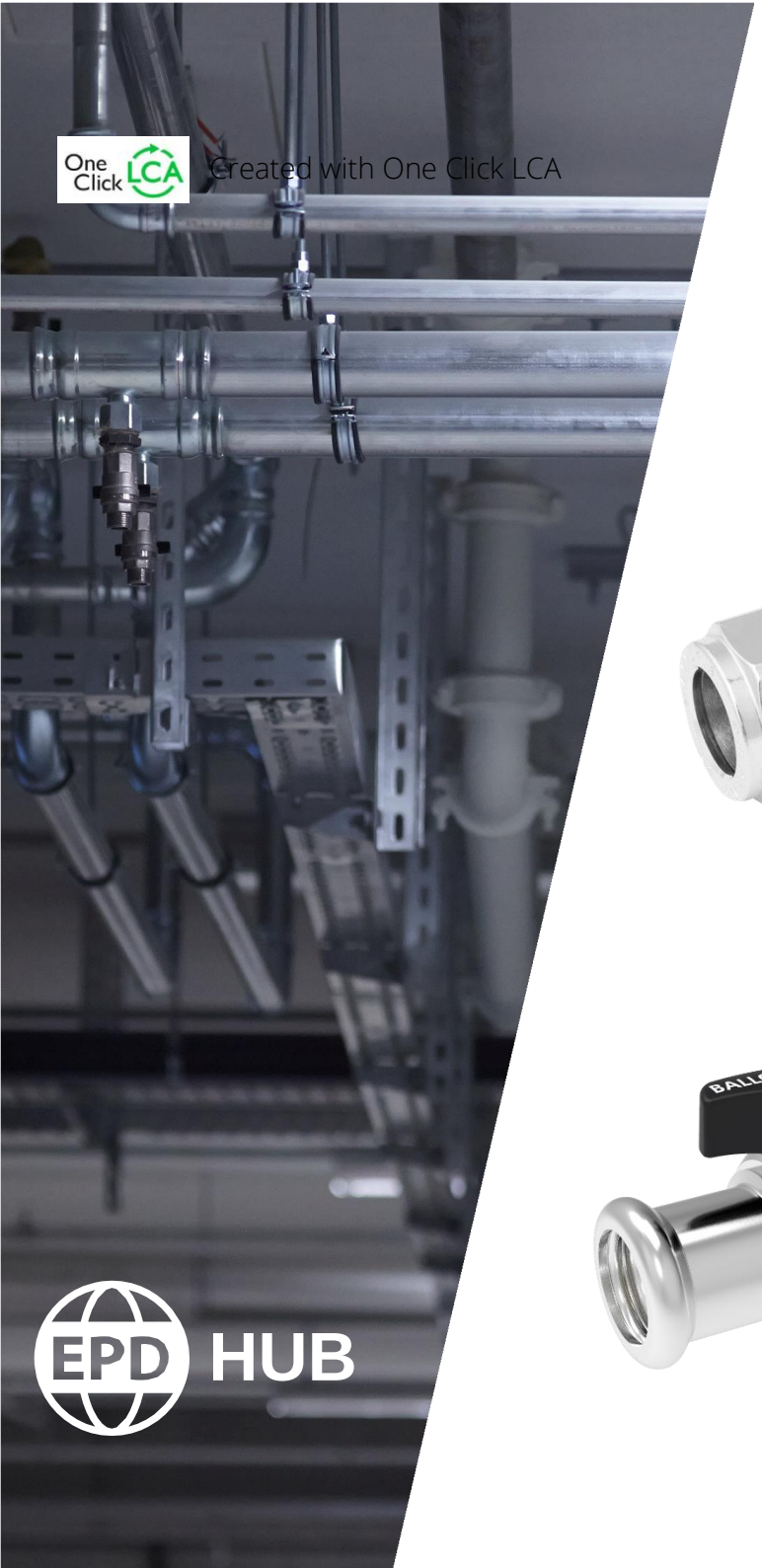


Created with One Click LCA

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2:2019 & ISO 14025 / ISO 21930

