



# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

FDA - Fire and Gas Damper  
Halton Marine Oy



## EPD HUB, HUB-7298

Published on 21.08.2026, last updated on 21.08.2026, valid until 20.08.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.



Created with One Click LCA

**Halton**

## GENERAL INFORMATION

### MANUFACTURER

|                 |                                    |
|-----------------|------------------------------------|
| Manufacturer    | Halton Marine Oy                   |
| Address         | Pulttikatu 2, 15700 Lahti, Finland |
| Contact details | haltonmarine@halton.com            |
| Website         | www.halton.com                     |

### 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             | Manufactured product                                                                                                                                                                   |
| Category of EPD    | Third party verified EPD                                                                                                                                                               |
| Parent EPD number  |                                                                                                                                                                                        |
| Scope of the EPD   | Cradle to gate with options, A4-A5, B2, B4, B6 and modules C1-C4, D                                                                                                                    |
| EPD author         | Sofia Malin                                                                                                                                                                            |
| EPD verification   | Independent verification of this EPD and data, according to ISO 14025:<br><br><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Elena Antuña-Bernardo as an authorized verifier for EPD Hub                                                                                                                            |

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.

## PRODUCT

|                                            |                           |
|--------------------------------------------|---------------------------|
| Product name                               | FDA - Fire and Gas Damper |
| Additional labels                          |                           |
| Product reference                          | ITM006342                 |
| Place(s) of raw material origin            | EU                        |
| Place of production                        | Lahti, Finland            |
| Place(s) of installation and use           | Global                    |
| Period for data                            | Calendar year, 2025       |
| Averaging in EPD                           | No grouping               |
| Variation in GWP-fossil for A1-A3 (%)      |                           |
| GTIN (Global Trade Item Number)            | -                         |
| NOBB (Norwegian Building Product Database) | -                         |
| A1-A3 Specific data (%)                    | 91,8                      |

## ENVIRONMENTAL DATA SUMMARY

|                                             |                                            |
|---------------------------------------------|--------------------------------------------|
| Declared unit                               | 1 kg of fire damper with electric actuator |
| Declared unit mass                          | 1 kg                                       |
| Mass of packaging                           | 0,31 kg                                    |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)     | 3,68                                       |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)      | 3,37                                       |
| Secondary material, inputs (%)              | 10,7                                       |
| Total energy use, A1-A3 (kWh)               | 42,5                                       |
| Net freshwater use, A1-A3 (m <sup>3</sup> ) | 0,05                                       |

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Halton Group is family-owned, global technology leader in indoor air solutions for demanding spaces. Our mission is to enable people's wellbeing in these environments. We design, manufacture and deliver indoor environment solutions for

- Commercial and public buildings
- Healthcare institutions and laboratories
- Professional kitchens and restaurants
- Energy production and heavy industry environments
- Marine vessels

We work in close cooperation with our customers and partners to meet their special needs and even exceed expectations. We enable safe, comfortable and productive indoor environments that are energy-efficient and comply with sustainable principles.

### PRODUCT DESCRIPTION

Halton FDA fire dampers are type-approved class A0(A60) fire and gas dampers for use in offshore, marine and navy ventilation systems. The FDA can be installed in rectangular or circular ducts. All fire dampers have a fusible link, and they prevent the spread of fire and gases within the ventilation ductwork. When the blades are in the open position, the device does not cause significant pressure loss, noise or flow disturbance. An open-closed indicator is visible on the outside of the damper. Fire dampers with non-standard dimensions can be supplied on request.

Further information can be found at:  
[www.halton.com](http://www.halton.com)

### PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|-----------------------|----------------|-----------------|
| Metals                | 98,5           | EU              |
| Minerals              | 0,1            | EU              |
| Fossil materials      | 1,4            | 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 | 0,47 |

### FUNCTIONAL UNIT AND SERVICE LIFE

|                        |                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Declared unit          | 1 kg of fire damper with electric actuator                                                                               |
| Mass per declared unit | 1 kg                                                                                                                     |
| Functional unit        | 1 kg of fire damper continuously energized and maintained in standby mode throughout its 25-year reference service life. |
| Reference service life | 25 years                                                                                                                 |

## SUBSTANCES, REACH - VERY HIGH CONCERN

| Substances of very high concern                                                    | EC | CAS       |
|------------------------------------------------------------------------------------|----|-----------|
| The product contains lead more than 1000 ppm (lead in alloy in electric actuator). |    | 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            | x                      | ND                    | x                          | 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 reference product is a fire damper primarily manufactured from steel and equipped with several electrical components. The product is available in different sizes. Manufacturing takes place at the Halton production facility in Lahti, Finland. The production stage includes the supply and transportation of steel materials and purchased components, laser cutting of steel sheets, bending and forming operations, pre-assembly of supplier components, final assembly and packaging.

