

Environmental Product Declaration



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

PC STRAND

from

Gallega de cordones y alambres, S.L.



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11535
Publication date:	2023-11-22
Valid until:	2028-11-22

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



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):

PCR 2019:14 Construction products (EN 15804+A2.2019) Version 1.3.1

The PCR review was conducted by:

The Technical Committee of the International EPD® System.

Chair: No chair appointed. Contact via info@environdec.com

Life Cycle Assessment (LCA)

LCA accountability: APPLUS – LGAI Technological Center S.A



Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: Marcel Gómez Ferrer | info@marcelgomez.com

Approved by: The International EPD® 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 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: Gallega de cordones y alambres, S.L.

Contact: Ismael Vieito, Ismael@galcore.es

Rúa Carracedo

15320 As Pontes de García Rodríguez, Spain

Description of the organisation:

In 1985, Mr Manuel Añón Rey founded *Hierros Añón* in Laracha, A Coruña, from a rebar workshop and iron warehouse established by his father, Mr. Manuel Añón González. The company was initially dedicated to the commercialization of steel for construction, being an iron distributor with sales throughout Galicia. Then, after the closing of *Sidegasa* in 1986, they looked for new suppliers and established commercial relations with *Siderúrgica Nacional Portuguesa*.

In early 90's, they began importing steel from England, Germany and Turkey to diversify their supply sources. In 1994, the privatization of *Siderúrgica Portuguesa* led to a decision to stop supplying iron to *Hierros Añón*, which prompted the company to focus even more on importing and approving steel.

At the end of 1994, *Gallega de Mallas, S.L.* was created, a company dedicated to the manufacture of electrowelded mesh and joist reinforcement with commercial success throughout Galicia and Spain. Faced with the lack of a constant supply of iron, *Hierros Añón* decided to manufacture its own steel and established *Siderúrgica Añón* in 2000.

Later, they were able to homologate their products, and in 2004, they acquired a modern steel mill, *Acieria de L'Atlantique*, in Bayonne, France. In 2006, *Siderúrgica Añón do Brasil, Ltda.* was incorporated.

In 2017 *Gallega de Mallas* moved to new facilities in Carballo and acquired stakes in *Laminoirs des Landes, SA* and *Comercial de Laminados* from the German Group *Kloeckner*.

Gallega de Cordones y Alambres, was born as a productive project in 2018, betting from the beginning, for the combination between technology and experience, which is why together with the most modern production systems they have staff that accumulates more than 20 years of experience in the sector of active armour, manufacturing products of the highest quality. All their experience, the latest technology in production machinery and the most modern facilities are focused on a single objective, to achieve a top quality product that meets the demands of their customers, for that they work every day, applying what they have learned over the years and acquiring new knowledge in a process of continuous improvement.

Product-related or management system-related certifications:

Galcore is certified by ISO 9001. Certificate nº: EC-9556/18 certified by Applus with accreditation nº: 02/C-SC032 and DOR "Officially Recognized Distinctive" for the product: Steel for active reinforcement. Certificate nº: PR-1856/087, certified by Applus with accreditation nº: 12 / C-PR054.

Name and location of production site(s): Gallega de cordones y alambres, S.L.

Rúa Carracedo. 15320 As Pontes de García Rodríguez, Spain.

Product information

Product name: PC STRAND

Product identification: Steel strands for prestressed concrete reinforcements (UNE 36094:1997)

Product description:

The product PC STRAND is an essential component in the construction industry. It is composed of seven high-strength steel wires, twisted to form a solid cord. This versatile product is used in various construction applications, such as the reinforcement of concrete structures, the construction of fences, the fixing of elements and the support of temporary formwork.

Thanks to its durability, mechanical strength and ability to ensure stability, steel cord plays a crucial role in civil engineering and architectural projects. It can be manufactured in different sizes depending on the weight of the roll. It can be of 3.200 kg and 4.000 kg.

