ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Frese Sanitary Valves and Fittings

Vexve Denmark | Frese A/S

EPD HUB, HUB-5533

Published on 25.02.2026 Last updated on 08.05.2026 Valid until 24.02.2031

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

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Vexve Denmark | Frese A/S
Address	Sorøvej 8, DK-4200 Slagelse
Contact details	dk.info@vexve.com
Website	www.frese.eu and www.vexve.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Manufactured product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Anne Damm, Vexve Denmark | Frese A/S
EPD verification	Independent verification of this EPD and data, according to ISO 14025: Internal verification External verification
EPD verifier	Sarah Curpen as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Frese Sanitary Valves and Fittings
Additional labels	This EPD covers: Frese Radiator Connection and Drain, Frese Stop Valves, Frese Tap Valves, Frese Frost Proof Tap, Frese PEX Union with Integrated Support Sleeve, Frese AluPEX Union with Integrated Support Sleeve, Frese Universal Spout, Frese Shower Tubes, Frese Drain Valves, Frese Ball Valve, Frese Compression Coupling, Frese Pipe Joiners, Frese Strainers, Frese Safety Valves, Frese Safety Units, and Frese Combination Ball Valves.
Product reference	Reference product is: Tap Valve DN15 M/Union/Non return (29-1235)
Place(s) of raw material origin	Asia and Europe
Place of production	Manufactured in China, Warehouse in Denmark.
Place(s) of installation and use	Europe
Period for data	Calendar year 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	-4,2%/+5%
GTIN (Global Trade Item Number)	5705564005168
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	17,7

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
Mass of packaging	0,21540 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	10
GWP-total, A1-A3 ($kgCO_2e$)	9,77
Secondary material, inputs (%)	32,6
Secondary material, outputs (%)	55,4
Total energy use, A1-A3 (kWh)	42,8
Net freshwater use, A1-A3 (m^3)	0,25

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Vexve – Inspired by Your Flow

Vexve aims to be the leading provider of mission-critical valve solutions in the transition to a low-carbon future.

At Vexve Denmark, we develop and manufacture dynamic valves and innovative, energy-efficient solutions for hydronic systems in buildings and industrial applications, marine systems and district energy networks. Our technologies optimise energy use and enhance overall system performance.

With more than 80 years of experience under the Frese name, we are proud to be part of the Vexve Group. Together, we work to become the leading provider of mission-critical valve technologies in the shift towards a lower-carbon future.

We supply more than 70 countries and employ over 900 people across modern production facilities in Finland, the Czech Republic, Germany, China and Denmark.

Our mission is to advance energy efficiency – through deep technical expertise, reliable partnerships and solutions that make a real difference.

PRODUCT DESCRIPTION

Product description:

Frese sanitary valves and fittings form a range of articles for domestic and commercial installations, designed for distribution of potable water and for heating and cooling systems in buildings. The product group covers frost taps for exterior walls, stop and drain valves, radiator connections and drain valves, pipe joiners and couplings, and universal necks and shower pipes.

Together, these products make it possible to connect, shut off, drain and tap water safely from the main water supply inlet to the final outlet.

The components are mainly metallic with sealing elements in polymer and elastomer materials and are available with threaded, compression, PEX and AluPEX connections to interface with common pipe systems.

Frost taps ensure outdoor tapping with internal frost-free closure and integrated check valve, while stop and drain valves provide local isolation and controlled emptying of sections of the system.

Radiator connections and drain valves support filling, venting and maintenance of heating circuits and domestic water systems.

Pipe joiners and couplings allow repair and adaptation of steel, copper, PEX and AluPEX pipework without extensive rebuilding, and universal necks and shower pipes complete the installation at the point of use.

All products are intended for long service life under typical operating pressures and temperatures for sanitary and HVAC applications and are designed to be easy to install, use and service.

In this EPD, the sanitary valves and fittings are treated as one product group with variations in size, connection type and configuration, representing the average material composition and function of the range.