Supplier-specific transportation distances were used whenever available. Where primary transportation data was not available, representative European road transport distances were applied based on supplier locations and typical logistics routes.

Production losses were considered and consist mainly of steel off-cuts generated during laser cutting and forming operations. Manufacturing waste consists predominantly of steel scrap, which is collected separately and sent for recycling. It was assumed that 95% of the steel scrap generated during manufacturing is recycled and 5% is disposed of as landfill waste according to Finnish waste treatment practices. Manufacturing waste is transported by road to a nearby treatment facility, with an assumed transport distance of 50 km.

Packaging materials include cardboard, wooden pallets and plastic film. Auxiliary materials used during manufacturing include welding gases. Other auxiliary materials, such as lubricants and cleaning agents, were excluded from the assessment due to their negligible contribution to the overall environmental impacts.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

## 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.

Energy use of the installation process was assumed to be insignificant since there is no need of heavy machineries that would use electricity, fuels or heat. Waste materials generated by product installation are packaging materials of the product. To define the distribution of the product to the customer, the weighted average of the five largest customers is considered. It is assumed that the average transportation distance from the production facility to the construction site is 2190 km. The product is transported via truck. The customer is responsible for waste management. A transportation distance of 75 km by road has been assumed for waste treatment. This reflects a typical regional average distance to the nearest waste treatment or recycling facility in Europe.

## PRODUCT USE AND MAINTENANCE (B1-B7)

During the use stage (B6), the product consumes electricity. The fire damper actuator is assumed to remain continuously energized and in standby mode throughout the entire 25-year reference service life. Electricity consumption is based on a constant power demand of 2 W.

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

## PRODUCT END OF LIFE (C1-C4, D)

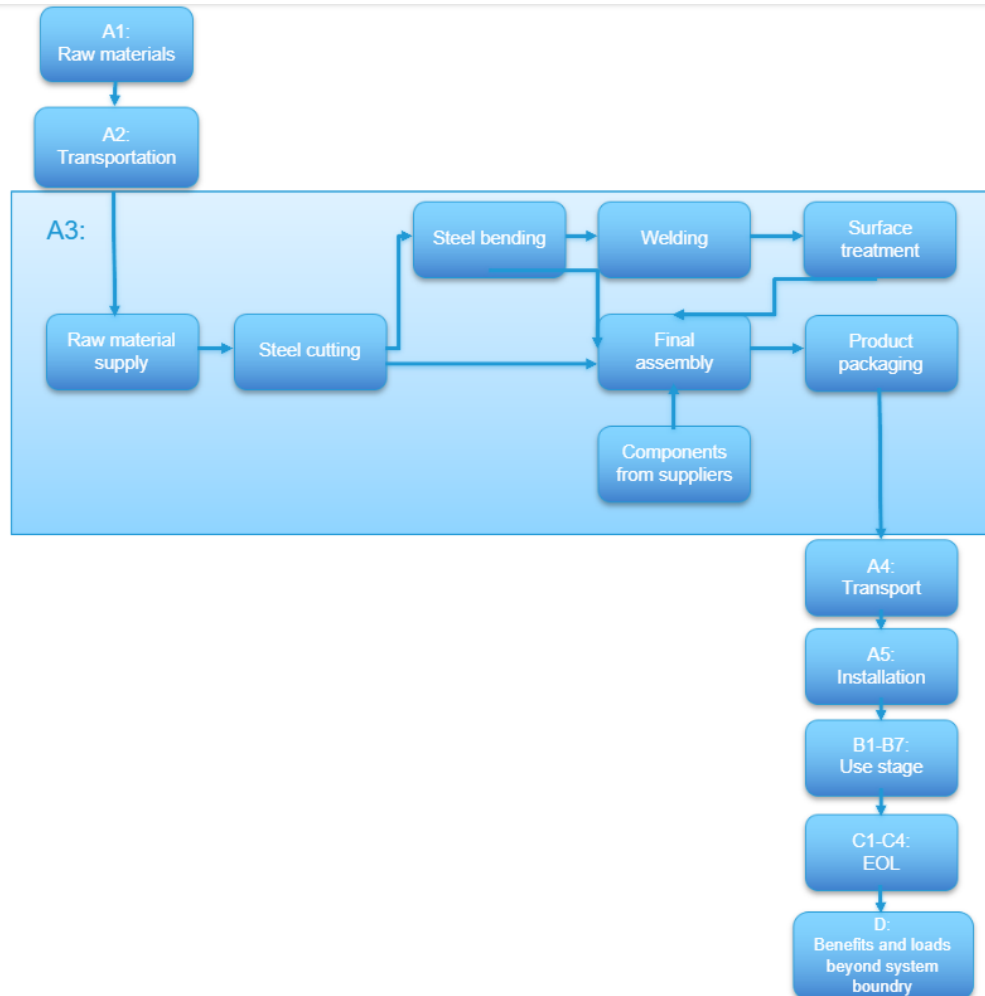
According to waste handling companies, the FDA fire damper is collected separately for recycling at the end-of-life stage. Steel and other recyclable materials are directed to recycling processes, while the remaining waste fractions are treated through energy recovery or landfill disposal according to local waste management practices and the scenarios applied in the LCA model. No significant environmental impacts from demolition activities

