GlobalEPD
A VERIFIED ENVIRONMENTAL DECLARATION

ECO PLATFORM EPD VERIFIED

AENOR

Bare Galvanized Strand P64

Environmental Product Declaration

EN ISO 14025:2010
EN 15804:2012+A2:2020
UNE 36904-2:2018

Publication date: 2025-04-10
Modification date: 2025-04-23
Validity date: 2029-04-09

The declared validity is subject to registration and publication on www.aenor.com

Global EPD Code: GlobalEPD 001-017 rev1

CELSA | TYCSA PSC

TYCSA PSC

The owner of this Declaration is responsible for its content, as well as for keeping the supporting documentation that justifies the data and statements included during the period of validity.

Owner of the Declaration

Tycsa PSC – Grupo Celsa
Pol. Industrial Nueva Montaña s/n,
39011 Santander (Cantabria)
Spain

Tel. (+34) 942 200 336 / 630 885 950
Mail icano@tycsa.com
Web www.tycsapsc.com

LCA Study

Abaleo S.L.
D. José Luis Canga Cabañes
c/ Poza de la Sal, 8; 3º A
28031 Madrid
Spain

Tel. (+34) 639 901 043
Mail jlcanga@abaleo.es
info@abaleo.es
Web https://abaleo.es/

GlobalEPD Programme Operator

AENOR CONFÍA S.A.U.
C/ Génova 6
28004 – Madrid
Spain

Tel. (+34) 902 102 201
Mail aenordap@aenor.com
Web www.aenor.com

AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programs.

UNE 36904-2:2018 The European Standard EN 15804:2012+A2:2019 serves as the basis for PCR
Independent verification of the declaration and data, according to Standard EN ISO 14025:2010 ☒ Interna ☒ Externa
Verification Body AENOR Product certification body accredited by ENAC with accreditation Nº 1/C-PR468

1. General Information

1.1. The organization

Tycsa PSC is the largest manufacturer of wires and high elastic limit steel strands for construction and the company in the sector with the largest presence in the international market, offering a long experience in manufacturing your products, with the contribution of a highly qualified human team and a global comercial presence.

Tycsa PSC began its journey in Barberá del Vallès (Barcelona) in the 1950s as one of the largest national producers of wires, strands and cables for different applications industrial, but with a strong export profile, with contact already at the time on a regular basis with different international markets.

Today, the extensive experience in combination with advanced production processes and rigorous control mechanisms make the quality of Tycsa PSC its best presentation.

Tycsa PSC is one of the Spanish steel companies that is part of the Steel Sustainability Brand, fulfilling all the objectives of this entity, which is associative and non-profit in nature.

As a member of the Steel Sustainability Brand, Tycsa PSC has Management systems with valid certificates issued by an accredited certification entity in accordance with:

- UNE-EN ISO 9001:2015 Quality management systems. Requirements
- UNE-EN ISO 14001:2015 Environmental management systems. Requirements.
- ISO 45001:2018 – Occupational Health and Safety mangement systems.

Likewise, it has a steel sustainability management system in accordance with:

- UNE 36901 "Sustainability Management Systems for Steelmaking.Requirements" (SGSS-1)
- SGSS-3 "Sustainability Mangement Systems for Steelmaking. Indicators for Steel Products for Active Reinforcement"

1.2. Scope of the Declaration.

This environmental product declaration describes environmental information related to the life cycle of production from cradle to gate with modules A4, C1-C4 and D (A1-A3, A4, C and D), of bare galvanized 7-wire strand (P64) produced by Tycsa in Santander plant.

The function performed by the product system studied is the production of galvanized strand for use in the construction sector as a construction element.

1.3. Lyfe cicle and conformity.

This EPD has been drawn up and verified according to the standards EN ISO 14025:2010, EN 15804:2012+A2:2020, UNE 36904-2:2018.

