

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Multitop cast iron Manhole Top

ACO Passavant Detego GmbH



EPD HUB, HUB-5945

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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.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	ACO Passavant Detego GmbH
Address	Scheidertalstraße 3, 65326 Aarbergen, DE
Contact details	info@aco.com
Website	www.aco.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	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	Pratikkumar Parmar, ACO Passavant Detego GmbH
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

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	Multitop cast iron Manhole Top
Additional labels	see list of variants in Annex
Product reference	210520
Place(s) of raw material origin	EU
Place of production	Aarbergen, Germany
Place(s) of installation and use	EU
Period for data	01-2024 to 12-2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	0
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	5

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of Multitop cast iron Manhole Top
Declared unit mass	1 kg
Mass of packaging	0,006 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	0,8
GWP-total, A1-A3 (kgCO ₂ e)	0,8
Secondary material, inputs (%)	95,3
Secondary material, outputs (%)	85
Total energy use, A1-A3 (kWh)	4,68
Net freshwater use, A1-A3 (m ³)	0,01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ACO is one of the world's leading water technology companies, particularly for rainwater and wastewater management. Our mission is "ACO. we care for water." Care in this sense means to be protective and attentive and is deeply anchored in the ACO WaterCycle. This cycle describes the collection, transportation, purification, storage and finally the reuse of this vital resource. Using innovative separation and filter technologies, ACO prevents the contamination of water from fats, fuels, heavy metals and microplastics. We prioritize durability and reusability in our products and continuously work to minimize their carbon footprint. Founded in Schleswig-Holstein in 1946, ACO is represented in over 50 countries around the world and is known for proximity to regional markets and business partnerships.

The ACO Passavant Detego is the specialist within the ACO Group for manhole covers and technical covers, as well as for road and bridge drainage systems. With innovative solutions for industry and infrastructure, we offer a wide range of standard products as well as customized special solutions, particularly for emergency exits and heavy-duty areas. Our focus is on safe functionality and aesthetic integration into the environment.

In addition to product development, our full service also includes installation, maintenance, and repair. So you receive everything from a single source.

The ACO Passavant Detego GmbH production site is certified according to the ISO 50001 energy management system, ISO 14001 environmental management system and ISO 9001 quality management system.

PRODUCT DESCRIPTION

Multitop cast iron Manhole Top 210520 is the representative product for the LCA covered in this EPD.

Multitop cast iron manhole tops are high-performance load-bearing components used in road and urban drainage infrastructure for the safe closure and access of underground sewer and utility systems. They are produced from high-quality cast iron in accordance with the requirements of DIN EN 124 for manhole tops used in traffic-bearing areas. The products are designed to withstand demanding mechanical loads, environmental exposure, and long-term operational stresses typical for installations in roadways, parking areas, and other zones requiring the D 400 load class.

As members of the RAL-GZ 692 certification scheme, Multitop cast iron Manhole Top products fulfil additional performance and quality criteria beyond the minimum regulatory requirements. These include enhanced testing for vertical position stability, resistance against tilting, durability and behaviour of elastomeric inserts, and long-term performance under real operating conditions.

The Multitop range is engineered for operational reliability, long service life, and structural durability. Robust design features such as optimized frame geometry, load distribution surfaces, and secure cover seating contribute to reduced maintenance needs and higher resistance against common operational failures such as mortar bed damage, cover movement, or vibration-induced noise.

Further information can be found at:
www.aco.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	EU
Minerals	0	-
Fossil materials	0	-
Bio-based materials	0	-

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	0,00195

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of Multitop cast iron Manhole Top
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

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	Recycling Recovery Reuse			

ND = Modules not declared. MNR = Modules not relevant

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.

All relevant processes required to produce raw materials and semi-finished product parts, including packaging materials and auxiliary substances, are included in Module A1. Cast iron product parts are manufactured from production facilities located in

Germany. The prefabricated cast iron product is manufactured from pig iron and steel scrap which are melted in electric furnace and cast in different shapes. The production losses are assumed to be 5% and the electricity transmission losses are assumed to be 3%.

The transport (A2) of all raw materials, prefabricated components, and packaging materials to the manufacturing site in Aarbergen, Germany is carried out mainly by road transport using lorry. Distances from suppliers had been assigned based on actual supplier locations within the EU. For those raw materials where no transport data are available, general 'market' processes from Ecoinvent are used.

