



# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025



**HERZ d.o.o.**

**HERZ water angle valve**

**EPD HUB, HUB-5727**

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         | <a href="http://www.herz-kovina.si/en/">http://www.herz-kovina.si/en/</a> |

This EPD is intended for business-to-business and/or business-to-consumer communication. 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.

### 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:<br><br>o Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Vera Durão, as an authorised verifier acting for EPD Hub Limited                                                                                                |

## PRODUCT

|                                            |                              |
|--------------------------------------------|------------------------------|
| Product name                               | HERZ water angle valve       |
| Additional labels                          | Construction product         |
| Product reference                          | KV 550                       |
| 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 (%)      | -9%                          |
| GTIN (Global Trade Item Number)            | -                            |
| NOBB (Norwegian Building Product Database) | -                            |
| A1-A3 Specific data (%)                    | 8,19                         |

## ENVIRONMENTAL DATA SUMMARY

|                                             |          |
|---------------------------------------------|----------|
| Declared unit                               | 1 kg     |
| Declared unit mass                          | 1 kg     |
| Mass of packaging                           | 0,064 kg |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)     | 12,1     |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)      | 12       |
| Secondary material, inputs (%)              | 32,9     |
| Secondary material, outputs (%)             | 59,4     |
| Total energy use, A1-A3 (kWh)               | 43,7     |
| Net freshwater use, A1-A3 (m <sup>3</sup> ) | 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

HERZ angle valves of the KV 55x series (primarily models KV 550–KV 559, including flat-sealing and extended versions) are designed for use as shut-off and control fittings in sanitary and potable water installations within buildings. They serve as isolation valves at connection points for faucets, household appliances (e.g., washing machines and dishwashers), or distribution lines. These valves are typically installed at wall outlets or beneath sinks in residential, commercial, and industrial buildings to enable isolation of individual draw-off points for maintenance or emergency purposes.

The valves provide a reliable seal with a 90-degree rotation of the handle between the fully open and fully closed positions or with a flat seal by rotating the handle clockwise to close and counterclockwise to open. Available designs include a ball mechanism with a chrome-plated ball and PTFE seats, or a flat-sealing variant with EPDM seals. Connections are available in flat-sealing or threaded configurations, most commonly G 3/4; certain models (e.g., KV 555) feature combined or dual outlets.

Key Technical Characteristics:

Nominal pressure rating: PN 10 to PN 16 (model-dependent; typically PN 10 for potable water applications)

Maximum operating pressure: up to 10–16 bar (refer to the specific product data sheet)

Operating temperature range: –10 °C to +90 °C (medium: water up to

+90 °C; no steam permitted)

Connection sizes: most commonly DN 15 to DN 20 (1/2" to 3/4")

Medium: potable (drinking) water and non-aggressive fluids

Materials: body – brass (CW617N or equivalent from 4MS), ball – chrome-plated brass, seals – PTFE or EPDM, handle – plastic or metal

Reference Service Life (RSL): 25 years

(applicable under typical conditions of use in building installations, in accordance with EN 15804 guidelines and manufacturer experience)

The described angle valves are intended exclusively for manual operation and provide dependable flow shut-off in potable water systems.

The main differences between the individual valves in the group are the percentage of brass by weight - approximately 83% for representative worst case and to the best case which have 93%, and minor differences in the amounts of plastic and PTFE seals. These differences result in environmental impacts that differ by ≤10% for most primary input streams (brass, plastic, PTFE). The valve with the highest impact for most indicators is the KV550 model; therefore, it was selected as the worst representative for the statement of results.

Further information can be found at:

<http://www.herz-kovina.si/en/>

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|-----------------------|----------------|-----------------|
| Metals                | 99             | EU              |
| Minerals              | -              | -               |
| Fossil materials      | 1              | 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 | 0,025 |

## FUNCTIONAL UNIT AND SERVICE LIFE

|                        |      |
|------------------------|------|
| Declared unit          | 1kg  |
| Mass per declared unit | 1 kg |
| Functional unit        | -    |
| Reference service life | 25   |

## 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                    |  | 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 for recycling. The distance between the manufacturing site and waste treatment facilities is around 450km. The wastewater treatment is also considered. Cardboard packaging is fully recyclable. In most cases, this is the retailer's responsibility, as products are usually shipped to store shelves without packaging.

A wooden pallet and packaging film are used as a packaging material for transporting the product from the factory. Pallets are returnable and reusable.