Table 1-1. Product Category Rule

Title	Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.
Register /version	UNE EN 15804:2012+A2:2020/AC :2021
Date of issue	2020
Administrator	AENOR

This EPD includes the lifecycle stages indicated in Table 1-2. This EPD is of the cradle-to-gate type with modules C and D.

Table 1-2. System boundaries. Information modules considered

Production stage	A1	Supply of raw materials	X
	A2	Transportation to factory	X
	A3	Manufacturing	X
Construction	A4	Transportation to construction site	X
	A5	Installation/construction	MND
Use stage	B1	Use	MND
	B2	Maintenance	MND
	B3	Repair	MND
	B4	Replacement	MND
	B5	Rehabilitation	MND
	B6	Energy use in service	MND
	B7	Water use in service	MND
End of life	C1	Deconstruction/demolition	X
	C2	Transportation	X
	C3	Waste treatment	X
	C4	Disposal	X
	D	Potential for reuse, recovery, and/or recycling	X

X = Module included in the LCA; NR = Not relevant module; MND = Not declared module

This EPD may not be comparable to others developed in other Programs or according to documents of different reference; specifically can not be comparable to EPDs not developed and verified according to the EN 15804 Standard.

Similarly, the EPDs may not be comparable if the source of the data is different (for example, databases), if all relevant information modules are not included or if they are not based on the same scenarios.

The comparison of construction products must be done on the same function, applying the same functional unit and at the level of the building or infrastructure, which means, including the behavior of the product throughout its entire life cycle, as well as the specifications of the section 6.7.2. of the EN ISO 14025 Standard.

1.4. Differences compared to previous versions of this EPD.

This modification is issued to update the composition of the product.

2. The Product

2.1. Identification of the product.

This EPD applies to the bare galvanized drawn steel strand P64 manufactured by Tycsa.

CPC Code: 4126 – Cold-rolled bars, wire rod, shapes, angles and sections of iron or steel; hot-rolled, drawn or extruded angles, shapes and sections of alloy steel; steel wire.

Table 2-1 Product description

Parameter	Galvanized Strand
Modulus of elasticity	195 GPa ±10%
Elongation	≥ 3,5% w L > 500 m
Relaxation	≤ 2,5% after 1.000 h at F_0=0.70xF_m

The composition and properties of the strand are established in the different standards applicable to this type of cord, for example:

- NF A 35-035 2001 Galvanized Wire and Strand
- NF A35-037-1_2021 Steel Products-Producted and sheathed high strength steel strands-General requirements
- NF A35-037-2_2021 Steel Products-Producted and sheathed high strength steel strands-Requirements for sliding protected and sheathed strands (type P)
- NF A35-037-3_2021 Steel Products-Producted and sheathed high strength steel strands-Requirements for adherent protected and sheathed strands (type SC)

2.2. Composition of the product.

The product for which this EPD is written is galvanized steel wire rod.

Tabla 2-2 Product composition

Material	% weight
Steel wire rod	96 - 97
Zinc	4 - 5

Tycsa's wire rod uses 96.98% scrap metal.

The manufacturer declares that during the product's life cycle, no hazardous substances listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" are used in a percentage greater than 0.1% of the product's weight. The primary packaging used in the shipment of the product (distribution packaging) has been included in the study.

Table 2-3 Distribution packaging

Material	Kg/ud. declared
Wood	3,49E+00
Paper	5,36E-03
Plastic	5,26E-01
Steel	1,65E+00
Others	5,62E-02

3. Information regarding the LCA

3.1. Life cycle analysis.

The Life Cycle Analysis Report for the EPD of the bare galvanized 7-wire strand manufactured by Tycsa was prepared by Abaleo S.L. using the Ecoinvent 3.10 database and SimaPro 9.6.0.1 software, which was the most up-to-date version available at the time of the LCA.

For the study, data from the Tycsa plant located in Santander (Cantabria) was used.

The LCA study follows the recommendations and requirements of international standards ISO 14040:2006, ISO 14044:2006, UNE-EN 15804:2012+A2:2020 and UNE 36904-2:2018 as RCP.

