BROEN

VALVE TECHNOLOGIES

ENVIRONMENTAL PRODUCT DECLARATION

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

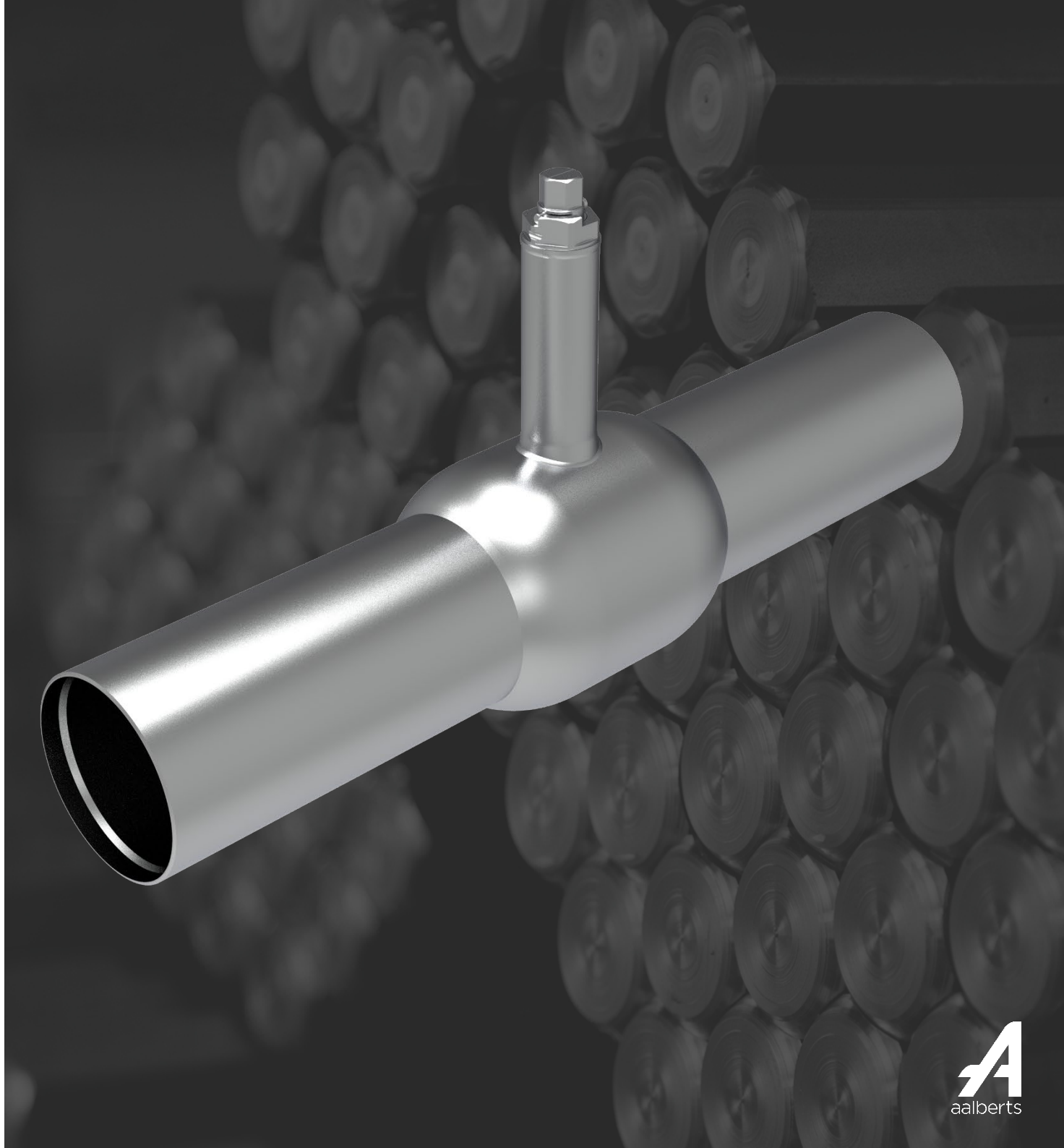
EPD Hub

aalberts

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

BROEN BALLOMAX®
Raw valves

- Full Bore: DN200-DN400
- Reduced Bore: DN250-DN500
- Carbon steel



EPD HUB, HUB-2073
Published on 20.09.2024,
last updated on 20.09.2024,
valid until 20.09.2029.

