) and 40% is dismantled with hydraulic excavator and tongs (diesel consumption of excavator: 36.1 liters/hour; capacity approx. 20 m³/h). Calculated diesel consumption for the demolition of 1 kg Aluminium is 0.0013 liters.

Transportation of demolished items (module C2)

With a collection rate of 100%, 95% of the Aluminium is transported to a nearby scrap yard and the remaining 5% is transported to a landfill site. The transports are carried out by a >32 ton truck over 50 km carrying the demolished items from the demolition site to a nearby scrap yard and landfill sites. Aluminium is collected as mixed construction waste.

Type	Capacity utilization	Type of vehicle	Average distance
Truck	75%	Euro 3.5-7.5t	50 km

Waste processing (module C3)

Aluminium must be mechanically separated from any other material surrounding them prior to recycling so that it can be made available to a downstream product system as secondary material. Hence, the environmental impacts of separation of Aluminium are considered in module C3.

Disposal (module C4)

This module assumes that 5% of the produced AAC HC YEW is disposed of in a landfill.

Reuse, Recycling, and Recovering Potential (module D)

Represents the recycling benefits of the used Aluminium and packaging materials.

Manufacturing and System Boundaries Diagram

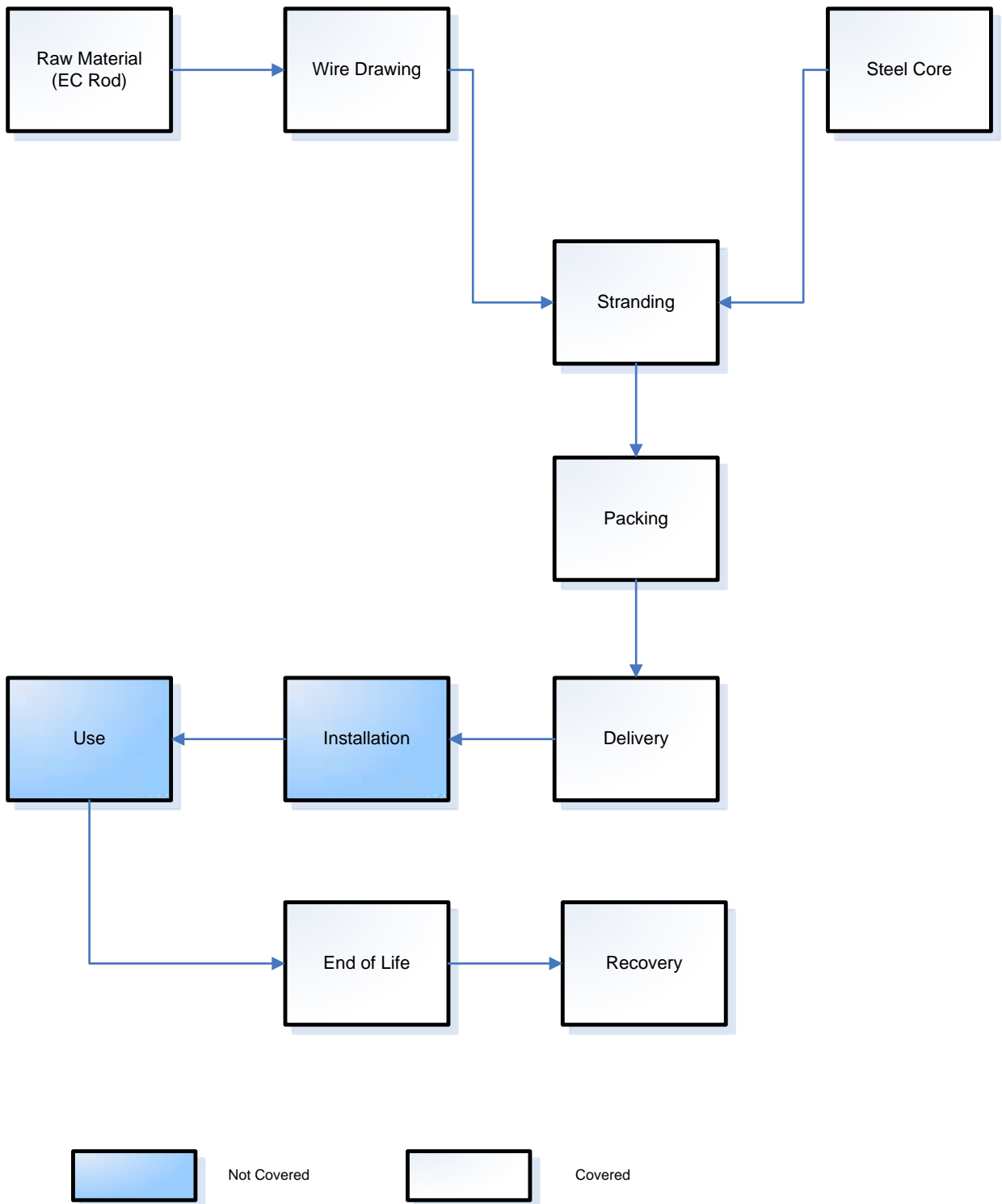
	Production Stage				Construction Process Stage	Use Stage							End of Life Stage				Resource Recovery Stage
	Raw Materials	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction Demolition	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	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Oman	GLO	Oman	GLO	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data	GWP > 90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	One Product				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	One manufacturing center				-	-	-	-	-	-	-	-	-	-	-	-	-

