



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025



HERZ d.o.o.

HERZ Ball valves

EPD HUB, HUB-5728

Published on 13.02.2026, last updated on 13.02.2026, valid until 12.02.2031

GENERAL INFORMATION

MANUFACTURER

Manufacturer	HERZ d.o.o.
Address	Grmaška c.3, 1275 Šmartno pri Litiji, Slovenia
Contact details	info@herz.si
Website	http://www.herz-kovina.si/en/

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EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Valentin Kodric, HERZ d.o.o., Grmaška c.3, 1275 Šmartno pri Litiji, Slovenia
EPD verification	Independent verification of this EPD and data, according to ISO 14025: o Internal verification ☒ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

PRODUCT

Product name	HERZ Ball valves
Additional labels	Construction product
Product reference	1 2100 09
Place(s) of raw material origin	Italy
Place of production	Šmartno pri Litiji, Slovenia
Place(s) of installation and use	EU
Period for data	JANUARY 2023 - DECEMBER 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	-20%
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	6,99

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
Mass of packaging	0,064 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	14,1
GWP-total, A1-A3 (kgCO ₂ e)	14,1
Secondary material, inputs (%)	32,2
Secondary material, outputs (%)	59,7
Total energy use, A1-A3 (kWh)	44,8
Net freshwater use, A1-A3 (m ³)	0,22

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The basic product range of the HERZ brand is ball valves of various designs for non-aggressive media, such as water, air, steam, oil derivatives, gases, as well as safety and regulatory elements for central heating systems, water and gas installations. HERZ products are the result of our own development and technology, which is subject to European standards that define usability and testing methods.

PRODUCT DESCRIPTION

Ball valves are used as closing, filling - draining fitting in industry and construction. Ball valves are used wherever the medium flow has to be reliably closed. Operating pressure varies according to the size and is given in the data sheet.

Products: 1 2110 XX, Ball valve with T or lever handle and backflow preventer, PN 16; 1 2190 XX, Ball valve with lever handle, DZR brass; 1 2201 01-06, Ball valve with lever-handle, PN 25; 1 2202 01-12, Flush ball valve without/with lever, PN 16 (for flush mounting); 1 2202 81-83, Ball valve with connection for temperature sensor, PN 25; 1 2202 21-26, Ball valve with lever handle (sheet steel galvanised), PN 25; 1 2205 13, Ball valve with T-handle, straight version, red, PN 25 (for manifold); 1 2205 23, Ball valve with T-handle, straight version, blue, PN 25 (for manifold); 1 2211 XX, Ball valve with T or lever handle (silumin), PN 25; 1 2216 XX, Ball valve with T or lever handle (silumin), PN 25; 1 2221 0X, Ball valve with freely rotating union nut and T-handle, PN 25; 1 2224 2X, Angled ball valve with freely rotating union nut and T-handle, PN 25; 1 2224 03-13, Ball valve with T-handle, angle version (for steel/stainless steel distributor), PN 25; 1 2228 01-14, Ball valve with T or lever handle (silumin), PN 25; 1 2268 03, Ball valve for pump connection with non-return valve, PN 16; 1 2269 03, Ball valve for pump connection, PN 16; 1 2412 01, Three-Port Ball Valve, PN 40; 1 2442 XX, Ball valve with freely rotating union nut, PN 16; 2 2110 01-12, Ball valve with T or lever handle and backflow

preventer, PN 16 (drinking water version)

Common characteristics for most Herz ball valves (series 1 22xx, 1 21xx, 1 24xx, etc.):

Body: Forged brass (often nickel-plated or DZR/dezincification-resistant)

Ball: Full bore, Seals: PTFE (ball & spindle/stem) or with EPDM.

Connections: Female thread ISO 228, some with union nut or male thread

Temperature range: -30 °C to +150 °C (water ≥0.5 °C, max. 110 °C short-term, no steam)

Medium: Water, chilled water, heating, non-aggressive media.