3.2. Study Scope.

The scope of this LCA is the manufacture of cradle to gate with modules C and D of the bare galvanized strand.

Limitations of the study.

The following are not included in the LCA:

- All equipment with a useful life greater than 3 years.
- The construction of plant buildings and other capital assets.
- Staff business travel, including staff travel to and from work.
- Research and development activities.

3.3. Declared Unit.

The declared unit is one tonne (1.000 kg) of product.

3.4. Reference Service Life (RSL).

The Reference Service Life (RSL) is not specified because the use stage is not included in the EPD.

3.5. Allocation criteria.

In accordance with the criteria of the reference standard, the allocation of system inputs and outputs was applied based on physical properties (mass). This allocation criterion was applied to general plant consumption (materials, fuel, water, and energy), transportation, packaging, emissions, discharges, and waste.

It has not been necessary to apply economic allocation criteria.

3.6. Cut-off Criteria.

The gross weight/volume of all materials used in the manufacturing process has been included in the LCA. Consequently, the criterion of including at least 99% of the total weight of the products used for the declared functional unit is met.

3.7. Representativeness, quality and selection of data.

To model the galvanized wire manufacturing process, production data from the Tycsa plant for 2021 were used, a period with representative production data. The specific data for the galvanizing process at the TQ plant correspond to 2022, as no treatment was carried out for Tycsa in 2021. Data was obtained on material and energy consumption, transportation; and waste generation.

When necessary, the Ecoinvent 3.10 database (March 2024) was used, which was the latest version available at the time of the LCA. For the inventory data, to model the LCA and to calculate the environmental impact categories required by the reference standard, SimaPro 9.6.0.1 software was used, which was the most up-to-date version available at the time of the study.

The following criteria were applied to select the most representative processes:

- The data should be representative of the technological development actually applied in manufacturing processes. If this information is unavailable, data representative of an average technology has been chosen.
- That the geographic data be as close as possible and, where appropriate, regionalized means.
- That the data be as current as possible.

To assess the quality of the primary data used in the study, the semi-quantitative data quality assessment criteria proposed by the European Union in its Guide to the Environmental Footprint of Products and Organizations were applied. The results obtained are as follows:

- Very good integrity. Score 1.
- Good methodological suitability and coherence. Score 2.
- Very good temporal representation. Score 2.
- Good technologicla represetation. Score 2.
- Very good geographical representation. Score 1.
- Low data uncertainty. Score 1.

According to the above data, the Data Quality Rating (DQR) takes the following value: 9/6 = 1.5, which indicates that the data quality is excellent.

To better understand the data quality assessment carried out, it is indicated that the score for each of the criteria varies from 1 to 5 (the lower the score, the higher the quality) and that the following table is applied to obtain the final score.:

Table 3-Data Quality Rating (DQR)

Overall data quality score (DQR)	Overall quality level of data
≤ 1,6	Excellent quality
1,6 a 2,0	Very good quality
2,0 a 3,0	Good quality
3 a 4,0	Reasonable quality
> 4	Insufficient quality

4. System boundaries, scenarios and additional technical information.

4.1. Description of the system boundaries.

In the product system of the Life Cycle Analysis of Tycsa's galvanized strand, the following phases have been studied:

Module A1 – Production of raw materials.

This module includes the production process of raw materials, which considers:

- Extraction of resources and raw materials.
- Transportation to raw material processing/production centers.
- Energy and fuel consumption during the production of raw materials.
- Consumption of other resources (such as water) during the production of raw materials.
- Generation of waste and emissions into the air and discharges into water and soil during the production of raw materials.
- Generation of electricity and heat from primary energy resources used in the manufacturing process.

Module A2 - Transportation of raw materials to the factory.

The transportation of the materials used in the plant has been considered, from the production sites (suppliers) to the Tycsa PSC facilities in Santander, distinguishing the mode of transport used for each one: truck. This stage also includes the round-trip transportation of the wire from the Tycsa facilities to the TQ plant where it is galvanized. The transportation distances have been provided by the facility managers, who know the location of their suppliers' facilities.