### 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: 60% recycling, 40% landfilled (source: Copper Alliance, 2021)

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

Plastic: 100% incineration as a conservative assumption.

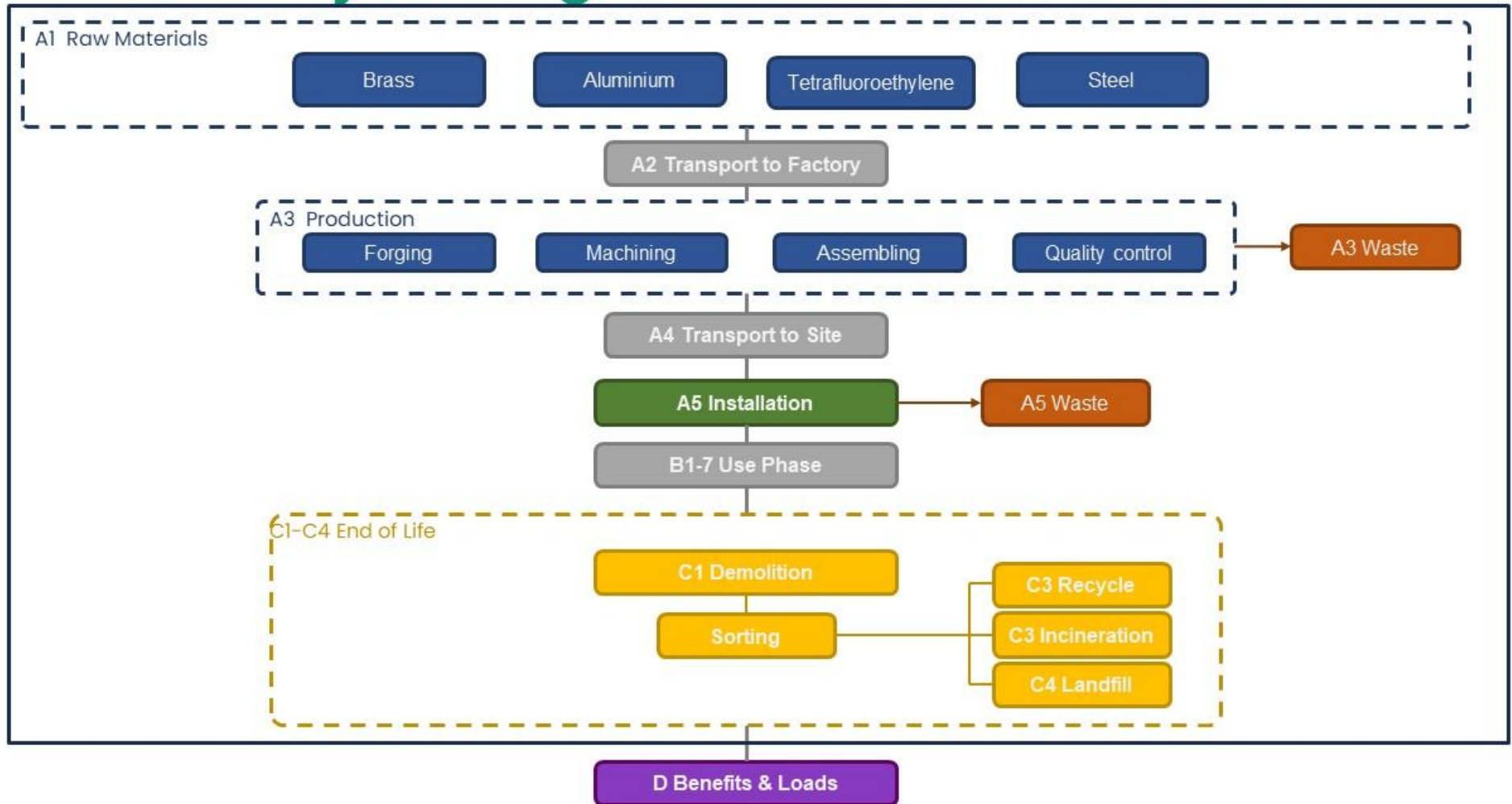
Benefits and loads are modelled in Module D. For the recycling scenario, benefits are the following:

- 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 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, % | -9%                         |