Created with one-click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	BROEN POLAND sp.z o.o.
Address	Pieszycka 10, 58-200 Dzierżoniów, Poland
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- Procurement & Sustainability specialist
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Imane Uald Lamkaddam as an authorized verifier for EPD Hub

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 BALLOMAX® Raw valves DN 200 8824225200A
Additional labels	This EPD covers BROEN BALLOMAX® Raw valves RB DN 250: 8704225250A RB DN 300: 8704225300A RB DN 350: 8704225350A RB DN 400: 8704225400A RB DN 500: 8704225500A FB DN 200: 8824225200A FB DN 250: 8824225250A FB DN 300: 8804225300A FB DN 400: 8804225400A
Product reference	DN 200 8824225200A scaled to 1 Kg
Place of production	Pieszycka 10, 58-200 Dzierżoniów, Poland
Period for data	01-01-2023 To 31-12-2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for	+6%

PRODUCT

Declared unit	DN 200 8824225200A scaled to 1 Kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	3.85
GWP-total, A1-A3 (kgCO2e)	3.14
Secondary material, inputs (%)	75.0
Secondary material, outputs (%)	60.0
Total energy use, A1-A3 (kWh)	17.8
Total water use, A1-A3 (m3e)	0.05

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.

BROEN BALLOMAX® energy efficiency – designed to last

Based on the heritage from leading edge innovations in Danish district heating, BROEN BALLOMAX® valves offer the most comprehensive range of proven ball valves for distribution and transmission of district energy in residential, commercial and industrial applications and are today a key component in district heating and district cooling networks throughout the world.

Safety is one of the concepts designed into a BROEN BALLOMAX®. The enormous power rushing through a district heating and cooling system puts great pressure on the components. Consequently, all components of a BROEN BALLOMAX® have been approved. The spindle is mounted from inside and cannot be ejected, and the water-based paint is harmless in the event of welding.

The maintenance of BROEN BALLOMAX® is minimal with no parts requiring replacement or lubrication. Everything has been made from the best raw materials and an annual activation of the ball ensures that it does not get stuck in the retainer. For the customer, the BROEN BALLOMAX® means a minimum of work.

Long life is a very important feature of the BROEN BALLOMAX®. We know that the replacement of a defective valve involves great inconvenience and costs, and when you choose a BROEN BALLOMAX® you are beyond that. We manufacture under the highest quality standards of the market in modern production facilities.

BROEN BALLOMAX® is your certainty of energy efficiency, reliability, and low operating costs.

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

PRODUCT AND MANUFACTURER

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	99	EUROPE,ASIA
Minerals		
Fossil materials	1	EUROPE,ASIA

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	0.88

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	8824225200A scaled to 1 Kg
Mass per declared unit VP-012	1 Kg

SUBSTANCES, REACH- VERY HIGH CONCERN

Substance	CAS
Gunmetal: Lead	**7439-92-1**

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3, see table below)

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 carbon steel mainly, stainless steel components and small polymer parts. The steel variants is received as tubes, bars or components in the factory and components are manufactured by processing the bars and tubes. The processes used to process the steel are milling, drilling, cutting and pressing. Scrap material derived from the production are sent to recycling, directly from the factory.

Polymer parts are sourced and directly consumed in the assembly of the valve. The valve consist of following components.

- Stem
- Stem guide
- Seat
- Connection
- Valve body
- Ball
- Polymer O-rings

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 wooden pallets is used.

The pallets transportation distance is defined as the distance between the supplier and BROEN, both located in Poland. 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 sent for waste treatment.

The mineral oils transportation is defined as the distance between BROEN and the treatment facility in Poland. 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.

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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

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

PRODUCT LIFE-CYCLE

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. Waste plastic is 100 % recycled and wood pallets is 72 % materials for energy recovery.

