# ENVIRONMENTAL PRODUCT DECLARATION

**In accordance with EN 15804+A2 & ISO 14025 / ISO 21930**

# Service connection valves

## AVK International A/S

**EPD HUB, HUB-2398**
Publishing date 22 December 2024, last updated on 22 December 2024, valid until 22 December 2029.

Created with One Click LCA

# GENERAL INFORMATION

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

**ABOUT THE MANUFACTURER**

AVK International A/S is part of the AVK Group, a privately owned Danish company employing +4,800 people worldwide. At AVK International A/S, we manufacture valves and accessories, and thanks to additional product types from other AVK factories, we are able to offer a very wide selection of high-quality products.

AVK is certified according to the internationally accepted ISO 14001 and ISO 50001 standards, which provide a foundation for eco-management and energy management, as well as to the ISO 9001, ISO 29001 and ISO 45001 standards.

| MANUFACTURER | |
|---|---|
| Manufacturer | AVK International A/S |
| Address | Smedeskovvej 40, 8464 Galten, Denmark |
| Contact details | julvib@avk.dk |
| Website | www.avkvalves.eu |

| EPD STANDARDS, SCOPE AND VERIFICATION | |
|---|---|
| Program operator | EPD Hub, hub@epdhub.com |
| Reference standard | EN 15804+A2:2019 and ISO 14025 |
| PCR | EPD Hub Core PCR Version 1.1, 5 Dec 2023 |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | - |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules |
| EPD author | Julie Vibe, AVK International A/S |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification |
| EPD verifier | Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited |

| PRODUCT | |
|---|---|
| Product name | Service connection valve |
| Additional labels | Series 03 - Service connection valves, Series 11 - Service connection angle valves and Series 103 - Supa Lock service |
| Product reference | See annex |
| Place of production | Galten, Denmark |
| Period for data | 01/10/2022 - 30/09/2023 |
| Averaging in EPD | Multiple products |
| Variation in GWP-fossil for A1-A3 | +5,43%/-3.26% |

| ENVIRONMENTAL DATA SUMMARY | |
|---|---|
| Declared unit | 1 kg of Service Connection Valve |
| Declared unit mass | 1 kg |
| GWP-fossil, A1-A3 ($kgCO_2e$) | 3.68E+00 |
| GWP-total, A1-A3 ($kgCO_2e$) | 3.60E+00 |
| Secondary material, inputs (%) | 39 |
| Secondary material, outputs (%) | 83.5 |
| Total energy use, A1-A3 (kWh) | 14.8 |
| Net freshwater use, A1-A3 ($m^3$) | 0.04 |



# PRODUCT AND MANUFACTURER

**PRODUCT DESCRIPTION**

AVK International's resilient seated service connection valves are designed for underground installation, with their primary function being the facilitation of the distribution of drinking water. The valves are part of the intermediate distribution system utilized in combination with the piping system. The valves within this study do not embody any motorized or electric components. AVK International's valves require no maintenance or inspection once installed and are only assumed to need repair/replace- ment if exterior damage is inflicted upon them.

The EPD is an average EPD for products in the series 03, 11 and 103. The EPD was generated using a representative product as the averaging method. The results of the EPD are calculated based on data for the variant 03/30-005

DN32, as this was determined to be the most representative variant.

Further information can be found at www.avkvalves.eu.

| PRODUCT RAW MATERIAL MAIN COMPOSITION | | |
|---|---|---|
| Raw material category | Amount, mass % | Material origin |
| Metals | 90 | ROW |
| Minerals | - | - |
| Fossil materials | 10 | EU |
| Bio-based materials | - | - |

| BIOGENIC CARBON CONTENT | |
|---|---|
| Product's biogenic carbon content at the factory gate | |
| Biogenic carbon content in product, kg C | - |
| Biogenic carbon content in packaging, kg C | 0.023 |

| FUNCTIONAL UNIT AND SERVICE LIFE | |
|---|---|
| Declared unit | 1 kg of service connection valve |
| Mass per declared unit | 1 kg |
| Functional unit | - |
| Reference service life | - |

| SUBSTANCES, REACH - VERY HIGH CONCERN | | |
|---|---|---|
| Substances of very high concern | EC | CAS |
| Brass: lead (Pb) | 231-100-4 | 7439-92-1 |