The KV 550 valve (representative product) represents the worst case of the products. Valves within the family are of the same dimensions and differ from each other in one connection (thread size), where the differences in brass weight between them are minimal. 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 angle valves are included in the EPD and can be found in our production range on our website (Herz-Kovina.si): KV 550 – KV 551 Water angle ball valve, PN16, Standard single-outlet angle ball valve for shutting off water flow in sanitary installations; KV 552 Water angle ball valve, PN16, Single-outlet angle ball valve, suitable for standard water supply connections; KV 553 – KV 554 Water angle ball valve with integrated filter, PN16, Angle ball valve equipped with a built-in strainer to protect downstream components from impurities in the water supply; KV 555 Double angle valve, PN16, Dual-outlet design allowing connection of two fixtures from a single inlet; KV 556 Angle valve for water – flat sealing (extended version), PN16, Extended-body variant with flat sealing for specific installation requirements; KV 557 – KV 558 Angle valve for water – flat sealing, PN16, Standard flat-sealing angle valve; KV 559 Angle valve for water – flat sealing (extended), PN16, Extended version of the flat-sealing angle valve.

### General Notes:

All models are intended for sanitary/water applications (drinking water systems) and feature a pressure rating of PN16. Connection types include threaded (G), copper pipe (Cu), or combined.

