

Environmental Product Declaration



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

Altech Expansion vessels



from

Saint-Gobain Distribution Sweden AB



Program:

The International EPD System, www.environdec.com

Program operator:

EPD International AB

Type of EPD:

EPD of multiple products, based on the worst-case results of the product group, published by trader
The list of included products is provided in the Product Information section

EPD registration number:

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Version date:

2026-04-22

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



General information

Program information

Programme:	The International EPD System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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PCR and verification

Product Category Rules (PCR):
CEN standard EN 15804:2012+A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Construction Products PCR 2019:14 version 2.0.1, Environmental Footprint (EF) 3.1 method.
PCR review was conducted by: <i>The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via support@environdec.com.</i>
Life Cycle Assessment (LCA)
LCA accountability: Tabi Farzad, SGDS, tabi.farzad@dahl.se
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ Individual EPD verification by individual verifier
Third-party verifier: <i>Sigita Židonienė, Vesta, sigita@vestaconsulting.lt</i> Verifiers company – Vesta Consulting, UAB
Approved by: The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

Ownership and limitations on use of EPD

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but published in different EPD programs, 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 and trader	Saint-Gobain Distribution Sweden AB Bryggerivägen 9 168 67 Bromma Stockholm
Contact	SGDS - Beriar Maroof (beriar.maroof@dahl.se)
Description of the organisation	Saint-Gobain Distribution Sweden AB - specialists in collaboration for more efficient business in construction and installation. Saint-Gobain Distribution Sweden AB is the head company of some of Sweden's leading trading companies in construction, sheet metal, tiles and installation. All the companies have long and solid industry experience and provide most of Sweden's craftsmen with materials for various projects. Customers in different companies can also buy support items from the sister companies in the group, and in selected cases, we take joint projects to facilitate the logistics of the supply of goods, which is then often critical for a smooth construction project. • Optimera - construction trade for professional carpenters • Dahl – heat, plumbing and sanitary specialist • Bevego - building sheet metal, ventilation and technical insulation • Kakelspecialisten and Konradsson's Tiles - tiles, tiling and bathroom fittings The company's focus is on sales and services with direct contact to about 150,000 customers regularly. Saint-Gobain Distribution Sweden AB is owned by Saint-Gobain with a presence in 64 countries and over 190 000 employees worldwide.
Location of production site	Netherland, Almere
Location of trader's warehouse	Sweden (Bålsta), Norway (Langhus), Denmark(Randers SV), Finland(Vantaa)



Product information

Product name	Altech Expansion vessels
Product identification	Expansion Vessels
UN CPC code	The United Nations Central Product Classification (CPC), version 2.1, assigns the code 41293 to tube or pipe fittings, expansion vessels, of stainless steel.
Product description	Expansion vessels are specifically made of steel. There are several different dimensions of vessels. Therefore, the declared unit represents all products regardless of size ranging from 8 to 600 litres and are CE-marked in accordance with the pressure equipment directive (PED) 2014/68/EU.
Technical data	The vessel shell is manufactured from steel. The vessels are equipped with a flexible internal membrane, which separates the system water from the gas cushion. The maximum operating temperature of the system medium is 120 °C, while the continuous operating temperature range of the membrane is –10 °C to +70 °C, in accordance with EN 13831. The production process begins with the selection of certified steel raw materials. The chemical composition and mechanical properties of each material batch are verified to ensure compliance with applicable standards. The steel is then cut and mechanically formed into the required shell and end-cap geometries. The formed components are assembled by welding to create the closed pressure vessel. Where required, heat treatment is applied to ensure structural integrity and consistent mechanical performance. After assembly, the vessels undergo the necessary inspections and quality control procedures in accordance with applicable standards and regulatory requirements. Each finished pressure expansion vessel is permanently marked for traceability and CE conformity, then packaged and prepared for transportation and distribution. Finally, the products are packaged and prepared for transportation and distribution.
Use	Pressure expansion vessels are designed for use in closed heating and cooling installations.

The EPD covers the following products variants in the Table 1. Other sizes manufactured by the same supplier and using the same material may be added in future updates.

Table 1: Product variants

Product	Article.Nr				Volume (Lit)	Weight (kg)	Density (kg/m ³)
	SE	NO	FI	DK			
*Altech 8L/1,5 (6bar)	5539330	1373096	3411501	370824008	8	2.2	275
Altech12L/1,5 (6bar)	5539331	1373097	3411502	370824012	12	2.4	200
Altech 18L/1,5 (6bar)	5539332	1373098	3411503	370824018	18	3.4	189
Altech 25L/1,5 (6bar)	5539333	1373099	3411504	370824025	25	4.2	168
Altech 35L/1,5 (6bar)	5539334	1373100	3411505	370824035	35	5.4	154,3
Altech 50L/1,5 (6bar)	5539335	1373101	3411506	370824050	50	8.7	174
Altech 80L/1,5 (6bar)	5539336	1373102	3411507	370824080	80	12.3	153,8
Altech 100L/1,5 (6bar)	5539344	1388924	3411508	370825100	100	13.9	139
Altech 150L/1,5 (6bar)	5539345	1388925	3411509	370825150	150	17.6	117,3
Altech 200L/1,5 (6bar)	5534989	8442011	3411510	370823200	200	25	125
Altech 250L/1,5 (6bar)	5534990	8442012	3411511	370823250	250	31.8	127,2
Altech 300L/1,5 (6bar)	5534991	8442013	3411512	370823300	300	35.6	118,7
Altech 400L/2,5 (6bar)	5535010	-	3411513	-	400	53.4	135,5
Altech 500L/2,5 (6bar)	5535011	-	3411514	370823500	500	60.2	120,4
Altech 600L/2,5 (6bar)	5535012	-	3411515	370823600	600	67	111,7