Service connection

# 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 | C | C | C | C4 | D | | | | |
| x | x | x | x | x | MND | MND | MND | MND | MND | MN | MN | x | x | x | x | x | | | | |
| Raw | Transport | Manufacturin | Transport | Assembly | Use | Maintenance | Repa | Replacement | Refurbishmen | Operational energy | Operational water | Deconstruction/ | Transport | Waste | Disposal | Reuse | Recovery | Recycling | | |

**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

The valve is made of mainly ductile iron along with components of steel, brass, rubber and plastic. The ductile iron body and bonnet
are casted and sourced from China and subsequently processed and coated at AVK International A/S. The steel is received as bars and processed into the stem component. Brass, rubber and plastic components

The A2 transport of the A1 materials is based on actual distances between the supplier and AVK International

The assembled valve consists of the following components:

- Epoxy coated ductile iron body and bonnet
- Stainless steel stem and bolts
- Brass and rubber wedge
- Brass thrust collar
- Rubber seals and rings

Following the assembly of the valve, the valve is pressure tested and packaged. The manufacturing process requires electricity and fuels for the different equipment as well as natural gas for heating.

Ancillary materials used for manufacturing includes mineral oils, tap water and steel shot powder. Production losses have been estimated from production waste accounts. All production waste is sent directly to recycling facilities. The

**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.

An average sales weighted distance for the transportation has been calculated based on sales data with location, transport mode and mass. 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.

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.

Installation is carried out underground at an installation depth of 1.2 m and requires excavation. The excavation activity has been calculated based on estimated volume of the valve and the required installation depth.

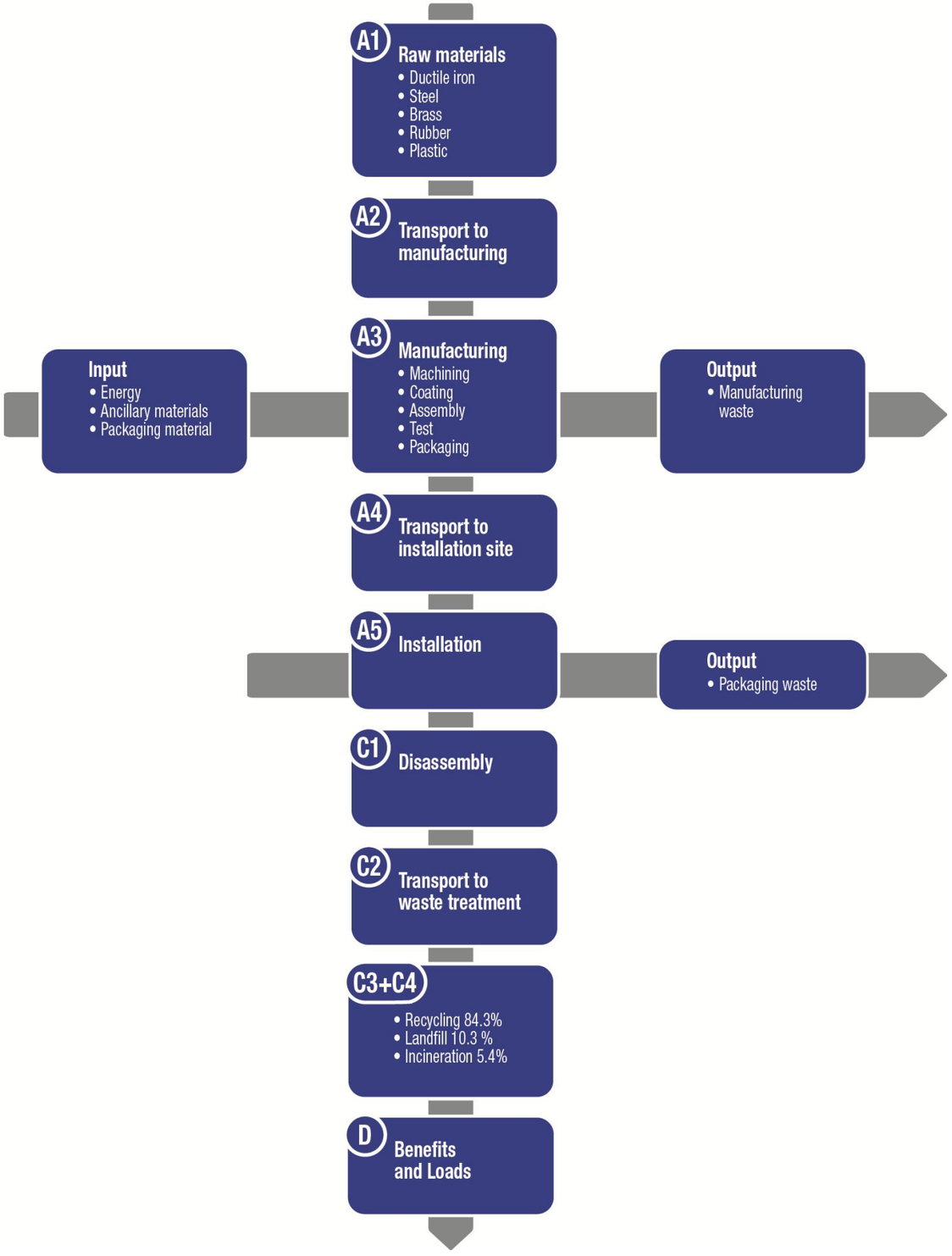
**PRODUCT USE AND MAINTENANCE (B1-B7)**
The use phase is not relevant for the life cycle emissions of this product and is therefore not accounted into the assessment.
Air, soil, and water impacts during the use phase have not been studied.

