Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Anchoring buoys*

***Full list of products presented in "Product description"**

from

Rödhammarbolagen AB

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on a representative product
EPD registration number:	EPD-IES-0034170:001
Version date:	2026-10-07
Validity date:	2031-10-07

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products, version 2.0.1, valid until: 2030-04-07
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette and Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/contact.
c-PCR, if applicable: N/A

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *David Palm, Dalemarken AB* Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Rödhammarbolagen AB

Address: Vretvägen 11, 142 34 Skogås, Sweden

Contact: Torbjörn Gozzi, torbjorn@rodhammar.se, 08-771 91 30, 070-771 30 23

Address and contact information of the LCA practitioner commissioned by the EPD owner:
Annie Johansson, annie.johansson@sweco.se
Jonna Halonen, jonna.halonen@sweco.se

Description of the organisation:
Rödhammarbolagen AB is a mechanical engineering company that manufactures and markets products within industrial water and wastewater (VA) and HVAC (VVS) for new installations, repairs, and maintenance.

The company was founded in 1907 by Birger Nilsson under the name *Birger Nilssons Verkstäder*, with operations in the copper and sheet metal industry. After a few years, the company had developed into one of the largest in Sweden within its field. In 1934, Birger's son Sven Rödhammar joined the company and introduced a more technical and manufacturing-oriented focus. Sven took over the company together with his wife Greta in 1958.

For many years, the manufacture of components for and work on fixed and rotating neon signs was a major part of the business. Examples include the Stomatol sign at Slussen, the NK clock, V-Centrum in Vällingby, and the Dagens Nyheter and Expressen signs in Marieberg. The company also carried out assignments and manufacturing work for certain museums.

For Rödhammarbolagen, the ambition has always been to strive for strong, high-quality products. In 1988, the son Sven-Åke Rödhammar took over the company from his father and grandfather. Since then, he has run the business with the ambition of introducing modern and technical tools to benefit efficient, quality-assured, and environmentally conscious production. Even before taking over the company, Sven-Åke Rödhammar was deeply involved in daily production. In 2015, he stepped back from production but continued to be engaged in the administrative side of the company.

Today, the company is run by Torbjörn Gozzi as CEO, with Sven-Åke Rödhammar and his family remaining as owners. RHB has managed its own marketing and sales operations since January 1, 2025.

Rödhammarbolagen's customers are primarily wholesalers, contractors, and municipalities throughout Sweden.

PRODUCT INFORMATION

Product name: Anchoring buoys

Product identification:
Anchoring buoys used to secure and stabilize pipes and pipe fittings in buried pipeline systems.

Visual representation (e.g., an image) of the product:



Figure 1 Anchoring buoys in different sizes.

UN CPC code: 4. Metal products, machinery and equipment

Product description:
Anchoring buoys are used to secure and stabilize pipes and pipe fittings in buried pipeline systems. They absorb and transfer forces caused by internal pressure, bends, tees, valves, and hydrants, helping prevent movement, separation, or excessive stress on joints and connections.

Anchoring buoys were introduced in the 1970s, manufactured by RHB since the mid-1980s. The anchoring buoys come in two different sub-product groups, see below.

- Anchoring buoy in stainless steel for cast iron pipes (dimensions DN80, DN100, DN125, DN150, DN200, DN250, DN300, DN350, DN400, DN500 and DN600)
- Anchoring buoy in stainless steel for plastic pipes (dimensions DN90, DN110, DN160, DN200, DN225, DN250, DN315, DN400, DN500 and DN630)

The manufacturing process for the anchoring buoys can be divided into the following steps:

1. Receive the materials from the material manufacturers
2. Cutting and shaping the material into the components of the anchoring buoys
3. Welding and assembly of components into final product
4. Packaging of final product

Name and location of production site(s):
Rödhammarbolagen AB, Vretvägen 11, 142 34 Skogås, Sweden

References to any relevant websites for more information or explanatory materials, if applicable.
More information about the products(s) can be found at Rödhammarbolagen's website, *https://rodhammar.se/*

