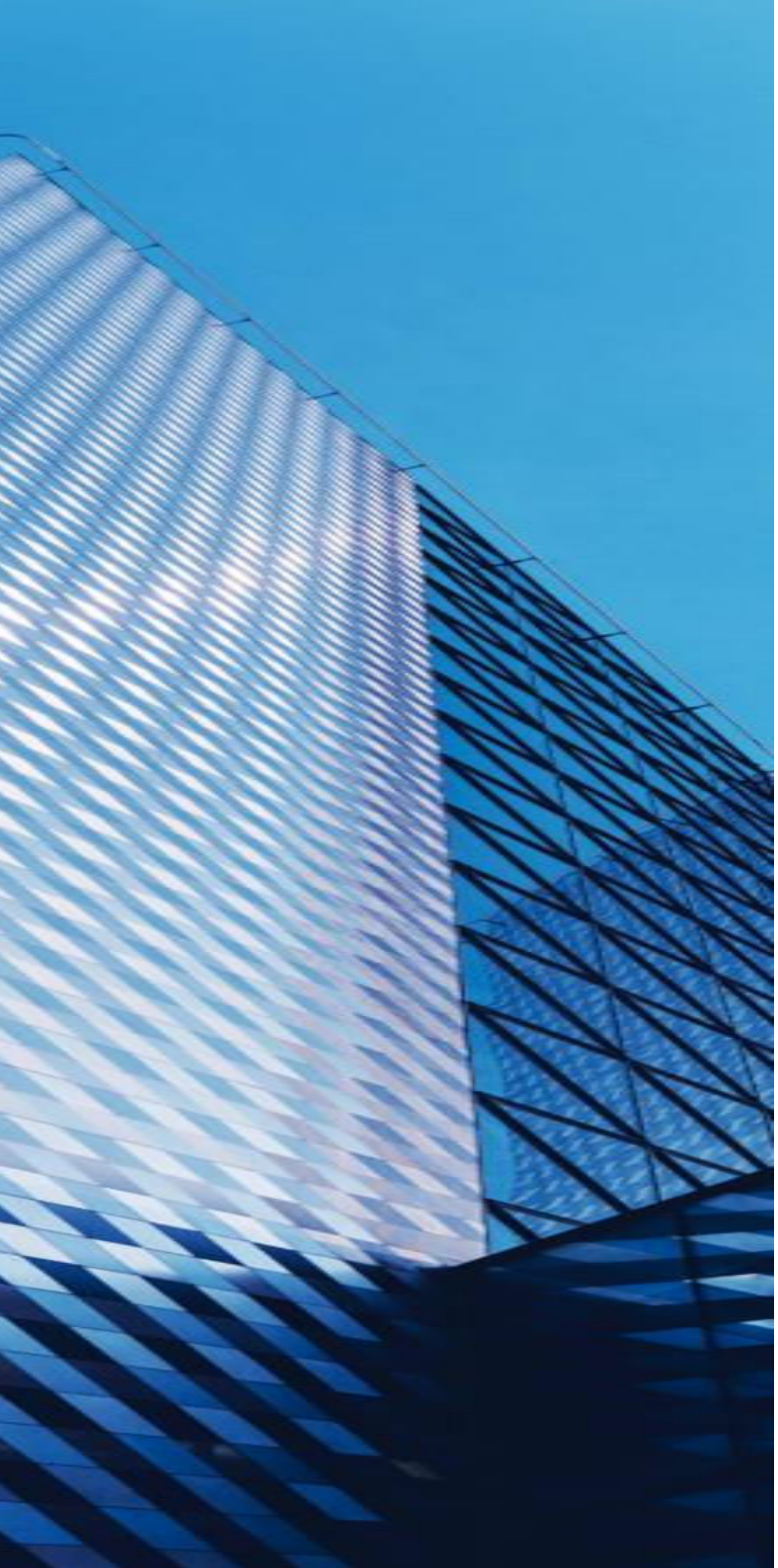
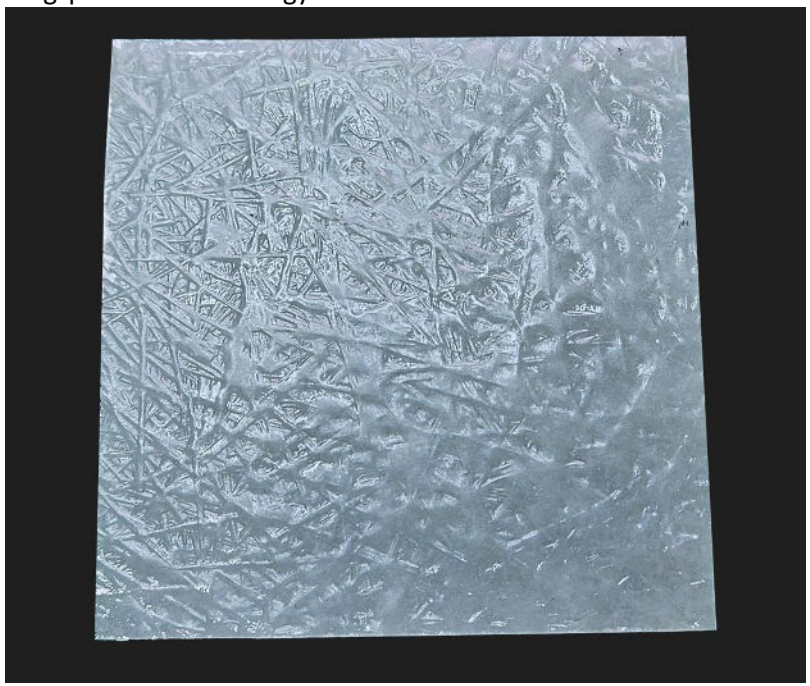