were identified; therefore, module C1 is not declared.

End-of-life treatment is assumed to take place in Europe, reflecting typical waste management practices for the intended market. Waste treatment scenarios, including recycling, energy recovery and landfill disposal, are based on currently available waste treatment technologies and practices. The selected end-of-life scenarios are considered representative of current waste management practices and one of the most likely treatment routes for the product and its main material fractions at the end of their service life. A transportation distance of 75 km by road has been assumed for transport to waste treatment facilities.

Module D includes the benefits and loads associated with material recycling through the substitution of virgin materials, as well as the benefits from energy recovery of combustible waste fractions.

## LIFE CYCLE FLOW DIAGRAM



## 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             | Physical Properties |
| Ancillary materials            | Physical Properties |
| Manufacturing energy and waste | Physical Properties |

### PRODUCT & MANUFACTURING SITES GROUPING

|                                      |                |
|--------------------------------------|----------------|
| Type of grouping                     | No grouping    |
| Grouping method                      | Not applicable |
| Variation in GWP-fossil for A1-A3, % |                |

This EPD is product and factory specific.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

Additional references were used in the modelling. These include steel supplier EPDs for material-specific environmental and recycled content data,

actuator manufacturer datasheets for electricity consumption assumptions, company-specific production data, and information from waste handling companies regarding end-of-life treatment practices.