CONTENT DECLARATION

The content declaration covers the representative product: Anchoring buoy for plastic pipes DN400.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Steel (AISI 304)	50,995	0%	0%	0
Polyurethane	0,179	0%	0%	0
Silicon carbide (blasting sand)	0,179	0%	0%	0
Polyethylene	0,102	0%	0%	0
TOTAL	51,45	0%	0%	0

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Cardboard box	1,18	2,3%	0,49
Wood	0,21	0,4%	0,08
TOTAL	1,38	3%	0,57

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Product content	Range of content in product group (kg)
Steel (AISI 304)	7,999-68,99 kg
Polyurethane	0,028-0,24 kg
Silicon carbide (blasting sand)	0,028-0,24 kg
Polyethylene	0,016-0,14kg
TOTAL	8-69 kg

The products do not include any substances on the SVHC list.

LCA INFORMATION

Declared unit: 1 piece (p) of product

Conversion factor to mass: 1 piece of product weighs 51,5kg

Reference service life:
The systems are for use in Sweden during 50-100 years.

Time representativeness:
Specific data has been collected through relevant documentation from Rödhammarbolagen AB's own production and supplier production representing the production year 2025. All data collected reflects the current actual production representative of Rödhammarbolagen AB's product flows and was collected from February 2026 to June 2026.

Geographical scope:
A1 and A2: Global, Europe and Sweden (the raw materials for components are produced in several continents, component production takes place in Europe and Sweden).
A3 and C: Sweden

Database(s) and LCA software used:
Modelling of environmental impact has been carried out with the LCA tool SimaPro, version 10.2.0.3. Generic datasets and background data have been based on LCI data from Ecoinvent 3.11, system model cut-off by classification..

Impact assessment methods:
Categories, units and parameters used to describe environmental impacts were selected according to PCR 2019:14, version 2.0.1 (PCR 2019:14). Characterization factors used to assess material and energy flows were applied according to EN 15804:2012+A2:2019/AC:2021 based on EF 3.1.

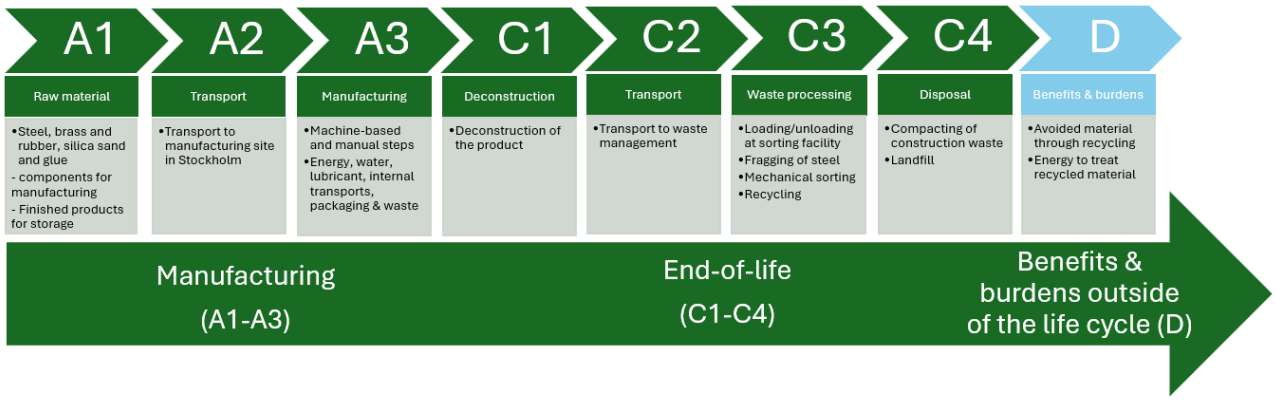
Description of system boundaries:
The EPD system boundary is defined as “Cradle-to-gate with modules C1–C4 and module D (A1–A3 + C + D)”.

A1: Material and components supply
Module A1 includes extraction and processing of raw materials used for the manufacturing of the components used in the components of the product systems. For fire hydrants and flush stations this phase also includes manufacturing of components at sub-suppliers.
A2: Transport to manufacturing
Module A2 includes the transport of materials and components (in some cases via a middle-hand) to the Rödhammarbolagen site for manufacturing of anchoring buoys and assembly of components in fire hydrants and flush stations. It includes both the impact from production and combustion of fuels during the transports.
A3: Manufacturing
Module A3 includes the manufacturing (assembly and production) at Rödhammarbolagen. This includes the impact related to electricity use, water use and management of waste that is generated at the facility. It also includes the packaging of the final product.
C1: De-installation
Module C1 includes de-installation of the products. This includes manual dismantling.