**PRODUCT END OF LIFE (C1-C4, D)**
The deconstruction of the valve is expected to mirror the installation (A5). The deconstruction is assumed to be carried out by professionals and the valve is sent to a waste handling site intact, where the disassembly and sorting of materials is carried out. The end-of-life product is assumed to be sent to the closest facilities by lorry and is assumed to be 50 km away (C2). Of the end-of-life product, 84.3 % sent

Due to the recycling and incineration potential of metals and plastics, the end-of-life product is converted into recycled materials, while energy and heat is produced from material incineration

# MANUFACTURING **PROCESS**

## Life cycle stages




# 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 material | 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 | Representative product |
| Variation in GWP-fossil for A1-A3 | +5,43%/-3,26% |

Among the products declared in this EPD, the service connection valve 03/30-005 DN32 has been used as the representative valve. From calculation it was concluded that this valve had the most average weighted distribution of materials and was consequently chosen as the most representative valve. Primary data represents the manufacturing of the 03/30-005 DN32 valve. The data was used to calculate representative impacts for the range of products declared. The valve connection varies in type and materials, but the manufacturing process and the overall material distribution is similar for all included product

**LCA SOFTWARE AND BIBLIOGRAPHY**

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

# ENVIRONMENTAL **IMPACT DATA**

**CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2. PEF**

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2$e | 3,15E+00 | 1,88E-01 | 2,67E-01 | 3,60E+00 | 1.51E-01 | 9.02E-02 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| GWP – fossil | kg $CO_2$e | 3,14E+00 | 1,88E-01 | 3,50E-01 | 3,68E+00 | 1.51E-01 | 6.10E-03 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| GWP – biogenic | kg $CO_2$e | 0,00E+00 | 0,00E+00 | -8,41E-02 | -8,41E-02 | 0.00E+00 | 8.41E-02 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| GWP – LULUC | kg $CO_2$e | 3,32E-03 | 1,25E-04 | 4,32E-04 | 3,88E-03 | 5.70E-05 | 1.24E-06 | MND | MND | MND | MND | MND | MND | MND | 7.38E-07 | 2.07E-06 | 2.68E-05 | 5.21E-07 | -1.15E-04 |
| Ozone depletion pot. | kg $CFC\text{-}_{11}$e | 4,25E-07 | 3,85E-08 | 2,71E-08 | 4,90E-07 | 3.77E-08 | 1.26E-09 | MND | MND | MND | MND | MND | MND | MND | 1.11E-09 | 1.26E-09 | 2.59E-09 | 2.20E-10 | -3.95E-08 |
| Acidification potential | mol $H^+$e | 5,05E-02 | 5,11E-03 | 1,18E-03 | 5,68E-02 | 5.02E-04 | 6.29E-05 | MND | MND | MND | MND | MND | MND | MND | 5.45E-05 | 2.29E-05 | 2.60E-04 | 5.15E-06 | -1.48E-02 |
| EP-freshwater[2)] | kg Pe | 2,84E-04 | 8,34E-07 | 1,84E-05 | 3,03E-04 | 1.08E-06 | 4.79E-08 | MND | MND | MND | MND | MND | MND | MND | 2.69E-08 | 4.27E-08 | 1.04E-06 | 5.89E-09 | -5.22E-05 |
| EP-marine | kg Ne | 4,11E-03 | 1,25E-03 | 1,99E-04 | 5,57E-03 | 1.11E-04 | 2.80E-05 | MND | MND | MND | MND | MND | MND | MND | 2.39E-05 | 6.81E-06 | 5.97E-05 | 1.99E-06 | -6.23E-04 |
| EP-terrestrial | mol Ne | 5,19E-02 | 1,39E-02 | 2,15E-03 | 6,80E-02 | 1.24E-03 | 3.00E-04 | MND | MND | MND | MND | MND | MND | MND | 2.62E-04 | 7.51E-05 | 6.83E-04 | 1.96E-05 | -1.59E-02 |
| POCP ("smog")[3)] | kg NMVOCe | 1,76E-02 | 3,64E-03 | 7,71E-04 | 2,20E-02 | 4.78E-04 | 8.32E-05 | MND | MND | MND | MND | MND | MND | MND | 7.23E-05 | 2.37E-05 | 1.85E-04 | 5.74E-06 | -5.94E-03 |
| ADP-minerals & metals[4)] | kg Sbe | 9,73E-04 | 2,95E-07 | 1,94E-06 | 9,75E-04 | 3.70E-07 | 6.15E-09 | MND | MND | MND | MND | MND | MND | MND | 3.74E-09 | 1.50E-08 | 2.47E-06 | 1.28E-09 | -2.88E-04 |
| ADP-fossil resources | MJ | 4,18E+01 | 2,46E+00 | 5,73E+00 | 5,00E+01 | 2.41E+00 | 8.48E-02 | MND | MND | MND | MND | MND | MND | MND | 7.21E-02 | 8.20E-02 | 2.75E-01 | 1.50E-02 | -1.02E+01 |
| Water use[5)] | $m^3$e depr. | 1,27E+00 | 8,09E-03 | 1,14E-01 | 1,40E+00 | 1.11E-02 | 7.41E-04 | MND | MND | MND | MND | MND | MND | MND | 2.74E-04 | 3.71E-04 | 9.73E-03 | 4.89E-05 | 2.66E-01 |