## 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   | 3,47E+00  | 3,11E-02 | -1,32E-01 | 3,37E+00  | 2,94E-01 | 3,34E-01 | ND | ND | ND | ND | ND | 2,78E+00 | ND | 0,00E+00 | 1,47E-02 | 2,53E-02 | 6,74E-04 | -3,95E-01 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 3,48E+00  | 3,10E-02 | 1,74E-01  | 3,68E+00  | 2,94E-01 | 2,69E-02 | ND | ND | ND | ND | ND | 2,77E+00 | ND | 0,00E+00 | 1,47E-02 | 2,53E-02 | 6,74E-04 | -3,95E-01 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | -6,92E-03 | 6,47E-06 | -3,07E-01 | -3,13E-01 | 6,77E-05 | 3,07E-01 | ND | ND | ND | ND | ND | 2,50E-03 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 1,25E-03  | 1,16E-04 | 4,63E-04  | 1,83E-03  | 1,31E-04 | 1,07E-06 | ND | ND | ND | ND | ND | 9,67E-04 | ND | 0,00E+00 | 6,51E-06 | 2,79E-05 | 4,05E-07 | -3,49E-04 |
| Ozone depletion pot.                | kg CFC-11e             | 1,53E-08  | 6,81E-10 | 3,31E-09  | 1,93E-08  | 4,28E-09 | 4,46E-11 | ND | ND | ND | ND | ND | 1,21E-07 | ND | 0,00E+00 | 2,05E-10 | 2,73E-10 | 1,94E-11 | -2,09E-09 |
| Acidification potential             | mol H <sup>+</sup> e   | 1,02E-02  | 1,03E-04 | 1,03E-03  | 1,13E-02  | 1,02E-03 | 3,78E-05 | ND | ND | ND | ND | ND | 1,46E-02 | ND | 0,00E+00 | 4,90E-05 | 2,57E-04 | 4,76E-06 | -2,21E-03 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 8,63E-03  | 2,13E-06 | 3,16E-04  | 8,94E-03  | 3,19E-05 | 1,47E-06 | ND | ND | ND | ND | ND | 4,31E-04 | ND | 0,00E+00 | 1,14E-06 | 1,39E-05 | 5,59E-08 | -2,25E-04 |
| EP-marine                           | kg Ne                  | 2,55E-03  | 3,13E-05 | 6,08E-04  | 3,19E-03  | 3,38E-04 | 2,03E-05 | ND | ND | ND | ND | ND | 2,15E-03 | ND | 0,00E+00 | 1,59E-05 | 5,79E-05 | 1,81E-06 | -3,72E-04 |
| EP-terrestrial                      | mol Ne                 | 2,76E-02  | 3,32E-04 | 2,88E-03  | 3,08E-02  | 3,66E-03 | 1,92E-04 | ND | ND | ND | ND | ND | 2,22E-02 | ND | 0,00E+00 | 1,73E-04 | 6,49E-04 | 1,98E-05 | -4,04E-03 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 9,21E-03  | 1,53E-04 | 9,71E-04  | 1,03E-02  | 1,50E-03 | 4,81E-05 | ND | ND | ND | ND | ND | 6,23E-03 | ND | 0,00E+00 | 6,82E-05 | 1,91E-04 | 7,10E-06 | -1,30E-03 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 2,53E-05  | 9,09E-08 | 1,55E-06  | 2,70E-05  | 8,42E-07 | 8,38E-09 | ND | ND | ND | ND | ND | 6,00E-07 | ND | 0,00E+00 | 4,83E-08 | 1,40E-06 | 1,08E-09 | -2,50E-06 |
| ADP-fossil resources                | MJ                     | 3,64E+01  | 4,54E-01 | 1,11E+02  | 1,48E+02  | 4,20E+00 | 3,30E-02 | ND | ND | ND | ND | ND | 3,41E+01 | ND | 0,00E+00 | 2,06E-01 | 2,92E-01 | 1,65E-02 | -4,39E+00 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 9,62E-01  | 2,36E-03 | 1,11E+00  | 2,07E+00  | 2,45E-02 | 8,27E-03 | ND | ND | ND | ND | ND | 6,94E+01 | ND | 0,00E+00 | 9,56E-04 | 5,10E-03 | 1,08E-04 | -7,85E-02 |