Incoming prefabricated cast-iron components undergo machining, and finishing, followed by assembly and quality inspection, at the ACO Passavant Detego

GmbH site (A3). The site operates with 100% renewable electricity under a contractual market-based supply, while natural gas is used for space heating, or auxiliary heating and diesel for internal vehicle movements.

The manufacturing waste generated onsite is included in A3, Metal scrap from machining assumed to be 85% recycled, 15% landfilled based on EU cast-iron recycling rates. The manufacturing waste is collected locally within a radius of 150 km and transported by lorry.

Packaging materials used at the site wooden pallets, PET straps, and paper are included in A3 based on average pallet distribution per product weight. The products are stacked on wooden pallets and secured with PET straps. Additionally, breakage and technical production waste are considered in environmental assessment.

The use of renewable 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.

The transportation of the declared product from the manufacturing facility to the point of installation is 100km assumed to facilitate customer and project-specific scaling of module A4, with lorry transport as the primary mode. The product is robust and well-packaged, resulting in no material losses during transport. A vehicle capacity utilization volume factor is assumed to be 1

which means full load. Although actual load factors may vary, this variability is considered negligible due to the relatively minor contribution of transport emissions to the overall environmental impact. To ensure a conservative approach, empty return trips are included in the assessment.

Installation of the product is carried out manually and does not require heavy machinery or additional material inputs. The only resource associated with installation is the small amount of energy used for manual handling and positioning of the product. No material flows, consumables, or auxiliary products are required during installation.

In Module A5, packaging materials are considered installation waste and assumed to be transported 50 km by lorry to a treatment facility. Based on statistical data, wood packaging is distributed as 32% recycled, 30% incinerated, and 38% landfilled, while plastic packaging is treated with 40% recycling, 37% incineration, and 23% landfill.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

PRODUCT END OF LIFE (C1-C4, D)

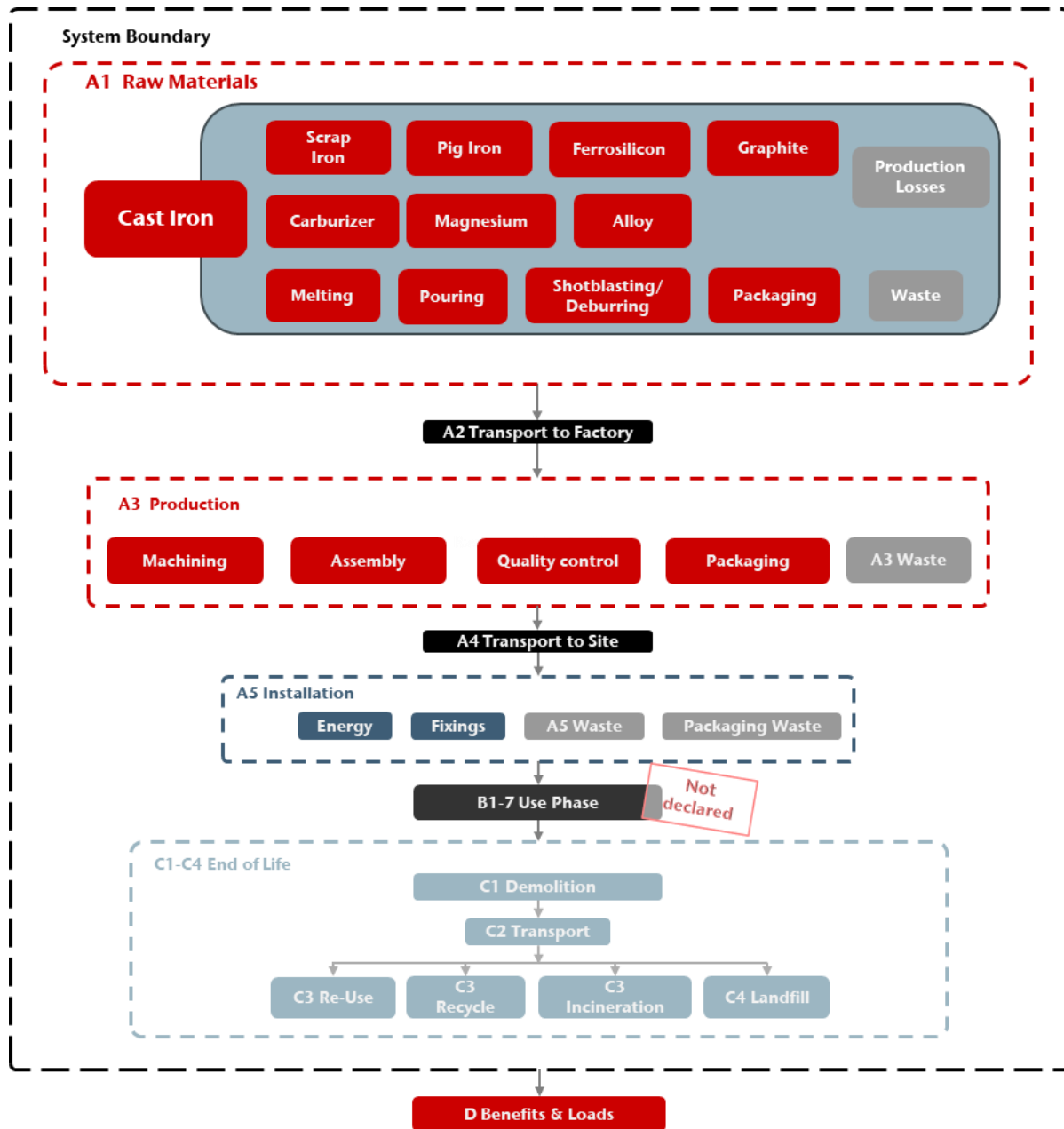
Module C1 covers the dismantling of the product. As with installation, the product is considered to be dismantled by a power tool and energy use is estimated to be the same as in installation. Module C2 represents the transportation to waste treatment. It is assumed that the steel waste is collected separately and transported to the waste treatment facility. Transportation distance to waste treatment plant is assumed between the range 50 km and 250 km and the transportation method is assumed to be lorry. These distances reflect typical logistics within Germany and are consistent with