Product application:

Find the “Application Guide” on the frontpage on our website: www.frese.eu.

Technical Characteristics:

Dimension: DN15-DN50
Pressure class: PN10 or PN16 (doesn’t apply for all for Universal Spout)
Max. temperature range: 65°C to 120°C

Product standards:

Find “Certificates and Declarations of Conformity on our website, under “Technical info” @ www.frese.eu.

Physical properties of the product:

Materials: The valves in this group are primarily made of brass, accounting for more than 80% of their total weight, except for 29-2014 frost-proof tap, which contains 45% brass and 40% copper. Other materials include stainless steel, rubber (such as EPDM), and plastics (such as ABS, PA6, PA66, and POM).

Surface: Some products are surface treated with trivalent chromium.

Further information can be found at: www.frese.eu and www.vexve.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	92,47%	Asia and Europe
Minerals	0	-
Fossil materials	7,53%	Asia and Europe
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	0,087

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
Lead: The brass used for the valves contains lead. For every 1 kg of brass, approximately 2% (0.02 kg) is lead.	231-100-4	7439-92-1

Where applicable, the articles covered by this EPD that contain SVHC above 0,1% (w/w) are registered in the ECHA SCIP database. SCIP numbers are available on our website www.frese.eu.

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		
×	×	×	×	×	ND	ND	ND	ND	ND	ND	ND	×	×	×	×	×		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The valves are composed of mainly brass, >80% (except for 29-2014 frost-proof tap, which contains 45% brass and 40% copper. However, the primary material in brass is copper). Other materials include stainless steel and various types of plastic components and rubber components.

Manufacturer 1 in China purchases pre-processed raw materials from suppliers and manufacturers, packages and delivers the finished products to a warehouse in Denmark. Pre-processed raw materials include contoured brass, hot-rolled stainless steel, some metal-worked brass, copper and stainless steel, and injection-moulded rubber and plastic parts. Places of raw material origin are both Asia and Europe but mostly within China, transport information is based on the actual distances between the supplier of raw materials and manufacturer 1 for each material.

Manufacturer 1 uses energy in the form of electricity for machining and completing the remaining processes to assemble the valve. Production losses for machining are accounted for. A location-based approach was used for modelling the electricity mix utilized at manufacturer 1 in China. Manufacturer 1 also uses ancillary resources such as water for leakage and sealing tests and cutting fluid (oil) for lubrication during metalworking. Finally, packaging materials for transporting the valves include wooden pallets, cardboard boxes, paper (installation guide), plastic bags and plastic

film. Transportation of ancillaries and packaging is defined as the distance between suppliers and manufacturers.

The packed valves are then transported from manufacturer 1 to manufacturer 2, a warehouse in Denmark, where the valves are stored before shipping to installation site. The transportation is calculated based on the distance from manufacturer 1 to manufacturer 2 and contains both sea freight and truck. Before shipping from manufacturer 2 to customers, the wooden pallet is replaced with a EUR-pallet due to customer preference, and the plastic film is also replaced. The products are then shipped to dedicated marketplaces. Energy is used in the form of electricity in the warehouse at manufacturer 2 where the valves are stored and repacked. A location-based approach was also used for modelling the electricity mix utilized at manufacturer 2, the warehouse in Denmark.

Production losses and manufacturing waste at manufacturer 1 consist of metal scrap from the processing of brass, stainless steel, and copper. The scrap is normally sold to authorized recycling facilities, but no documentation was provided by the supplier. Therefore, this conservative scenario was applied instead: Brass and copper 60% recycling and 40% landfill (source: internationalcopper.org,). Stainless stees 95% recycling and 5% landfill (Source: worldstainless.org).