* Worse - case representative

The UN CPC (Central Product Classification) code

The United Nations Central Product Classification (CPC), version 2.1, assigns the code 41293 to tube or pipe fittings, expansion vessels, of stainless steel.

Table 2: UN CPC code

Material Type	CPC Code
Stainless steel	41293

Content declaration

Description of the main components and/or material

The expansion vessels are primarily composed of steel components, which provide the required structural integrity and durability during operation. Additional materials include rubber, brass, polymer-based components, nitrogen, and surface coatings, each fulfilling specific functional roles such as sealing, fastening, or protective finishing.

No post-consumer recycled content is included in the materials used. The packaging consists of cardboard and paper, ensuring adequate protection during storage and transportation.

For the environmental assessment, a worst-case data scenario has been applied, based on the product with the highest material intensity (i.e. highest density) within the declared product group.

The present EPD is therefore based on a worst-case approach, reflecting products marketed across the Nordic countries, including Sweden, Denmark, Norway, and Finland. The expansion vessel models within the declared product group are highly comparable in terms of material composition, with only minor variations. The primary differences between models relate to nominal volume and corresponding total mass.

Given that material intensity—particularly steel content—is the main driver of environmental impacts in modules A1–A3, product density (defined as mass per nominal vessel volume, kg/m³) has been used as the key selection parameter.

Based on this assessment, Altech 8L/1,5 (6bar) has been selected as the worst-case representative product, as it exhibits the highest density within the declared product range.

A detailed specification of the materials used in the products and their packaging is provided in Table 3.

Table 3: material specification for production of 1 kg of expansion vessel and its packaging based on worst case data

Raw material	Mass, kg	Range in product group (kg)	Post-consumer recycled material, mass-% of product	Biogenic material ¹ , kg / declared unit
Steel	0,835	0,835-0,88	0	0
Rubber	0,084	0,063-0,084	0	0
Brass	0,0039	0,0001-0,0039	0	0
*LDPE	0,0001	0,00008-0,0001	0	0
Steel zinc	0,05	0,00-0,05	0	0
*Nitrogen	0,006	0,0037- 0,006	0	0
PP	0,002	0,00007-0,002	0	0
Paper	0,002	0,00002-0,002	0	0,001
*Polyamide	0,0039	0,00002-0,0039	0	0
PP (paint)	0,016	0,006-0,016	0	0
Total	1		0	0,001
Material	Mass, kg		Mass-% (versus the product)	Biogenic material, kg C / declared unit
Cardboard	0,103	0,076-0,103	10,3%	0,045
*Paper	0,0001	0,0001-0,002	0,01%	0,00005

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂

*Excluded from LCA modelling – cut-off rule applied

Hazardous substances

At the date of issue of this declaration (date: 2026-02-05), there is no “Substance of Very High Concern” (SVHC) in concentration above 0.1 % in the products or packaging according to the European REACH regulation.

LCA information

Declared unit	1 kg of Expansion vessel
Reference service life	30-50 years
Time representativeness	The data used to model product manufacturing correspond to 2024. The data from generic databases are from 2021 – 2024. No data used is older than 5 years.
Database(s) and LCA software used	Calculation completed in GaBi v 10.9 with an integrated Ecoinvent database v.3.10 integrated CUP2023.2

Data

Generic database data was used for the production of raw materials, energy, transportation, packaging and end-of-life. Specific data was collected from the factory.

Type of EPD

The EPD type is a multi-product EPD, based on the worst-case data results within the product group, and published by the trader. It covers a cradle-to-gate with options, modules C1-C4, module D and optional modules.

Omissions of life cycle stages and processes

- **A1-A3:** The plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the potential environmental impacts through the life cycle of the product
- **B1-B7:** The use phase of the products is not included
- The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities are excluded

Cut-off criteria

At least 95% of the total mass and energy inflows, as well as 95% of the associated environmental impacts, are included for each information module (A1–A3, A4–A5, B1–B7, C1–C4, and D). Minor flows that together contribute less than 5% of the overall mass, energy, or environmental impact of a module are considered negligible and have therefore been excluded. In this study, no cut-off criteria have been applied. In this EPD, the following materials are treated according to the cut-off rule, as they represent a very small mass fraction of the product and have a negligible impact on the overall results: paper used for packaging, polyamide used for the valve cap, LDPE used for label and nitrogen used for filling the vessels. The total mass of excluded materials is 0.010 kg, corresponding to 1% of the declared product mass. Each individual material contributes less than 1% of the total mass. Therefore, both the individual (1%) and cumulative (5%) cut-off criteria are fulfilled in accordance with the applicable PCR requirements

Allocation

The allocation procedure follows Sections 4.5.2 and 4.5.3 of PCR 2019:14 version 2.0.1 and complies with EN 15804+A2 and ISO 21930. In line with EN 15804, allocation is avoided wherever possible. Where allocation cannot be avoided, it is based on physical relationships such as mass or volume, provided that economic differences are not significant.