BROEN VALVE TECHNOLOGIES

BROEN BALLOFIX® Ball valve

- Brass
- Nickel plated
- Chrome plated

EPD HUB, Hub-1355

Publishing date 2 May 2024
Last updated date 2 May 2024
Valid until date 2 May 2029

EPD HUB

GENERAL INFORMATION

MANUFACTURER

Manufacturer	BROEN A/S
Address	Skovvej 30 Assens 5610, Denmark
Contact details	broen@broen.com
Website	https://www.broen.com/

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	Manufactured product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Ibrahim Khaled Matar- Sustainability specialist
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	BROEN BALLOFIX®DN10R 42193700-226052
Additional labels	This EPD covers BROEN BALLOFIX® standard valves.
Product reference	42193700-226052 scaled to 1 Kg
Place of production	Denmark Skovvej 30, Assens 5610; Poland ul.Strefowa 19 PL-58-200 Dzierżoniów
Period for data	01-01-2023 To 31-12-2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	-24% +22%

ENVIRONMENTAL DATA SUMMARY

Declared unit	42193700-226052 scaled to 1 Kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	5,39E+00
GWP-total, A1-A3 (kgCO2e)	4,84E+00
Secondary material, inputs (%)	75.0
Secondary material, outputs (%)	60.0
Total energy use, A1-A3 (kWh)	24.8
Total water use, A1-A3 (m3e)	0,13

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

BROEN Valve Technologies is a leading international manufacturer of valve technology and we operate on three continents across the world.

BROEN is headquartered in Assens, Denmark and is part of Aalberts N.V. listed on the EuroNext Stock Exchange (NL).

For more than 70 years BROEN has been the global leader in the development and production of valve technology for the control of water, air and gas.

BROEN delivers complete solutions for HVAC building installations and is a leading supplier of district energy valves and valve technology for natural gas.

PRODUCT DESCRIPTION

BROEN offers a wide range of ball valves for water, heating and gas installations. The original BROEN BALLOFIX® valve was developed in the 1960s and now, more than 120 million BROEN BALLOFIX® valves have been installed all over the world. The original BROEN BALLOFIX® still assures you the best quality, functionality and design. Our product range is under constant development and is suitable for all common pipes.

Widest range:
BROEN delivers a wide range of original BROEN BALLOFIX® ball valves. The range includes versions with filters, angled, eccentric and non-return valves.
Any connection technology:
BROEN BALLOFIX® is available with all common types of connections including connections from other Aalberts brands like VSH, Pegler and HENCO.

- Press fittings for both V and M jaws
- Push fittings
- Compression fittings
- Press fittings for multilayer

Approvals:
- KIWA
- KIWA SE
- SINTEF
- Watermark
- WRAS
- ETA
- STF

Further information can be found at https://www.broen.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	93,5	SWEDEN, EUROPE
Minerals		
Fossil materials	6,5	ASIA
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	0.153

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	42193700-226052 scaled to 1 Kg
Mass per declared unit	1 Kg

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	SCIP number
LEAD	0bbf05b7-55fd-41e3-a414-9dbf4d2ea30b

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.

The valve is made of brass mainly, small polymer parts and minor stainless steel parts. The brass is received as tubes, bars or hot stamped components in the factory and components are manufactured by processing the bars and tubes. The processes used to process the brass are milling, drilling, cutting and pressing. Scrap material derived from the production are sent to recycling, directly from the factory. EPDM parts are sourced and are directly consumed in the assembly of the valve. The valve consist of following components.