The transport distance is defined as the distance between manufacturer 1 and the respective recycling recipient. Wastewater is discharged to treatment facilities via piping. Cutting fluid is reused internally, and the small amount not reused is picked up by a chemical waste handler and is incinerated with energy recovery. Manufacturing waste at manufacturer 2 consists of the wooden pallet and plastic film that are replaced. According to EUROSTAT plastic is mostly recycled and wooden pallets are mostly landfilled. Transport is calculated as the distance from manufacturer 2 to the local waste handling site responsible for managing waste.

TRANSPORT AND INSTALLATION (A4-A5)

The transport distance from manufacturer 2 to the installation site is calculated as an average of all kilometers traveled to deliver this valve to customers during 2024. The calculation relies on relative annual sales percentages combined with actual distances in kilometers.

Every valve sold in 2024 stayed within the EU, and the chosen transport method was lorries. We assume full truckloads, meaning the vehicle capacity utilization factor is set to one. Yes, it can vary, but since transportation emissions play only a minor role in the overall environmental impact, those variations are considered negligible. Nothing gets lost during transport because the packaging is secure, and even nested packaging assumes full volume utilization.

The installation process is normally carried out using hand tools or handheld equipment with minimal energy use, therefore the resources required for A5 installation are considered negligible in this assessment.

When installation happens, the waste comes from packaging, and it falls into four material types: cardboard, paper, plastic, and wood. According to EUROSTAT cardboard, paper and plastic are mostly recycled, while wooden pallets are mostly landfilled (but typically reused).

PRODUCT USE AND MAINTENANCE (B1-B7)

The life expectancy for our valves is approximately 15 years, with a warranty period of 5 years.

Frese Sanitary Valve and Fittings do not need maintenance, repair or refurbishment. The use phase is not relevant for the life cycle emissions of this product and is therefore not accounted for in the assessment.

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

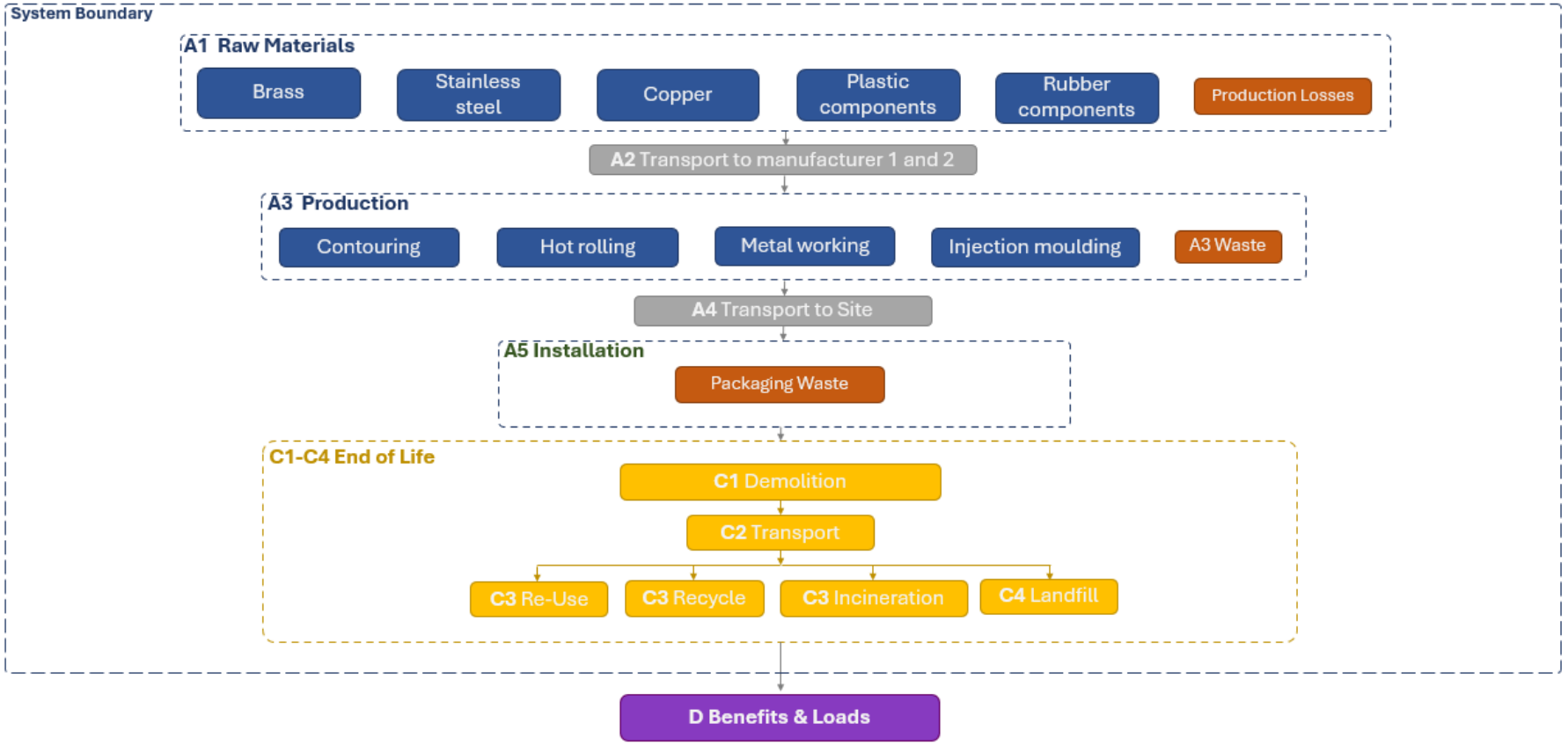
PRODUCT END OF LIFE (C1-C4, D)