The background datasets used in this study are based on Ecoinvent 3.10 applying the system model “Allocation, cut-off, EN15804”.

No co-products are generated during the production of expansion vessels; therefore, allocation between products is not required. All energy use, auxiliary materials and process-related inputs within the manufacturing plant are directly assigned to the declared product. As the production line is dedicated to this product type, no allocation of energy consumption between products is necessary.

In accordance with the cut-off approach, once production waste leaves the system boundary for recycling, no further environmental burdens from subsequent recycling processes are attributed to the current product system. These downstream recycling processes are assigned to the subsequent product system.

This modelling approach ensures consistency with EN 15804+A2, ISO 21930 and the cut-off allocation principle.

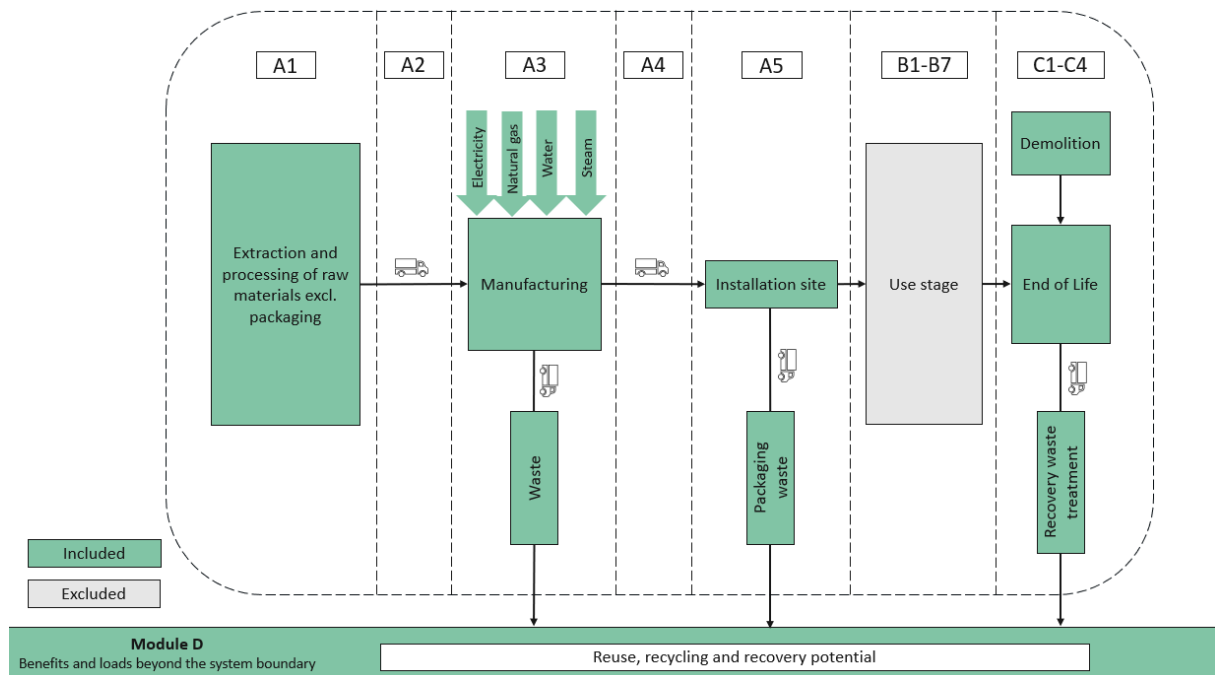
Geographical scope

This LCA study centres around the production and manufacturing process expansion vessel articles in Netherland. The supplier is located in Netherland, and the distribution of the products is within Nordic.

Description of system boundaries

According to EN 15804:2012+A2:2019/AC:2021, all construction products should declare modules A1-A3 but also C1-C4 and D. LCA modelling approach is attributional LCA. The system boundary of this LCA study is set from a cradle-to-gate with options, modules C1-C4, module D and optional modules.

The life cycle stages included are the product stage (modules A1-A3), transport to the installation site (module A4), construction and installation and also packaging waste management (module A5), and the end-of-life stage (module C). Module D captures the benefits from the end-of-life treatment of materials, whether directed toward material or energy recovery. Module B is excluded as it is not associated with any activities or emissions that cause environmental impacts.



More information

A1-A3 Raw materials and manufacturing stage

A1: This module includes the extraction and initial production of raw materials used to manufacture expansion vessels and their packaging. The product consists mainly of steel. The vessels included in this study are sourced from a supplier located in Netherlands. For this LCA, supplier data corresponding to the worst-case configuration has been selected to reflect the upper bound of potential environmental impacts and to ensure that results are not underestimated. The dataset represents the product with the highest material intensity (i.e. highest density) within the declared product group, thereby providing a conservative basis for the assessment.