The main differences between the individual valves in the group are the percentage of brass by weight (approximately 81% for DN8 to 93% for DN50) and minor differences in the amounts of plastic and PTFE seals. These differences result in differences in environmental impacts of ≤20% for most primary input streams (brass, plastic, PTFE). The valve with the highest impact for most indicators is the DN8 model; therefore, it was selected as the worst representative for the statement of results.

Further information can be found at:

<https://herz-armaturen.at/>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	98	EU
Minerals	-	-
Fossil materials	2	EU
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	0,024

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	20

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
Lead (Pb) is present in our brass products (>0.1% weight by weight (w/w)) max. 0,6%	231-100-4	7439-92-1

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	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use		Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recycling

Not declared = ND.

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.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The valve is made of raw brass forged and metal processing in our company. The pieces are assembled with other valves components like handles, body, balls, fittings, spindle, screw, O-ring, sealant and nut. Main components are from brass, plastics, steel, PTFE and adhesive. The A2 distance one way is between 70 km to 450 km. The manufacturing process requires gas, We obtain electricity from the grid, where a large part of the electricity comes from nuclear power plants and hydroelectric power plants. A smaller part of the energy comes from solar power plants and thermal power plants. We have heating with wood chips on site. A local supplier 2km away produces wood chips from lower quality wood from surrounding forests. Approximately 45% of brass is waste during processing. We combine the transportation of brass waste with the supply of new brass from the same supplier. The brass waste is sent to recycling. The distance between manufacturing site and waste treatment facilities is around 450km. The wastewater treatment is also considered. A wooden pallet and packaging film are used as a packaging material for transporting the product from the factory. Pallets are returnable and reusable. Cardboard packaging is fully recyclable. In most cases, this is the responsibility of the retailer, as products are usually shipped to store shelves without packaging.

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.

Average distance of transportation from production plant to retailer's site is assumed as 400 km and the transportation method is assumed to be lorry. 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. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Transportation does not cause losses as product is packaged properly. The installation procedure is given in the technical data of the product and requires minimal additional energy and materials (sealing material). Environmental impacts from installation into the building include generation of waste packaging materials (A5) and release of biogenic carbon dioxide from wood pallets. The impacts of material production, its processing and disposal as installation waste are also included.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use stage of the product (modules B1–B7 are not declared).

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

The product itself can be quickly removed from the installation and, with minimal additional work, disassembled to the extent that the brass and plastic handle are separated (for Module C1 demolition: no energy needed to demolish/disassemble the product).

End-of-life stage (C1–C4 + D)

Assumed scenario for EU:

Brass and aluminium: 60% recycling, 40% landfilled (source: Copper Alliance, 2021)

Steel: 100% landfilled as a conservative assumption, as the quantity is too small to be recycled.

Plastic: 100% incineration as a conservative assumption.