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, 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     | 2,05E-08 | 2,92E-09 | 4,10E-08 | 6,45E-08 | 2,88E-08 | 4,01E-10 | ND | ND | ND | ND | ND | 2,66E-08 | ND | 0,00E+00 | 1,17E-09 | 3,64E-09 | 1,12E-10 | -3,00E-08 |
| Ionizing radiation <sup>6)</sup> | kBq<br>11235e | 2,61E-02 | 5,37E-04 | 9,10E+00 | 9,12E+00 | 3,52E-03 | 3,86E-05 | ND | ND | ND | ND | ND | 7,10E-01 | ND | 0,00E+00 | 1,67E-04 | 1,10E-03 | 1,03E-05 | -4,17E-02 |
| Ecotoxicity (freshwater)         | CTUe          | 4,52E+00 | 1,59E-01 | 1,85E+01 | 2,32E+01 | 8,71E-01 | 6,99E-02 | ND | ND | ND | ND | ND | 4,59E+00 | ND | 0,00E+00 | 3,26E-02 | 1,79E-01 | 2,20E-03 | -1,64E+01 |
| Human toxicity, cancer           | CTUh          | 4,96E-10 | 5,39E-12 | 2,99E-10 | 8,01E-10 | 4,62E-11 | 7,76E-12 | ND | ND | ND | ND | ND | 1,29E-10 | ND | 0,00E+00 | 2,50E-12 | 1,92E-11 | 1,24E-13 | -3,66E-10 |
| Human tox. non-cancer            | CTUh          | 4,52E-09 | 3,03E-10 | 3,49E-09 | 8,31E-09 | 2,61E-09 | 4,61E-10 | ND | ND | ND | ND | ND | 1,20E-08 | ND | 0,00E+00 | 1,29E-10 | 1,26E-09 | 2,88E-12 | -2,67E-09 |
| SQP <sup>7)</sup>                | -             | 1,99E+00 | 4,19E-01 | 3,72E+01 | 3,96E+01 | 4,19E+00 | 1,02E-02 | ND | ND | ND | ND | ND | 1,44E+00 | ND | 0,00E+00 | 1,23E-01 | 5,29E-01 | 3,23E-02 | -2,00E+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 <sup>8)</sup> | MJ             | 2,09E+00 | 7,60E-03 | 3,57E+00 | 5,68E+00 | 5,84E-02 | -2,80E+00 | ND | ND | ND | ND | ND | 5,57E+00 | ND | 0,00E+00 | 2,83E-03 | 2,71E-02  | 1,59E-04 | -6,80E-01 |
| Renew. PER as material             | MJ             | 1,62E-03 | 0,00E+00 | 2,65E+00 | 2,66E+00 | 0,00E+00 | -2,65E+00 | ND | ND | ND | ND | ND | 1,16E-05 | ND | 0,00E+00 | 0,00E+00 | -1,62E-03 | 0,00E+00 | 0,00E+00  |
| Total use of renew. PER            | MJ             | 2,10E+00 | 7,60E-03 | 6,23E+00 | 8,33E+00 | 5,84E-02 | -5,45E+00 | ND | ND | ND | ND | ND | 5,57E+00 | ND | 0,00E+00 | 2,83E-03 | 2,55E-02  | 1,59E-04 | -6,80E-01 |
| Non-re. PER as energy              | MJ             | 3,66E+01 | 4,55E-01 | 1,10E+02 | 1,47E+02 | 4,20E+00 | -2,75E-01 | ND | ND | ND | ND | ND | 3,88E+01 | ND | 0,00E+00 | 2,06E-01 | 2,80E-01  | 1,65E-02 | -4,39E+00 |
| Non-re. PER as material            | MJ             | 1,55E-01 | 0,00E+00 | 5,74E-01 | 7,29E-01 | 0,00E+00 | -5,74E-01 | ND | ND | ND | ND | ND | 1,28E-04 | ND | 0,00E+00 | 0,00E+00 | -1,55E-01 | 0,00E+00 | 0,00E+00  |
| Total use of non-re. PER           | MJ             | 3,67E+01 | 4,55E-01 | 1,11E+02 | 1,48E+02 | 4,20E+00 | -8,49E-01 | ND | ND | ND | ND | ND | 3,88E+01 | ND | 0,00E+00 | 2,06E-01 | 1,26E-01  | 1,65E-02 | -4,39E+00 |
| Secondary materials                | kg             | 1,07E-01 | 2,00E-04 | 6,16E-03 | 1,13E-01 | 1,76E-03 | 6,89E-05  | ND | ND | ND | ND | ND | 9,55E-05 | ND | 0,00E+00 | 9,26E-05 | 3,28E-04  | 4,15E-06 | 1,19E-01  |
| Renew. secondary fuels             | MJ             | 1,76E-03 | 2,49E-06 | 4,00E-02 | 4,17E-02 | 2,29E-05 | 3,53E-07  | ND | ND | ND | ND | ND | 2,47E-08 | ND | 0,00E+00 | 1,18E-06 | 1,55E-05  | 8,57E-08 | -2,08E-05 |
| Non-ren. secondary fuels           | MJ             | 4,13E-06 | 0,00E+00 | 0,00E+00 | 4,13E-06 | 0,00E+00 | 0,00E+00  | ND | ND | ND | ND | ND | 0,00E+00 | 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> | 2,17E-02 | 7,03E-05 | 2,60E-02 | 4,78E-02 | 6,02E-04 | 6,64E-05  | ND | ND | ND | ND | ND | 3,35E-02 | ND | 0,00E+00 | 2,73E-05 | 1,18E-04  | 1,70E-05 | -1,47E-03 |

8) PER = Primary energy resources.