This product is third party verified by Applus according to the DCOR (Officially Recognised Quality Mark) and SPC-085 "Steel products for concrete", achieving great product capabilities.



PC STRAND can be found in diameters from 9,3 to 16 mm and the designation of the products is the following:

- Y 1860 S7 (Ø 9,3mm)
- Y 1860 S7 (Ø 13,0mm)
- Y 1860 S7 (Ø 15,2mm)
- Y 1770 S7 (Ø 16,0mm)

PC STRAND		
Characteristics UNE 36094:1997	Unit	Value
Density	Kg/m ³	7,85
Tensile strength	Mpa	> 1875
Ratio (Elastic Limit and Tensile Strength)	mm	0,88 to 0,95
Agt	%	≥ 3,5
E (min/max)	%	182,2 to 208,7
Elastic limit (0,1)	kN	82,2 to 237
Elastic limit (0,2)	kN	85,1 to 246
Breaking strenght (CR)	kN	96,7 to 279
Breadking strenght (CR máx)	kN	113 to 326
Mass per metre	g/m	408 to 1176
Cross Section	mm ²	52 to 150
Max arrow	mm	25
Deflected traction EN-ISO 15630-3	%	< 28
Stress corrosion EN-ISO 15630-3	h	>1,5
Relaxation EN-ISO 15630-3	%	At 60 < 1,5 At 70 < 2,5 At 80 < 4,5
Fatigue resistance EN-ISO 15630-3	Mpa	Exceeding 2 million cycles at 190 Mpa
Loss of strength after bending- unbending EN-ISO 15630-3	%	>5

UN CPC code: **4126** Bars, rods, angles, shapes and sections, cold processed or further worked, of iron or steel; angles, shapes and sections, hot-rolled, hot drawn or extruded, of alloy steel; steel wire. According to the Statistical document "Central Product Classification (CPC) Series M No. 77, Ver.2.1."

Geographical scope: Coverage of Spanish technologies and processes during the Product and Construction Process Stage (A1-A4) and Spanish coverage during the Transport, Usage, End of Life Stage and Resource Recovery Stage.

LCA information

Declared unit: In the present study, the declared unit is considered being 1 ton of PC STRAND. According to UNE 36904-1:2018. The reference unit to express environmental information is 1000 kg of basic construction steel product.

Reference service life: The RSL used in this EPD is 50 years. According to the UNE 36904-1 standard: "The reference useful life of the structure in which the products under consideration are located". The

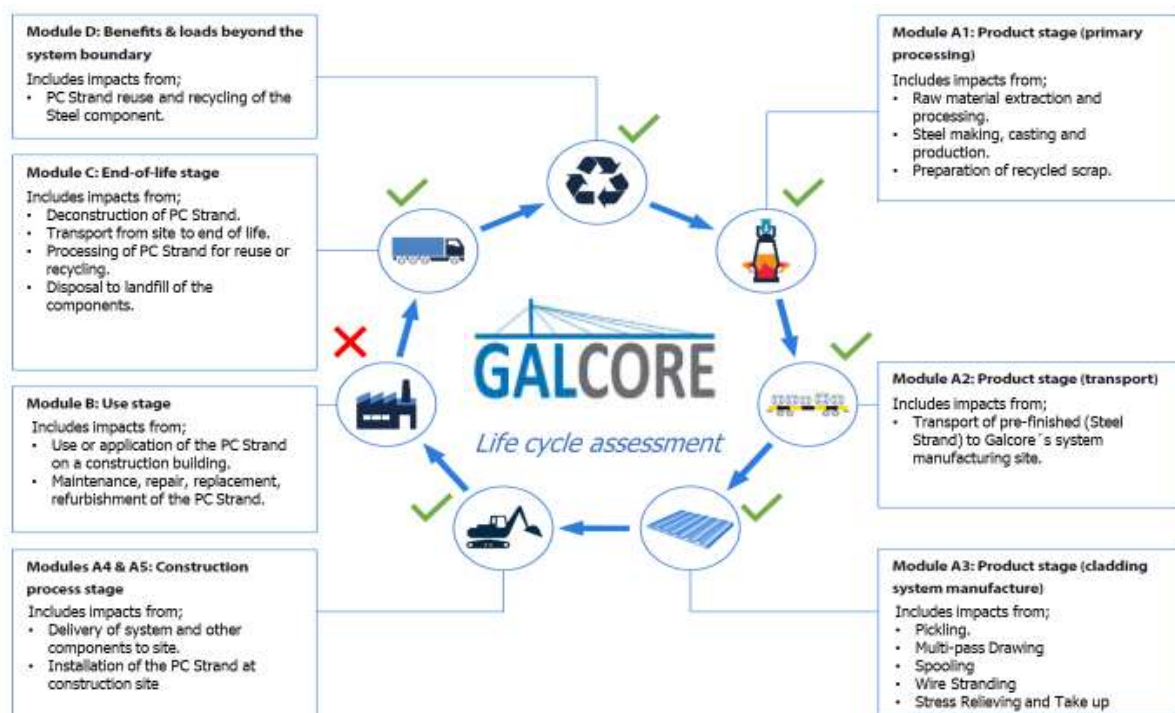
product is placed in concrete structures and, according to the concrete structural code information, its useful life is 50 years.