ENVIRONMENTAL PRODUCT DECLARATION

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

Kingspan Glass Reinforced Plastic Ortho (NOR)
Kingspan Water & Energy



EPD HUB, HUB-1371
Publishing date 10 May 2024, last updated on 10 May 2024, valid until 10 May 2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kingspan Water & Energy
Address	Gåserødveien 11, 3158 Andebu, Norway
Contact details	baga.info@kingspan.com
Website	https://www.kingspan.com/no/nn/forretningsomrader/Kingspan-water-energy/

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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Michela Ferrando
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ 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	Kingspan Glass Reinforced Plastic Ortho (NOR)
Additional labels	-
Product reference	-
Place of production	Andebu, Norway
Period for data	2023 (12 months)
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	- %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	5,21E+00
GWP-total, A1-A3 (kgCO2e)	5,22E+00
Secondary material, inputs (%)	0.92
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	21.1
Net fresh water use, A1-A3 (m3)	0.07

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kingspan Water & Energy is an industry leader in the design and manufacture of efficient ways of storing and protecting water and energy. KWE product offering ranges from sewage treatment plants, attenuation tanks, rainwater harvesting and separators to fuel storage tanks and monitoring systems. Kingspan Water & Energy is part of Kingspan Group PLC, global market leader in high-performance building solutions.

PRODUCT DESCRIPTION

Glass (fiber) reinforced plastic (GRP) is a composite material consisting of a polymer matrix and glass fibers. The polymer matrix is usually an epoxy, vinyl ester or polyester curing resin. The GRP Ortho laminate uses an unsaturated polyester resin. The resin provides the environmental and chemical resistance to the product, is the binder for the fibers in the structural laminate and defines the shape of a GRP part. The glass fibers give strength to the composite. They can be randomly arranged or oriented. The most common type of glass fiber used is for GRP E-glass, which is aluminium-borosilicate glass. E-CR glass (electrical/chemical resistance) is also often used in applications that require particularly high protection against acid corrosion.
The resulting material is used in the production of tanks and other components used in Water Treatment tanks. Sludge Separators, Pumping Stations, Aquaculture, Chemical/ industrial tanks, Oil Petroleum Tanks.

Further information can be found at https://www.kingspan.com/no/nn/forretningsomrader/Kingspan-water-energy/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
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	MND	MND	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.

GRP laminates are manufactures in our Andebu facility in Norway, via spray lay-up or direct roving. Fibre glass strands, polyester resin and catalyst are added together and the mix is either sprayed over a mould with an air compressed spray gun (spray-up) or wound onto the shape (direct roving). Once that full coverage is assured, the mixture is compacted with a roller and left to cure. The parts are then removed from the mould. The process is completed by trimming excess fibreglass where needed, combining parts together to form the required shape of the final product, spraying the joints with the same mix of materials used for the tank manufacturing and curing.

Products manufactured in the Andebu plant are usually delivered without packaging.

An average travel distance of 100km is considered for the local supply of resin and filler (transportation by lorry, 16-32 metric ton, EURO 5). For the delivery of glass fibre supply a combination of road transport (5500km) and ferry transport (118km) are assumed. For the delivery of catalyst material, a combination of road transport (3844km) and ferry transport (118km) are assumed.