PRODUCT USE AND MAINTENANCE (B1-B7)

A BROEN BALLOMAX® 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)

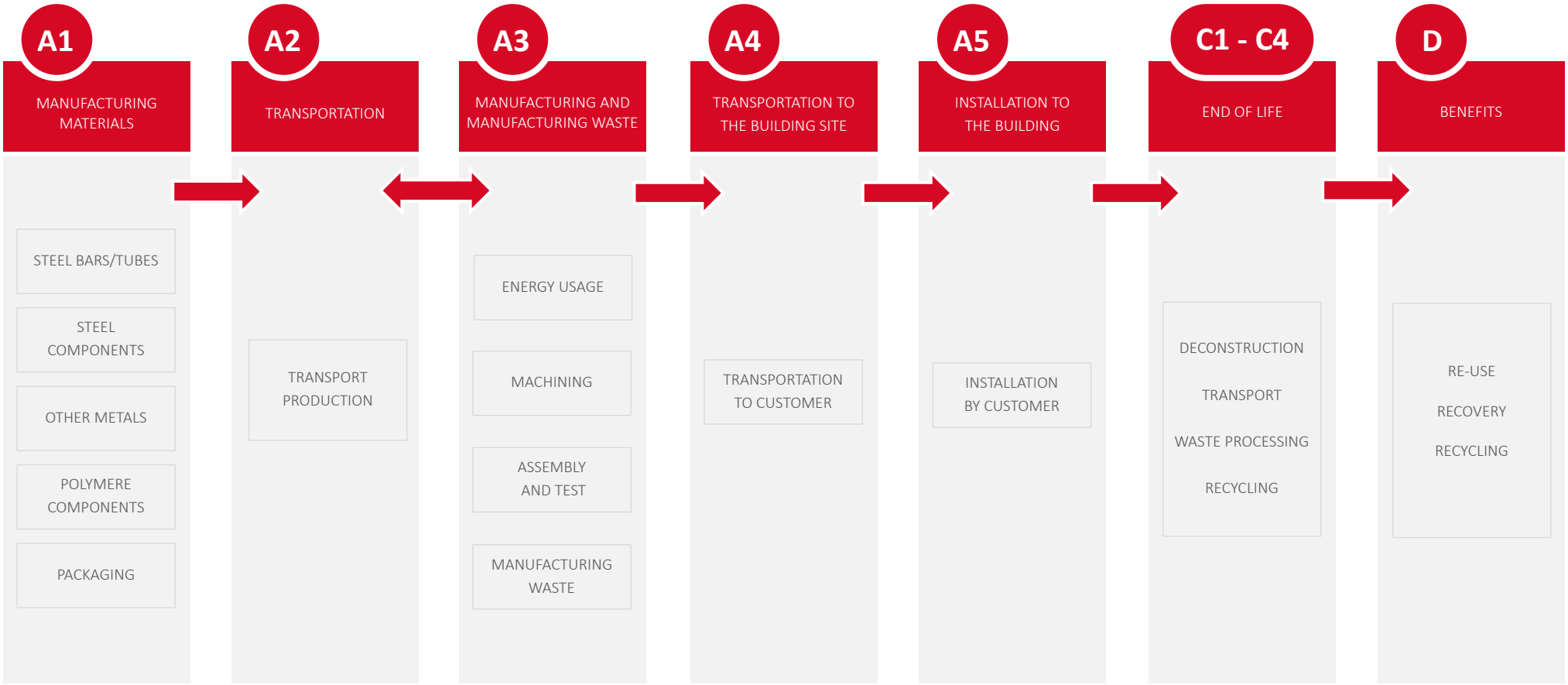
The consumption of energy and natural resources for disassembling the end-of-life is assumed to be negligible, as the disassembly of the product is done by the buyer or the recycling facilities (C1). The end-of-life product is assumed to be sent to the closest facilities by lorry, which is dependent on the individual country (C2). 85% of the product is sent for recycling. 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

BROEN BALLOMAX®

life-cycle



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	+6%

The BROEN BALLOMAX® Raw valve DN200 8824225200A valve has been selected as the representative valve. It is a valve that have the closest to average GWP among the covered valves. After careful considerations, it was decided that this valve is the most representative among the BROEN BALLOMAX® valves declared in this EPD.