Module A3 - Manufacturing.

The different stages of production have been considered in the manufacturing process. This module considers water consumption, the production of auxiliary materials used in each stage, and the production of packaging. This stage also considers emissions to both water and air resulting from the production process, as well as the management and transportation of the waste generated. Waste transportation distances have been provided by plant managers, who are aware of the location of their waste management facilities.

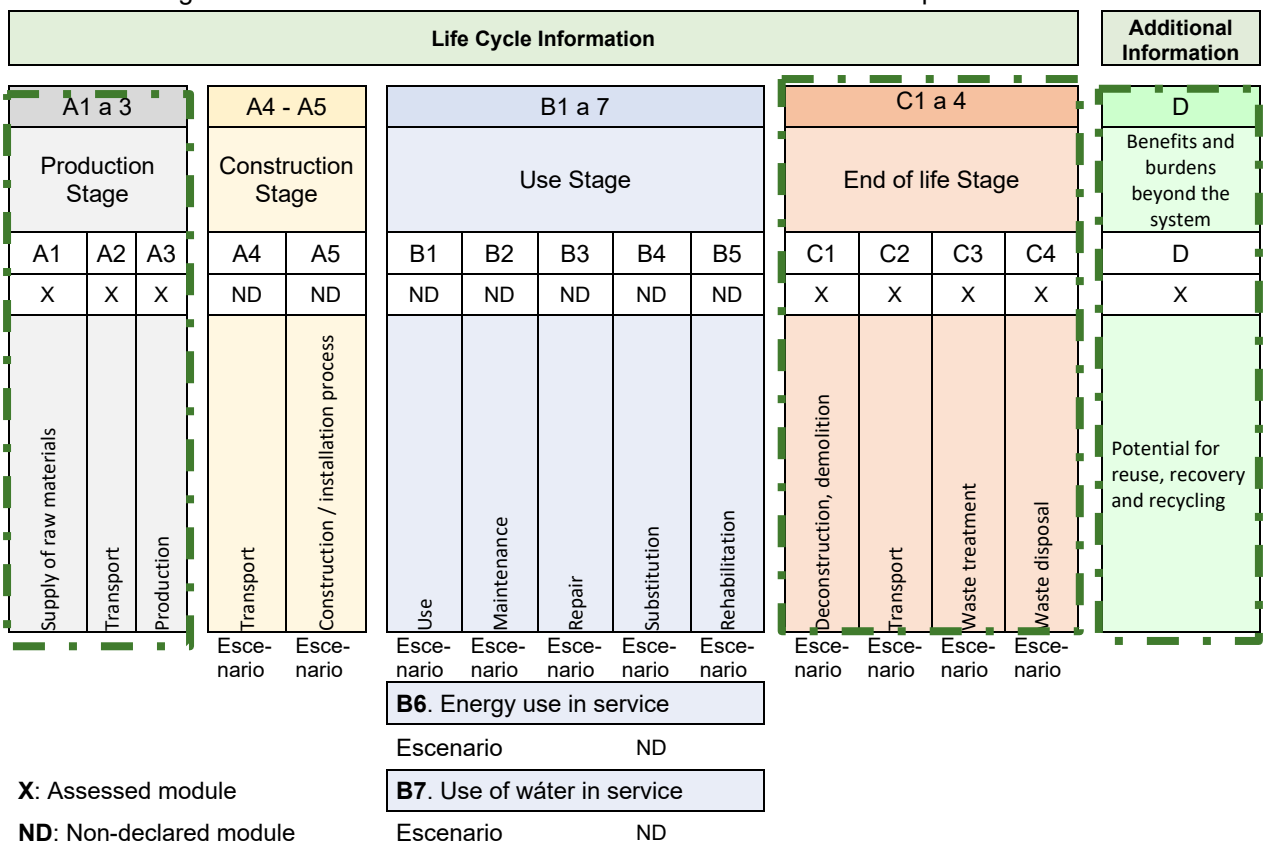
Moduce C1 – Deconstruction / demolition.