A2: This module covers the transportation of raw materials to the manufacturing sites. The manufacturers provided specific information on the transportation distances between the raw material sources and the factories.

A3: This stage includes resources used during the manufacturing process of the expansion vessel articles as well as the manufacturing of the packaging material. It is assumed that the inputs and outputs from this module are distributed equally across the products per declared unit as the processes are similar across all products. After production, the expansion vessels are transported to distribution centers in one of Nordic countries before reaching the final customers. Table 4 shows the datasets used for energy and resource inputs for manufacturing the Expansion vessel articles. Table 5, 6 and 7 represents the data applied for transportation of product as trader. No waste is generated at this stage.

Table 4 Dataset for resource use

Resource	Dataset	Database	Geographical Reference	Time Reference	GWP excl Biogenic
Electricity	Dutch electricity grid mix	AIB	NL	2024	0,419 kg CO2 eq

Table 5 Transportation dataset (Trader) – A3

Transportation Type	Fuel Type	Database	Geographical Reference	Time Reference
Truck	Diesel	Ecoinvent 3.10	GLO	2021

Table 6 Transportation distance (Trader) – A3

Product	Transportation Type	Distance (km) (Worse case) (FI)
Expansion vessel	Truck	2245

Table 7 Transportation type (Trader) – A3

Transportation Type	Capacity utilisation (incl. return) %	Dataset	Database	Geographical Reference	Time Reference
Truck	61	Truck-trailer, Euro 0 - 6 mix, 34 - 40t gross weight / 27t payload capacity	Sphera	GLO	2022

A4 Transport to construction process stage

It assumes an extra 350 km as generic data for transportation by truck to the installation site in Sweden, Norway, Denmark or Finland. Detailed data sets for these transportation routes are provided in Table 8.

Table 8: Transport to the building site - A4

Scenario information		Unit per DU
Fuel type and consumption of vehicle or vehicle type	Truck-trailer, Euro 0 - 6 mix, 34 - 40t gross weight	
Distance [km]		350
Fuel/Energy consumption value [l/tkm]	EU 28: Diesel mix (9.40 wt.% bio components)	
Capacity Utilisation (including empty returns) [%]		61
Volume capacity		1

A5 Installation

This stage includes the installation of the product and the management of packaging waste generated at the installation site.

The installation is carried out manually using standard hand tools. No electricity-consuming equipment is required. Therefore, no additional material or energy inputs are included in module A5. The environmental impact associated with the installation process is considered negligible.

The packaging materials considered in module A5 originate from module A3. These materials are delivered together with the product and, upon unpacking at the installation site, become waste.

Packaging is disposed in this study, using Swedish average data (Naturvardsverket, 2025) listed in Table 9.

Table 9 Packaging disposal waste rates

Material	Recycling Rate	Incineration Rate	Landfill Rate
Cardboard	81%	17%	2%

B1-B7 Use stage

This stage includes no activities or emissions related to the product.

C1 Deconstruction

The deconstruction phase (Module C1) accounts for the energy required to dismantle or remove the product at the end of its life. In the case of expansion vessels, this typically involves manual handling and limited use of electrically powered tools such as saws, drills, or forklifts.

In this assessment, the energy demand associated with deconstruction is considered negligible. This is due to the minimal impact of such activities relative to the total life cycle energy of the product and the absence of significant material or energy inputs during this stage.

C2 Transport

This module includes the transportation distance to waste processing. This is assumed to be 80 km for products/materials sent to recycling or landfills, and 130 km for products/materials sent to incineration.

C3 Waste processing

The waste rate of the product in this scenario is shown in Table 10. In module C3, the end-of-life product is prepared for recycling in a subsequent product system. The treatment considered in this module includes dismantling, sorting, and mechanical preparation processes such as cutting and pressing of the steel components.

Table 10 Waste treatment rates – C3-C4

Material	Recycling Rate	Incineration Rate	Landfill Rate
Steel +Paint	70%	0%	30%
Steel zinc plated	70%	0%	30%
Rubber	25%	71%	4%
Brass	70%	0%	30%
PP	22%	75%	3%
Paper	81%	17%	2%

C4 waste disposal

The impacts of landfilling and final disposal of the product at its end of life are calculated. Due to consideration of collection and recycling efficiencies, the materials that are not processed are assumed to be landfilled as municipal solid waste.

The summary of the end-of-life scenario C1-C4 is presented in Table 11.

Table 11: End of the life (C1-C4) scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0,676
Recovery process – kg for energy recovery	0,064
Disposal (total) – kg for final deposition	0,26
Scenario assumptions (e.g. transportation): Dismantled product is transported (km)	80

100% scenarios

In addition to the most probable end-of-life stage scenario, 100% scenarios have been modelled to give other perspectives. The 100% scenarios have been modelled in accordance with the default values given in table 4 of PCR2019:14 Version 2.0, to complement other processes in the end-of-life stage.