Disassembly is typically done with hand tools or handheld equipment, using so little energy that the resources needed for this step (C1) are considered negligible in the assessment. At the end of their life, products are assumed to be transported by lorry to the nearest waste handling site, with an average distance of 20 km (C2).

In module C3, energy and resources are used to sort and process brass, copper, stainless steel, rubber, plastics, and composite materials for recycling or incinerating with energy recovery (efficiency above 60%). Waste that is incinerated without energy recovery or sent to landfill is included in module C4. 95% of stainless steel is recycled, while 60% of brass and copper is recycled; the remaining 5% of stainless steel and 40% of brass are landfilled, according to internationalcopper.org and worldstainless.org. For rubber and plastic components, 73% is incinerated with energy recovery, and 27% is landfilled, according to plasticseurope.org.

Because parts of the product and its packaging can be recycled or used for energy recovery, using recycled materials reduces the need to produce new raw materials. Additionally, energy gained from incinerating waste can replace electricity and heat that would otherwise come from primary sources. All environmental benefits and impacts from incineration and recycling (module C), as well as from waste packaging in modules A5 and A3, are included in module D.

SYSTEM DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end of life processing of the product. All industrial processes from raw material acquisition and pre-processing, production, product distribution and installation and end-of-life management are included. For easier modelling and because of lack of accuracy in available modelling resources, some constituents under 1% of product mass are excluded. This includes the surface treatment of the valves which constitutes a very small amount and has a negligible impact on the emissions of the product. Costs for large equipment and buildings, construction work and infrastructure, as well as the upkeep and operation of major machinery, employee-related activities, and energy and water used for office management and sales are not included.

Surface treatment has been excluded because it's only some of Frese sanitary valves and fittings that are surface treated with trivalent chromium. And it accounts for less than 1% of the valves' weight. In fact, the plating layer is extremely thin, approximately 0.001 micrometers. It is also excluded because during end-of-life, chrome is not separated from the brass. In recycling, it melts together with the metal, which is acceptable due to the very small amount. If landfilled, the chrome remains on the metal surface.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	-4,2%/+5%

Tap Valve DN15 with Union and Non-return (29-1235) has been selected as the representative valve. It was chosen because it is one of the best-selling Frese Sanitary Valves and Fittings products and is closest to the general average mass of Frese Sanitary Valves and Fittings products. Most of the materials and components seen in 29-1235 are also seen in many of the other products in the group.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD System Verification 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'.