X = Included, ND=Module not declared, NR= Module not relevant

Modules from A5 to B7 are not included (X refers to considered stage; N refers to not relevant stage and ND to not declared stage).

Scope of this Life Cycle Assessment 'Cradle to Gate with Options'					
A1 Raw Materials Production	A2 Transport raw materials	A3 Manufacture	A4 Distribution	End of use Stage (C1-C4)	Recovering and Recycling (D)
Raw Materials	Raw material Transportation	Wire Drawing and Stranding	Transport to customers by sea and road	Demolition, transport, disposal.	Reuse, recovery and recycling potential

5.5 The following diagram is a more detailed description of the process.



5.6 Content Declaration

Product Components	Weight %	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium	57.862	0	0
Steel Core	39.737	0	0
Grease	2.401	0	0
Total	100	0	0

Packaging Materials			
Packaging Materials	Weight Kg	Weight % (Versus the Product)	Weight biogenic carbon, kg C/kg
Corrugated Sheet - 2 Ply	1045	0.23	0
Strap PP	55	0.01	0
LLDPE Sheet Black	1665	0.36	0
Wooden Drum	58240	0.88	0
Total	61,005	1.48	0
Biogenic carbon content is not presents since the packaging weights less than a 5% over the product's weight.			

5.7 Substances listed in the "Candidate List of SVHC"

During the life cycle of the product, no hazardous substances listed in the "Candidate List of substances of very high concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

5.8 More information

Cut-off rules: more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

Allocations: The allocation of common inputs and outputs is based on the general allocation rule what represents the proportion of production of every specific product in overall production expressed in Metric Tons. Generic process data for production of input materials were used.

Electricity: A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Sohar, Sultanate of Oman, has been used for this LCA.

Calculation Rules: Datasets from Ecoinvent 3.9.1 with emission factors for raw materials and generic chemicals have been characterized to adjust them to the characteristics of manufacturing of suppliers or counties where suppliers are located. Specific datasets with the emissions factors corresponding to the fuel combustion of

production plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact. Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment.

All transports of components have been included in the LCA considering real distances travelled by materials used for production. It is estimated in a global scale according to Ecoinvent™ criteria. As exact port locations are not known in detail, transport distances have been calculated from a one of the ports in the country of origin to the factory. Operation in port has also been excluded. Road distances calculated using Google Maps. Maritime distances calculated using Marine Traffic Voyage Planner.

By Products Assignment: There are no by-products in this Environmental Product Declaration. Hence no allocation had to be applied.

6.0 ENVIRONMENTAL PERFORMANCE

6.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared units “One-Ton of Aluminium Conductor Steel Reinforced (ACSR-Panther)” is presented for the Oman Aluminium Processing Industries. During the assessment it was not evident to distinguish the differences in the consumption of electricity, water and raw material during the manufacturing. Hence, the calculation is based on total production vs total consumption against manufacturing of the product. Environmental impacts are calculated using the EF-3.1, (ILCD).

Conversion

Conversion factor from Ton to One Kilometer of Aluminium Conductor Steel Reinforced (ACSR-Panther).

