ENVIRONMENTAL PRODUCT DECLARATION

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

NFG Factory - Gorzow - Hot-dip Galvanized Steel Products
Nordic Fastening Group AB

NORDIC FASTENING GROUP AB

EPD HUB, HUB-0813
Publishing date 2 November 2023, last updated on 2 November 2023, valid until 2 November 2028.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Nordic Fastening Group AB
Address	Rattgatan 15
Contact details	info@nfgab.se
Website	www.nfgab.se

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	Building products
Category of EPD	Sister EPD to HUB-0722
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Niklas Klippenberg
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Magaly González Vázquez, 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	NFG Factory - Gorzow - Hot-dip Galvanized Steel Products
Additional labels	NFG & NEO
Product reference	-
Place of production	Poland - Gorzow
Period for data	2022 (1jan-31Dec)
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	10%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of NFG Product
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2,48E+00
GWP-total, A1-A3 (kgCO2e)	2,37E+00
Secondary material, inputs (%)	144.0
Secondary material, outputs (%)	85.0
Total energy use, A1-A3 (kWh)	10.6
Total water use, A1-A3 (m3e)	2,77E-02

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

We provide you with all types of fasteners and connections – everything from basic joints with screws, bolts or nuts, to connections with threaded sleeves, threaded bars, tension rods or fasteners for steel construction. In addition to our extensive range comprising approximately 30,000 articles, we also produce customised connections, either modified or completely newly designed, for your special projects.

PRODUCT DESCRIPTION

This is an average Sister EPD scoping all Hot-dip galvanized steel products that can be produced in NFG Factory in Gorzow Poland.
The Factory produce metal products for lifting and fastening to the steel and concrete market around Europe.
Multiply products with different carbon steels are within the scoop.
Concrete fastening products that are used in the manufacture of concrete elements and concrete structures. These products include various lifting systems, with several variants of lifts and anchors (e.g. lifting anchors, erecting anchors, transport anchors and universal lifts) within each system.
Fasteners and connections – from basic joints with screws, washers and nuts to connections with threaded sleeves, threaded bars, tension rods or fasteners for steel construction.

Further information can be found at www.nfgab.se.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	100	EU
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	0.0441

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of NFG Product
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

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	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

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.

NFG Product manufacturing process described in a flowchart in the EPD and below in text:
Rawmaterial-(Cutting-punching-Milling-Turning-Bending-Welding)-Cleaning-Coating-Sorting-Packing

Rawmaterial transport is 168km for hot rolled reinforcing bars and 485 for hot rolled flat steel to our factory, and the way of transport is lorry. (A2)
Material origin from EU.

Hydraulic oils, cutting emulsions and other lubrication oils are used during the process to reduce the wear of machines and to ensure stable cutting conditions.
Information from the factory, total ancillary materials are divided by the total production of products yearly.
The manufacturing process requires low voltage electricity for the equipment.

The steel waste produced at the plant is assumed to be directed to recycling 85% and landfill 15%, Assumed transport is 50km.
The loss of material is considered in A3, and the percentage of loss is 5,2% for total declared unit steel was calculated by divided manufacturing mass with waste.

A wooden pallet and cardboard bottom is used as a packaging material for transporting the product from the factory gate.

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.

The transportation distance is defined according to the PCR. Distance of transportation from Nordic Fastening Group AB´s factory in Poland to building site in Europe is assumed to be 600km and the transportation method is assumed to be lorry.
Transported mass in A4,(Material (1,055280) + Pallet 0,098067 + Cardboard 0,00004) - (Waste Steel 0,055280) = 1,09811kg.
Vehicle capacity utilization volume factor is assumed to be 1 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.

Wood and paper packaging is considered in A5, and 50km is assumed as average distance to waste management