D Benefits and loads beyond the system boundary

This module includes loads and benefits obtained from energy recovery and/or recycling materials.

More information

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

Table 12: Modules declared and geographical scope

	Product stage			Assembly stage		Use stage							End-of-life stage				Benefits & loads beyond system boundary
	Raw materials	Transport	Manufacturing	Transport	Assembly	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	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	NL	EU	EU	Nordic	Nordic	-	-	-	-	-	-	-	Nordic	Nordic	Nordic	Nordic	Nordic
**Specific data used	13,5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	17,6%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* This is an EPD for a trader, the transportation from the plant to Nordic is included in A3. Therefore, this part has the geography EU.

** 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.

Declaration of data sources, reference years, and share of primary data

Process	Source type	Source	Reference year	Data category	Share of primary data of GWP-GHG results for A1-A3
Production of raw material	Database	Ecoinvent v3.10 + Sphera	2024	Generic data	0%
Transport of components to assembly site +warehouse	Database + Collected data	Ecoinvent v3.10 + Sphera	2024	Primary data	>1%
Manufacturing of product	Collected data	EPD owner	2024	Primary data	12,65%
Manufacturing of packaging	Data base	Ecoinvent v3.10 + Sphera	2024	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					13,5%

Table 13: data sources, reference years, and share of primary data

Summary of data quality

All datasets used were sourced from reputable databases, specifically LCA for Experts (GaBi) v10.9 with an integrated Ecoinvent database v3.10, and CUP2023.2. These datasets offer strong technological representativeness and reflect either Sweden or the EU28 average, making them reliable. The data quality is assessed as *good*. Primary data were collected directly from the Netherlands manufacturing site over a complete one-year period and reflect actual operational conditions. Secondary data were taken from established and quality-checked databases, representing appropriate regional and technological conditions. Together, these datasets ensure high representativeness, completeness, and consistency, meeting the requirements of EN 15941:2024.

Table 14: data quality

Aspect	Description	Assessment / Justification
Data collection period	Primary data collected for January – December 2024.	Represents a full 12-month operational period. No deviations from the recommended one-year data collection period.
Type of data	Primary data from the manufacturer (energy, material inputs, emissions, waste, water). Secondary data from recognized databases for upstream and downstream processes.	Primary data measured or metered on site. Secondary data sourced from Ecoinvent v3.10 and GaBi 2024, representing Dutch or European average conditions where available.
Geographical representativeness	Netherlands – manufacturing site for steel expansion vessels.	Primary data reflect actual Dutch production. Secondary datasets are regionally or globally representative where no Dutch data exist.
Technological representativeness	Current production technology for forged steel expansion vessels	Reflects actual process configuration, equipment, and energy mix used at the facility.
Temporal representativeness	Reference year 2024; secondary data published within the last five years.	Data reflect present conditions; no outdated datasets used.
Completeness	All significant input and output flows included (> 99 % mass and energy coverage).	Coverage sufficient for reliable results; no major data gaps identified.
Consistency	Uniform system boundaries, cut-off criteria, and allocation rules applied across all datasets.	Modelling follows EN 15804 and EN 15941 requirements.
Precision / uncertainty	Primary data measured directly; secondary data with documented data-quality indicators.	Overall uncertainty is low and acceptable for EPD purposes.
Data-quality assessment result	—	Overall data quality: GOOD, in accordance with EN 15941:2024 § 7.3.3 and Annex C.
Overall data quality		Good

Environmental performance

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. As module C is included in the EPD, it is discouraging the use of the results of modules A1-A3 without considering the results of module C.

Mandatory impact category indicators based on the worst-case data scenario according to EN 15804, EF 3.1

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	2,39E+00	7,56E-02	1,83E-01	0,00E+00	8,33E-03	2,20E-01	4,95E-03	-1,19E+00
GWP-fossil	kg CO ₂ eq	2,54E+00	7,42E-02	9,11E-03	0,00E+00	8,17E-03	2,17E-01	4,88E-03	-1,19E+00
GWP-biogenic	kg CO ₂ eq	-1,55E-01	2,02E-04	1,73E-01	0,00E+00	2,33E-05	3,34E-03	6,36E-05	1,98E-03
GWP-luluc	kg CO ₂ eq	2,17E-03	1,21E-03	1,79E-05	0,00E+00	1,36E-04	8,63E-06	1,68E-06	-5,62E-04
ODP	kg CFC-11 eq	2,12E-08	7,33E-15	1,11E-10	0,00E+00	1,19E-15	3,59E-10	6,72E-11	-3,21E-09
AP	mole H ⁺ eq	1,19E-02	1,26E-04	5,49E-05	0,00E+00	1,10E-05	1,20E-04	2,03E-05	-2,63E-03
EP-freshwater	kg P eq	1,34E-04	3,07E-07	1,08E-07	0,00E+00	3,45E-08	3,48E-07	5,73E-08	-1,19E-05
EP-marine	kg N eq	2,46E-03	3,76E-05	2,35E-05	0,00E+00	4,10E-06	4,34E-05	7,07E-06	-7,25E-04
EP-terrestrial	mole N eq	2,52E-02	4,46E-04	2,17E-04	0,00E+00	4,77E-05	4,81E-04	7,79E-05	-8,16E-03
POCP	kg NMVOC eq	9,42E-03	1,06E-04	7,17E-05	0,00E+00	1,11E-05	1,52E-04	2,64E-05	-2,59E-03
ADP-minerals & metals ¹	kg Sb eq	3,93E-05	6,13E-09	3,06E-08	0,00E+00	7,04E-10	5,41E-08	7,20E-09	1,32E-06
ADP-fossil	MJ	3,80E+01	9,52E-01	1,16E-01	0,00E+00	1,06E-01	2,92E-01	6,12E-02	-1,08E+01
WDP	m ³	1,15E+00	1,07E-03	3,86E-03	0,00E+00	1,25E-04	1,55E-02	2,33E-03	-4,55E-02
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								