- Spindel
- Retaining nipple
- Compression ring
- Valve body brass
- Ball
- EPDM O-rings
- Nipple
- Roset
- Roset back piece

Other small parts In addition a small handle from composite with a small stainless steel screw to mount is included. Other polymer parts include O-rings made from EPDM. Additional processes used to manufacture the valves are testing and packaging. The transport assumptions are based on the actual distances between the supplier and BROEN for each component. The production loss is metal scrap from the processing of metals. CO2 emissions from the consumption of electricity is based on the actual emission provided by the supplier, where more than 50% comes from renewable sources. For packaging a cardboard package is used, and for some valves small plastic bags are used, however these plastic bags are excluded as their weights are not significant. The carboards transportation distance is defined as the distance between the supplier and BROEN, both located in Denmark. The ancillaries for the production is tap water, mineral oils for lubrication purposes. The tap water waste is run to treatment facilities via pipes and the mineral oils are collected then send for waste treatment. The mineral oils transportation is defined as the distance between BROEN and the treatment facility in Denmark. The obtained scrap from the metal processing is send to authorised recycling facilities, and the transportation is defined as the distance between BROEN and the facilities.

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 is defined according to the PCR. Distance of transportation from production to building site, is estimated from the countries with the largest sales volume, The transportation method is a combination of lorry and containership, depending on the country. Vehicle capacity utilization volume factor is assumed to be 1 which means full loads, it may vary but as role of transportation emission in total results are small, the variety is assumed to be negligible. Empty returns are not taken into account as it is assumed that the return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products.
The only waste in A5 for the product comes from the packaging. The transportation of packaging from building site to recycling station is assumed to be 100 km in all scenarios. 60% of the packaging is assumed to be recycled.
Additionally, the distance for transporting the valves from Denmark to Poland for assembly, then returned back, is also accounted for.

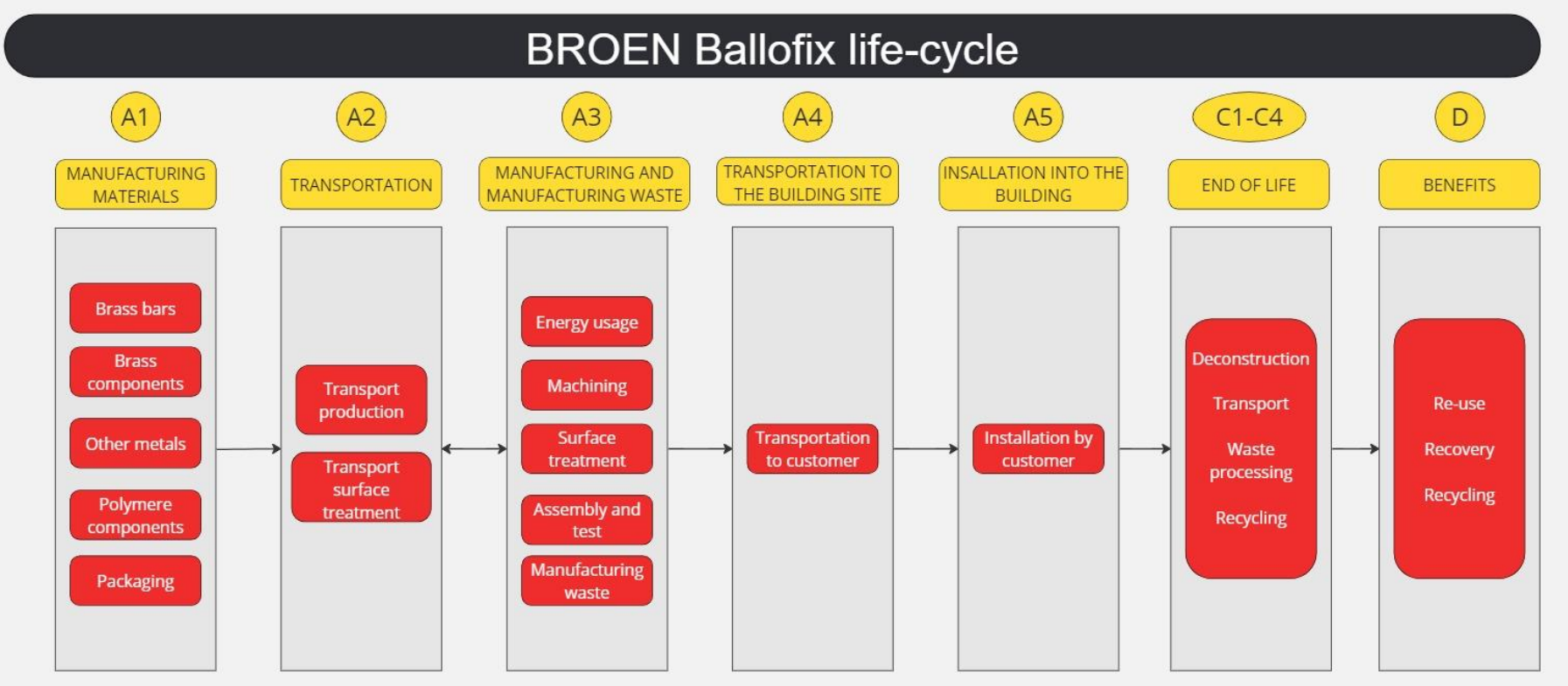
PRODUCT USE AND MAINTENANCE (B1-B7)