conservative modeling practices in life cycle assessments. Module C3 maps the waste treatment for reuse, recovery and/or recycling. The assumption has been made that cast iron can be 85% recycled and 15% landfilled according to world steel data.

Module D includes the benefits and loads from the recycling of cast iron and the energy recovery of packaging materials. For the recovered cast iron, the substituted process is the production of virgin pig iron European primary cast iron production dataset,

representing the avoided extraction and smelting of virgin material. For the benefits only primary and no secondary materials were considered. For energy recovery from wooden pallets and plastic packaging, the substituted processes are the German electricity grid mix and heat from natural-gas-fired boilers, reflecting regionally representative primary energy sources. Net flows in Module D are calculated as the difference between recovered outputs and the corresponding substituted primary processes.

MANUFACTURING PROCESS



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.

Elastomeric components have been excluded from the LCA because their contribution to the total product mass is extremely small and well below the EN 15804 cut-off criterion. Their inclusion would not influence any impact category in a meaningful way, and no environmentally relevant flows are associated with these components. All significant material and energy inputs are included, and the exclusion of these negligible elastomeric parts does not affect the completeness or representativeness of the study.

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 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	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

A conservative production loss of 5 % was assumed; although higher than the site-specific losses observed at the ACO facility, this assumption was applied to ensure conservative, consistent, and representative modelling within the EPD methodology.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	0

The representative product comprises cast iron in both the frame and cover components and the declared unit for this EPD is 1 kg of the Multitop cast iron Manhole Top.

Annex 1 contains the detailed list of Multitop cast iron Manhole Top variants covered by this EPD. The annex extends the information provided in the main document by presenting all article numbers, dimensions, and declared unit masses that form part of the Multitop cast iron Manhole Tops product family. While the annex offers full supporting detail, the validity of this EPD extends to the entire Multitop cast iron Manhole Top product family included but not limited to the annex.

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'.