C2: Transport to waste treatment
Module C2 includes the emissions from the transport of the products to the waste treatment (both indirect emissions from the production of fuels and direct emissions from the combustion of fuels).
C3: Waste processing
The waste from the products is included in module C until the "end-of-waste"-state alternatively disposed. Recycling and incineration processes are covered in this module. Anchoring buoys are assumed to go to recycling as an entire entity. The metal recycling process is assumed to generate 95% material that can be further processed into new metal, and 5% residue flows from the waste processing that go to landfill.
C4: Disposal
Module C4 includes the disposal of the products according to the scenario described in C3. Landfilling of waste streams from C3 are handled in C4. This includes the 5% residue flows from the waste processing that go to landfill.
D: Benefits and burdens beyond the system boundary
Module D includes benefits and burdens from the material recovery of steel. The avoided material through recycling is seen as a benefit, while the energy to treat the recycled material until it is functionally equivalent to the assumed substituted material is considered a burden. For plastic and rubber parts that are being incinerated in C3, the benefits are energy recovery.

Process flow diagram:
Process flow diagram of the product system, divided into the life-cycle stages and modules showing the main processes included and the system boundary of the LCA.

At the output of Module C3, 95% of the metal fraction reaches End-of-Waste status through recycling, while plastic and rubber components reach End-of-Waste status through energy recovery in the waste incineration. The remaining 5% of the metal fraction is disposed of in landfill in Module C4. Recovered metal and energy are accounted for in Module D.



Electricity in A3:
Rödhammarbolagen uses purchased electricity from Fortum, with guarantees of origin stating 100% hydro power. The corresponding calculated emission factor for the electricity on the site is 0,0451 kg CO2eq / kWh. The emission factor was calculated using IPCC 2021 (GWP-GHG).

End-of-life:
At the end-of-life the product is deconstructed and then transported to waste management. A realistic scenario has been used where 95% of the steel go to recycling, the rest goes to landfill. The current market is the Swedish market, hence scenarios for customers located in Sweden has been used through module C.

Allocation:
The amount of material in each component is based on specific data. For energy consumption, water use and waste at the production plant, allocation based on mass was used. Total production volumes over a year were used to allocate the environmental impacts from the production processes per unit of studied products respectively.

Cut-off criteria:
The cut-off criteria established by the PCR is 1% of all material and energy flows to a single unit process and 5% of total inflows (mass and energy) per module. No cut-offs exceeding this limit have been made. Production and end-of-life processes of infrastructure and capital goods used in the product system have been excluded, except for datasets for electricity and heat.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	SE / EU 27	SE	-	-	-	-	-	-	-	-	-	SE	SE	SE	SE	SE
Share of primary data	4,17%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	120%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Declaration of share of primary data (A1-A3):

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Raw material	Collected data combined with generic data	EPD Owner and ecoinvent 3.11	2025	Secondary data	0%
Transport	Collected data combined with generic data	ecoinvent 3.11	2025	Secondary data	0%
Other processes at Rödhammarbolagen	Collected data combined with generic data	EPD Owner and ecoinvent 3.11	2025	Secondary data	0%
Energy use at Rödhammarbolagen	Collected data	EPD owner	2025	Primary data	4,17%
Total share of primary data, of GWP-GHG results for A1-A3					4,17%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Data quality:

The overall data quality and robustness of the results are considered to be good. Most of the input data that is important for the result is based on specific information about material and energy flows from Rödhammarbolagen. All specific (measured) data has been verified by Rödhammarbolagen. Generic datasets were sourced from ecoinvent v3.11 and selected according to technological, geographical and temporal representativeness.

A data quality assessment was performed separately for each mandatory environmental impact category. The processes contributing cumulatively to at least 80% of the absolute result in modules A1–C4 were assessed with regard to technological, geographical and temporal representativeness. It is presented in the table below.