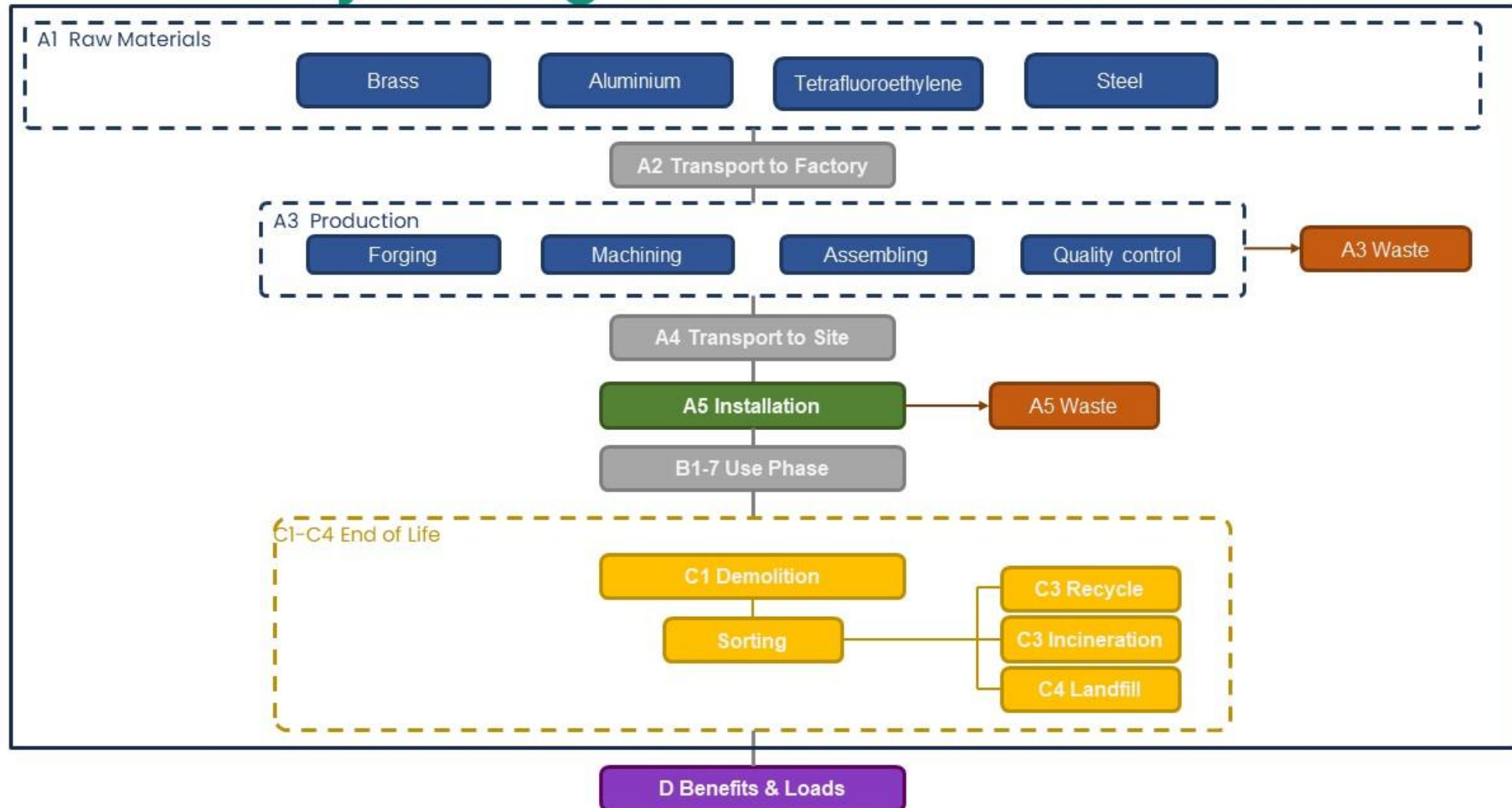
Benefits and loads are modelled in Module D. For the recycling scenario, the benefits are the following:

- Recycled brass substitutes primary brass (ecoinvent dataset: market for brass, recycling input credit)
- Recycled plastic substitutes primary plastic (PP/PE mix)
- Energy from incineration substitutes the average EU heat and electricity mix (substitution ratio according to EN 15804+A2)

Loads are modelled by impacts associated with producing secondary material/energy.

SYSTEM DIAGRAM

Life-cycle diagram for HERZ ball valves



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.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

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 material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on worst-case results
Variation in GWP-fossil for A1-A3, %	-20%