## END OF LIFE – WASTE

| Impact category     | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6       | B7 | C1       | C2       | C3       | C4       | D         |
|---------------------|------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----------|----|----------|----------|----------|----------|-----------|
| Hazardous waste     | kg   | 1,24E-01 | 6,82E-04 | 5,63E-02 | 1,81E-01 | 2,69E-02 | 1,99E-03 | ND | ND | ND | ND | ND | 1,05E-04 | ND | 0,00E+00 | 3,59E-04 | 4,07E-02 | 1,89E-05 | -8,43E-02 |
| Non-hazardous waste | kg   | 7,55E-01 | 1,33E-02 | 6,16E-01 | 1,38E+00 | 5,31E-01 | 2,18E-01 | ND | ND | ND | ND | ND | 1,66E-01 | ND | 0,00E+00 | 6,74E-03 | 7,82E-02 | 9,55E-04 | -1,19E+00 |
| Radioactive waste   | kg   | 4,79E-04 | 1,33E-07 | 1,89E-03 | 2,37E-03 | 8,42E-07 | 9,47E-09 | ND | ND | ND | ND | ND | 7,43E-05 | ND | 0,00E+00 | 4,09E-08 | 2,69E-07 | 2,52E-09 | -8,80E-06 |

## END OF LIFE – OUTPUT FLOWS

| Impact category               | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6       | B7 | C1       | C2       | C3       | C4       | D        |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----------|----|----------|----------|----------|----------|----------|
| Components for re-use         | kg   | 3,09E-05 | 0,00E+00 | 0,00E+00 | 3,09E-05 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 0,00E+00 | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling       | kg   | 1,44E-01 | 0,00E+00 | 2,10E-01 | 3,54E-01 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | 1,76E-09 | ND | 0,00E+00 | 0,00E+00 | 8,94E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec      | kg   | 3,39E-04 | 0,00E+00 | 0,00E+00 | 3,39E-04 | 0,00E+00 | 2,10E-01 | ND | ND | ND | ND | ND | 9,23E-18 | ND | 0,00E+00 | 0,00E+00 | 2,00E-03 | 0,00E+00 | 0,00E+00 |
| Exported energy               | MJ   | 8,33E-03 | 0,00E+00 | 0,00E+00 | 8,33E-03 | 0,00E+00 | 2,56E+00 | ND | ND | ND | ND | ND | 0,00E+00 | 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 | 3,80E-01 | ND | ND | ND | ND | ND | 0,00E+00 | 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 | 2,18E+00 | ND | ND | ND | ND | ND | 0,00E+00 | 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               | 3,22E+00 | 3,09E-02 | 1,74E-01 | 3,43E+00 | 2,93E-01 | 2,69E-02 | ND | ND | ND | ND | ND | 2,76E+00 | ND | 0,00E+00 | 1,46E-02 | 2,52E-02 | 6,68E-04 | -3,93E-01 |
| Ozone depletion Pot. | kg CFC <sub>11</sub> e             | 1,91E-08 | 5,42E-10 | 2,98E-09 | 2,26E-08 | 3,41E-09 | 3,75E-11 | ND | ND | ND | ND | ND | 1,27E-07 | ND | 0,00E+00 | 1,64E-10 | 2,35E-10 | 1,54E-11 | -2,01E-09 |
| Acidification        | kg SO <sub>2</sub> e               | 7,95E-03 | 8,06E-05 | 8,19E-04 | 8,85E-03 | 7,81E-04 | 2,65E-05 | ND | ND | ND | ND | ND | 1,24E-02 | ND | 0,00E+00 | 3,75E-05 | 2,07E-04 | 3,52E-06 | -1,84E-03 |
| Eutrophication       | kg PO <sub>4</sub> <sup>3</sup> e  | 1,05E-03 | 2,42E-05 | 3,71E-02 | 3,82E-02 | 2,11E-04 | 1,03E-05 | ND | ND | ND | ND | ND | 2,06E-03 | ND | 0,00E+00 | 9,13E-06 | 3,08E-05 | 1,13E-06 | -2,44E-04 |
| POCP (“smog”)        | kg C <sub>2</sub> H <sub>4</sub> e | 8,20E-04 | 7,23E-06 | 7,31E-05 | 9,00E-04 | 6,80E-05 | 2,04E-06 | ND | ND | ND | ND | ND | 5,01E-04 | ND | 0,00E+00 | 3,36E-06 | 1,18E-05 | 3,33E-07 | -1,73E-04 |
| ADP-elements         | kg Sbe                             | 2,12E-05 | 8,89E-08 | 1,79E-06 | 2,31E-05 | 8,19E-07 | 6,71E-09 | ND | ND | ND | ND | ND | 6,00E-07 | ND | 0,00E+00 | 4,71E-08 | 1,39E-06 | 1,05E-09 | -2,49E-06 |