Time representativeness: The data collected are for the year 2021, based on the production from the same year.

Database(s) and LCA software used: The LCA database profile is EcoInvent version 3.6 (September 2019) and the LCA software is SimaPro 9.1.1 with the characterization method based in EN 15804 + A2 Method v1.0.

Description of system boundaries: The scope of the Declaration and the limits of the system apply from "Cradle to gate with options" covering all information modules A1 to A4, C1 to C4 and D.

System diagram:



The life cycle analysis is based on the EN 15804:2012 + A2:2019 standard, where the following cutting criteria are applied:

PRODUCT STAGE (A1 - A3): The production stage consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packing material and production emissions are included, energy consumed comes from an ES energy supplier and it's specific energy mix, with a value of 0,267 kg CO2 eq/kWh. The limits of the system to nature are related between the resources derived from petroleum and the Technosphere in the production of PC Strand, where most of its content is Steel.

With regards to the production process of the Stages A1-A3, it can be described as the following:

The PC Strand is a steel product used for Prestressed Concrete, consisting of commonly three or seven wires twisted together in a single cross-section. This product is widely used worldwide in precast prestressed concrete elements, like I-beams or slabs, or post-tensioned elements, i.e. bridge decks and piers, storage tanks, wind turbine towers, or offshore platforms.

For the manufacturing of PC Strand, the raw material used is the high carbon wire rod, with a content of carbon as high as 85% in weight. Carried from the rolling mill by vessels or directly by lorry trucks, the coils are stored outside the factory and classified according to the diameter of the rod, the grade, and the cast number.

The first step carried out at the factory is the pickling of the wired rod: by successive immersions in hydrochloric acid and clean water, rust and scale are removed from the surface of the steel. Once it has achieved the desired degree of cleaning, the surface is ready to receive a layer of phosphate. This soft, thin, and highly elastic layer prevents rusting and contributes to the lubrication processes in the subsequent steps. Before leaving the pickling facilities, the wire is dipped in a neutralizing bath and dried.