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 –**

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 2,92E-07 | 8,62E-09 | 7,81E-09 | 3,08E-07 | 1.75E-08 | 1.56E-09 | MND | MND | MND | MND | MND | MND | MND | 1.45E-09 | 5.79E-10 | 3.66E-09 | 1.04E-10 | -7.98E-08 |
| Ionizing radiation[6)] | kBq U235e | 2,75E-01 | 1,14E-02 | 8,40E-02 | 3,70E-01 | 1.24E-02 | 4.61E-04 | MND | MND | MND | MND | MND | MND | MND | 3.34E-04 | 4.03E-04 | 2.87E-03 | 6.79E-05 | -3.42E-02 |
| Ecotoxicity (freshwater) | CTUe | 5,07E+02 | 1,69E+00 | 4,35E+00 | 5,13E+02 | 2.01E+00 | 6.05E-02 | MND | MND | MND | MND | MND | MND | MND | 4.73E-02 | 7.19E-02 | 1.44E+00 | 1.04E-02 | -1.18E+02 |
| Human toxicity, cancer | CTUh | 5,42E-07 | 1,04E-10 | 3,87E-10 | 5,43E-07 | 5.24E-11 | 7.89E-12 | MND | MND | MND | MND | MND | MND | MND | 2.72E-12 | 1.91E-12 | 4.21E-11 | 2.52E-13 | -9.99E-09 |
| Human tox. non-cancer | CTUh | 8,89E-07 | 1,24E-09 | 3,92E-09 | 8,94E-07 | 2.04E-09 | 5.91E-11 | MND | MND | MND | MND | MND | MND | MND | 3.50E-11 | 7.17E-11 | 1.69E-09 | 6.60E-12 | -3.11E-07 |
| SQP[7)] | - | 2,26E+01 | 8,73E-01 | 4,62E+00 | 2,81E+01 | 2.80E+00 | 2.70E-02 | MND | MND | MND | MND | MND | MND | MND | 9.59E-03 | 8.22E-02 | 5.19E-01 | 3.21E-02 | -7.34E+00 |

6) EN 15804+A2 disclaimer for Ionizing radiation, human health.
This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal. in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator;
7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8)] | MJ | 4,88E+00 | 1,92E-02 | 9,77E-01 | 5,87E+00 | 3.12E-02 | 1.40E-03 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| Renew. PER as material | MJ | 4,88E-04 | 0,00E+00 | 5,13E-01 | 5,13E-01 | 0.00E+00 | -5.13E-01 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| Total use of renew. PER | MJ | 4,88E+00 | 1,92E-02 | 1,49E+00 | 6,39E+00 | 3.12E-02 | -5.11E-01 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Non-re. PER as energy | MJ | 3,94E+01 | 2,46E+00 | 5,63E+00 | 4,75E+01 | 2.41E+00 | 8.48E-02 | MND | MND | MND | MND | MND | MND | MND | 7.38E-07 | 2.07E-06 | 2.68E-05 | 5.21E-07 | -1.15E-04 |
| Non-re. PER as material | MJ | 2,43E+00 | 0,00E+00 | -4,19E-02 | 2,39E+00 | 0.00E+00 | -2.70E-02 | MND | MND | MND | MND | MND | MND | MND | 1.11E-09 | 1.26E-09 | 2.59E-09 | 2.20E-10 | -3.95E-08 |
| Total use of non-re. PER | MJ | 4,18E+01 | 2,46E+00 | 5,59E+00 | 4,99E+01 | 2.41E+00 | 5.78E-02 | MND | MND | MND | MND | MND | MND | MND | 5.45E-05 | 2.29E-05 | 2.60E-04 | 5.15E-06 | -1.48E-02 |
| Secondary materials | kg | 3,90E-01 | 1,03E-03 | 7,63E-03 | 3,99E-01 | 6.82E-04 | 6.03E-05 | MND | MND | MND | MND | MND | MND | MND | 2.69E-08 | 4.27E-08 | 1.04E-06 | 5.89E-09 | -5.22E-05 |
| Renew. secondary fuels | MJ | 2,33E-03 | 3,84E-06 | 1,39E-02 | 1,62E-02 | 5.99E-06 | 1.98E-07 | MND | MND | MND | MND | MND | MND | MND | 2.39E-05 | 6.81E-06 | 5.97E-05 | 1.99E-06 | -6.23E-04 |
| 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 | 2.62E-04 | 7.51E-05 | 6.83E-04 | 1.96E-05 | -1.59E-02 |
| Use of net fresh water | $m^3$ | 3,75E-02 | 1,91E-04 | 3,31E-03 | 4,10E-02 | 3.20E-04 | 2.27E-05 | MND | MND | MND | MND | MND | MND | MND | 7.23E-05 | 2.37E-05 | 1.85E-04 | 5.74E-06 | -5.94E-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 | 4,88E+00 | 1,92E-02 | 9,77E-01 | 5,87E+00 | 2.59E-03 | 1.60E-04 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| Non-hazardous waste | kg | 4,88E-04 | 0,00E+00 | 5,13E-01 | 5,13E-01 | 4.50E-02 | 3.89E-02 | MND | MND | MND | MND | MND | MND | MND | 5.38E-03 | 5.48E-03 | 1.84E-01 | 7.30E-04 | -8.88E-01 |
| Radioactive waste | kg | 4,88E+00 | 1,92E-02 | 1,49E+00 | 6,39E+00 | 1.67E-05 | 5.40E-07 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