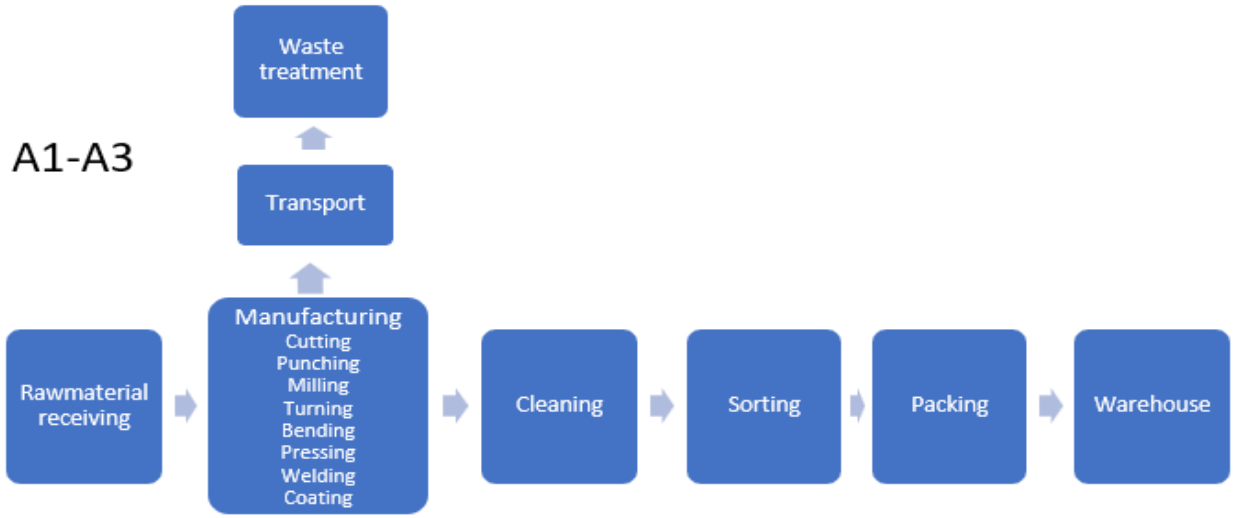
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

Demolition, the source of energy is power tool and is negligible (C1).
It is assumed that 85% of the waste is collected and transported to the waste treatment center. Transportation distance to treatment is assumed as 50 km in Sweden and the transportation method is assumed to be lorry (C2).
85% of steel is recycled at the end of life according to costumer. (C3)
15% of the steel is used for landfill for final disposal (C4).
Due to the recycling process, the end-of-life product is converted into recycled/landfill for steel, while the wood is incinerated for energy recovery and paper is recycled.
Benefits as heat from packaging for steel plate is shown in(D)

MANUFACTURING PROCESS



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 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	No allocation
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Averaged by shares of total volume
Variation in GWP-fossil for A1-A3	10%

This average EPD is made for NFGAB´s factory in Gorzow Poland.
They produce metal products for lifting and fastening purpose to the steel and concrete market around Europe.

Multiply products with different coated carbon steels are within the scoop. Each product has been added with the individual composition, and only products with in the 50%-range in the GWP fossils calculated for A1 - A3 are included in this average EPD. The GWP fossils calculated for A1 - A3 varies by 10%. The allocation was made based on the production volumes for 2022.

This is a Sister EPD to HUB-0722 NFG Factory - Gorzow - Plain Steel Products

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 v3.8 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	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,35E+00	3,62E-02	-1,47E-02	2,37E+00	5,98E-02	1,21E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,87E-02	7,91E-04	-1,71E-01
GWP – fossil	kg CO_2e	2,34E+00	3,62E-02	1,03E-01	2,48E+00	5,98E-02	1,87E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,86E-02	7,90E-04	-3,09E-02
GWP – biogenic	kg CO_2e	4,95E-03	1,40E-05	-1,18E-01	-1,13E-01	2,38E-05	1,19E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,25E-05	5,15E-07	-1,40E-01
GWP – LULUC	kg CO_2e	2,72E-03	1,33E-05	2,27E-04	2,96E-03	2,15E-05	2,75E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,44E-05	7,46E-07	-7,05E-07
Ozone depletion pot.	kg CFC_{-11}e	2,17E-07	8,32E-09	7,27E-09	2,32E-07	1,43E-08	1,24E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,30E-09	3,20E-10	-3,01E-09
Acidification potential	mol H^+e	2,92E-02	1,53E-04	6,01E-04	2,99E-02	2,50E-04	8,90E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,36E-04	7,43E-06	-3,84E-05
EP-freshwater[2)]	kg Pe	1,39E-04	2,96E-07	1,15E-05	1,51E-04	4,09E-07	7,42E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,98E-07	8,28E-09	-4,39E-08
EP-marine	kg Ne	2,93E-03	4,55E-05	9,56E-05	3,07E-03	7,55E-05	1,77E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,99E-05	2,57E-06	-4,27E-06
EP-terrestrial	mol Ne	1,06E-01	5,02E-04	1,07E-03	1,07E-01	8,33E-04	1,96E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	5,77E-04	2,83E-05	-4,85E-05
POCP ("smog")[3)]	kg NMVOCe	7,35E-03	1,61E-04	3,38E-04	7,85E-03	2,68E-04	5,54E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,59E-04	8,23E-06	-2,47E-05
ADP-minerals & metals[4)]	kg Sbe	7,16E-05	8,48E-08	1,03E-06	7,27E-05	1,40E-07	3,02E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,51E-06	1,82E-09	-1,12E-08
ADP-fossil resources	MJ	3,50E+01	5,43E-01	2,02E+00	3,76E+01	9,15E-01	2,34E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,52E-01	2,17E-02	-5,05E-01
Water use[5)]	m^3e depr.	1,13E+00	2,43E-03	5,48E-02	1,19E+00	4,22E-03	3,74E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,89E-03	6,87E-05	3,84E-03