## 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 <sup>1)</sup>           | kg CO <sub>2</sub> e   | 1,11E+01 | 7,16E-02 | 8,79E-01  | 1,20E+01  | 7,24E-02 | 9,37E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,38E-03 | 3,98E-02 | 2,57E-03 | -4,77E+00 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 1,10E+01 | 7,16E-02 | 9,69E-01  | 1,21E+01  | 7,24E-02 | 3,01E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,38E-03 | 3,98E-02 | 2,57E-03 | -4,73E+00 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | 2,73E-02 | 1,61E-05 | -9,06E-02 | -6,33E-02 | 1,64E-05 | 9,06E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -2,97E-02 |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 1,64E-02 | 3,20E-05 | 2,45E-04  | 1,67E-02  | 3,24E-05 | 3,29E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,41E-06 | 1,91E-05 | 1,57E-06 | -6,14E-03 |
| Ozone depletion pot.                | kg CFC-11e             | 3,50E-05 | 1,06E-09 | 3,81E-08  | 3,50E-05  | 1,07E-09 | 3,60E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,95E-11 | 1,82E-10 | 7,31E-11 | -3,17E-08 |
| Acidification potential             | mol H <sup>+</sup> e   | 5,09E-01 | 2,44E-04 | 4,76E-03  | 5,14E-01  | 2,47E-04 | 1,22E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,84E-05 | 1,78E-04 | 1,81E-05 | -2,21E-01 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 4,00E-02 | 5,57E-06 | 1,52E-04  | 4,01E-02  | 5,63E-06 | 5,82E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,19E-07 | 8,80E-06 | 2,21E-07 | -1,70E-02 |
| EP-marine                           | kg Ne                  | 2,89E-02 | 8,02E-05 | 9,94E-04  | 2,99E-02  | 8,11E-05 | 1,31E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,03E-06 | 4,14E-05 | 6,92E-06 | -1,31E-02 |
| EP-terrestrial                      | mol Ne                 | 3,84E-01 | 8,73E-04 | 9,49E-03  | 3,94E-01  | 8,82E-04 | 4,96E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,56E-05 | 4,58E-04 | 7,49E-05 | -1,70E-01 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 1,09E-01 | 3,60E-04 | 3,00E-03  | 1,12E-01  | 3,64E-04 | 1,63E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,71E-05 | 1,34E-04 | 2,67E-05 | -4,84E-02 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 6,72E-03 | 2,00E-07 | 1,47E-06  | 6,72E-03  | 2,02E-07 | 6,12E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,50E-08 | 9,53E-07 | 4,22E-09 | -2,78E-03 |
| ADP-fossil resources                | MJ                     | 1,16E+02 | 1,04E+00 | 1,24E+01  | 1,30E+02  | 1,05E+00 | 3,11E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,81E-02 | 1,95E-01 | 6,21E-02 | -5,37E+01 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 6,58E+00 | 5,13E-03 | 6,61E+00  | 1,32E+01  | 5,19E-03 | 8,54E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,86E-04 | 4,57E-03 | 2,25E-04 | -2,60E+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 PO<sub>4</sub>e; 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 | 7,17E-09 | 4,14E-08 | 1,34E-06 | 7,25E-09 | 2,15E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,39E-10 | 2,44E-09 | 4,08E-10 | -5,58E-07 |
| Ionizing radiation <sup>6)</sup> | kBq U235e | 9,86E-01 | 9,05E-04 | 2,92E-01 | 1,28E+00 | 9,15E-04 | 8,18E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,80E-05 | 6,92E-04 | 4,23E-05 | -3,76E-01 |
| Ecotoxicity (freshwater)         | CTUe      | 6,99E+02 | 1,47E-01 | 1,92E+00 | 7,01E+02 | 1,49E-01 | 1,12E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,10E-02 | 1,57E-01 | 8,82E-01 | -2,90E+02 |
| Human toxicity, cancer           | CTUh      | 5,71E-08 | 1,18E-11 | 2,64E-10 | 5,74E-08 | 1,19E-11 | 1,11E-12 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,88E-13 | 1,49E-11 | 5,45E-13 | -2,18E-08 |
| Human tox. non-cancer            | CTUh      | 5,15E-06 | 6,73E-10 | 5,86E-09 | 5,16E-06 | 6,80E-10 | 6,01E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,06E-11 | 8,96E-10 | 3,05E-11 | -2,13E-06 |
| SQP <sup>7)</sup>                | -         | 1,65E+02 | 1,05E+00 | 1,32E+01 | 1,79E+02 | 1,06E+00 | 2,91E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,87E-02 | 3,62E-01 | 1,21E-01 | -6,85E+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 <sup>8)</sup> | MJ             | 2,45E+01 | 1,42E-02 | 1,73E+00 | 2,62E+01 | 1,44E-02 | -9,36E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,07E-03 | 2,98E-02  | 6,46E-04  | -9,09E+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  | 2,57E-01  |
| Total use of renew. PER            | MJ             | 2,45E+01 | 1,42E-02 | 2,52E+00 | 2,70E+01 | 1,44E-02 | -1,73E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,07E-03 | 2,98E-02  | 6,46E-04  | -8,83E+00 |
| Non-re. PER as energy              | MJ             | 1,16E+02 | 1,04E+00 | 1,39E+01 | 1,31E+02 | 1,05E+00 | 3,98E-03  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,81E-02 | -1,67E-01 | 6,22E-02  | -5,37E+01 |
| Non-re. PER as material            | MJ             | 7,23E-02 | 0,00E+00 | 5,19E-02 | 1,24E-01 | 0,00E+00 | -5,19E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00  | -7,23E-02 | 2,70E-02  |
| Total use of non-re. PER           | MJ             | 1,16E+02 | 1,04E+00 | 1,39E+01 | 1,31E+02 | 1,05E+00 | -4,80E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,81E-02 | -1,67E-01 | -1,02E-02 | -5,37E+01 |
| Secondary materials                | kg             | 3,29E-01 | 4,42E-04 | 4,57E-03 | 3,35E-01 | 4,47E-04 | 2,17E-05  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,32E-05 | 2,25E-04  | 1,59E-05  | 5,48E-01  |
| Renew. secondary fuels             | MJ             | 2,06E-03 | 5,62E-06 | 2,77E-02 | 2,97E-02 | 5,68E-06 | 2,16E-07  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,22E-07 | 1,02E-05  | 3,24E-07  | -7,20E-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 <sup>3</sup> | 2,15E-01 | 1,54E-04 | 9,63E-03 | 2,24E-01 | 1,55E-04 | -8,05E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,15E-05 | 1,10E-04  | 4,34E-05  | -8,40E-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   | 2,89E+00 | 1,76E-03 | 9,14E-03 | 2,90E+00 | 1,78E-03 | 2,06E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,32E-04 | 1,89E-03 | 8,24E-05 | -1,18E+00 |
| Non-hazardous waste | kg   | 1,54E+02 | 3,26E-02 | 5,71E+00 | 1,60E+02 | 3,29E-02 | 1,42E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,45E-03 | 5,28E-02 | 2,87E-02 | -6,52E+01 |
| Radioactive waste   | kg   | 2,54E-04 | 2,21E-07 | 3,14E-05 | 2,86E-04 | 2,24E-07 | 2,04E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,67E-08 | 1,70E-07 | 1,03E-08 | -9,60E-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 | 3,74E-01 | 3,74E-01 | 0,00E+00 | 2,08E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 5,94E-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 <sub>2</sub> e               | 1,08E+01 | 7,12E-02 | 9,65E-01 | 1,18E+01 | 7,20E-02 | 4,44E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,35E-03 | 3,98E-02 | 2,55E-03 | -4,72E+00 |
| Ozone depletion Pot. | kg CFC <sub>11</sub> e             | 4,07E-05 | 8,43E-10 | 4,21E-08 | 4,08E-05 | 8,52E-10 | 2,90E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,34E-11 | 1,51E-10 | 5,81E-11 | -2,75E-08 |
| Acidification        | kg SO <sub>2</sub> e               | 4,46E-01 | 1,86E-04 | 3,95E-03 | 4,50E-01 | 1,88E-04 | 9,05E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,40E-05 | 1,43E-04 | 1,34E-05 | -1,93E-01 |
| Eutrophication       | kg PO <sub>4</sub> <sup>3</sup> e  | 2,26E-02 | 4,54E-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 | 2,11E-05 | 4,45E-06 | -9,76E-03 |
| POCP ("smog")        | kg C <sub>2</sub> H <sub>4</sub> e | 1,91E-02 | 1,66E-05 | 2,14E-04 | 1,94E-02 | 1,68E-05 | 1,04E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,25E-06 | 8,47E-06 | 1,25E-06 | -8,39E-03 |
| ADP-elements         | kg Sbe                             | 6,71E-03 | 1,95E-07 | 1,45E-06 | 6,71E-03 | 1,97E-07 | 5,88E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,46E-08 | 9,49E-07 | 4,14E-09 | -2,78E-03 |
| ADP-fossil           | MJ                                 | 1,02E+02 | 1,02E+00 | 1,23E+01 | 1,15E+02 | 1,04E+00 | 2,97E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,70E-02 | 1,84E-01 | 6,15E-02 | -4,82E+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 <sup>9)</sup> | kg CO <sub>2</sub> e | 1,10E+01 | 7,16E-02 | 9,70E-01 | 1,21E+01 | 7,24E-02 | 3,01E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,38E-03 | 3,98E-02 | 2,57E-03 | -4,74E+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 – CH<sub>4</sub> fossil, CH<sub>4</sub> 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 CO<sub>2</sub> 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 <sub>2</sub> e/kWh     | 0.74                                                                                                                                                               |
| District heating data source and quality | 1) Heat production, wood chips from industry, at furnace 1000kW, World, Ecoinvent;<br>2) Heat production, propane, at industrial furnace >100kW, World, Ecoinvent, |
| District heating kg CO <sub>2</sub> e/MJ | 1) 0.0181;<br>2) 0.0945                                                                                                                                            |
| Fuel input                               | -                                                                                                                                                                  |
| Fuel input kg CO <sub>2</sub> 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,<br>2) Market for transport, freight, lorry >32 metric ton, EURO5 |
| Average transport distance, km                  | 1) 1600 km<br>2) 4020 km                                                                                                                    |
| Capacity utilization (including empty return) % | 70                                                                                                                                          |
| Bulk density of transported products            | 5,32E+02                                                                                                                                    |
| Volume capacity utilization factor              | <1                                                                                                                                          |