A BROEN BALLOFIX® ball valve needs no maintenance, repair or refurbishment and has no operational water or energy use during its lifetime.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

The consumption of energy and natural resources for disassembling the end-of-life is assumed to be negligible, as the disassembly of the product is done by the buyer or the recycling facilities (C1). The end-of-life product is assumed to be sent to the closest facilities by lorry, which is dependent on the individual country (C2). 85% of the product is sent for recycling, and 85% of polymer parts are sent for incineration with energy recovery (C3). 15% of the end-of-life product is assumed to go to a landfill or be lost in the processing (C4). Due to the recycling and incineration potential of metals and plastics, the end-of-life is converted into recycled materials, while heat is produced from material incineration (D). The benefits and burdens of waste packaging in A5 are also considered in module 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	-24% +17%

The BROEN BALLOFIX®DN10R,A,Ø12,Ø12 42193700-226052 valve has been selected as the representative valve. It is a valve that is made from all the possible materials combination a BROEN BALLOFIX® can have. After careful considerations, it was decided that this valve is the most representative among the BROEN BALLOFIX® valves.

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	4,43E+00	5,13E-01	-1,03E-01	4,84E+00	1,31E-01	5,76E-01	MND	MND	MND	MND	MND	MND	MND	MNR	9,39E-03	1,21E-01	2,21E-03	-8,51E-02
GWP – fossil	kg CO_2e	4,42E+00	5,13E-01	4,53E-01	5,39E+00	1,31E-01	1,47E-02	MND	MND	MND	MND	MND	MND	MND	MNR	9,38E-03	1,21E-01	2,21E-03	-8,50E-02
GWP – biogenic	kg CO_2e	0,00E+00	5,81E-05	-5,61E-01	-5,61E-01	0,00E+00	5,62E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	8,20E-03	1,89E-04	4,29E-03	1,27E-02	4,83E-05	6,77E-06	MND	MND	MND	MND	MND	MND	MND	MNR	3,46E-06	8,50E-07	1,39E-06	-6,26E-05
Ozone depletion pot.	kg CFC_{-11}e	2,48E-07	1,18E-07	4,13E-08	4,07E-07	3,02E-08	1,43E-09	MND	MND	MND	MND	MND	MND	MND	MNR	2,16E-09	1,41E-10	5,27E-10	-4,02E-09
Acidification potential	mol H^+e	2,11E-01	2,17E-03	2,63E-03	2,16E-01	5,62E-04	7,87E-05	MND	MND	MND	MND	MND	MND	MND	MNR	3,97E-05	2,02E-05	1,09E-05	-6,17E-04
EP-freshwater[2)]	kg Pe	9,89E-04	4,20E-06	2,90E-05	1,02E-03	1,06E-06	2,56E-07	MND	MND	MND	MND	MND	MND	MND	MNR	7,68E-08	3,23E-08	1,76E-08	-3,75E-06
EP-marine	kg Ne	1,14E-02	6,46E-04	1,07E-03	1,31E-02	1,67E-04	2,86E-05	MND	MND	MND	MND	MND	MND	MND	MNR	1,18E-05	8,39E-06	3,50E-06	-7,81E-05
EP-terrestrial	mol Ne	1,58E-01	7,12E-03	6,87E-03	1,72E-01	1,84E-03	2,90E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1,30E-04	9,15E-05	3,65E-05	-9,00E-04
POCP ("smog")[3)]	kg NMVOCe	4,37E-02	2,28E-03	1,65E-03	4,76E-02	5,87E-04	7,75E-05	MND	MND	MND	MND	MND	MND	MND	MNR	4,17E-05	2,24E-05	1,13E-05	-2,48E-04