The 1 2100 09 DN8 valve (representative product) represents the worst-case of the products. The variability of the primary data or the emissions between the products did not amount to more than 10 % of brass, plastic, and PTFE material. The comparison is based on the data between the largest and smallest valve in this family. The primary data was averaged by calculating a weighted average of the products consumption of raw materials, energy, and production of wastes. Following types of the ball valves are included in the EPD and can be found in our production range on our website (Herz.eu): 1 2110 XX, Ball valve with T or lever handle and backflow preventer, PN 16; 1 2190 XX, Ball valve with lever handle, DZR brass; 1 2201 01-06, Ball valve with lever-handle, PN 25; 1 2202 01-12, Flush ball valve without/with lever, PN 16 (for flush mounting); 1 2202 81-83, Ball valve with connection for temperature sensor, PN 25; 1 2202 21-26, Ball valve with lever handle (sheet steel galvanised), PN 25; 1 2205 13, Ball valve with T-handle, straight version, red, PN 25 (for manifold); 1 2205 23, Ball valve with T-handle, straight version, blue, PN 25 (for manifold); 1 2211 XX, Ball valve with T or lever handle (silumin), PN 25; 1 2216 XX, Ball valve with T or lever handle (silumin), PN 25; 1 2221 0X, Ball valve with freely rotating union nut and T-handle, PN 25; 1 2224 2X, Angled ball valve with freely rotating union nut and T-handle, PN 25; 1 2224 03-13, Ball valve with T-handle, angle version (for steel/stainless steel distributor), PN 25; 1 2228 01-14, Ball valve with T or lever handle (silumin), PN 25; 1 2268 03, Ball valve for pump connection with non-return valve, PN 16; 1 2269 03, Ball valve for pump connection, PN 16; 1 2412 01, Three-Port Ball Valve, PN 40; 1 2442 XX, Ball valve with freely rotating union nut, PN 16; 2 2110 01-12, Ball valve with T or lever handle and backflow preventer, PN 16 (drinking water version)

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

A5 scenario packaging treatment: Eurostat (EU, 2021, in kg).
Aluminium treatment scenario (Module C-D): Copper Alliance, 2021

ENVIRONMENTAL IMPACT DATA

The 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.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

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 ₂ e	1,32E+01	7,27E-02	8,73E-01	1,41E+01	7,24E-02	9,37E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,38E-03	7,09E-02	2,48E-03	-5,02E+00
GWP – fossil	kg CO ₂ e	1,31E+01	7,27E-02	9,64E-01	1,41E+01	7,24E-02	3,01E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,38E-03	7,10E-02	2,48E-03	-5,01E+00
GWP – biogenic	kg CO ₂ e	2,79E-02	1,64E-05	-9,06E-02	-6,27E-02	1,64E-05	9,06E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,22E-06	-5,17E-05	-1,16E-06	-2,33E-03
GWP – LULUC	kg CO ₂ e	1,64E-02	3,25E-05	2,40E-04	1,67E-02	3,24E-05	3,29E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,41E-06	1,95E-05	1,54E-06	-6,06E-03
Ozone depletion pot.	kg CFC-11e	8,08E-05	1,07E-09	3,68E-08	8,08E-05	1,07E-09	3,60E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,94E-11	1,95E-10	7,02E-11	-3,24E-08
Acidification potential	mol H ⁺ e	5,03E-01	2,48E-04	4,73E-03	5,08E-01	2,47E-04	1,22E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,83E-05	1,86E-04	1,74E-05	-2,19E-01
EP-freshwater ²⁾	kg Pe	3,94E-02	5,66E-06	1,51E-04	3,95E-02	5,63E-06	5,82E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,19E-07	8,95E-06	2,14E-07	-1,68E-02
EP-marine	kg Ne	2,89E-02	8,14E-05	9,88E-04	2,99E-02	8,11E-05	1,31E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E-06	4,57E-05	6,66E-06	-1,33E-02
EP-terrestrial	mol Ne	3,82E-01	8,86E-04	9,42E-03	3,92E-01	8,82E-04	4,96E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,56E-05	4,95E-04	7,20E-05	-1,71E-01
POCP (“smog”) ³⁾	kg NMVOCe	1,09E-01	3,65E-04	2,97E-03	1,12E-01	3,64E-04	1,63E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,70E-05	1,43E-04	2,57E-05	-4,88E-02
ADP-minerals & metals ⁴⁾	kg Sbe	6,58E-03	2,03E-07	1,44E-06	6,58E-03	2,02E-07	6,12E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,50E-08	9,60E-07	4,09E-09	-2,72E-03
ADP-fossil resources	MJ	1,20E+02	1,06E+00	1,23E+01	1,34E+02	1,05E+00	3,11E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,81E-02	2,02E-01	5,97E-02	-5,63E+01
Water use ⁵⁾	m ³ e depr.	6,55E+00	5,21E-03	6,60E+00	1,32E+01	5,19E-03	8,54E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,86E-04	6,63E-03	2,25E-04	-2,57E+00