The LCA assumes that 100% of the steel produced was used to complement the structure of buildings. A generic process from the Ecoinvent 3.10 database was used to represent the demolition process.

Module C2 - Transportation to the waste treatment/recovery site.

It is considered that, at the end of its useful life, the studied product is transported by road an average distance of 100 km to the nearest waste management point, with EURO6 trucks of 16-32 tons.

Table 4-1. Stages and information modules for the evaluation of construction products.



<u>Module C3</u> – Waste treatment, and <u>Module C4</u> – Waste disposal.

To determine the recycling and landfill and incineration percentages of the products studied, the criteria of Part C of Annex 2 V2.1 (May 2020) of the Circular Footprint Formula of the European Union Environmental Footprint methodology (COMMISSION RECOMMENDATION (EU) 2021/2279 of 15 December 2021 on the use of environmental footprint methods to measure and report the environmental performance of products and organizations throughout their life cycle) are applied.

Table 4-2 Modulce C parameters

Parameter	Value (per unit declared))
Demolition	It is considered that, during the deconstruction and disassembly process of the products studied, the consumption of material and energy are included within the framework of the building or civil works of which they are part.
Collection process, specified by type	1.000 kg. collected separately.
	0 kg collected with a mixture of construction waste.
Recovery system, specified by type	0 kg for reuse.
	850 kg for recycling.
	0 kg for energy recovery.
Deletion, specified by type	67,5kg for incineration
	82,5 kg for final disposal.
Assumptions for scenario development (transport)	Transport of waste in a 16-32 tonne EURO6 truck: - Average distance of 100 km from the construction site to the management points.

Módulo D - Benefits beyond the system

The steel used in the manufacture of these products is 96.98% scrap, so module D is calculated based on the percentage of steel remaining.

Waste recovered or recycled during the product stage is not included in the system limits of this module because it represents less than 1% of the declared unit.

4.2. Description of the manufacturing process.

The production process consists of the following phases:

Pickling of wire rod

The pickling phases are as follows:

- Pickling in an HCl bath: HCl plus water.
- Activation: water plus the addition of a salt.
- Phosphating: water plus the addition of a salt.
- Borating: water plus the addition of a salt.
- Drying: using hot air blowers produced by gas combustion.

To represent the production of wire rod, the current published EPD of the supplier's wire rod has been used.

Wire drawing

Once the pickled wire rod is obtained, it moves on to the drawing process, where a distinction is made between the operations intended to manufacture:

- Prestressing wire. Prestressing wire uses a drawing machine that incorporates an induction furnace, which requires a significant amount of electricity.
- Post-tensioning wire used to manufacture strand components.

As materials to be incorporated in the process, soap powder is used here as a wire drawing lubricant.

Water is also consumed for cooling.

Galvanizing

Between the post-tensioning stage and strand forming, the wire is transported to the galvanizing plant located 40 km from the Tycsa plant. The entire process is carried out here, before being returned to the Santander plant where it continues with the manufacturing stages.

Stranding

The next phase is stranding, which is the stage to form the 7-wire strand.

No products are added to the process except for the drawn wires. The main consumption is electricity, and water is used to cool the wire, as these machines also incorporate an induction furnace.

INLETS			OUTLETS
• Wire rod. • Electricity. • Natural gas. • Hydrochloric acid. • Pickling activator. • Phosphate salts. • Borax. • Pickling additives. • Swamp water. • Soap. • Tungsten carbide dies. • Auxiliary steel elements. • Plastic caps (PVC and LDPE	• Diesel. • Lubricant/oils. • Grease. • Polyurethane foam. • Plastic coating (HDPE). • Alcohol. • Sodium hydroxide. • Lime hydroxide. • Flocculant. • Packaging (plastic and metal). • Paper. • Hypochlorite. • Cooling tower additives.	A1. Production of raw materials ↓ A2. Transport to factory ↓ A3. Production process of drawn steel products ↓ A4. Transportation of the final product to the construction site. ↓ C. End od life D. Benefits and burdens beyond the system	• Drawn steel products • Air emissions. • Wastewater treatment in our own treatment plant. • Discharge to municipal wastewater treatment plant. • Transportation of waste to the management point. • Management of generated waste.