Process	Source type	Source & data category	Reference year	Geographical representativeness	Technical representativeness	Temporal representativeness
Electricity, high voltage {SE}| electricity production, hydro, reservoir, non-alpine region | Cut-off, S	Database	Representative secondary data	2025	Very good	Very good	Very good
Steel, chromium steel 18/8 {RoW}| steel production, electric, chromium steel 18/8 | Cut-off, U	Database	Representative secondary data	2025	Good	Good	Very Good
Electricity, high voltage {SE}| electricity production, hydro, reservoir, non-alpine region | Cut-off, S	Database	Representative secondary data	2025	Good	Good	Very Good

Process	Source type	Source & data category	Reference year	Geographical representativeness	Technical representativeness	Temporal representativeness
Steel, chromium steel 18/8 {RoW}| steel production, electric, chromium steel 18/8 | Cut-off, U	Database	Representative secondary data	2025	Good	Good	Very Good
Metal working, average for steel product manufacturing {RoW}| metal working, average for steel product manufacturing | Cut-off, U	Database	Representative secondary data	2025	Good	Good	Very Good
Tap water {Europe without Switzerland}| market for tap water | Cut-off, U	Database	Representative secondary data	2025	Good	Good	Very Good

Variation between products

As the LCA and EPD:s are developed for groups of products, there is variation in the results for different products within the products groups. The variation is declared as the difference between the declared result and the lowest or highest results.

For anchoring buoys, the representative product represents the heaviest product out of the ones sold during 2025. There are however other products with lower material input and some with higher material intensity in the product group. Hence, both minimum and maximum variation is presented below as well as the absolute variation.

LCA result of one declared unit product (A1-C4)	Unit	Variation in results in relation to declared results, minimum (%)	Variation in results in relation to declared results, maximum (%)	Absolute variation (%)
GWP-fossil	kg CO2 eq.	-84%	35%	120%
GWP-biogenic	kg CO2 eq.	-84%	35%	120%
GWP-luluc	kg CO2 eq.	-84%	35%	120%
GWP-total	kg CO2 eq.	-84%	35%	120%
ODP	kg CFC 11 eq.	-84%	35%	120%
AP	mol H+ eq.	-84%	35%	120%
EP-freshwater	kg P eq.	-84%	35%	120%
EP- marine	kg N eq.	-84%	35%	120%
EP-terrestrial	mol N eq.	-84%	35%	120%
POCP	kg NMVOC eq.	-84%	35%	120%
ADP-minerals&metals*	kg Sb eq.	-84%	35%	120%
ADP-fossil*	MJ	-84%	35%	120%
WDP*	m3	-84%	35%	120%
GWP-GHG	kg CO2 eq.	-84%	35%	120%

The variation in GWP-GHG A1-A3 is 120%.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	4,31 E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,93 E-02	6,31E -01	1,64 E-01	8,43 E-03	-4,60E +01
GWP-fossil	kg CO_2 eq.	3,98 E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,93 E-02	6,31E -01	1,64 E-01	8,43 E-03	-4,71E +01
GWP-biogenic	kg CO_2 eq.	1,79 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,42 E-06	1,42E -04	1,73 E-04	2,80 E-06	1,12E +00
GWP-luluc	kg CO_2 eq.	1,54 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	7,94 E-07	9,97E -06	4,11 E-04	4,12 E-07	-7,32E -03
ODP	kg CFC 11 eq.	2,85 E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,93 E-10	1,43E -08	2,49 E-09	1,22 E-10	-1,86E -07
AP	mol H^+ eq.	1,99 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,78 E-04	1,63E -03	1,50 E-03	7,61 E-05	-1,61E -01
EP-freshwater	kg P eq.	3,33 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,61 E-07	3,25E -06	1,99 E-06	2,09 E-07	-1,88E -02
EP-marine	kg N eq.	3,97 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,40 E-05	6,22E -04	7,07 E-04	3,50 E-05	-3,52E -02
EP-terrestrial	mol N eq.	3,94 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	9,20 E-04	6,79E -03	7,74 E-03	3,83 E-04	-4,06E -01
POCP	kg NMVOC eq.	1,27 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,75 E-04	2,70E -03	2,31 E-03	1,16 E-04	-1,42E -01
ADP-minerals&metals*	kg Sb eq.	7,26 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	6,76 E-10	1,65E -08	7,05 E-09	2,83 E-10	-6,54E -06
ADP-fossil*	MJ	4,63 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,52 E-01	8,39E +00	2,60 E+00	1,08 E-01	-4,94E +02
WDP*	m^3	2,03 E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,88 E-04	2,74E -03	7,93 E-03	9,21 E-05	-2,93E +00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption														