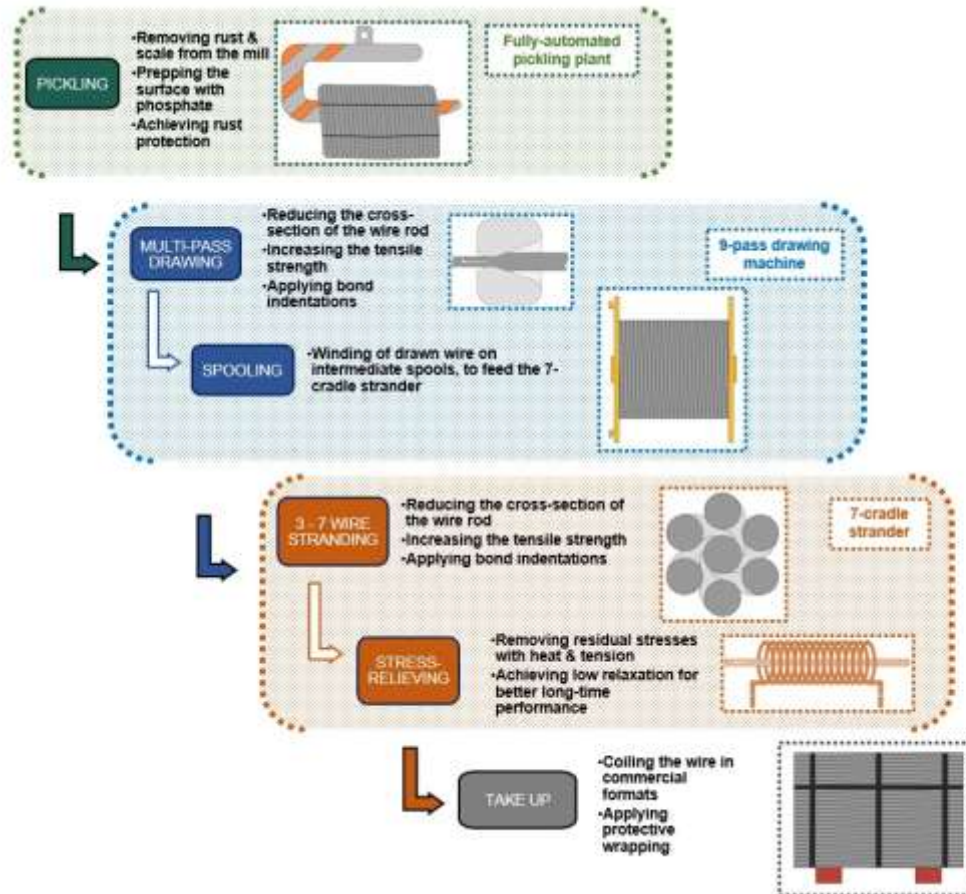
The primary process in the manufacturing of the PC STRAND is the drawing of the wire rod in a multi-pass machine. From its original cross-section, the wire rod is pulled through a series of carbide dies that progressively reduce its cross-section, reaching a total reduction of around 85%. Lubricant powder is applied before each die, to reduce friction between the steel and the carbide, and it is continuously renovated. Temperatures are extensively controlled throughout the entire process, aiming to keep the wire always below 200 °C. In each successive reduction, the microcrystalline structure of the wire is modified, leading to high anisotropic distribution and, consequently, reaching a very noticeable increase in the tensile strength.

After each wire has reached its desired diameter, it can be passed through a rolling head, to create a series of surface indentations, if required by the customer. After this optional step, individual wires are coiled in a reusable spool, and, according to the number of wires in the PC Strand, the same number of spools are placed in a strander machine. This machine twists the wires with a defined orientation and pitch, crafting the strand, which exits this machine with its final shape, but with a non-desirable residual stresses state. These stresses are removed with an inline combination of tension and heat.

After chilling the strand in a cooling tray, it is kept in a master coil until the depletion of the wire spools in the strander machine. After finishing each load of individual wires, new reusable spools are placed in and a new master coil unit replaces the previous, which can now be recoiled to the commercial weights and formats required by the customers. Later, the PC Strand coils are labelled, secured with steel straps, placed over wooden blocks, and stored in the warehouse.

The production process is represented in the following diagram:

System diagram:



CONSTRUCTION PROCESS STAGE (A4 - A5): This stage consists of transporting the product from Galcore’s production plan to an average distance of their buyers during the 2021. It also includes the loss of material during construction. This includes additional production required, transportation, and end-of-life material lost during construction.