Image 1 Production process diagram.

5. Declaration of the environmental parameters of the LCA and the LCI.

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Mandatory environmental indicators according to EN 15804 (reference package EF 3.1)

Parameter	A1-A3	C1	C2	C3	C4	D
GWP-total	9,84E+02	5,88E+01	7,69E+00	4,20E+00	8,02E-01	-3,97E+01
GWP-fossil	9,76E+02	5,88E+01	7,69E+00	4,19E+00	8,01E-01	-3,97E+01
GWP-biogenic	4,87E+00	0,00E+00	3,00E-04	7,03E-03	9,55E-04	-2,64E-03
GWP-luluc	3,05E+00	2,02E-03	1,95E-04	8,72E-03	2,61E-05	-5,32E-03
ODP	2,12E-05	9,25E-07	1,62E-07	6,62E-08	1,54E-08	-1,53E-07
AP	3,78E+00	5,49E-01	9,19E-03	2,70E-02	5,88E-03	-1,32E-01
EP-freshwater	3,46E-02	5,55E-05	6,67E-06	2,69E-04	2,85E-06	-1,93E-03
EP-marine	8,26E-01	2,58E-01	2,01E-03	8,09E-03	2,70E-03	-2,82E-02
EP-terrestrial	8,33E+00	2,83E+00	2,19E-02	8,92E-02	2,97E-02	-3,32E-01
POCP	3,14E+00	8,42E-01	2,00E-02	2,72E-02	9,13E-03	-1,16E-01
ADP-minerals&metals [1]	8,20E-02	2,46E-06	2,63E-07	2,32E-07	3,22E-08	-6,00E-06
ADP-fossil [1]	1,89E+04	7,74E+02	1,05E+02	8,54E+01	1,06E+01	-4,07E+02
WDP [1]	6,97E+02	6,11E-01	4,38E-02	7,31E-01	1,36E-02	-2,29E+00

GWP - total (kg CO_2 eq.): Global warming potential; **GWP - fossil (kg CO_2 eq.)**: Global warming potential of fossil fuels; **GWP - biogenic (kg CO_2 eq.)**: Biogenic global warming potential; **GWP - luluc (kg CO_2 eq.)**: Global warming potential of land use and land-use change; **ODP (kg CFC-11 eqStratospheric ozone depletion potential**; **AP (mol H+ eq)**: Acidification potential, accumulated surplus; **EP-freshwater (kg Peq)**: Eutrophication potential, fraction of nutrients reaching the final freshwater compartment; **EP-marine (kg N eq)**: Eutrophication potential, fraction of nutrients reaching the final marine water compartment; **EP-terrestrial (mol N eqEutrophication potential, accumulated surplus**; **POCP (kg NMVOC eq)**: Tropospheric ozone formation potential; **ADP-minerals&metals (kg Sb eq)**: Abiotic resource depletion potential for non-fossil resources**APD-fossil (MJ, v.c.n)**: Abiotic resource depletion potential for fossil resources; **WDP (m^3 eq)**: Water deprivation potential (user), water deprivation-weighted consumption; **NR**: Not relevant.