Module A3 (waste): World Stainless 2024, International Chromium Development Association (ICDA) 2023

Module A5 (Installation Energy): Industrial Energy Consumption Guide

Module A5(Packaging): EUROSTAT

Module C-D: World Stainless 2024, International Chromium Development Association (ICDA) 2023, EUROSTAT.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	7,59E-01	1,75E-02	1,95E-02	7,96E-01	1,04E-02	9,76E-03	ND	ND	ND	ND	ND	ND	ND	9,87E-04	2,28E-02	1,92E-02	9,37E-04	-5,65E-02
GWP – fossil	kg CO ₂ e	7,52E-01	1,74E-02	2,63E-02	7,95E-01	1,04E-02	2,53E-03	ND	ND	ND	ND	ND	ND	ND	9,82E-04	2,28E-02	1,92E-02	9,36E-04	-5,73E-02
GWP – biogenic	kg CO ₂ e	6,18E-03	3,88E-06	-6,80E-03	-6,14E-04	2,27E-06	7,22E-03	ND	ND	ND	ND	ND	ND	ND	2,20E-06	4,97E-06	-4,08E-05	-2,98E-07	8,02E-04
GWP – LULUC	kg CO ₂ e	1,32E-03	7,71E-06	1,15E-05	1,34E-03	4,05E-06	3,45E-06	ND	ND	ND	ND	ND	ND	ND	3,01E-06	8,86E-06	2,37E-05	5,35E-07	-7,39E-06
Ozone depletion pot.	kg CFC-11e	1,42E-08	2,67E-10	8,75E-10	1,53E-08	2,17E-10	2,08E-11	ND	ND	ND	ND	ND	ND	ND	1,81E-11	4,75E-10	2,58E-10	2,71E-11	-3,86E-10
Acidification potential	mol H ⁺ e	4,00E-03	5,78E-05	7,46E-05	4,13E-03	2,46E-05	6,55E-06	ND	ND	ND	ND	ND	ND	ND	5,77E-06	5,37E-05	2,29E-04	6,64E-06	-2,05E-04
EP-freshwater ²⁾	kg Pe	7,49E-04	1,35E-06	2,28E-06	7,52E-04	7,27E-07	9,86E-07	ND	ND	ND	ND	ND	ND	ND	9,14E-07	1,59E-06	1,24E-05	7,70E-08	-2,24E-05
EP-marine	kg Ne	8,74E-04	1,88E-05	2,97E-05	9,22E-04	6,44E-06	1,98E-06	ND	ND	ND	ND	ND	ND	ND	9,06E-07	1,41E-05	5,06E-05	2,53E-06	-5,02E-05
EP-terrestrial	mol Ne	8,74E-03	2,04E-04	2,92E-04	9,24E-03	6,97E-05	1,23E-05	ND	ND	ND	ND	ND	ND	ND	8,12E-06	1,52E-04	5,72E-04	2,76E-05	-5,43E-04
POCP (“smog”) ³⁾	kg NMVOCe	2,90E-03	8,62E-05	1,09E-04	3,09E-03	4,27E-05	3,98E-06	ND	ND	ND	ND	ND	ND	ND	2,67E-06	9,33E-05	1,69E-04	9,90E-06	-1,98E-04
ADP-minerals & metals ⁴⁾	kg Sbe	6,87E-06	4,88E-08	5,62E-08	6,97E-06	2,98E-08	1,40E-08	ND	ND	ND	ND	ND	ND	ND	1,33E-08	6,51E-08	1,36E-06	1,49E-09	-2,22E-08
ADP-fossil resources	MJ	1,54E+01	2,54E-01	3,97E-01	1,61E+01	1,56E-01	2,45E-02	ND	ND	ND	ND	ND	ND	ND	2,28E-02	3,42E-01	2,58E-01	2,30E-02	-6,71E-01
Water use ⁵⁾	m ³ e depr.	3,01E-01	1,26E-03	6,02E-02	3,62E-01	8,00E-04	7,57E-04	ND	ND	ND	ND	ND	ND	ND	6,23E-04	1,75E-03	4,64E-03	6,63E-05	-2,44E-03