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and 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 experience with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	3,58E+00	6,12E-03	1,00E+00	4,59E+00	1,19E-02	2,04E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,47E-02	1,88E-04	-1,30E-03
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,04E+00	1,04E+00	0,00E+00	-1,04E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,79E-05
Total use of renew. PER	MJ	3,58E+00	6,12E-03	2,04E+00	5,63E+00	1,19E-02	-1,04E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	4,47E-02	1,88E-04	-1,34E-03
Non-re. PER as energy	MJ	3,12E+01	5,43E-01	1,94E+00	3,37E+01	9,15E-01	2,34E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,52E-01	2,17E-02	-5,05E-01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	6,85E-02	6,85E-02	0,00E+00	-6,85E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,79E-05
Total use of non-re. PER	MJ	3,12E+01	5,43E-01	2,01E+00	3,37E+01	9,15E-01	-4,51E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,52E-01	2,17E-02	-5,05E-01
Secondary materials	kg	1,44E+00	1,51E-04	4,23E-03	1,45E+00	2,58E-04	7,96E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,81E-04	4,55E-06	1,31E-04
Renew. secondary fuels	MJ	9,70E-04	1,52E-06	3,50E-02	3,60E-02	2,27E-06	2,50E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,46E-05	1,19E-07	-6,94E-09
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	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	2,59E-02	7,04E-05	1,71E-03	2,77E-02	1,21E-04	9,55E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,48E-04	2,37E-05	-8,41E-05

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	4,60E-01	7,20E-04	7,77E-03	4,69E-01	9,81E-04	1,47E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,71E-03	0,00E+00	-2,25E-04
Non-hazardous waste	kg	4,71E+00	1,18E-02	5,08E-01	5,23E+00	1,71E-02	3,12E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	5,47E-02	1,50E-01	9,54E-02
Radioactive waste	kg	1,79E-04	3,63E-06	1,27E-05	1,95E-04	6,31E-06	7,78E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,48E-06	0,00E+00	-8,38E-08

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,45E-01	0,00E+00	4,70E-02	1,92E-01	0,00E+00	2,00E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00
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	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	9,02E-04	0,00E+00	0,00E+00	9,02E-04	0,00E+00	1,13E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	3,39E+00	3,58E-02	1,02E-01	3,53E+00	5,92E-02	1,83E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,83E-02	7,74E-04	-3,04E-02
Ozone depletion Pot.	kg CFC-$_{11}$e	2,41E-07	6,59E-09	6,19E-09	2,53E-07	1,13E-08	1,00E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,86E-09	2,53E-10	-2,49E-09
Acidification	kg SO_2e	2,29E-02	1,19E-04	5,02E-04	2,35E-02	1,93E-04	7,31E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	1,91E-04	5,61E-06	-3,31E-05
Eutrophication	kg PO_4^3e	9,77E-03	2,71E-05	4,09E-04	1,02E-02	4,32E-05	2,77E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,30E-05	1,21E-06	6,22E-06
POCP (“smog”)	kg C_2H_4e	1,31E-03	4,65E-06	2,88E-05	1,35E-03	7,61E-06	3,00E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	7,22E-06	2,35E-07	-3,47E-06
ADP-elements	kg Sbe	7,92E-05	8,21E-08	1,03E-06	8,03E-05	1,36E-07	2,98E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,50E-06	1,79E-09	-1,16E-08
ADP-fossil	MJ	4,59E+01	5,43E-01	2,02E+00	4,85E+01	9,15E-01	2,34E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	2,52E-01	2,17E-02	-5,05E-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

Why does verification transparency matter? Read more online
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

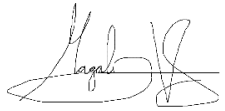
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
02.11.2023



EPD Hub
VERIFIED ISO 14025