It also includes the end of the useful life of the packaging material until the end of the state of disposal or final waste disposal. Installation of the product, including manufacturing, transportation, and end-of-life of auxiliary materials and any use of energy or water necessary for the installation or operation of the product construction works are considered.

Stage A4 - Transport to construction site: It includes transport from the production site to a central warehouse where it will be further distributed. During this stage, no transport losses are assumed.

SCENARIO INFORMATION	VALUE/DESCRIPTION
Type of vehicle used for transport	Lorry (Truck) > 32t, EURO4
Vehicle lead capacity	> 32 Ton
Fuel type and consumption	Diesel: 30L/100km
Distance to the site	640 km
Capacity of utilization (including empty returns)	Default value from Ecoinvent 3.6
Bulk density of transported products	Kg/m ³
Volume capacity utilization factor	Not Applicable

END OF LIFE STAGE (C1 - C4): When the end of the product life stage is reached, the deconstruction begins. This EPD includes deconstruction (C1), which includes the removal of the building's floor covering, including the initial on-site selection of materials; necessary transportation (C2) from the deconstruction site to the sorting location and the distance to final disposal. The end of life stage includes final landfill disposal (C4), where the waste is disposed of, which includes physical pre-treatment and management at the disposal site, waste processing (C3), being the incineration and necessary recycling processes to the final point of disposal.

SCENARIO INFORMATION	VALUE/DESCRIPTION
Collection process specified by type	Reinforcing steel (i.a. metals): 1000 kg with mixed construction waste.
Recovery system specified by type	0 kg for Incineration
	950 kg for Recycling
	0 kg for Re-use
Elimination specified by type	5 kg disposal to landfill
Assumptions for scenario development (e.g. transport)	Lorry (Truck), unspecified (default) market group for (GLO) Distance to landfill 100 km, to incineration 150 km and to recycling 50 km

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D): This stage contains the potential loads and benefits of recycling and re-use of raw materials/products. The loads contain the needed recycling processes from end-of-wastepoint up to the point-of-equivalence of the substituted primary raw material and a load for secondary material that will be lost at the end-of-life stage. The loads and benefits of recycling and reuse are included in this module. The benefits are calculated based on the primary content and the primary equivalent.

In addition, the benefits of energy recovery are granted at this stage. The amount of avoided energy is based on the Lower Heating Values of the materials and the efficiencies of the incinerators as mentioned in the NMD Determination method v1.0 or EcoInvent 3.6 (2019).

Therefore, it will be considered that in this EPD, of all the previously declared cut criteria, only modules **"A1-A4"; "C1-C4" and "D"** are declared; being the minimum required by the EN 15804:2012 + A2:2019 standard.

Product classification according to UNE 36094: The product is classified in accordance with UNE 36094 and in reference to the Steel Wire and Strand for prestressed concrete.

Data quality: All process-specific data was collected for the 2021 operating year and is therefore up-to-date.

The data is obtained from the company and verified by **APPLUS - LGAI Technological Center S.A**

The generic data were taken from the database EcoInvent (version 3.6). The data quality assessment covers geography representativeness, technology representativeness and time representativeness, and is based on the data quality criteria from the Annex E, Table E.2 of EN15804+A2:2019.

The data quality overall can be classified as very good.

With regard to the exclusion criteria for inputs and outputs (cut-off rules), what is indicated in the UNE-EN 36904-1:2018 standard is considered, which indicates that If there is not enough information, the energy of the process and the materials that represent less than 1% of the total energy and mass used can be excluded (if they do not cause significant impacts). The sum of all excluded inputs and outputs cannot exceed 5% of the total mass and energy used, as well as the environmental emissions produced. With other criteria, the polluter pays principle, the principle of modularity and that it does not consider the emissions generated in the long term have been considered.

The system's LCA calculation did not consider flows related to the construction of production plants, application machines and employee transport and the study cover at least 95% of the materials and energy per module and at least 99% of the total material and energy use of each unit process.