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, EF 3.1

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	1,30E-06	7,28E-09	4,10E-08	1,35E-06	7,25E-09	2,15E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,39E-10	2,49E-09	3,92E-10	-5,66E-07
Ionizing radiation ⁶⁾	kBq U235e	1,01E+00	9,19E-04	2,92E-01	1,30E+00	9,15E-04	8,18E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,80E-05	7,07E-04	4,13E-05	-3,86E-01
Ecotoxicity (freshwater)	CTUe	6,86E+02	1,49E-01	1,90E+00	6,88E+02	1,49E-01	1,12E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,10E-02	2,19E-01	1,01E+00	-2,85E+02
Human toxicity, cancer	CTUh	5,80E-08	1,20E-11	2,61E-10	5,83E-08	1,19E-11	1,11E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,88E-13	1,77E-11	5,38E-13	-2,15E-08
Human tox. non-cancer	CTUh	5,04E-06	6,83E-10	5,74E-09	5,05E-06	6,80E-10	6,01E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,05E-11	9,94E-10	3,29E-11	-2,09E-06
SQP ⁷⁾	-	1,63E+02	1,06E+00	1,32E+01	1,77E+02	1,06E+00	2,91E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,86E-02	3,66E-01	1,16E-01	-6,76E+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	2,43E+01	1,45E-02	1,72E+00	2,60E+01	1,44E-02	-9,36E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,07E-03	3,02E-02	6,29E-04	-8,93E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	7,94E-01	7,94E-01	0,00E+00	-7,94E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,71E-02
Total use of renew. PER	MJ	2,43E+01	1,45E-02	2,52E+00	2,68E+01	1,44E-02	-1,73E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,07E-03	3,02E-02	6,29E-04	-8,87E+00
Non-re. PER as energy	MJ	1,20E+02	1,06E+00	1,38E+01	1,35E+02	1,05E+00	3,98E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,81E-02	-6,34E-01	5,97E-02	-5,63E+01
Non-re. PER as material	MJ	1,67E-01	0,00E+00	5,19E-02	2,19E-01	0,00E+00	-5,19E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-1,67E-01	2,72E-02
Total use of non-re. PER	MJ	1,20E+02	1,06E+00	1,39E+01	1,35E+02	1,05E+00	-4,80E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,81E-02	-6,34E-01	-1,08E-01	-5,63E+01
Secondary materials	kg	3,22E-01	4,49E-04	4,46E-03	3,27E-01	4,47E-04	2,17E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,32E-05	2,31E-04	1,54E-05	5,55E-01
Renew. secondary fuels	MJ	2,21E-03	5,70E-06	2,77E-02	2,99E-02	5,68E-06	2,16E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,22E-07	1,04E-05	3,11E-07	-7,11E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	2,13E-01	1,56E-04	9,67E-03	2,23E-01	1,55E-04	-8,05E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-05	1,45E-04	3,78E-05	-8,27E-02

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	2,92E+00	1,79E-03	8,53E-03	2,93E+00	1,78E-03	2,06E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,32E-04	2,44E-03	8,17E-05	-1,23E+00
Non-hazardous waste	kg	1,52E+02	3,31E-02	5,64E+00	1,58E+02	3,29E-02	1,42E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,45E-03	6,75E-02	3,26E-02	-6,47E+01
Radioactive waste	kg	2,59E-04	2,25E-07	3,14E-05	2,91E-04	2,24E-07	2,04E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,66E-08	1,74E-07	1,01E-08	-9,82E-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	6,25E-02	6,25E-02	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	3,66E-01	3,66E-01	0,00E+00	2,08E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,97E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	6,70E-04	6,70E-04	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	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	1,04E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,38E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,05E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