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 – total1)	kg CO2e	2,69E+00	4,15E-01	2,64E-02	3,14E+00	1,60E-01	7,28E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,77E-02	1,10E-03	-1,99E-01
GWP – fossil	kg CO2e	2,69E+00	4,15E-01	7,43E-01	3,85E+00	1,60E-01	1,07E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,77E-02	1,10E-03	-1,99E-01
GWP – biogenic	kg CO2e	0,00E+00	0,00E+00	-7,18E-01	-7,18E-01	0,00E+00	7,18E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO2e	6,28E-03	2,34E-04	8,65E-04	7,38E-03	5,74E-05	1,21E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,93E-05	9,26E-07	1,10E-04
Ozone depletion pot.	kg CFC-11e	1,42E-07	8,82E-08	3,59E-08	2,66E-07	3,81E-08	1,33E-09	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,78E-09	3,95E-10	-5,49E-09
Acidification potential	mol H+e	1,37E-02	8,13E-03	6,07E-03	2,79E-02	6,67E-04	4,48E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,86E-04	9,20E-06	-7,92E-04
EP-freshwater2)	kg Pe	1,12E-04	2,35E-06	1,75E-05	1,32E-04	1,09E-06	4,79E-07	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,20E-06	1,03E-08	-6,53E-07
EP-marine	kg Ne	2,45E-03	2,04E-03	9,28E-04	5,42E-03	2,02E-04	9,93E-06	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	6,09E-05	3,21E-06	-2,30E-05
EP-terrestrial	mol Ne	2,72E-02	2,27E-02	1,01E-02	6,00E-02	2,22E-03	1,10E-04	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	7,03E-04	3,50E-05	-2,06E-03
POCP (“smog”)3)	kg NMVOCe	1,02E-02	6,03E-03	3,18E-03	1,94E-02	7,16E-04	3,36E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,93E-04	1,02E-05	-1,12E-03
ADP-minerals & metals4)	kg Sbe	3,21E-05	7,54E-07	6,42E-06	3,93E-05	3,75E-07	3,39E-08	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,01E-06	2,26E-09	-5,83E-06
ADP-fossil resources	MJ	1,40E+01	5,67E+00	5,18E+00	2,49E+01	2,44E+00	1,61E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,04E-01	2,68E-02	-1,55E+00
Water use5)	m3e depr.	1,37E+00	2,11E-02	2,61E-01	1,65E+00	1,13E-02	2,83E-03	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	6,39E-03	8,58E-05	7,00E-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.

ENVIRONMENTAL IMPACT DATA

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	1,86E-07	2,88E-08	2,72E-08	2,42E-07	1,88E-08	7,14E-10	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,72E-09	1,85E-10	-1,01E-08
Ionizing radiation6)	kBq U235e	1,34E-01	2,65E-02	4,75E-02	2,08E-01	1,26E-02	2,63E-03	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,38E-03	1,21E-04	6,66E-03
Ecotoxicity (freshwater)	CTUe	7,56E+01	4,34E+00	1,25E+01	9,24E+01	2,03E+00	1,32E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,37E+00	1,76E-02	-5,09E+00
Human toxicity, cancer	CTUh	3,17E-08	1,98E-10	3,12E-09	3,51E-08	5,36E-11	6,76E-12	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	4,26E-11	4,41E-13	1,88E-09
Human tox. non-cancer	CTUh	7,29E-08	3,67E-09	9,84E-09	8,64E-08	2,15E-09	1,35E-10	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,90E-09	1,15E-11	1,14E-08
SQP7)	-	9,37E+00	3,66E+00	5,90E+01	7,21E+01	2,85E+00	1,06E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	6,10E-01	5,74E-02	-7,46E-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.