Allocation:

Whenever allocations could be avoided, primary data have been used. Where this has not been possible, mass-based physical allocations have been used.

The allocation for inputs of materials, such as raw materials or packaging materials, are direct.

The allocation for consumptions, such as energy, water and steam, have been allocated from 2021 production.

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	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	EU	EU	EU	EU													EU
Specific data used	>90% GWP			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	0 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0 %			EU average for Galcore	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

This EPD is representative for one ton of steel wire with the trade name PC STRAND manufactured at the production site Gallega de cordones y alambres, S.L.

The data for PC STRAND has been used for the calculation as it is one of the main products manufactured by Galcore.

The components for Galcore´s PC STRAND product are detailed here and his explanation of each phase:

Products Component: Also known as raw material supply, The % for manufacturing one ton of PC STRAND.

Packing Material: Includes amount of packaging materials used for one ton of the product.

Ancillary materials: Refers to those materials used during the life cycle of a product, but which are not directly part of the final product.

Energy consumption: Refers to the energy consumed to manufacture one ton of the product. From 2021 ES specific mix from energy supplier.

Product components	Weight, %	Post-consumer material, weight, %	Biogenic material, weight, % and kg C/kg
Steel Wire	51 %	18 %	0
Steel Wire 1	28 %	75.54 %	0
Steel Wire 2	21 %	85 %	0
TOTAL	100 %	48.18 %	0
Packaging materials	Mass per declared unit (kg/ton)	Weight, % (versus the product)	Weight biogenic carbon, kg C/ton
High-strength steel strap	1.99E+00	0.199 %	0
Pine Wood Block	3.18E+00	0.318 %	5.84E+00
TOTAL	5.17E+00	0.517 %	5.84E+00 kg C

Hazardous Materials Content:

During the life cycle of the product, no dangerous substance included in the "List of substances candidates for authorization (SVHC)" in a percentage greater than 0.1% of the weight of the product.

**RESULTS:
ENVIRONMENTAL INFORMATION**

PC STRAND



Results of the environmental performance indicators

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Mandatory impact category indicators according to EN 15804

** 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.*

Results of 1 ton PC STRAND.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1,84 E+03	5,80 E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	7,09 E+00	0,00 E+00	2,63 E-01	-7,02 E+02
GWP-biogenic	kg CO ₂ eq.	-4,78E +00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	4,73 E+00	4,62 E-02	7,30 E+00
GWP-luluc	kg CO ₂ eq.	2,60E +00	1,71 E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	2,60 E-03	0,00 E+00	7,34 E-05	5,18 E-01
GWP-total	kg CO ₂ eq.	1,84 E+03	5,8 0E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	7,09 E+00	0,00 E+00	2,64 E-01	-6,94 E+02
ODP	kg CFC 11 eq.	1,26 E-04	1,37 E-05	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	1,56 E-06	0,00 E+00	1,08 E-07	-1,71 E-05
AP	mol H ⁺ eq.	8,88 E+00	2,96 E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	4,11 E-02	0,00 E+00	2,50 E-03	-2,71 E+00
EP-freshwater	kg P eq.	1,02 E-01	4,46 E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	7,15 E-05	0,00 E+00	2,95 E-06	-2,48 E-02
EP-marine	kg N eq.	1,75 E+00	1,01 E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	1,45 E-02	0,00 E+00	8,60 E-04	-5,02 E-01
EP-terrestrial	mol N eq.	2,00 E+01	1,11 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	1,60 E-01	0,00 E+00	9,48 E-03	-5,86 E+00
POCP	kg NMVOC eq.	8,35 E+00	3,31 E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	4,56 E-02	0,00 E+00	2,75 E-03	-3,99 E+00
ADP-minerals&metals*	kg Sb eq.	3,00 E-02	9,97 E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	1,80 E-04	0,00 E+00	2,41 E-06	-4,74 E-04
ADP-fossil*	MJ	2,17 E+04	9,09 E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	1,07 E+02	0,00 E+00	7,36 E+00	-4,90 E+03
WDP*	m ³	7,27 E+02	2,95 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	3,82 E-01	0,00 E+00	3,30 E-01	-1,34 E+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															