ADP-minerals & metals[4)]	kg Sbe	5,07E-03	1,20E-06	6,99E-06	5,08E-03	3,07E-07	1,08E-07	MND	MND	MND	MND	MND	MND	MND	MNR	2,20E-08	5,07E-08	3,49E-09	-5,38E-08
ADP-fossil resources	MJ	5,85E+01	7,71E+00	5,92E+00	7,21E+01	1,97E+00	1,28E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,41E-01	1,60E-02	3,73E-02	-9,02E-01
Water use[5)]	m^3e depr.	3,67E+00	3,45E-02	3,40E-01	4,04E+00	8,82E-03	1,23E-02	MND	MND	MND	MND	MND	MND	MND	MNR	6,31E-04	3,59E-03	1,36E-04	-1,07E-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	5,91E-07	5,91E-08	4,04E-08	6,90E-07	1,51E-08	1,05E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1,08E-09	1,27E-10	1,92E-10	-5,72E-09
Ionizing radiation[6)]	kBq U235e	7,32E-01	3,67E-02	4,26E-02	8,11E-01	9,44E-03	9,42E-04	MND	MND	MND	MND	MND	MND	MND	MNR	6,71E-04	7,43E-05	1,66E-04	-5,56E-03
Ecotoxicity (freshwater)	CTUe	1,93E+03	6,93E+00	2,04E+01	1,96E+03	1,76E+00	5,62E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,27E-01	5,05E-02	1,16E+00	-1,93E+00
Human toxicity, cancer	CTUh	9,56E-08	1,70E-10	3,52E-10	9,61E-08	4,36E-11	2,72E-11	MND	MND	MND	MND	MND	MND	MND	MNR	3,11E-12	4,96E-12	3,25E-09	-2,34E-11
Human tox. non-cancer	CTUh	2,77E-06	6,86E-09	8,50E-09	2,79E-06	1,75E-09	7,59E-10	MND	MND	MND	MND	MND	MND	MND	MNR	1,25E-10	1,93E-10	2,23E-07	-8,07E-10
SQP[7)]	-	7,57E+01	8,88E+00	1,56E+01	1,00E+02	2,27E+00	1,02E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,62E-01	1,30E-02	1,40E-01	-5,36E-01

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	1,41E+01	8,69E-02	4,21E+00	1,84E+01	2,24E-02	6,95E-03	MND	MND	MND	MND	MND	MND	MND	MNR	1,59E-03	1,09E-03	3,87E-04	-1,45E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	4,91E+00	4,91E+00	0,00E+00	-4,91E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,41E+01	8,69E-02	9,13E+00	2,33E+01	2,24E-02	-4,91E+00	MND	MND	MND	MND	MND	MND	MND	MNR	1,59E-03	1,09E-03	3,87E-04	-1,45E-01
Non-re. PER as energy	MJ	5,71E+01	7,71E+00	5,84E+00	7,07E+01	1,97E+00	1,28E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,41E-01	1,60E-02	3,73E-02	-9,02E-01
Non-re. PER as material	MJ	1,34E+00	0,00E+00	3,98E-02	1,38E+00	0,00E+00	-3,98E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-1,14E+00	-2,01E-01	0,00E+00
Total use of non-re. PER	MJ	5,85E+01	7,71E+00	5,88E+00	7,21E+01	1,97E+00	8,81E-02	MND	MND	MND	MND	MND	MND	MND	MNR	1,41E-01	-1,12E+00	-1,64E-01	-9,02E-01
Secondary materials	kg	2,44E+00	2,14E-03	3,83E-01	2,82E+00	5,48E-04	1,87E-04	MND	MND	MND	MND	MND	MND	MND	MNR	3,91E-05	2,28E-05	7,02E-06	-7,39E-05
Renew. secondary fuels	MJ	1,28E-03	2,16E-05	2,72E-02	2,85E-02	5,45E-06	1,55E-06	MND	MND	MND	MND	MND	MND	MND	MNR	3,95E-07	3,55E-07	3,14E-07	-4,86E-07
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	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,21E-01	9,99E-04	8,10E-03	1,30E-01	2,55E-04	2,31E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1,83E-05	1,38E-05	4,41E-05	-5,95E-04