## Installation scenario documentation - A5 (Installation waste)

| Scenario parameter                                                                                                                                                             | Value                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ancillary materials for installation (specified by material) / kg or other units as appropriate                                                                                | -                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Water use / m <sup>3</sup>                                                                                                                                                     | -                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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<br>Plastic: 0.00067kg<br>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:<br>- Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling, 5.0E-4 kg<br>- Treatment of waste packaging paper, municipal incineration, Ecoinvent, 4.8E-5 kg<br>- Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 5.4E-5 kg<br><br>Plastic:<br>- Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 2.7E-4 kg |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | <ul style="list-style-type: none"> <li>- Treatment of waste polyethylene, municipal incineration, Ecoinvent, 2.5E-4 kg</li> <li>- Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 1.5E-4 kg</li> </ul> <p>Wood:</p> <ul style="list-style-type: none"> <li>- Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 0.02 kg</li> <li>- Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.019 kg</li> <li>- Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.024 kg</li> </ul> |
| 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, 0.5935 kg                                                                                                                                                                                                                                   |
| Recovery process – kg for energy recovery    | -                                                                                                                                                                                                                                                                                                                   |
| Recovery process – kg for final deposition   | <ol style="list-style-type: none"> <li>1) Treatment of scrap steel, inert material landfill, Ecoinvent, sum: 0.3917 kg</li> <li>2) Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 0.00995 kg</li> <li>3) Treatment of waste aluminium, sanitary landfill, Ecoinvent, 0.00498 kg</li> </ol> |
| 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