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	5,96E-08	1,74E-09	1,59E-09	6,29E-08	1,01E-09	5,32E-11	ND	ND	ND	ND	ND	ND	ND	2,06E-11	2,22E-09	3,10E-09	1,51E-10	-5,33E-09
Ionizing radiation ⁶⁾	kBq U235e	2,34E-01	2,29E-04	8,23E-04	2,35E-01	1,88E-04	6,14E-04	ND	ND	ND	ND	ND	ND	ND	6,31E-04	4,12E-04	2,19E-03	1,44E-05	2,14E-04
Ecotoxicity (freshwater)	CTUe	8,54E+00	3,54E-02	4,10E-02	8,62E+00	1,84E-02	1,46E-02	ND	ND	ND	ND	ND	ND	ND	3,48E-03	4,03E-02	1,50E-01	1,93E-03	-1,89E+00
Human toxicity, cancer	CTUh	5,21E-10	2,88E-12	1,38E-11	5,38E-10	1,73E-12	5,63E-13	ND	ND	ND	ND	ND	ND	ND	3,32E-13	3,79E-12	1,72E-11	1,73E-13	-1,72E-10
Human tox. non-cancer	CTUh	1,12E-08	1,64E-10	1,09E-10	1,14E-08	1,01E-10	2,40E-11	ND	ND	ND	ND	ND	ND	ND	1,72E-11	2,21E-10	1,17E-09	3,97E-12	-1,47E-08
SQP ⁷⁾	-	3,57E+00	2,56E-01	9,98E-01	4,83E+00	1,57E-01	8,01E-03	ND	ND	ND	ND	ND	ND	ND	5,08E-03	3,44E-01	5,02E-01	4,52E-02	-1,19E-01

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

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	2,14E+00	3,54E-03	2,46E-01	2,39E+00	2,54E-03	-5,86E-02	ND	ND	ND	ND	ND	ND	ND	6,27E-03	5,56E-03	4,81E-02	2,22E-04	8,20E-03
Renew. PER as material	MJ	0,00E+00	0,00E+00	6,33E-02	6,33E-02	0,00E+00	-6,33E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,36E-03
Total use of renew. PER	MJ	2,14E+00	3,54E-03	3,09E-01	2,45E+00	2,54E-03	-1,22E-01	ND	ND	ND	ND	ND	ND	ND	6,27E-03	5,56E-03	4,81E-02	2,22E-04	1,26E-02
Non-re. PER as energy	MJ	1,38E+01	2,54E-01	3,63E-01	1,45E+01	1,56E-01	-2,41E-02	ND	ND	ND	ND	ND	ND	ND	2,29E-02	3,42E-01	2,58E-01	2,30E-02	-6,71E-01
Non-re. PER as material	MJ	1,51E+00	0,00E+00	-8,07E-03	1,50E+00	0,00E+00	-3,17E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,25E+00	-2,21E-01	2,12E-02
Total use of non-re. PER	MJ	1,54E+01	2,54E-01	3,55E-01	1,60E+01	1,56E-01	-5,58E-02	ND	ND	ND	ND	ND	ND	ND	2,29E-02	3,42E-01	-9,92E-01	-1,98E-01	-6,49E-01
Secondary materials	kg	9,53E-01	1,08E-04	1,80E-03	9,55E-01	6,76E-05	6,93E-06	ND	ND	ND	ND	ND	ND	ND	3,78E-06	1,48E-04	3,15E-04	5,78E-06	3,84E-02
Renew. secondary fuels	MJ	8,61E-05	1,37E-06	1,70E-03	1,79E-03	8,52E-07	6,02E-08	ND	ND	ND	ND	ND	ND	ND	3,02E-08	1,86E-06	1,46E-05	1,20E-07	-5,54E-08
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	8,77E-03	3,75E-05	1,41E-03	1,02E-02	2,31E-05	1,39E-05	ND	ND	ND	ND	ND	ND	ND	1,97E-05	5,04E-05	1,37E-04	2,39E-05	-1,80E-05

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	1,17E-01	4,24E-04	5,26E-04	1,18E-01	2,26E-04	7,95E-05	ND	ND	ND	ND	ND	ND	ND	5,78E-05	4,94E-04	1,69E-03	2,54E-05	3,58E-03
Non-hazardous waste	kg	4,26E+00	7,90E-03	1,34E-01	4,40E+00	4,52E-03	1,18E-02	ND	ND	ND	ND	ND	ND	ND	4,47E-03	9,90E-03	6,09E-02	5,80E-04	-1,25E-01
Radioactive waste	kg	6,00E-05	5,61E-08	2,09E-07	6,03E-05	4,66E-08	1,59E-07	ND	ND	ND	ND	ND	ND	ND	1,62E-07	1,02E-07	5,60E-07	3,52E-09	6,34E-08