Additional environmental indicators

Parameter	A1-A3	C1	C2	C3	C4	D
GWP-GHG*	9,84E+02	5,88E+01	7,69E+00	4,20E+00	8,02E-01	-3,97E+01
PM	3,10E-05	1,58E-05	5,95E-07	4,17E-07	2,18E-07	-2,64E-06
IRP [1]	1,47E+02	6,92E-02	1,43E-02	5,99E-01	1,36E-03	-1,32E-01
ETP-fw [2]	2,32E+04	2,68E+01	4,04E+00	5,92E+00	1,55E+01	-3,45E+03
HTP-c [2]	4,52E-06	4,10E-09	5,74E-10	1,01E-09	1,17E-09	-1,31E-05
HTP-nc [2]	2,76E-05	5,83E-08	6,56E-08	1,76E-08	4,46E-09	-1,20E-07
SQP [2]	3,70E+03	1,64E+00	2,35E-01	9,54E+00	1,03E+01	-3,76E+01

GWP - GHG (kg CO_2 eq.): Global warming potential excluding biogenic CO2; **PM (disease incidence)**: Potential for disease incidence due to particulate matter emissions; **IRP (kBq U235 eq)**: Human exposure efficiency relative to U235; **ETP-fw (CTUe)**: Comparative ecosystem toxic unit potential - freshwater; **HTP-c (CTUh)**: Comparative ecosystem toxic unit potential - carcinogenic effects; **HTP-nc (CTUh)**: Comparative ecosystem toxic unit potential - non-carcinogenic effects; **SQP (Pt)**: Soil quality potential index.

Notice 1. This impact category primarily addresses the potential impacts of low doses of ionizing radiation on human health from the nuclear fuel cycle. It does not consider effects due to potential nuclear accidents or occupational exposure from radioactive waste disposal at underground facilities. The ionizing radiation potential of soil, due to radon or some building materials, is also not measured in this parameter.

Notice 2. The results of this environmental impact indicator should be used with caution, as the uncertainties in the results are high and experience with this parameter is limited.

**This indicator takes into account all greenhouse gases except the absorption and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. As such, the indicator is identical to the total GWP except that the CF for biogenic CO2 is set to zero.*

Resource usage indicators

Parameter	A1-A3	C1	C2	C3	C4	D
PERE	2,17E+03	1,70E+00	3,65E-01	1,54E+01	4,08E-02	-4,37E+00
PERM*	6,29E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	2,24E+03	1,70E+00	3,65E-01	1,54E+01	4,08E-02	-4,37E+00
PENRE	1,89E+04	7,74E+02	1,05E+02	8,54E+01	1,06E+01	-4,07E+02
PENRM*	2,32E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	1,89E+04	7,74E+02	1,05E+02	8,54E+01	1,06E+01	-4,07E+02
SM	1,02E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	1,27E+01	2,43E-02	2,69E-03	5,57E-02	5,43E-04	-6,83E-02

PERE (MJ, v.c.n.): Renewable primary energy use excluding renewable primary energy resources used as feedstock; **PERM (MJ, v.c.n.):** Renewable primary energy use used as feedstock; **PERT (MJ, v.c.n.):** Total renewable primary energy use; **PENRE (MJ, v.c.n.):** Non-renewable primary energy use, excluding non-renewable primary energy resources used as feedstock; **PENRM (MJ, v.c.n.):** Non-renewable primary energy use used as feedstock; **PENRT (MJ, v.c.n.):** Total non-renewable primary energy use; **SM (kg)**: Use of secondary renewable fuels; **RSF (MJ, v.c.n.):** Use of secondary renewable fuels; **NRSF (MJ, v.c.n.):** Use of non-renewable secondary fuels; **FW (m^3)**: Net use of freshwater resources; **NR**: Not relevant.

** Energy used as raw material is declared according to option B of PCR 2019:14 – the indicator for energy used as raw material reflects the energy used as raw material in the product and packaging, and is not subsequently transferred in a useful form to another product system.*

Waste indicators

Parameter	A1-A3	C1	C2	C3	C4	D
HWD	4,46E-01	5,31E-03	6,96E-04	2,17E-04	6,88E-05	-4,47E-03
NHWD	4,18E+01	2,26E-02	3,20E-03	3,91E-02	1,27E+02	-2,55E-01
RWD	9,74E-02	3,95E-05	9,86E-06	4,86E-04	8,97E-07	-9,02E-05

HWD (kg): Hazardous waste disposed; **NHWD (kg)**: Non-hazardous waste disposed; **RWD (kg)**: Radioactive waste disposed; **NR**: Not relevant.