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

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

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	4,13 E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,93 E-02	6,31E -01	1,64 E-01	8,43 E-03	-4,71E +01
PM	disease inc.	3,29 E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,13 E-09	4,20E -08	4,31 E-08	2,16 E-09	-3,51E -06
IRP[2]	kBq U-235 eq	2,56 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	4,89 E-05	2,11E -03	3,69 E-02	2,47 E-05	-3,92E -01
ETP-fw[3]	CTUe	4,49 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	7,23 E-03	3,00E -01	6,50 E-02	3,96 E-03	-1,16E +02
HTP-c[3]	CTUh	4,64 E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,03 E-12	4,25E -11	9,32 E-12	5,59 E-13	-6,95E -08
HTP-nc[3]	CTUh	6,22 E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,90 E-11	4,18E -09	1,86 E-10	1,07 E-11	-8,34E -08
SQP[3]	Pt	9,29 E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND	4,28 E-04	1,07E -02	1,13 E-01	1,06 E-01	-4,74E +01

Resource use indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,43 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,50 E-04	2,09E -02	3,21 E-01	4,62 E-04	-5,36E +00
PERM	MJ	1,73 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
PERT	MJ	2,45 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,50 E-04	2,09E -02	3,21 E-01	4,62 E-04	-5,36E +00
PENRE	MJ	4,95 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,68 E-01	8,92E +00	2,74 E+00	1,15 E-01	-5,25E +02
PENRM	MJ	1,28 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	-6,91 E+00	0,00 E+00	0,00E +00
PENRT	MJ	4,96 E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,68 E-01	8,92E +00	-4,17 E+00	1,15 E-01	-5,25E +02

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

[2] 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.

[3] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

SM	kg	2,14 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
RSF	MJ	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
NRSF	MJ	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
FW	m^3	5,34 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,12 E-06	1,37E -04	1,65 E-04	2,73 E-06	-1,67E -01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
Non-hazardous waste disposed	kg	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
Radioactive waste disposed	kg	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00

Output flow indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
Material for recycling	kg	7,75 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	4,86 E+01	0,00 E+00	0,00E +00
Materials for energy recovery	kg	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	0,00 E+00	0,00 E+00	0,00E +00
Exported energy, electricity	MJ	1,73 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	1,07 E+00	0,00 E+00	0,00E +00
Exported energy, thermal	MJ	1,56 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00 E+00	0,00E +00	9,59 E+00	0,00 E+00	0,00E +00

Additional LCA results (other environmental performance results) of the product(s)

Results for additional scenarios in module C and D
In accordance with the PCR, 100% scenarios should be developed. If any of the declared scenarios is a mix of end-of-life alternatives (reuse, recycling, incineration with energy recovery, landfill, etc.), also the corresponding 100% scenarios (100% reuse, 100% recycling, 100% incineration with energy recovery, 100% landfill, etc.) shall be declared. In other words, the 100% scenarios of relevance for the intended market shall be declared.

Scenarios shall be realistic and representative for the most probable end-of-life treatment alternatives considering the geographical scope of the EPD. However, also relevant 100% scenarios shall be declared, as described above, even if they are not realistic. As the products are sold on the Swedish market, the original scenario developed, with a 95% recycled product, is estimated to be the most accurate one.

Scenarios identified, apart from the most likely one developed in the study for the market, are 100% recycling and 100% landfill. The results for modules C3, C4 and D change when one of the alternative scenarios is used. For each product, the original results for these modules are presented together with the corresponding results for each alternative scenario, see table below.