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	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	1,60E-01	1,60E-01	0,00E+00	1,91E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,50E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	3,00E-05	3,00E-05	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	1,41E-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 – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,91E-03	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	8,21E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	7,51E-01	1,73E-02	2,66E-02	7,95E-01	1,03E-02	2,64E-03	ND	ND	ND	ND	ND	ND	ND	9,82E-04	2,26E-02	1,92E-02	9,28E-04	-5,70E-02
Ozone depletion Pot.	kg CFC ₁₁ e	1,23E-08	2,13E-10	7,13E-10	1,33E-08	1,73E-10	1,73E-11	ND	ND	ND	ND	ND	ND	ND	1,51E-11	3,78E-10	2,13E-10	2,15E-11	-3,83E-10
Acidification	kg SO ₂ e	3,25E-03	4,43E-05	5,58E-05	3,35E-03	1,95E-05	5,45E-06	ND	ND	ND	ND	ND	ND	ND	4,92E-06	4,26E-05	1,84E-04	4,91E-06	-1,63E-04
Eutrophication	kg PO ₄ ³ e	1,88E-03	1,08E-05	5,91E-05	1,95E-03	4,86E-06	9,30E-07	ND	ND	ND	ND	ND	ND	ND	6,36E-07	1,06E-05	2,66E-05	1,56E-06	-3,63E-05
POCP (“smog”)	kg C ₂ H ₄ e	2,51E-04	3,98E-06	5,48E-06	2,61E-04	1,99E-06	3,59E-07	ND	ND	ND	ND	ND	ND	ND	2,68E-07	4,34E-06	1,09E-05	4,65E-07	-3,34E-05
ADP-elements	kg Sbe	6,61E-06	4,76E-08	5,36E-08	6,71E-06	2,91E-08	1,39E-08	ND	ND	ND	ND	ND	ND	ND	1,32E-08	6,36E-08	1,36E-06	1,46E-09	-2,25E-08
ADP-fossil	MJ	1,13E+01	2,50E-01	3,83E-01	1,20E+01	1,53E-01	1,37E-02	ND	ND	ND	ND	ND	ND	ND	1,17E-02	3,35E-01	2,20E-01	2,28E-02	-6,75E-01

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	7,53E-01	1,74E-02	2,63E-02	7,97E-01	1,04E-02	2,54E-03	ND	ND	ND	ND	ND	ND	ND	9,85E-04	2,28E-02	1,92E-02	9,37E-04	-5,73E-02

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity production, hydro, reservoir, alpine region, Norway, Ecoinvent, 0.0065 kgCO₂e/kWh
2. Heat production, natural gas, at boiler modulating >100kW, Albania, Ecoinvent, 0.0766 kgCO₂e/MJ
3. Heat production, heavy fuel oil, at industrial furnace 1MW, Albania, Ecoinvent, 0.10 kgCO₂e/MJ
4. Market for diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO₂e/MJ

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO6, 100 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	1,29E+03
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)

1. Market group for electricity, low voltage, Ecoinvent, 0.003 kWh

Installation scenario documentation - A5 (Installation waste)

1. Exported Energy: Electricity, Ecoinvent, 0.0029 MJ
2. Exported Energy: Electricity, Ecoinvent, 5.4E-6 MJ
3. Exported Energy: Electricity, Ecoinvent, 0.003 MJ
4. Exported Energy: Thermal, Ecoinvent, 0.004 MJ
5. Exported Energy: Thermal, Ecoinvent, 7.5E-6 MJ
6. Exported Energy: Thermal, Ecoinvent, 0.0042 MJ
7. Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 0.0014 kg

8. Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.0013 kg
9. Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.0017 kg
10. Treatment of waste packaging paper, municipal incineration, Ecoinvent, 2.4E-6 kg
11. Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 2.7E-6 kg
12. Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling, 2.5E-5 kg
13. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 4.4E-4 kg
14. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 2.8E-4 kg
15. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 4.8E-4 kg

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

1. Market group for electricity, low voltage, Ecoinvent, 0.003 kWh
2. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0.85 kg
3. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.15 kg

Scenario information	Value
Scenario assumptions e.g. transportation	Transportation of the product from the demolition site to the appropriate waste treatment facility is assumed to occur within the radius of 250 km to recycling centers, 150 km to energy recovery facilities, and 50 km to landfill sites, respectively.