Additionally, the EPD Generator also uses IDEMAT as a source of environmental data. IDEMAT provides life cycle inventory data for materials and processes and includes the Eco-costs LCIA method, which monetizes environmental impacts and complies with ISO 14008.

References for installation waste (A5) are taken from EUROSTAT [env_waspac] - Eurostat *"Packaging waste by waste management operations"* (2021).

End-of-Life recycling rate references are sourced from:

Worldstainless.org Recycling - worldstainless *"The global life cycle of stainless steels"* (2019) reporting that 95% of stainless steel is recycled.

Internationalcopper.org Recycling - copperalliance *"Copper recycling"* (2016) reporting that approximately 60% of copper alloys, such as brass are recycled.

Plasticseurope.org Building & construction - Plastics Europe *"Overview of Plastic Waste from Building and Construction by Polymer and by Recycling, Energy Recovery and Disposal"* (2018) reporting that approximately 73% of plastic and rubber waste is treated via incineration with energy recovery.

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_2e	8,07E+00	3,28E-01	1,37E+00	9,77E+00	1,92E-02	3,29E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,14E-03	1,89E-01	4,20E-03	-2,53E+00
GWP – fossil	kg CO_2e	8,00E+00	3,28E-01	1,70E+00	1,00E+01	1,92E-02	6,69E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,14E-03	1,89E-01	4,20E-03	-2,48E+00
GWP – biogenic	kg CO_2e	4,56E-02	5,35E-05	-3,21E-01	-2,76E-01	4,34E-06	3,22E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,51E-07	-4,62E-05	-2,01E-06	-4,28E-02
GWP – LULUC	kg CO_2e	1,72E-02	1,74E-04	1,14E-03	1,85E-02	8,57E-06	4,46E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,05E-07	1,85E-05	1,48E-06	-6,29E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	7,53E-08	4,72E-09	1,15E-08	9,15E-08	2,83E-10	4,74E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,31E-11	2,14E-10	7,29E-11	-2,63E-08
Acidification potential	mol H^+e	5,08E-01	8,63E-03	1,02E-02	5,27E-01	6,53E-05	2,42E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,91E-06	1,85E-04	1,81E-05	-2,19E-01
EP-freshwater[2)]	kg Pe	4,63E-02	1,21E-05	4,89E-04	4,68E-02	1,49E-06	1,41E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,45E-07	8,60E-06	2,15E-07	-1,74E-02
EP-marine	kg Ne	2,76E-02	2,16E-03	1,44E-03	3,12E-02	2,15E-05	3,99E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,35E-06	4,54E-05	4,87E-05	-1,09E-02
EP-terrestrial	mol Ne	3,72E-01	2,40E-02	1,42E-02	4,10E-01	2,34E-04	8,21E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,56E-05	5,07E-04	7,51E-05	-1,54E-01
POCP ("smog")[3)]	kg NMVOCe	1,06E-01	6,56E-03	4,67E-03	1,17E-01	9,63E-05	2,89E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E-05	1,46E-04	2,72E-05	-4,28E-02
ADP-minerals & metals[4)]	kg Sbe	7,10E-03	3,89E-07	1,59E-06	7,10E-03	5,35E-08	3,20E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,92E-09	8,99E-07	4,19E-09	-3,07E-03
ADP-fossil resources	MJ	1,06E+02	4,10E+00	1,96E+01	1,30E+02	2,78E-01	4,74E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,10E-02	2,03E-01	6,18E-02	-3,28E+01
Water use[5)]	m^3e depr.	7,23E+00	1,26E-02	1,31E+01	2,04E+01	1,37E-03	1,76E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,59E-04	1,19E-02	1,90E-04	-2,43E+00