- 1 KM = 1.004 MT

Environmental impacts: GHG -GWP

Example: $A1 = 3.65E+03 \text{ kgCo2e/ton} \times 1.004 = 3.66E+03 \text{ (3664.6) kgCo2e/KM}$

$A2 = 4.88E+01 \text{ kgCo2e/ton} \times 1.004 = 4.90E+01 \text{ (48.995) kgCo2e/KM}$

$A3 = 1.25E+02 \text{ kgCo2e/ton} \times 1.004 = 1.266E+02 \text{ (125.5) kgCo2e/KM}$



Aluminium Conductor Steel Reinforced (ACSR-Panther)

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding thresholds values, safety margins or risks.

Core Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	3.65E+03	4.88E+01	1.25E+02	2.94E-02	ND	ND	1.32E+01	2.92E+00	5.05E+02	1.43E+01	-1.97E+03
Climate change (GWP) – biogenic	kg CO2e	5.80E+00	8.13E-03	1.39E-02	0.00E+00	ND	ND	1.15E-03	0.00E+00	1.46E+00	1.09E-01	-5.29E+00
Climate change (GWP) – LULUC	kg CO2e	1.99E+00	3.32E-02	6.18E-03	0.00E+00	ND	ND	5.73E-04	0.00E+00	8.56E-01	9.39E-02	-1.76E+00
Climate change (GWP) – total	kg CO2e	3.66E+03	4.89E+01	1.25E+02	2.94E-02	ND	ND	1.32E+01	2.92E+00	5.07E+02	1.45E+01	-1.98E+03
Ozone depletion	kg CFC11e	1.26E-04	9.60E-06	3.92E-06	0.00E+00	ND	ND	3.67E-07	0.00E+00	3.10E-05	1.66E-06	-1.38E-04
Acidification	mol H+e	1.53E+01	1.57E+00	2.93E-01	1.03E-02	ND	ND	1.67E-02	1.02E-03	2.41E+00	1.03E-01	-9.81E+00
Eutrophication, aquatic freshwater	kg PO4e	1.64E+00	4.64E-03	4.82E-03	0.00E+00	ND	ND	4.73E-04	0.00E+00	6.86E-01	2.23E-02	-1.56E+00
Eutrophication, aquatic freshwater	Kg P eq	5.35E-01	1.51E-03	1.57E-03	0.00E+00	ND	ND	1.54E-04	0.00E+00	2.23E-01	7.26E-03	-5.09E-01
Eutrophication, aquatic marine	kg Ne	2.33E+00	3.87E-01	1.09E-01	5.13E-03	ND	ND	4.59E-03	5.12E-04	6.81E-01	1.90E-02	-2.08E+00
Eutrophication, terrestrial	mol Ne	2.52E+01	4.30E+00	1.19E+00	5.78E-02	ND	ND	4.90E-02	5.73E-03	4.94E+00	1.70E-01	-2.25E+01
Photochemical ozone formation	kg NMVOCe	1.37E+01	1.11E+00	4.66E-01	1.53E-02	ND	ND	3.10E-02	1.51E-03	1.81E+00	4.64E-02	-8.04E+00
Abiotic depletion, minerals & metals	kg Sbe	1.99E-02	6.64E-05	8.60E-05	0.00E+00	ND	ND	7.32E-06	0.00E+00	4.68E-03	1.78E-03	-9.49E-03
Abiotic depletion of fossil resources	MJ	4.23E+04	6.55E+02	2.04E+03	0.00E+00	ND	ND	2.30E+02	0.00E+00	6.12E+03	1.80E+02	-2.64E+04
Water use	m3e depr.	1.27E+02	1.47E+00	8.37E+00	0.00E+00	ND	ND	9.49E-01	0.00E+00	3.49E+02	1.60E+01	-5.78E+02

EN 15804:2012+A2:2019/AC: 2021 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10⁻³ = 0.00157"