Manufacturing impact takes into account 17% production losses and the use of ancillary materials such as those used for equipment cleaning and a spray lacquer used to imprint branding logos. End of life scenario considered for manufacturing waste is incineration with energy recovery (73% efficiency, of which 62% heat; 11% electricity), with average transport distance of 100km (transportation by lorry, 16-32 metric ton, EURO 5) to a local treatment facility.

The manufacturing process is powered by a mix of renewable electricity purchased (certified and sourced from photovoltaic, hydro, wind, geothermal and biomass sources) and generated by roof solar PVs. The impact study also accounts for onsite fuel use (LPG used for space heating) and mobile combustion (diesel used for forklifts).

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover transport and installation phases.

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.

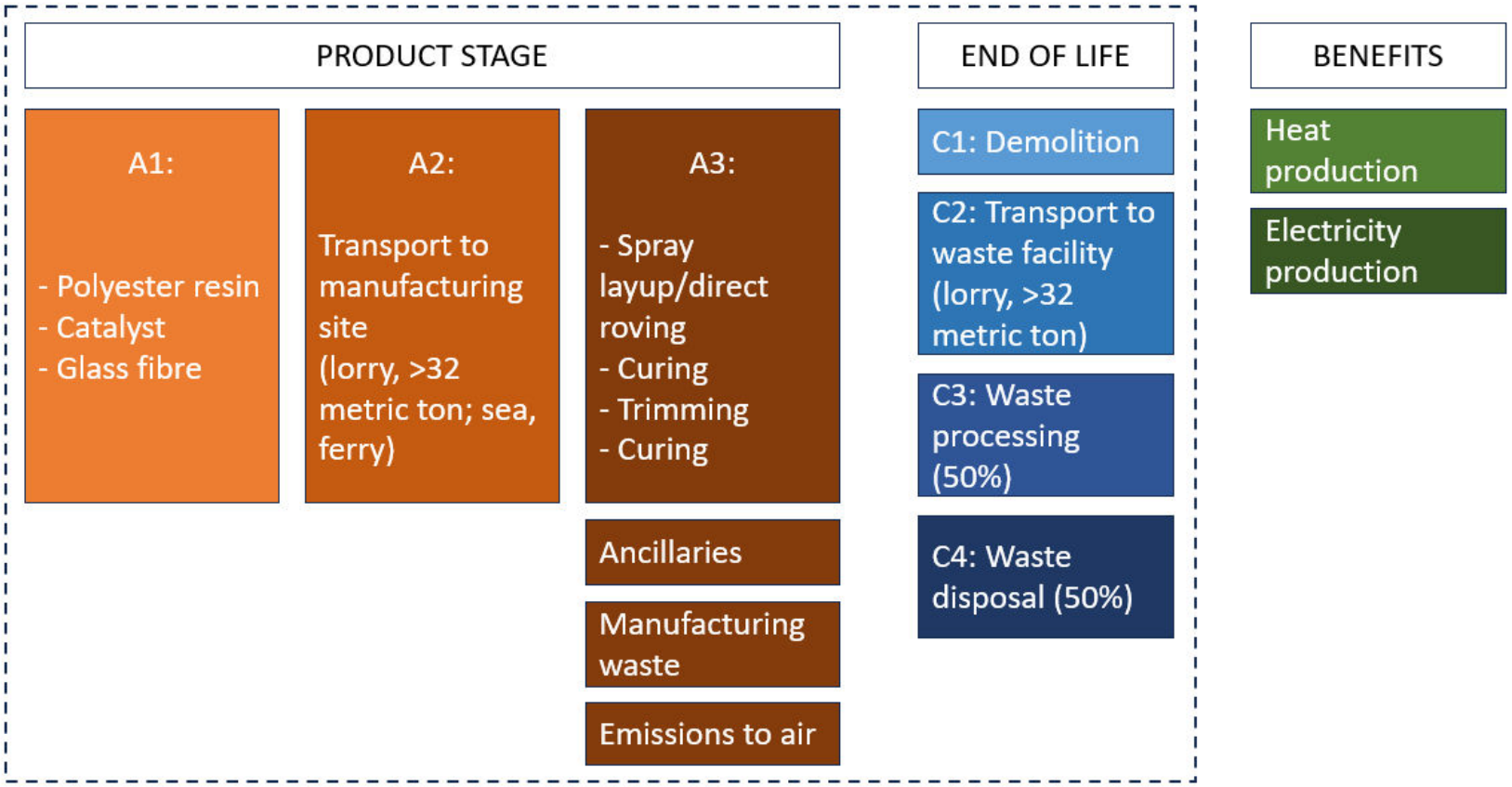
PRODUCT USE AND MAINTENANCE (B1-B7)