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	1,77E+00	1,02E-02	3,17E-02	1,81E+00	2,57E-03	6,55E-04	MND	MND	MND	MND	MND	MND	MND	MNR	1,87E-04	3,19E-05	1,40E-01	-6,95E-03
Non-hazardous waste	kg	6,22E+01	1,68E-01	7,07E-01	6,30E+01	4,23E-02	1,67E-01	MND	MND	MND	MND	MND	MND	MND	MNR	3,07E-03	4,10E-02	9,84E-03	-2,61E-01
Radioactive waste	kg	2,45E-04	5,16E-05	1,90E-05	3,16E-04	1,32E-05	5,48E-07	MND	MND	MND	MND	MND	MND	MND	MNR	9,43E-07	2,75E-08	0,00E+00	-2,56E-06

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	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	1,77E+00	1,77E+00	0,00E+00	2,31E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	8,50E-01	1,50E-01	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,54E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	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	MNR	0,00E+00	9,79E-01	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	4,34E+00	5,08E-01	4,75E-01	5,32E+00	1,30E-01	1,63E-02	MND	MND	MND	MND	MND	MND	MND	MNR	9,29E-03	1,21E-01	1,98E-03	-8,33E-02
Ozone depletion Pot.	kg CFC_{-11}e	2,06E-07	9,35E-08	3,40E-08	3,34E-07	2,39E-08	1,19E-09	MND	MND	MND	MND	MND	MND	MND	MNR	1,71E-09	1,20E-10	4,17E-10	-3,27E-09
Acidification	kg SO_2e	1,85E-01	1,69E-03	1,96E-03	1,88E-01	4,37E-04	5,93E-05	MND	MND	MND	MND	MND	MND	MND	MNR	3,09E-05	1,46E-05	8,40E-06	-5,25E-04
Eutrophication	kg PO_4^3e	5,80E-02	3,84E-04	1,31E-03	5,97E-02	9,84E-05	5,21E-05	MND	MND	MND	MND	MND	MND	MND	MNR	7,03E-06	1,09E-05	4,10E-05	-1,32E-04
POCP (“smog”)	kg C_2H_4e	7,08E-03	6,59E-05	1,11E-04	7,25E-03	1,70E-05	3,63E-06	MND	MND	MND	MND	MND	MND	MND	MNR	1,21E-06	3,08E-07	6,38E-07	-2,23E-05
ADP-elements	kg Sbe	5,07E-03	1,16E-06	6,65E-06	5,07E-03	2,97E-07	1,03E-07	MND	MND	MND	MND	MND	MND	MND	MNR	2,13E-08	5,01E-08	3,43E-09	-5,35E-08
ADP-fossil	MJ	5,84E+01	7,71E+00	6,06E+00	7,22E+01	1,97E+00	1,28E-01	MND	MND	MND	MND	MND	MND	MND	MNR	1,41E-01	1,60E-02	3,73E-02	-9,02E-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

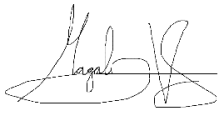
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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
02.05.2024



VERIFIED ISO 14025