**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 | 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 | 3,97E-01 | 3,97E-01 | 0.00E+00 | 1.67E-02 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 8.43E-01 | 0.00E+00 | 0.00E+00 |
| Materials for energy rec | kg | 0,00E+00 | 0,00E+00 | 5,73E-03 | 5,73E-03 | 0.00E+00 | 1.63E-02 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0.00E+00 | 2.95E-01 | MND | MND | MND | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | 1.02E+00 | 0.00E+00 | 0.00E+00 |

**ENVIRONMENTAL IMPACTS – EN 15804+A1. CML / ISO 21930**

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Pot. | kg $CO_2$e | 3,04E+00 | 1,86E-01 | 3,42E-01 | 3,57E+00 | 1.50E-01 | 7.44E-03 | MND | MND | MND | MND | MND | MND | MND | 5.32E-03 | 5.43E-03 | 1.84E-01 | 6.82E-04 | -8.34E-01 |
| Acidification | kg $SO_2$e | 4,37E-02 | 4,09E-03 | 9,85E-04 | 4,87E-02 | 4.07E-04 | 4.49E-05 | MND | MND | MND | MND | MND | MND | MND | 3.89E-05 | 1.78E-05 | 2.08E-04 | 3.89E-06 | -1.28E-02 |
| Eutrophication | kg $PO_4$ e | 1,55E-02 | 4,65E-04 | 6,70E-04 | 1,66E-02 | 8.45E-05 | 7.44E-05 | MND | MND | MND | MND | MND | MND | MND | 9.24E-06 | 4.04E-06 | 8.98E-05 | 1.18E-05 | -3.60E-03 |
| POCP (“smog”) | kg $C_2H4e$ | 2,29E-03 | 1,07E-04 | 6,87E-05 | 2,47E-03 | 1.86E-05 | 1.46E-06 | MND | MND | MND | MND | MND | MND | MND | 9.20E-07 | 7.05E-07 | 7.97E-06 | 1.88E-07 | -8.36E-04 |
| ADP-elements | kg Sbe | 9,71E-04 | 2,89E-07 | 1,93E-06 | 9,74E-04 | 3.60E-07 | 5.91E-09 | MND | MND | MND | MND | MND | MND | MND | 3.70E-09 | 1.46E-08 | 2.47E-06 | 1.26E-09 | -2.88E-04 |
| ADP-fossil | MJ | 4,18E+01 | 2,46E+00 | 5,72E+00 | 5,00E+01 | 2.41E+00 | 8.48E-02 | MND | MND | MND | MND | MND | MND | MND | 7.20E-02 | 8.20E-02 | 2.74E-01 | 1.50E-02 | -1.02E+01 |

# VERIFICATION STATEMENT

**VERIFICATION PROCESS FOR THIS EPD**

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard,

- 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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
22.12.2024

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.

EPD Hub
VERIFIED ISO 14025

# ANNEX

**INCLUDED VALVE**

| | | |
|---|---|---|
| 03/00-010 | 11/00-010 | 103/00-003 |
| 03/08-013 | 11/30-010 | 103/00-034 |
| 03/30-005 | 11/38-010 | 103/02-003 |
| 03/34-001 | | 103/02-034 |
| 03/40-005 | | 103/31-003 |
| 03/42-001 | | 103/31-034 |
| 03/65-005 | | 103/31-034 |
| 03/85-005 | | 103/50-003 |
| 03/90-005 | | 103/50-034 |
| 03/70-005 | | |