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	1,25E-06	1,24E-08	2,48E-08	1,29E-06	1,92E-09	3,15E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,13E-10	2,37E-09	4,10E-10	-4,48E-07
Ionizing radiation[6]	kBq U235e	9,01E-01	2,08E-03	3,48E-02	9,38E-01	2,42E-04	3,31E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,74E-05	7,41E-04	4,11E-05	-3,53E-01
Ecotoxicity (freshwater)	CTUe	4,81E+03	3,39E-01	1,14E+01	4,82E+03	3,93E-02	1,69E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,66E-03	3,90E-01	7,48E-02	-3,09E+02
Human toxicity, cancer	CTUh	5,74E-08	6,77E-11	3,05E-10	5,78E-08	3,16E-12	4,21E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,53E-13	1,40E-11	6,51E-13	-2,31E-08
Human tox. non-cancer	CTUh	5,35E-06	1,22E-09	1,01E-08	5,36E-06	1,80E-10	2,24E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,02E-11	8,20E-10	5,51E-11	-2,29E-06
SQP[7]	-	1,67E+02	8,37E-01	4,09E+01	2,09E+02	2,80E-01	4,39E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,13E-02	3,45E-01	1,24E-01	-7,20E+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	2,48E+01	3,47E-02	3,50E+00	2,83E+01	3,81E-03	-2,80E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,06E-04	2,91E-02	6,32E-04	-1,01E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	3,16E+00	3,16E+00	0,00E+00	-3,16E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,85E-01
Total use of renew. PER	MJ	2,48E+01	3,47E-02	6,66E+00	3,15E+01	3,81E-03	-5,96E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,06E-04	2,91E-02	6,32E-04	-9,71E+00
Non-re. PER as energy	MJ	1,04E+02	4,10E+00	1,81E+01	1,26E+02	2,78E-01	-5,24E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,10E-02	-1,30E+00	-6,72E-01	-3,28E+01
Non-re. PER as material	MJ	2,56E+00	0,00E+00	1,64E-01	2,72E+00	0,00E+00	-1,64E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,87E+00	-6,90E-01	4,72E-02
Total use of non-re. PER	MJ	1,06E+02	4,10E+00	1,82E+01	1,29E+02	2,78E-01	-1,69E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,10E-02	-3,16E+00	-1,36E+00	-3,28E+01
Secondary materials	kg	3,26E-01	1,93E-03	5,70E-03	3,33E-01	1,18E-04	8,22E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E-05	2,32E-04	1,61E-05	3,19E-01
Renew. secondary fuels	MJ	2,85E-03	6,68E-06	3,49E-02	3,78E-02	1,50E-06	4,66E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,69E-07	1,02E-05	3,30E-07	-7,52E-04
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	2,23E-01	3,23E-04	2,69E-02	2,50E-01	4,11E-05	-7,90E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,58E-06	2,45E-04	-1,57E-05	-1,04E-01

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	2,51E+00	5,62E-03	1,95E-02	2,54E+00	4,71E-04	9,08E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,49E-05	6,78E-03	7,18E-05	-8,55E-01
Non-hazardous waste	kg	1,56E+02	8,07E-02	9,90E-01	1,57E+02	8,72E-03	1,78E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,99E-04	1,02E-01	1,02E-01	-5,68E+01
Radioactive waste	kg	2,33E-04	5,07E-07	6,41E-06	2,40E-04	5,93E-08	8,42E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,26E-09	1,84E-07	1,00E-08	-9,23E-05