¹ 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 experience with the indicator

Use of resources based on the worst-case data scenario

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE ²	MJ	4,14E+00	7,92E-02	5,14E-03	0,00E+00	9,16E-03	9,00E-03	1,39E-03	7,34E-01
PERM	MJ	1,44E+00	0,00E+00	-1,28E+00	0,00E+00	0,00E+00	-2,51E-02	0,00E+00	0,00E+00
PERT	MJ	5,58E+00	7,92E-02	-1,28E+00	0,00E+00	9,16E-03	-1,61E-02	1,39E-03	7,34E-01
PENRE	MJ	3,54E+01	9,52E-01	1,16E-01	0,00E+00	1,06E-01	2,92E-01	6,12E-02	-1,08E+01
PENRM	MJ	2,61E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,53E+00	-0,94 E+00	-1,37E-03
PENRT	MJ	3,80E+01	9,52E-01	1,16E-01	0,00E+00	1,06E-01	-1,24E+00	-8,78E-01	-1,08E+01
SM	kg	1,32E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,30E-02
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
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
FW	m ³	2,68E-02	8,90E-05	9,11E-05	0,00E+00	1,02E-05	3,60E-04	5,43E-05	-1,60E-03
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								

²Option A was chosen for the calculations of the primary energy indicators. according to on Annex 3 of PCR 2019:14

Additional voluntary indicators based on the worst-case data scenario

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ³	kg CO2 eq	2,52E+00	7,50E-02	1,16E-02	0,00E+00	8,26E-03	2,17E-01	4,86E-03	-1,19E+00
PM	Disease incidences	2,00E-07	1,52E-09	7,80E-10	0,00E+00	1,08E-10	2,32E-09	3,38E-10	-4,26E-08
IRP	kBq U235 eq.	4,24E-02	1,71E-04	1,20E-04	0,00E+00	2,81E-05	2,39E-04	4,07E-05	1,26E-02
ETP-fw	CTUe	7,49E+01	7,00E-01	7,16E-02	0,00E+00	7,90E-02	1,36E+00	3,15E-01	-4,06E+00
HTP-c	CTUh	2,18E-07	1,40E-11	6,21E-11	0,00E+00	1,60E-12	2,36E-10	1,23E-11	-2,00E-09
HTP-nc	CTUh	7,97E-08	6,22E-10	2,01E-10	0,00E+00	7,16E-11	2,63E-10	3,45E-10	5,68E-09
SQP	Pt	2,28E+01	4,63E-01	5,40E-02	0,00E+00	5,23E-02	2,90E-01	1,01E-01	1,55E-02
Acronyms	GWP-GHG = global warming potential - greenhouse gases PM= Particulate matter emissions ; IRP= Ionising radiation, human health; ETP-fw=Ecotoxicity (freshwater); ETP-c= Human toxicity, cancer effects; HTP-nc=Human toxicity, non-cancer effects; SQP= Land use related impacts / soil quality								

Waste and output flows based on the worst-case data scenario

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	6,91E-01	3,08E-11	2,43E-04	0,00E+00	4,07E-12	6,94E-02	1,88E-02	-2,85E-03
NHWD	kg	4,07E+00	1,47E-04	1,19E-02	0,00E+00	1,74E-05	5,22E-01	2,94E-01	-7,21E-02
RWD	kg	3,17E-05	1,23E-06	4,32E-07	0,00E+00	1,94E-07	2,12E-07	3,01E-08	1,24E-04
Acronyms	HW = Hazardous waste disposed; NHW = Non-hazardous waste disposed; RW = Radioactive waste disposed								

³ 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 CO2 is set to zero

Output flows based on the worst-case data scenario

Results per declared unit: 1 kg									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
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
MFR	kg	0,00E+00	0,00E+00	8,34E-02	0,00E+00	0,00E+00	6,59E-01	0,00E+00	-1,37E-03
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
EEE	MJ	0,00E+00	0,00E+00	3,76E-02	0,00E+00	0,00E+00	2,50E-01	0,00E+00	-1,37E-03
EET	MJ	0,00E+00	0,00E+00	6,81E-02	0,00E+00	0,00E+00	4,45E-01	0,00E+00	-1,37E-03
Acronyms	CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; ETE = Exported thermal energy								

Information on biogenic carbon content

Table 15: biogenic carbon content

Biogenic carbon content*	Unit	Value
Biogenic carbon content in product	kg C	0,0009
Biogenic carbon content in the accompanying packaging	kg C	0,045

1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Additional Environmental Performance

In addition to the most probable scenario, results from the corresponding 100% scenarios are added in this section.