Environmental impact – scenarios for end-of-life											
Fire hydrant		**100% recycling**					**100% landfill**				
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO2-eq.	1,93E-02	6,31E-01	1,64E-01	0,00E+00	-4,84E+01	1,93E-02	6,31E-01	1,64E-01	1,69E-01	0,00E+00
GWP-fossil	kg CO2-eq.	1,93E-02	6,31E-01	1,64E-01	0,00E+00	-4,95E+01	1,93E-02	6,31E-01	1,64E-01	1,69E-01	0,00E+00
GWP-biogenic	kg CO2-eq.	3,42E-06	1,42E-04	1,73E-04	0,00E+00	1,18E+00	3,42E-06	1,42E-04	1,73E-04	5,61E-05	0,00E+00
GWP-luluc	kg CO2-eq.	7,94E-07	9,97E-06	4,11E-04	0,00E+00	-7,71E-03	7,94E-07	9,97E-06	4,11E-04	8,24E-06	0,00E+00
ODP	kg CFC 11 eq.	2,93E-10	1,43E-08	2,49E-09	0,00E+00	-1,96E-07	2,93E-10	1,43E-08	2,49E-09	2,44E-09	0,00E+00
AP	mol H^+ eq.	1,78E-04	1,63E-03	1,50E-03	0,00E+00	-1,69E-01	1,78E-04	1,63E-03	1,50E-03	1,52E-03	0,00E+00
EP-freshwater	kg P eq.	1,61E-07	3,25E-06	1,99E-06	0,00E+00	-1,98E-02	1,61E-07	3,25E-06	1,99E-06	4,18E-06	0,00E+00
EP-marine	kg N eq.	8,40E-05	6,22E-04	7,07E-04	0,00E+00	-3,71E-02	8,40E-05	6,22E-04	7,07E-04	6,99E-04	0,00E+00
EP-terrestrial	mol N eq.	9,20E-04	6,79E-03	7,74E-03	0,00E+00	-4,27E-01	9,20E-04	6,79E-03	7,74E-03	7,65E-03	0,00E+00
POCP	kg NMVOC eq.	2,75E-04	2,70E-03	2,31E-03	0,00E+00	-1,49E-01	2,75E-04	2,70E-03	2,31E-03	2,32E-03	0,00E+00

ADPm	kg Sb eq.	6,76E-10	1,65E-08	7,05E-09	0,00E+00	-6,88E-06	6,76E-10	1,65E-08	7,05E-09	5,65E-09	0,00E+00
ADPf	MJ	2,43E-03	5,57E-02	5,07E-01	0,00E+00	-4,43E+02	2,43E-03	5,57E-02	5,07E-01	8,16E-02	0,00E+00
WDP	m^3	1,88E-04	2,74E-03	7,93E-03	0,00E+00	-3,09E+00	1,88E-04	2,74E-03	7,93E-03	1,84E-03	0,00E+00
GWP-GHG	kg CO2-eq.	1,93E-02	6,31E-01	1,64E-01	0,00E+00	-4,96E+01	1,93E-02	6,31E-01	1,64E-01	1,69E-01	0,00E+00
PM	disease inc.	5,13E-09	4,20E-08	4,31E-08	0,00E+00	-3,69E-06	5,13E-09	4,20E-08	4,31E-08	4,33E-08	0,00E+00
IRP	kBq U-235 eq	4,89E-05	2,11E-03	3,69E-02	0,00E+00	-4,13E-01	4,89E-05	2,11E-03	3,69E-02	4,94E-04	0,00E+00
ETP-fw	CTUe	7,23E-03	3,00E-01	6,50E-02	0,00E+00	-1,22E+02	7,23E-03	3,00E-01	6,50E-02	7,91E-02	0,00E+00
HTP-c	CTUh	1,03E-12	4,25E-11	9,32E-12	0,00E+00	-7,32E-08	1,03E-12	4,25E-11	9,32E-12	1,12E-11	0,00E+00
HTP-nc	CTUh	1,90E-11	4,18E-09	1,86E-10	0,00E+00	-8,77E-08	1,90E-11	4,18E-09	1,86E-10	2,13E-10	0,00E+00
SQP	Pt	4,28E-04	1,07E-02	1,13E-01	0,00E+00	-4,99E+01	4,28E-04	1,07E-02	1,13E-01	2,12E+00	0,00E+00
PERE	MJ	5,50E-04	2,09E-02	3,21E-01	0,00E+00	-5,65E+00	5,50E-04	2,09E-02	3,21E-01	9,24E-03	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,50E-04	2,09E-02	3,21E-01	0,00E+00	-5,66E+00	5,50E-04	2,09E-02	3,21E-01	9,25E-03	0,00E+00
PENRE	MJ	2,54E-03	5,75E-02	5,08E-01	0,00E+00	-4,65E+02	2,54E-03	5,75E-02	5,08E-01	8,58E-02	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	-6,91E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-6,91E+00	0,00E+00	0,00E+00
PENRT	MJ	2,54E-03	5,75E-02	-6,40E+00	0,00E+00	-4,65E+02	2,54E-03	5,75E-02	-6,40E+00	8,58E-02	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	5,12E-06	1,37E-04	1,65E-04	0,00E+00	-1,75E-01	5,12E-06	1,37E-04	1,65E-04	5,47E-05	0,00E+00
HWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NHWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Abbreviations