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 ₂ e	1,26E+01	7,23E-02	9,59E-01	1,36E+01	7,20E-02	4,44E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,35E-03	7,09E-02	2,46E-03	-4,99E+00
Ozone depletion Pot.	kg CFC ₁₁ e	9,40E-05	8,56E-10	4,06E-08	9,41E-05	8,52E-10	2,90E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,34E-11	1,62E-10	5,58E-11	-2,81E-08
Acidification	kg SO ₂ e	4,41E-01	1,89E-04	3,93E-03	4,45E-01	1,88E-04	9,05E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,40E-05	1,49E-04	1,29E-05	-1,92E-01
Eutrophication	kg PO ₄ ³ e	2,25E-02	4,61E-05	2,01E-03	2,46E-02	4,59E-05	3,34E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,41E-06	2,30E-05	4,31E-06	-9,77E-03
POCP ("smog")	kg C ₂ H ₄ e	1,90E-02	1,69E-05	2,13E-04	1,92E-02	1,68E-05	1,04E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,25E-06	8,85E-06	1,20E-06	-8,40E-03
ADP-elements	kg Sbe	6,57E-03	1,98E-07	1,42E-06	6,57E-03	1,97E-07	5,88E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,46E-08	9,56E-07	4,01E-09	-2,72E-03
ADP-fossil	MJ	1,05E+02	1,04E+00	1,22E+01	1,18E+02	1,04E+00	2,97E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,70E-02	1,91E-01	5,90E-02	-5,06E+01

ADDITIONAL INDICATOR – GWP-GHG

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 ₂ e	1,31E+01	7,27E-02	9,64E-01	1,42E+01	7,24E-02	3,01E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,38E-03	7,10E-02	2,48E-03	-5,01E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, Slovenia, residual mix, 2023, Slovenia, One Click LCA
Electricity kg CO ₂ e/kWh	0.74
District heating data source and quality	1) Heat production, wood chips from industry, at furnace 1000kW, World, Ecoinvent; 2) Heat production, propane, at industrial furnace >100kW, World, Ecoinvent,
District heating kg CO ₂ e/MJ	1) 0.0181; 2) 0.0945
Fuel input	-
Fuel input kg CO ₂ e/MJ	-

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type	1) Market for transport, freight, lorry, 16-32 metric ton, diesel, EURO 6, 2) Market for transport, freight, lorry >32 metric ton, EURO5
Average transport distance, km	1) 1600 km 2) 4020 km
Capacity utilization (including empty return) %	70
Bulk density of transported products	6,26E+02
Volume capacity utilization factor	<1

Installation scenario documentation A5

Scenario parameter	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m ³	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	-
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Paper: 0.0006002kg Plastic: 0.00067kg Wood: 0.063kg
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	Paper: - Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling, 5.0E-4 kg - Treatment of waste packaging paper, municipal incineration, Ecoinvent, 4.8E-5 kg - Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 5.4E-5 kg Plastic: - Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 2.7E-4 kg - Treatment of waste polyethylene, municipal incineration, Ecoinvent, 2.5E-4 kg

	- Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 1.5E-4 kg Wood: - Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 0.02 kg - Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.019 kg - Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.024 kg
Direct emissions to ambient air, soil and water / kg	-

End of life scenario documentation - C1-C4 (Data source)

Scenario information	Value
Recovery process – kg for re-use	-
Recovery process – kg for recycling	Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0,597 kg
Recovery process – kg for energy recovery	-
Recovery process – kg for final deposition	1) Treatment of scrap steel, inert material landfill, Ecoinvent, sum: 0,3737 kg 2) Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 0,023 kg 3) Treatment of waste aluminium, sanitary landfill, Ecoinvent, 0.0057 kg
Scenario assumptions	50km
Collection process – kg collected separately	-

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

Vera Durão, as an authorised verifier acting for EPD Hub Limited

13.02.2026