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)

GRP laminates are extremely durable and do not degrade even under extreme conditions. Due to the long lifespan of GRP products, there aren't many documented cases or guidelines for products end of life. GRP tanks are installed mostly underground, and excavation work can prove expensive, time consuming and disruptive. For this reason and in consideration of the inert properties of the material, we assumed that in 50% of the cases the tank will be left underground. In this case, landfill is modelled as proxy end of life scenario. In circumstances where the tank needs to be replaced and a physical removal of the tank is necessary (assumed 50% of cases), excavation works with a diesel digger and the assistance of a crane are estimated. Due to continuous exposure to waste liquids and materials throughout the tank's lifecycle and consequent contamination, at the end of service life we assume that the product will be sent for incineration with energy recovery. An average distance of 100km is assumed, to transfer the waste product by lorry (16-32 metric ton, EURO 5) to a treatment facility and to a disposal site. In Module D, the net benefit of incinerating the tank is accounted for, as electricity and heat production.

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	Not applicable
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

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

This EPD is product and factory specific and does not contain average calculations.

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. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases 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	4,62E+00	2,46E-01	3,52E-01	5,22E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,14E-01	9,39E-03	1,17E+00	1,55E-03	-7,94E-01
GWP – fossil	kg CO_2e	4,61E+00	2,46E-01	3,52E-01	5,21E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,14E-01	9,38E-03	1,17E+00	5,26E-03	-7,93E-01
GWP – biogenic	kg CO_2e	8,12E-03	5,21E-06	-6,77E-04	7,45E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-3,72E-03	-3,72E-03	-6,60E-04
GWP – LULUC	kg CO_2e	2,91E-03	9,09E-05	4,99E-04	3,50E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,13E-05	3,46E-06	2,30E-05	5,33E-06	-3,11E-04
Ozone depletion pot.	kg CFC_{-11}e	4,64E-07	5,66E-08	2,23E-08	5,43E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	6,72E-08	2,16E-09	7,86E-09	1,60E-09	-4,52E-08
Acidification potential	mol H^+e	2,18E-02	1,05E-03	9,47E-04	2,38E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,27E-03	3,97E-05	2,99E-04	4,44E-05	-5,92E-03
EP-freshwater[2)]	kg Pe	1,15E-04	2,02E-06	2,42E-06	1,19E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,04E-06	7,68E-08	7,20E-07	8,17E-08	-2,86E-05
EP-marine	kg Ne	3,74E-03	3,11E-04	3,24E-04	4,37E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,45E-03	1,18E-05	1,26E-04	1,52E-05	-7,15E-04
EP-terrestrial	mol Ne	4,09E-02	3,43E-03	3,58E-03	4,79E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,59E-02	1,30E-04	1,36E-03	1,67E-04	-8,41E-03
POCP ("smog")[3)]	kg NMVOCe	1,52E-02	1,10E-03	2,91E-02	4,53E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,36E-03	4,17E-05	3,46E-04	4,82E-05	-2,30E-03
ADP-minerals & metals[4)]	kg Sbe	1,93E-04	5,77E-07	1,42E-06	1,95E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,59E-07	2,20E-08	3,14E-07	1,77E-08	-5,99E-07
ADP-fossil resources	MJ	7,60E+01	3,70E+00	2,41E+00	8,21E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,23E+00	1,41E-01	2,25E-01	1,22E-01	-9,94E+00
Water use[5)]	m^3e depr.	2,66E+00	1,65E-02	1,43E-01	2,82E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,14E-02	6,31E-04	2,36E-02	7,09E-04	-6,75E-02

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.