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	1,90E-01	1,90E-01	0,00E+00	1,29E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,54E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	2,10E-02	2,10E-02	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	5,37E-02	5,37E-02	0,00E+00	1,28E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,51E-01	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	2,27E-02	2,27E-02	0,00E+00	5,35E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,33E-01	0,00E+00	0,00E+00
Exported energy –	MJ	0,00E+00	0,00E+00	3,10E-02	3,10E-02	0,00E+00	7,42E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,18E-01	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_2e	8,00E+00	3,26E-01	1,69E+00	1,00E+01	1,91E-02	2,17E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,13E-03	1,89E-01	4,10E-03	-2,48E+00
Ozone depletion Pot.	kg CFC_{-11}e	6,58E-08	3,75E-09	1,02E-08	7,98E-08	2,26E-10	3,91E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,43E-11	1,79E-10	5,79E-11	-2,21E-08
Acidification	kg SO_2e	4,45E-01	6,88E-03	8,77E-03	4,61E-01	4,99E-05	1,84E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,25E-06	1,47E-04	1,34E-05	-1,92E-01
Eutrophication	kg PO_4^3e	2,96E-02	7,69E-04	2,58E-03	3,29E-02	1,22E-05	2,47E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,33E-06	2,33E-05	6,00E-06	-8,58E-03
POCP (“smog”)	kg C_2H_4e	1,87E-02	3,45E-04	3,95E-04	1,94E-02	4,45E-06	4,97E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,93E-07	8,83E-06	1,51E-06	-7,93E-03
ADP-elements	kg Sbe	7,09E-03	3,83E-07	1,52E-06	7,09E-03	5,21E-08	3,13E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,78E-09	8,92E-07	4,10E-09	-3,06E-03
ADP-fossil	MJ	9,24E+01	4,06E+00	1,94E+01	1,16E+02	2,74E-01	4,16E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,04E-02	1,91E-01	6,12E-02	-2,76E+01

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	8,02E+00	3,28E-01	1,70E+00	1,00E+01	1,92E-02	6,69E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,14E-03	1,89E-01	4,20E-03	-2,49E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DUCOMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity, consumption mix w/o renewables, China, 2023, China, One Click LCA, 1.15 kgCO2e/kWh

2. Market for electricity, low voltage, Denmark, Ecoinvent, 0.19 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry >32 metric ton, EURO5, 150.48 km

Scenario parameter	Value
Capacity utilization (including empty return) %	• Lorry 50%
Bulk density of transported products (kg/m³)	0,0001096 m³
Volume capacity utilization factor	• Lorry = 1

Installation scenario documentation - A5 (Installation waste)

Scenario information	Value	
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Wood packaging	0,04010
	Paper/Cardboard packaging	0,14160
	Plastic packaging	0,00130
Output materials (**specified by type**) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (**specified by route**) / kg		Wood packaging	Paper / Cardboard	Plastic packaging
	Recycling	0,01283	0,11753	0,00052
	Energy recovery	0,01203	0,01133	0,00048
	Disposal	0,01524	0,01274	0,00030

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

Scenario information	Value
Collection process – kg collected separately	1 kg
Collection process – kg collected with mixed waste	0 kg
Recovery process – kg for re-use	0 kg
Recovery process – kg for recycling	0,5541 kg
Recovery process – kg for energy recovery	0,0551 kg
Disposal (total) – kg for final deposition	0,3908 kg
Scenario assumptions e.g. transportation	Transportation is estimated to be 20 km to the closest waste handling site from client location. By > 32-ton lorry (Euro 5) EU.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Sarah Curpen as an authorized verifier for EPD Hub Limited 25.02.2026

ANNEX

This Environmental Product Declaration “Frese Sanitary Valves and Fittings” covers the following product groups, all of which are brass-based products:

- Frese Stop Valves
- Frese Tap Valves
- Frese Frost Proof Tap
- Frese Universal Spout
- Frese Shower Tubes
- Frese Drain Valves
- Frese Radiator Connection
- Frese Ball Valve
- Frese Combination Ball Valve
- Frese Safety Valves
- Frese Safety Unit

The declaration covers the relevant accessories and spare parts linked to these product groups, including:

- Frese PEX Union with Integrated Support Sleeve
- Frese AluPEX Union with Integrated Support Sleeve
- Frese Pipe Joiners
- Frese Compression Coupling