GWP-total = Global Warming Potential – total; GWP-fossil = Global Warming Potential – fossil fuels; GWP-biogenic = Global Warming Potential – biogenic; GWP-luluc = Global Warming Potential – land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use

Scaling factors:

As the material composition is homogenous for anchoring buoys, and the results are scalable, scaling factors for all of the products is presented below. To get the results for a specific product the scaling factor presented below is multiplied with the presented results for the anchoring buoys.

Article number	Definition of product	Scaling factor
1139064	Anchoring buoy in stainless steel for cast iron pipes, DN100	0,16
1139066	Anchoring buoy in stainless steel for cast iron pipes, DN150	0,17
1139067	Anchoring buoy in stainless steel for cast iron pipes, DN200	0,23
1139068	Anchoring buoy in stainless steel for cast iron pipes, DN250	0,26
1139069	Anchoring buoy in stainless steel for cast iron pipes, DN300	0,31
1139070	Anchoring buoy in stainless steel for cast iron pipes, DN350	0,36
1139071	Anchoring buoy in stainless steel for cast iron pipes, DN400	0,48
1139072	Anchoring buoy in stainless steel for cast iron pipes, DN500	0,96
1139073	Anchoring buoy in stainless steel for cast iron pipes, DN400	1,08
2220011	Anchoring buoy in stainless steel for plastic pipes, DN90	1,16
2220012	Anchoring buoy in stainless steel for plastic pipes, DN110	1,33
2220013	Anchoring buoy in stainless steel for plastic pipes, DN160	0,21
2220014	Anchoring buoy in stainless steel for plastic pipes, DN200	0,26
2220015	Anchoring buoy in stainless steel for plastic pipes, DN225	0,32
2220016	Anchoring buoy in stainless steel for plastic pipes, DN250	0,38
2220017	Anchoring buoy in stainless steel for plastic pipes, DN315	0,51
2220018	Anchoring buoy in stainless steel for plastic pipes, DN400	1,00
2220019	Anchoring buoy in stainless steel for plastic pipes, DN500	1,16
2220020	Anchoring buoy in stainless steel for plastic pipes, DN630	1,35

ADDITIONAL ENVIRONMENTAL INFORMATION

Rödhammarbolagen works with refurbishment of existing systems, this prolongs the lifetime and hence the utilisation of many of the components in the products. This is in line with reducing the environmental impact from the product in the long-term perspective. Making sure that the components have a long lifetime and only exchanging absolutely necessary parts at the end-of-life is recommended to reduce the impact.

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CPC	Central product classification
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals & metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)

PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents

CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

REFERENCES

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ISO 14040:2006. Environmental management — Life cycle assessment — Principles and framework.

ISO 14044:2006. Environmental management — Life cycle assessment — Requirements and guidelines.

LCA report Rödhammarbolagen AB. Sweco. Johansson & Halonen.

VERSION HISTORY

Version 1, 2026-10-07

- Original Version of the EPD

EPD
INTERNATIONAL EPD SYSTEM
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