ADDITIONAL (OPTIONAL) 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
Particulate matter	Incidence	2,26E-07	2,84E-08	1,74E-08	2,71E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	8,76E-08	1,08E-09	2,04E-09	8,90E-10	-5,57E-08
Ionizing radiation[6)]	kBq U235e	3,78E-01	1,76E-02	6,34E-03	4,02E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,94E-02	6,71E-04	1,86E-03	5,82E-04	-1,52E-01
Ecotoxicity (freshwater)	CTUe	1,21E+02	3,33E+00	3,87E+00	1,28E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,54E+00	1,27E-01	3,18E+00	9,00E-02	-1,80E+01
Human toxicity, cancer	CTUh	3,51E-09	8,18E-11	1,49E-10	3,74E-09	MND	MND	MND	MND	MND	MND	MND	MND	MND	9,75E-11	3,11E-12	2,28E-10	3,79E-12	-2,29E-10
Human tox. non-cancer	CTUh	1,63E-07	3,29E-09	3,11E-09	1,69E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,84E-09	1,25E-10	2,20E-09	5,99E-11	-7,37E-09
SQP[7)]	-	1,04E+01	4,26E+00	1,27E+00	1,59E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,50E-01	1,62E-01	6,72E-02	2,96E-01	-6,98E+00

6) EN 15804+A2 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; 7) SQP = Land use related impacts/soil quality.

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	3,68E+00	4,17E-02	1,74E+00	5,46E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,42E-02	1,59E-03	2,09E-02	2,11E-03	-1,88E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,84E-03	1,84E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	3,68E+00	4,17E-02	1,74E+00	5,46E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,42E-02	1,59E-03	2,09E-02	2,11E-03	-1,88E+00
Non-re. PER as energy	MJ	6,45E+01	3,70E+00	2,38E+00	7,06E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,23E+00	1,41E-01	2,25E-01	1,22E-01	-9,94E+00
Non-re. PER as material	MJ	1,15E+01	0,00E+00	-1,06E+00	1,04E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-5,18E+00	-5,18E+00	0,00E+00
Total use of non-re. PER	MJ	7,60E+01	3,70E+00	1,32E+00	8,10E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,23E+00	1,41E-01	-4,96E+00	-5,06E+00	-9,94E+00
Secondary materials	kg	9,18E-03	1,03E-03	1,72E-03	1,19E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,66E-03	3,91E-05	2,20E-04	4,38E-05	-7,34E-04
Renew. secondary fuels	MJ	2,91E-04	1,04E-05	1,43E-05	3,16E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,41E-06	3,95E-07	3,01E-06	1,68E-06	-4,68E-06
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	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	6,66E-02	4,79E-04	3,20E-03	7,03E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,57E-04	1,83E-05	5,72E-04	1,31E-04	-5,15E-03

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	1,92E-01	4,90E-03	1,24E-02	2,09E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,66E-03	1,87E-04	0,00E+00	0,00E+00	-6,03E-02
Non-hazardous waste	kg	5,13E+00	8,05E-02	1,61E-01	5,37E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,98E-02	3,07E-03	5,00E-01	5,00E-01	-2,34E+00
Radioactive waste	kg	1,30E-04	2,47E-05	5,45E-06	1,60E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,98E-05	9,43E-07	0,00E+00	0,00E+00	-5,03E-05

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	MND	MND	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	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	0,00E+00	0,00E+00	8,00E-03	8,00E-03	MND	MND	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	4,38E+00	2,44E-01	3,49E-01	4,98E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,11E-01	9,29E-03	1,17E+00	5,17E-03	-7,78E-01
Ozone depletion Pot.	kg CFC_{-11}e	4,39E-07	4,49E-08	1,86E-08	5,02E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,32E-08	1,71E-09	7,76E-09	1,27E-09	-3,71E-08
Acidification	kg SO_2e	1,82E-02	8,13E-04	7,13E-04	1,97E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	2,33E-03	3,09E-05	2,13E-04	3,36E-05	-5,04E-03
Eutrophication	kg PO_4^3e	7,73E-03	1,85E-04	3,21E-04	8,23E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,40E-04	7,03E-06	2,55E-04	1,08E-05	-1,04E-03
POCP (“smog”)	kg C_2H_4e	1,27E-03	3,17E-05	5,10E-05	1,35E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	5,10E-05	1,21E-06	7,16E-06	1,37E-06	-2,20E-04
ADP-elements	kg Sbe	4,80E-05	5,59E-07	1,39E-06	4,99E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	1,57E-07	2,13E-08	1,89E-07	1,71E-08	-5,99E-07
ADP-fossil	MJ	7,59E+01	3,70E+00	2,41E+00	8,21E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	4,23E+00	1,41E-01	2,25E-01	1,22E-01	-9,94E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	4,61E+00	2,46E-01	3,52E-01	5,21E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	3,14E-01	9,38E-03	1,17E+00	5,26E-03	-7,93E-01

9) 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). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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

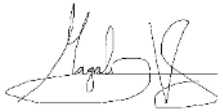
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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
10.05.2024



VERIFIED ISO 14025