Outflow indicators

Parameter	A1-A3	C1	C2	C3	C4	D
CRU	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	4,20E-01	0,00E+00	0,00E+00	8,50E+02	0,00E+00	0,00E+00
MER	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,75E+01	0,00E+00
EEE	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU (kg): Components for reuse; **MFR (kg)**: Materials for recycling; **MER (kg)**: Materials for energy recovery; **EE (MJ)**: Exported energy; **NR**: Not Relevant.

Biogenic carbon content

	Galvanized Strand
Product - Kg C/ud. declared	0
Packaging - Kg C/ud. declared	1,75

6. Additional environmental information.

6.1. Co-products.

The production of Tycsa strands does not generate by-products.

6.2. Indoor air emissions.

The manufacturer declares that the strands studied do not generate emissions into the indoor air during their useful life.

6.3. Emission to soil and water.

The manufacturer declares that the studied strands do not generate emissions to the soil or water during their useful life.

6.4. Electrical mix used

The electricity mix used for the characterization of electricity for the year 2021 in Tycsa and 2022 in TQ is that of the marketing companies, obtained from the annual reports of the National Commission of Markets and Competition:

- GWP mix Tycsa 2021:0,258 kgCO_2e/kWh.
- GWP mix TQ 2022: 0,273 kgCO_2e/kWh.

6.5. Human toxicity and ecotoxicity

The human toxicity and ecotoxicity of the studied life cycle of the Tycsa cord have been evaluated by applying the ReCiPe 2016 Midpoint (E) V1.09 /World (2010) E methodology.

The results refer to the declared functional unit, which is 1.000 kg (1 ton) of product.

Parameter	A1-A3	C1	C2	C3	C4	D
Terrestrial ecotoxicity	1,14E+04	6,23E+01	2,07E+02	4,83E+00	9,16E+00	-1,24E+04
Freshwater ecotoxicity	7,04E+00	1,30E-02	6,24E-02	1,15E-03	1,32E-02	-7,97E-01
Marine ecotoxicity	9,29E+04	2,19E+02	7,92E+02	1,68E+01	5,04E+01	-2,07E+03
Human carcinogenic toxicity	4,37E+03	2,91E-01	3,11E-02	4,68E-01	1,29E+00	-2,03E+00
Human non-carcinogenic toxicity	8,45E+04	1,51E+02	5,88E+02	2,67E+01	2,79E+01	-2,98E+02

Terrestrial ecotoxicity (kg 1,4-DCB); Freshwater ecotoxicity (kg 1,4-DCB); Marine ecotoxicity (kg 1,4-DCB); Human carcinogenic toxicity (kg 1,4-DCB); Human non-carcinogenic toxicity (kg 1,4-DCB)

References

[1] UNE-EN 15804:2012+A2:2020. Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.

[2] UNE 36904-2:2018. Steel industry. Environmental product declarations. Product category rules. Structural steel products. Part 2: Processed products and prestressing system applicators.

[3] General Programme Instructions of GlobalEPD 3rd revision (09-10-2023).

[4] UNE-EN ISO 14025:2010. Environmental labels and declarations. Type III environmental declarations. Principles and procedures. (ISO 14025:2006).

[5] UNE-EN ISO 14040:2006/A1:2021. Environmental Management. Life Cycle Assessment. Principles and Framework. Amendment 1. (ISO 14040:2006/Amd 1:2020).

[6] UNE-EN ISO 14044:2006/A1:2021. Environmental Management. Life Cycle Assessment. Requirements and Guidelines. Amendment 2. (ISO 14044:2006/Amd 2:2020).

[7] Life Cycle Assessment Report for the EPDs of Tycsa PSC's 7-wire galvanized strands. Written by Abaleo S.L., March 2025. Version 5.

[8] Databases and impact assessment methodologies applied using SimaPro 9.6.0.1

Index

AENOR

Una declaración ambiental verificada

GlobalEPD