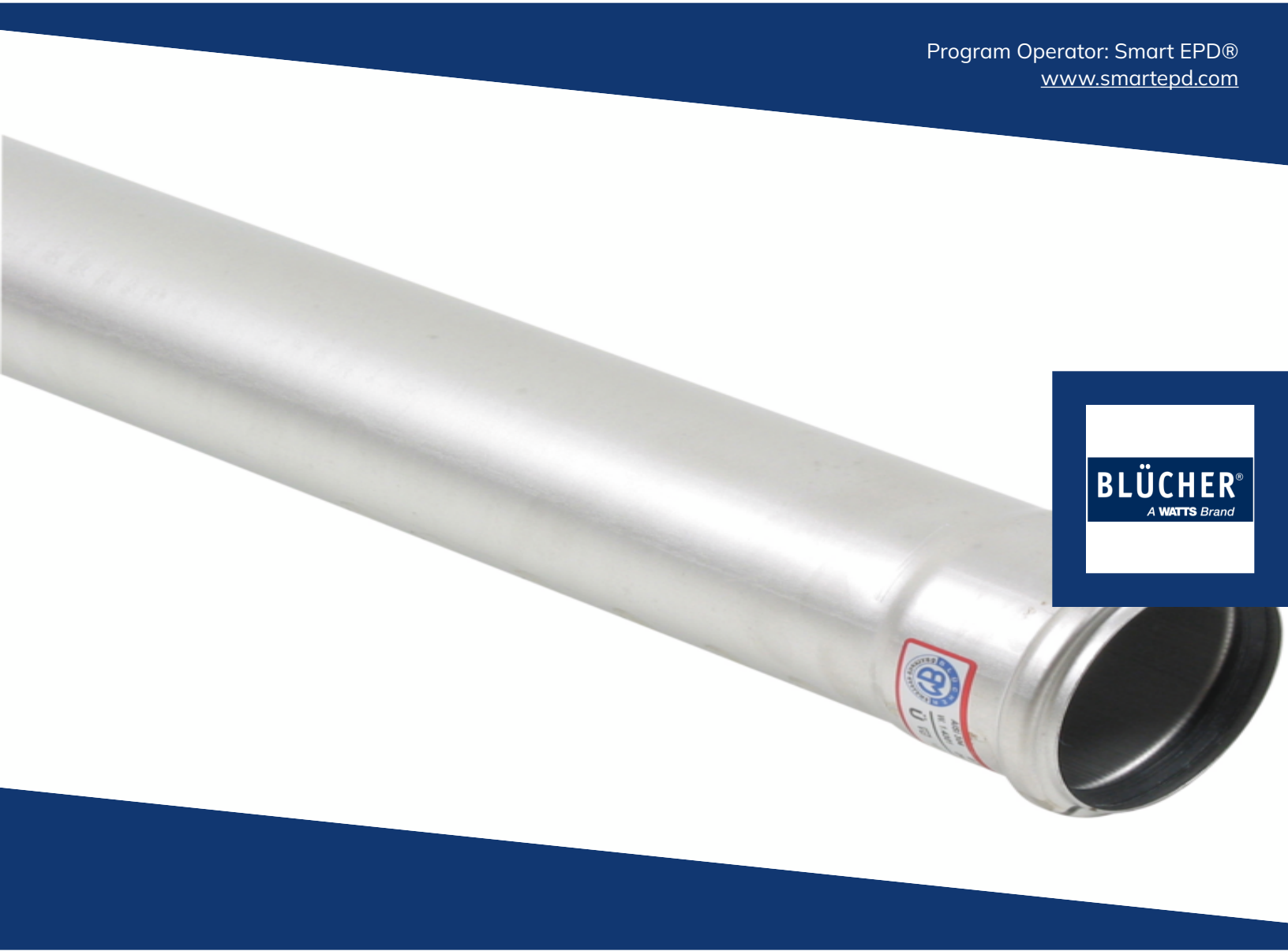


Program Operator: Smart EPD®
www.smartepd.com



SmartEPD-2025-100-0669-01.2

BLUCHER® EuroPipe

Date of Issue

Dec 02, 2025

Expiration date

Dec 02, 2030

Last updated

Jan 15, 2026



Refer to the EPD Library at www.smartepd.com for the latest EPD listing information

General Information

BLÜCHER

📍 Pugdølvej 1, 7480 Vildbjerg, Denmark

☎ (978) 688-1811

✉ vasanth.gnanadoss@wattswater.com 🌐 <https://www.blucher.com/>



Product Name:	BLUCHER® EuroPipe
Declared Unit:	1 kg of product plus packaging
Declaration Number:	SmartEPD-2025-100-0669-01.2
Date of Issue:	December 02, 2025
Expiration:	December 02, 2030
Last updated:	January 15, 2026
EPD Scope:	Cradle to grave A1 - A3, A4, A5, B1 - B7, C1 - C4, D
Market(s) of Applicability:	Europe

General Organization Information

BLUCHER A/S is among the global leaders in sustainable stainless steel drainage solutions. Based in Vildbjerg, Denmark with around 400 employees located at 18 different locations across the world our products are made from 95% recycled materials, crafted into fully recyclable stainless steel. As part of Watts Water Technologies (USA), we benefit from shared values in quality, responsibility, and efficiency.