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 15802+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.

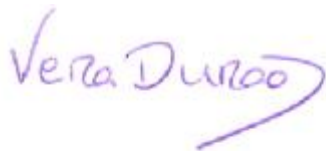
Verified tools

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

09.04.2026



ANNEX 1: OVERVIEW OF THE OTHER VARIANTS

The representative product for this product family is article 210520, a Multitop cast iron Manhole top with a reported GWP A1–A3 fossil of 0,795 kgCO₂e per kg of cast iron. All variants listed in this annex follow the same material composition, same production process, and same upstream supply chains as the baseline product. Therefore, the environmental impacts of the variants scale linearly with net product weight, consistent with requirements for declaring product families with identical manufacturing and composition.

This annex provides the data for the Multitop cast iron manhole top product family, and these calculations ensure transparent and replicable determination of variant-specific results. Although the table lists the individual article numbers and their calculated values, the EPD covers the entire Multitop cast iron manhole top product family, not exclusively the variants shown.

MULTITOP CAST IRON MANHOLE TOPS VARIANTS

Product	Net Product Weight (kg)	Product Width (mm)	Product Length (mm)	Product Height (mm)	Load Class	Product GWP A1-A3 fossil (kg CO ₂ eq)
210520	92	600	600	125	D400	73
210525	92	600	600	125	D400	73
210522	92	600	600	125	D400	73
210521	95	600	600	125	D400	76
210523	95	600	600	125	D400	76
210526	95	600	600	125	D400	76
210560	88,5	600	600	140	D400	70
210568	88,5	600	600	140	D400	70
210563	88,5	600	600	140	D400	70
210561	90,5	600	600	140	D400	72
210569	90,5	600	600	140	D400	72
210564	90,5	600	600	140	D400	72
210500	89,9	600	600	160	D400	71
210505	89,9	600	600	160	D400	71
210503	89,9	600	600	160	D400	71
210501	91,9	600	600	160	D400	73
210504	91,9	600	600	160	D400	73
210508	91,9	600	600	160	D400	73
210590	88,5	600	600	140	D400	70
1206927	88,5	600	600	140	D400	70
1206929	88,5	600	600	140	D400	70
210591	90,5	600	600	140	D400	72
1206928	90,5	600	600	140	D400	72
1206930	90,5	600	600	140	D400	72
210580	90,9	600	600	160	D400	72
1206931	90,9	600	600	160	D400	72
1206933	90,9	600	600	160	D400	72

Product	Net Product Weight (kg)	Product Width (mm)	Product Length (mm)	Product Height (mm)	Load Class	Product GWP A1-A3 fossil (kg CO2 eq)
210581	90,9	600	600	160	D400	72
1206932	90,9	600	600	160	D400	72
1206934	90,9	600	600	160	D400	72
603956	91,5	600	600	125	D400	73
210556	111	600	600	125	D400	88
210557	113	600	600	125	D400	90
210606	144,3	800	800	160	D400	115
210607	146,6	800	800	160	D400	117
210608	126,8	800	800	125	D400	101
210601	126,8	800	800	125	D400	101
210609	129,2	800	800	125	D400	103
210600	125,4	800	800	125	D400	100
1209143	121	800	800	125	D400	96
1209442	123	800	800	125	D400	98

Scope of Variants and Exclusions

The article numbers for the “Adapter frame” 1204755, 1204754, 1260000141 represent cast iron adaptor rings that may be used together with certain Multitop covers. These items are not part of the product system declared in this EPD and are therefore:

- excluded from the declared unit,
- not included in the net product weight, and
- not included in any environmental impact calculation.

These adaptor rings have separate BOM structures and independent production processes that are not connected to the manufacturing of the cast iron manhole covers. For this reason, their mass is excluded from the net weight of the manhole top, and they are not included in the EPD for the Multitop cast iron manhole cover product family.

The table summarises, for each variant, the net cast iron mass, dimensional properties, strength class, and the calculated GWP A1–A3 fossil per declared unit (DU). These values provide a transparent and auditable basis for assessing product-specific impacts within the Multitop product family. This information allows users to refer to the exact product configuration relevant for their construction project or LCA use case.