Additional Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3.00E-04	1.48E-06	9.11E-07	5.46E-08	ND	ND	8.58E-08	5.26E-09	3.00E-05	7.83E-07	-1.70E-04
Ionizing radiation, human health	kBq U235e	6.65E+01	2.80E+00	3.34E-01	0.00E+00	ND	ND	1.35E-02	0.00E+00	4.23E+01	1.75E+00	-5.92E+01
Eco-toxicity (freshwater)	CTUe	1.51E+04	1.80E+02	8.06E+01	8.74E-02	ND	ND	7.54E+00	8.33E-03	3.73E+03	3.93E+02	-7.50E+03
Human toxicity, cancer effects	CTUh	1.00E-05	1.92E-08	1.33E-08	1.01E-09	ND	ND	1.38E-09	1.00E-10	8.76E-06	2.34E-08	-7.94E-06
Human toxicity, non-cancer effects	CTUh	3.00E-05	1.61E-07	2.21E-07	1.94E-08	ND	ND	2.24E-08	1.96E-09	4.00E-05	8.50E-07	-2.00E-05
Land use related impacts/soil quality	Dimensionless	3.14E+05	8.18E+01	4.14E+01	0.00E+00	ND	ND	3.98E+00	0.00E+00	2.37E+03	1.38E+02	-3.08E+05

EN 15804:2012+A2:2019/AC: 2021 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Environmental impacts – GWP-GHG

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ e	3.65E+03	4.88E+01	1.25E+02	2.94E-02	ND	ND	1.32E+01	2.92E+00	5.05E+02	1.44E+01	-1.97E+03

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	4.28E+04	4.13E+00	2.97E+00	0.00E+00	ND	ND	2.71E-01	0.00E+00	5.36E+02	2.39E+01	-4.21E+04
Renewable PER used as materials	MJ	3.67E+00	1.82E-02	2.77E-02	0.00E+00	ND	ND	2.87E-03	0.00E+00	1.88E+00	4.60E-02	-3.20E+00
Total use of renewable PER	MJ	4.28E+04	4.15E+00	3.00E+00	0.00E+00	ND	ND	2.74E-01	0.00E+00	5.38E+02	2.39E+01	-4.21E+04



Non-renew. PER used as energy	MJ	4.23E+04	6.55E+02	2.04E+03	0.00E+00	ND	ND	2.30E+02	0.00E+00	6.12E+03	1.80E+02	-2.64E+04
Non-renew. PER used as materials	MJ	4.34E-03	1.09E-05	1.43E-05	0.00E+00	ND	ND	1.44E-06	0.00E+00	1.36E-03	5.27E-05	-4.81E-03
Total use of non-renewable PER	MJ	4.23E+04	6.55E+02	2.04E+03	0.00E+00	ND	ND	2.30E+02	0.00E+00	6.12E+03	1.80E+02	-2.64E+04
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Waste

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	4.26E+04	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.71E+05
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic Carbon Content

Details	Unit	A1-A3
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in accompanying packaging	Kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂. "Reading example: 1.57E-03 = 1.57*10⁻³ = 0.00157"

Disclaimer: "According to the EN 15804:2012+A2:2019 standard, the LCIA results are relative expressions translating impacts into environmental themes such as climate change, ozone depletion, etc. (midpoint impact categories). Thus, the LCIA results do not predict impacts on category endpoints such as impact on the extinction of species or human health. In addition, the results do not provide information about the exceeding of thresholds, safety margins or risks".

6.2 Interpretation of LCA Study Results

In general terms, as it is shown in the table of core environmental impact indicators, A1-A3 modules have the higher impact, representing above 80% of the whole impact. A4 module has a less impact. C2 and C4 module has little impact too, representing at most 0.16% and 0.01% respectively of the whole impact. Refer the below table 1 for more detailed explanations.

Concluding, the study provides fair understanding of environmental impacts during the various life cycle stages of Aluminium Conductor Steel Reinforced (ACSR-Panther) production. It also identifies the hot spots in the value chain where improvement activities can be prioritized and accordingly actions can be planned. The scope covers the ecological information to be divided into raw material production (A1), transportation (A2), manufacturing (A3), delivery (A4), product dismantling (C1), transport of dismantled product to site (C2), waste processing (C3), waste disposal (C4) as well as the end of life stage recycling (D) considerations.