Additional mandatory and voluntary impact category indicators

Results of 1 ton PC STRAND.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,84E+03	5,80E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,09E+00	0,00E+00	2,63E-01	-7,01E+02
ETP - fw	CTUe	1,02E-01	4,46E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,15E-05	0,00E+00	2,95E-06	-2,48E-02
PM	disease incidence	1,54E-04	5,40E-06	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,37E-07	0,00E+00	4,86E-08	-4,06E-05
HTP - c	CTUh	1,62E-05	1,78E-08	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,09E-09	0,00E+00	1,10E-10	-9,07E-08
HTP - nc	CTUh	2,10E-04	8,23E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,04E-07	0,00E+00	3,39E-09	1,36E-04
IR	kBq U235 eqv.	7,31E+01	3,97E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,48E-01	0,00E+00	3,02E-02	1,20E+01
SQP	Pt	8,09E+03	1,04E+03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,27E+01	0,00E+00	1,54E+01	-1,08E+03
Acronyms	ETP-fw = Ecotoxicity, freshwater; PM = Particulate Matter; HTP-c = Human toxicity, cancer; HTP-nc = Human toxicity, non-cancer; IR = Ionising radiation, human health; SQP = Land use.															

Resource use indicators

Results of 1 ton PC STRAND.

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,32E+03	1,14E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E+00	0,00E+00	5,95E-02	1,42E+02
PERM	MJ	4,50E+01	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,37E+03	1,14E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E+00	0,00E+00	5,95E-02	1,42E+02
PENRE	MJ	2,30E+04	9,65E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E+02	0,00E+00	7,82E+00	-5,08E+03
PENRM	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,30E+04	9,65E+02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E+02	0,00E+00	7,82E+00	-5,08E+03
SM	kg	4,82E+02	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	2,04E+01	1,04E-01	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,30E-02	0,00E+00	7,86E-03	-2,54E+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															

¹ 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 CO₂ is set to zero.

Waste indicators

Results of 1 ton PC STRAND.																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,03 E-01	2,20 E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	2,71 E-04	0,00 E+00	1,10 E-05	-8,41 E-02
Non-hazardous waste disposed	kg	7,39 E+02	7,91 E+01	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	6,78 E+00	0,00 E+00	5,00 E+01	-6,87 E+01
Radioactive waste disposed	kg	6,87 E-02	6,20 E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	7,02 E-04	0,00 E+00	4,83 E-05	4,15 E-03

Output flow indicators

Results of 1 ton PC STRAND.																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Material for recycling	kg	3,05 E+01	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	9,50 E+02	0,00 E+00	0,00 E+00
Materials for energy recovery	kg	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Exported energy, electricity	MJ	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Exported energy, thermal	MJ	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

Other environmental performance indicators

Results per declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	5,84E+00

Estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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

UNE 36904-1:2018: Steel industry. Environmental product declarations. Product category rules. Structural steel products. Part 1: Basic products

PCR 2019:14 Construction products (EN 15804+A2:2019) Version 1.3.1.

ISO 14040:2006, Environmental management – Life cycle assessment – Principles and Framework.

ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO 14025:2011, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

EN 15804+A2: 2019, Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products.

UNE 36094:1997, Steel wire and strand for prestressed concrete.

UNE-EN ISO 15630-3:2019, Steel for the reinforcement and prestressing of concrete – Test methods – Part 3: Prestressing steel.

ROYAL DECREE 470/2021 of June, which approves the Structural Code. (DCOR)

LCA report information for the environmental product declaration of PC STRAND, APPLUS – LGAI Technological Center, version 3, November 2023