Mandatory impact category indicators according to EN 15804, EF 3.1

Results per declared unit: 1 kg														
Indicator	Unit	C1 100%	C2 100% RC	C2 100% INC	C2 100% LF	C3 100% RC	C3 100% INC	C3 100% LF	C4 100% RC	C4 100% INC	C4 100% LF	D 100% RC	D 100% INC	D 100% LF
GWP-total	kg CO2 eq	0,00E+00	8,33E-03	8,33E-03	8,33E-03	5,43E-02	3,28E-01	0,00E+00	0,00E+00	0,00E+00	4,44E-02	-1,74E+00	-1,08E-01	0,00E+00
GWP-fossil	kg CO2 eq	0,00E+00	8,17E-03	8,17E-03	8,17E-03	5,08E-02	3,24E-01	0,00E+00	0,00E+00	0,00E+00	4,13E-02	-1,74E+00	-1,08E-01	0,00E+00
GWP-biogenic	kg CO2 eq	0,00E+00	2,33E-05	2,33E-05	2,33E-05	3,43E-03	3,35E-03	0,00E+00	0,00E+00	0,00E+00	3,12E-03	3,96E-03	-2,92E-05	0,00E+00
GWP-luluc	kg CO2 eq	0,00E+00	1,36E-04	1,36E-04	1,36E-04	1,54E-05	1,42E-06	0,00E+00	0,00E+00	0,00E+00	1,15E-05	-8,65E-04	-2,05E-05	0,00E+00
ODP	kg CFC-11 eq	0,00E+00	1,19E-15	1,19E-15	1,19E-15	5,47E-10	9,58E-11	0,00E+00	0,00E+00	0,00E+00	3,79E-10	-7,00E-09	-2,03E-09	0,00E+00
AP	mole H+ eq	0,00E+00	1,10E-05	1,10E-05	1,10E-05	1,81E-04	4,55E-05	0,00E+00	0,00E+00	0,00E+00	1,32E-04	-4,21E-03	-2,23E-04	0,00E+00
EP-freshwater	kg P eq	0,00E+00	3,45E-08	3,45E-08	3,45E-08	6,70E-07	6,78E-08	0,00E+00	0,00E+00	0,00E+00	5,08E-07	-1,97E-05	-1,07E-06	0,00E+00
EP-marine	kg N eq	0,00E+00	4,10E-06	4,10E-06	4,10E-06	6,15E-05	1,77E-05	0,00E+00	0,00E+00	0,00E+00	4,55E-05	-1,10E-03	-4,47E-05	0,00E+00
EP-terrestrial	mole N eq	0,00E+00	4,77E-05	4,77E-05	4,77E-05	6,87E-04	1,97E-04	0,00E+00	0,00E+00	0,00E+00	4,76E-04	-1,24E-02	-4,64E-04	0,00E+00
POCP	kg NMVOC eq	0,00E+00	1,11E-05	1,11E-05	1,11E-05	2,26E-04	5,06E-05	0,00E+00	0,00E+00	0,00E+00	1,54E-04	-4,38E-03	-2,00E-04	0,00E+00
ADP-minerals & metals ⁴	kg Sb eq	0,00E+00	7,04E-10	7,04E-10	7,04E-10	8,93E-08	1,26E-08	0,00E+00	0,00E+00	0,00E+00	5,53E-08	-2,40E-07	-3,92E-08	0,00E+00
ADP-fossil	MJ	0,00E+00	1,06E-01	1,06E-01	1,06E-01	4,93E-01	4,96E-02	0,00E+00	0,00E+00	0,00E+00	3,59E-01	-1,81E+01	-1,51E+00	0,00E+00
WDP	m3	0,00E+00	1,25E-04	1,25E-04	1,25E-04	1,31E-02	1,41E-02	0,00E+00	0,00E+00	0,00E+00	1,16E-02	-1,48E-01	-5,03E-03	0,00E+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													

⁴ 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 experience with the indicator