ENVIRONMENTAL IMPACT DATA

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 energy8)	MJ	4,59E+00	5,14E-02	7,05E+00	1,17E+01	3,17E-02	1,61E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	5,37E-02	2,35E-04	-2,18E-01
Renew. PER as material	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
Total use of renew. PER	MJ	4,59E+00	5,14E-02	7,05E+00	1,17E+01	3,17E-02	1,61E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	5,37E-02	2,35E-04	-2,18E-01
Non-re. PER as energy	MJ	3,82E+01	5,67E+00	8,48E+00	5,23E+01	2,44E+00	1,60E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,04E-01	2,68E-02	-1,55E+00
Non-re. PER as material	MJ	2,62E-01	0,00E+00	0,00E+00	2,62E-01	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	-2,23E-01	-3,93E-02	0,00E+00
Total use of non-re. PER	MJ	3,85E+01	5,67E+00	8,48E+00	5,26E+01	2,44E+00	1,60E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	8,14E-02	-1,25E-02	-1,55E+00
Secondary materials	kg	8,87E-01	2,08E-03	3,49E-02	9,24E-01	6,89E-04	9,09E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,39E-04	5,67E-06	1,30E-01
Renew. secondary fuels	MJ	4,66E-04	1,14E-05	2,12E-01	2,13E-01	6,08E-06	5,73E-07	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,75E-05	1,49E-07	-3,10E-05
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	m3	3,85E-02	5,48E-04	7,16E-03	4,62E-02	3,24E-04	8,61E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,79E-04	2,93E-05	-5,27E-03

[8] PER = Primary energy resources.

ENVIRONMENTAL IMPACT DATA

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	1,13E+00	7,63E-03	1,37E-01	1,28E+00	2,62E-03	5,68E-04	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,06E-03	0,00E+00	-1,15E-01
Non-hazardous waste	kg	2,22E+00	9,32E-02	1,63E+00	3,94E+00	4,56E-02	2,22E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	7,17E-02	1,85E-01	-3,28E-01
Radioactive waste	kg	1,00E-04	3,90E-05	2,04E-05	1,60E-04	1,69E-05	1,10E-06	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,77E-06	0,00E+00	1,25E-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	5,03E-05	0,00E+00	1,10E+00	1,10E+00	0,00E+00	1,20E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	1,03E+00	1,85E-01	0,00E+00
Materials for energy rec	kg	3,19E-13	0,00E+00	0,00E+00	3,19E-13	0,00E+00	3,60E-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	1,42E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACT DATA

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 CO2e	2,66E+00	4,11E-01	7,33E-01	3,81E+00	1,58E-01	1,06E-02	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,73E-02	1,05E-03	-1,84E-01
Ozone depletion Pot.	kg CFC-11e	1,61E-07	6,99E-08	3,00E-08	2,60E-07	3,02E-08	1,07E-09	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,24E-09	3,13E-10	-7,82E-09
Acidification	kg SO2e	1,21E-02	6,49E-03	5,21E-03	2,38E-02	5,16E-04	3,63E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	2,30E-04	6,95E-06	-6,34E-04
Eutrophication	kg PO43e	2,90E-03	7,95E-04	1,57E-03	5,27E-03	1,15E-04	2,48E-05	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	7,69E-05	6,21E-06	-2,85E-04
POCP (“smog”)	kg C2H4e	1,03E-03	1,75E-04	2,51E-04	1,46E-03	2,03E-05	1,60E-06	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	8,69E-06	3,07E-07	-1,46E-04
ADP-elements	kg Sbe	3,96E-05	7,35E-07	7,12E-06	4,75E-05	3,65E-07	3,34E-08	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,01E-06	2,23E-09	-5,82E-06
ADP-fossil	MJ	3,54E+01	5,67E+00	9,64E+00	5,07E+01	2,44E+00	1,60E-01	MND	MND	MND	MND	MND	MND	MND	MNR	0,00E+00	3,04E-01	2,68E-02	-1,55E+00

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.

Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited
20.09.2024

EPD Hub
VERIFIED ISO 14025