| Impact category | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6       | B7 | C1       | C2       | C3       | C4       | D         |
|-----------------|------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----------|----|----------|----------|----------|----------|-----------|
| ADP-fossil      | MJ   | 3,48E+01 | 4,46E-01 | 2,69E+00 | 3,79E+01 | 4,14E+00 | 3,24E-02 | ND | ND | ND | ND | ND | 3,41E+01 | ND | 0,00E+00 | 2,04E-01 | 2,75E-01 | 1,63E-02 | -3,82E+00 |

### 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 | 3,48E+00 | 3,11E-02 | 1,75E-01 | 3,68E+00 | 2,94E-01 | 2,69E-02 | ND | ND | ND | ND | ND | 2,77E+00 | ND | 0,00E+00 | 1,47E-02 | 2,53E-02 | 6,74E-04 | -3,95E-01 |

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

1. Electricity production, nuclear, boiling water reactor, Finland, Ecoinvent, 0.0075 kgCO<sub>2</sub>e/kWh

#### Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry, >32 metric ton, diesel, EURO 5, 2190.0 km

#### Transport to the building site (A4) - Scenario documentation

| Scenario parameter                              | Value |
|-------------------------------------------------|-------|
| Capacity utilization (including empty return) % | 50    |
| Bulk density of transported products            | 437   |
| Volume capacity utilization factor              | 1     |

#### Installation at the building site (A5) - Scenario documentation

| Scenario parameter                       | Value                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------|
| Energy: type and consumption (MJ or kWh) | -                                                                                       |
| Water use (m <sup>3</sup> )              | -                                                                                       |
| Ancillary materials: type and mass (kg)  | -                                                                                       |
| Waste materials: type and mass (kg)      | 0.2 kg of wooden pallet, 0.1 kg softwood board and 0.01 kg PP of plastic wrapping film. |
| Waste materials: output routes           | Wooden pallet, softwood board and PP wrapping film: 0.31 kg incineration                |
| Direct emissions (kg)                    | -                                                                                       |

#### Use stages scenario documentation - B2 Maintenance

| Scenario information            | Value |
|---------------------------------|-------|
| Maintenance process description | -     |
| Maintenance cycle (per RSL)     |       |
| Energy use (kWh/cycle)          | -     |
| Water use (m3 or litres/cycle)  | -     |
| Ancillary materials (kg/cycle)  | -     |
| Waste materials (kg/cycle)      | -     |

#### Use stages scenario documentation - B4 Replacement

| Scenario information              | Value |
|-----------------------------------|-------|
| Replacement cycle (per RSL)       |       |
| Activity type, Energy use (kWh)   | -     |
| Exchange of worn parts, mass (kg) | -     |

#### End of life (C1-C4) - Scenario documentation

| Scenario information                                        | Value                                 |
|-------------------------------------------------------------|---------------------------------------|
| Collection process: collected separately (kg)               | 1.0031                                |
| Collection process: Mixed waste (kg)                        | 0,00663                               |
| Recovery: re-use (kg)                                       | 0                                     |
| Recovery: recycling (kg)                                    | 0,89                                  |
| Recovery: energy recovery (kg)                              | 0,01                                  |
| Disposal (kg)                                               | 0,11                                  |
| Scenario assumptions e.g. transportation (mode, km) & other | Lorry, 16-32 metric ton, EURO5; 75 km |

## 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

Elena Antuña-Bernardo as an authorized verifier for EPD Hub Limited  
21.08.2026