Table 1 - Interpretation of most significant contributors to life cycle parameters (All Aluminum Alloy Conductor HC YEW)

Impact Indicator	Description	Most significant contributor
Depletion of abiotic resources – fossil fuels	Indicator of the depletion of natural fossil fuel resources.	The total cradle to gate impact is 4.50E+04 (44981.47) MJ. In A1 – A3, the Raw material process (94.02%) and production process (4.53%) has the highest impacts. A total credit of - 2.64E+04 (26434.80) MJ is taken in module D.
Climate Change (Global Warming Potential- GWP-GHG)	Indicator of potential global warming due to emissions of greenhouse gases to the air. Divided into 3 subcategories based on the emission source: (1) fossil resources, (2) bio-based resources, and (3) land use change.	The total cradle to gate impact is 3.82E+03 (3823.53) kg CO2 eq. In A1 – A3, the raw material (95.41%) followed by production (3.25%) has the highest impacts. A total credit of - 1.97E+03 (1383.54) kg CO2 eq is taken in the module D.
Climate change (fossil)	Indicator of the Climate change is largely driven by the release of greenhouse gases like CO 2.	The total cradle to gate impact is 3.82E+03 (3821.49) kg CO2 eq. In A1 – A3, the raw material (95.46%) followed by production (3.26%) has the highest impacts. A total credit of - 1.97E+03 (1969.74) kg CO2 eq is taken in the module D.

7.0 MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. The verifier and The Program Operator do not make any claim or present any responsibility about the legality of the product. The EPD owner has the sole ownership, liability, and responsibility for the EPD. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

EPDs within the same product category but registered in different EPD programmes 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; have equivalent content declarations; and be valid at the time of comparison.

8.0 ADDITIONAL INFORMATION

8.1 Action against Erosion, Environmental Restoration, and Landscaping of the work.

Application of measures to prevent erosion, restore the environment, and landscape the job includes restoring all elements immediately connected to it. The restoration of other related items indirectly is also suggested, including auxiliary facilities and landfill lands.

We recycle as many waste materials as possible. We follow a Just-in-Time manufacturing strategy to increase efficiency, reduce wastage and eliminate the need for excess storage.

8.2 Information related to Sector EPD

This is not a sector EPD.




8.3 Differences versus previous versions

This is the first version of the EPD.

9.0 VERIFICATION

Diffusion Institution	International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom
Registration Number	ICIS-202409-57
Date of Publication	21.09.2024
Valid until	20.09.2029
Geographical Scope	Global
Product category rules (PCR): PCR 2020:17 Construction products (EN 15804:2012+A2:2019/AC:2021) Version 1.2.5 dated 01.11.2022. EN standard EN 15804 serves as the Core Product Category Rules (PCR)	
PCR review was conducted by: International Climate Intelligence System.	
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: <input type="checkbox"/> EPD Process Certification (internal) <input checked="" type="checkbox"/> EPD Verification (external)	
Third party verifier: Mr.Luis Manuel, San Adrián, Spain Accredited by: International Climate Intelligence System	

10.0 CONTACT INFORMATION

EPD Owner	<p>Oman Aluminium Processing Industries SPC (OAPIL) Sohar Industrial Estate, P O Box 324, Sohar, PC 322, Sultanate of Oman Tel : +968 26827330 sanjeev.gupta@oapil.com www.oapil.com</p>	
LCA Author	<p>Alan Beski Christopher -Sustainability Consultant GCAS Quality Certifications P.O.Box 65561, Dubai, UAE www.gcasquality.com info.dubai@gcasquality.com</p>	
Verifier Details	<p>Name: Mr.Luis Manuel Location: San Adrián, Spain Accredited by: International Climate Intelligence System</p>	

11.0 REFERENCES

LCA Report: Life Cycle Inventory of Aluminium Conductor Steel Reinforced (ACSR-Panther) by Oman Aluminium Processing Industries SPC (OAPIL)

Software: Air.e LCA Version 3.16.3.4 www.solidforest.com

Main database: Ecoinvent 3.9.1 www.ecoinvent.org

Geographical scope of the EPD: Global

ISO 14040:2006 "Environmental management -- life cycle assessment -- principles and framework";

ISO 14044:2006 "Environmental management -- life cycle assessment -- requirements and guidelines";

ISO 14025:2006 "Environmental labels and declarations -- type III environmental declarations -- principles and procedures".

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

General Programme Instructions of the International Climate Intelligence System