Additional Mandatory Indicators

Results per declared unit: 1 kg														
Indicator	Unit	C1 100%	C2 100% RC	C2 100% INC	C2 100% LF	C3 100% RC	C3 100% INC	C3 100% LF	C4 100% RC	C4 100% INC	C4 100% LF	D 100% RC	D 100% INC	D 100% LF
GWP-GHG5	kg CO2 eq	0,00E+00	8,26E-03	8,26E-03	8,26E-03	5,06E-02	3,24E-01	0,00E+00	0,00E+00	0,00E+00	4,14E-02	-1,74E+00	-1,07E-01	0,00E+00
PM	Disease incidences	0,00E+00	1,08E-10	1,08E-10	1,08E-10	3,58E-09	2,19E-10	0,00E+00	0,00E+00	0,00E+00	1,70E-09	-6,89E-08	-2,37E-09	0,00E+00
IRP	kBq U235 eq.	0,00E+00	2,81E-05	2,81E-05	2,81E-05	4,71E-04	7,08E-05	0,00E+00	0,00E+00	0,00E+00	3,95E-04	1,70E-02	-8,57E-04	0,00E+00
ETP-fw	CTUe	0,00E+00	7,90E-02	7,90E-02	7,90E-02	2,86E+00	5,34E-01	0,00E+00	0,00E+00	0,00E+00	2,91E+00	-6,68E+00	-1,64E-01	0,00E+00
HTP-c	CTUh	0,00E+00	1,60E-12	1,60E-12	1,60E-12	3,33E-10	3,37E-11	0,00E+00	0,00E+00	0,00E+00	7,74E-11	-3,08E-09	-1,89E-10	0,00E+00
HTP-nc	CTUh	0,00E+00	7,16E-11	7,16E-11	7,16E-11	4,46E-10	9,67E-11	0,00E+00	0,00E+00	0,00E+00	1,36E-09	7,20E-09	-4,12E-10	0,00E+00
SQP	Pt	0,00E+00	5,23E-02	5,23E-02	5,23E-02	5,17E-01	1,59E-02	0,00E+00	0,00E+00	0,00E+00	4,90E-01	-1,91E-01	-3,02E-01	0,00E+00
Acronyms	GWP-GHG = global warming potential - greenhouse gases PM= Particulate matter emissions ; IRP= Ionising radiation, human health; ETP-fw=Ecotoxicity (freshwater); ETP-c= Human toxicity, cancer effects; HTP-nc=Human toxicity, non-cancer effects; SQP= Land use related impacts / soil quality													

⁵ 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 CO2 is set to zero

Disclaimers

Table 16: Disclaimers

ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted	2
	Water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
Disclaimer 1 – 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.		
Disclaimer 2 – 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 experience with the indicator.		

Abbreviations

General

- **EPD** – Environmental Product Declaration
- **LCA** – Life Cycle Assessment
- **PCR** – Product Category Rules
- **ISO** – International Organization for Standardization
- **EN** – European Norm
- **UN CPC** – United Nations Central Product Classification

Environmental Impact and LCA Metrics

- **GWP** – Global Warming Potential
- **GWP-GHG** – Global Warming Potential (Greenhouse Gas-specific)
- **PM** – Particulate Matter
- **ODP** – Ozone Depletion Potential
- **AP** – Acidification Potential
- **EP** – Eutrophication Potential
- **POCP** – Photochemical Ozone Creation Potential
- **IRP** – Ionizing Radiation Potential
- **ETP-fw** – Ecotoxicity Potential (Freshwater)
- **HTP-c** – Human Toxicity Potential (Cancer)
- **HTP-nc** – Human Toxicity Potential (Non-Cancer)
- **SQP** – Soil Quality Potential

Energy and Waste Metrics

- **PERE** – Primary Energy, Renewable
- **PERM** – Primary Energy, Renewable (Material Use)
- **PERT** – Total Use of Renewable Primary Energy
- **PENRE** – Primary Energy, Non-Renewable
- **PENRM** – Primary Energy, Non-Renewable (Material Use)
- **PENRT** – Total Use of Non-Renewable Primary Energy
- **SM** – Secondary Material
- **RSF** – Renewable Secondary Fuels
- **NRSF** – Non-Renewable Secondary Fuels
- **FW** – Fresh Water Use
- **HWD** – Hazardous Waste Disposed
- **NHWD** – Non-Hazardous Waste Disposed
- **RWD** – Radioactive Waste Disposed
- **CRU** – Components for Reuse
- **MFR** – Materials for Recycling

- **MER** – Materials for Energy Recovery
- **EEE** – Exported Electrical Energy
- **EET** – Exported Thermal Energy

Software and Databases

- **GaBi** – LCA Software (GaBi by Sphera)
- **Ecoinvent** – Life Cycle Inventory Database
- **CUP2023.2** – Version of the Ecoinvent Database

References

Ecoinvent (2024)	Ecoinvent dataset version 3.10 (2024)
EN15804:2012+A2:AC/2021	Sustainability of construction works – Environmental product declaration – Core rules for the product category of constructions products
EPD International (2024)	General Programme Instructions of the International EPD® System, version 5.0
ISO 14020:2022	International Standard ISO 14020 – Environmental statements and programmes for products – Principles and general requirements
ISO 14025:2006	International Standard ISO 14025 – Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040:2006	International Standard ISO 14040: Environmental Management – Life cycle assessment – Principles and framework. Second edition 2006-07-01.
ISO 14044:2006	International Standard ISO 14044: Environmental Management – Life cycle assessment – Requirements and Guidelines
Association of Issuing Bodies	AIB (2024) Dutch energy mix AIB (2024) Swedish energy mix
PCR 2019:14	Construction products v 2.0.1
Naturvardsverket, 2025	https://www.naturvardsverket.se/
Sphera 2025	Sphera (2024) LCA for Experts. MLC database CUP 2024.02.

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