Since 1991, BLUCHER A/S has maintained ISO9001 quality certification, and since 2014, we've been certified to ISO14001 for environmental management reflecting our dedication to both product excellence and ecological stewardship.

Watts Water Technologies: Commitment to People & Community

As BLUCHER A/S's parent company, Watts Water Technologies brings a strong foundation in corporate social responsibility and global citizenship:

Human Rights & Ethical Governance

Watts has implemented a formal Human Rights Policy, aligned with the UN Global Compact and the Universal Declaration of Human Rights, ensuring fair labor practices and ethical treatment across its global workforce

Diversity, Equity & Inclusion (DEI)

Committed to a diverse, inclusive workplace, Watts supports multiple Employee Resource Groups like Black Matters, Women of Watts, Pride Matters, Vet Matters, LAW Matters, and Tech Matters to foster belonging, awareness, and career advancement.

It actively enhances DEI through targeted recruiting (including partnerships with HBCUs), mentorship programs, bias training, and inclusive hiring standards.

Employee Safety & WellBeing

Watts places zero-harm employee safety at the forefront, with extensive safety training, near-miss reporting systems, and certified health & safety programs (e.g., ISO 45001 at some sites)

Additional benefits include regular pay equity reviews, expanded parental leave, family-planning support, and global mental health resources via an Employee Assistance Program

Professional Growth & Engagement

Watts supports talent development through structured programs like iLead, One Watts Performance System, LinkedIn Learning, coaching, and internships

Employees engage in regular surveys (with high participation rates), CEO communications, and transparent goal-setting processes to inform organizational strategy and culture.

Community Impact & Social Stewardship

Watts invests in global water access projects (e.g., partnership with Planet Water Foundation providing clean water to thousands in Cambodia, India, Mexico, the Philippines, and Indonesia)

Additional community efforts include support for Ukraine relief, disaster aid (e.g., Hurricane Ida), STEM education initiatives, robotics mentorship, and educational partnerships targeting under-resourced students including scholarships and support for Historically Black Colleges & Universities.

Environmental & Governance Leadership

Watts has achieved recognition as one of America's Most Responsible Companies for six years in a row, including AllTime Champion status for 2025. It also became the first to earn WAVE Water Stewardship verification, reduces global water use intensity (11%), uses 100% certified renewable energy credits at key sites, integrates ESG into supply chains, and holds strong sustainability scores (e.g. MSCI AA).

Why This Matters for BLUCHER A/S

As a part of this ecosystem, BLUCHER A/S not only benefits from robust environmental and quality systems but also shares a deep commitment to human rights, employee safety, diversity, and societal contribution. Together, we deliver sustainable, responsible, and innovative stainless-steel solutions backed by corporate citizenship and global impact.



Further information can be found at: <https://www.blucher.com/>

Limitations, Liability, and Ownership




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





Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.

Reference Standards

Standard(s):	ISO 14025 and EN 15804+A2:2019/AC:2021
Core PCR:	Smart EPD® Part A Product Category Rules for Building and Construction Products and Services, 1000, v1.2 Date of issue: March 14, 2025 Valid until: March 14, 2030
Sub-category PCR review panel:	 Contact Smart EPD for more information.
General Program Instructions:	 Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:  Vas Gnanadoss |  Watts Water |  vasanth.gnanadoss@wattswater.com

EPD Program Operator:  Smart EPD |  info@smartepd.com |  www.smartepd.com |  585 Grove St., Ste. 145, Herndon, VA 20170, USA

Verification: Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

 Vijay Thakur |  Individual Verifier |  thakur.vijay3011@gmail.com

External

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

 Vijay Thakur |  Individual Verifier |  thakur.vijay3011@gmail.com

External

Product Information

Declared Unit:	1 kg of product plus packaging
Mass:	1 kg
Reference Service Life:	60 Years
Product Specificity:	<p>✓ Product Average</p> <p>✗ Product Specific</p>
Variation in GWP Result (Products):	0% to 0%
Variation in GWP Result (Facilities):	0% to 0%

Product Description

BLUCHER piping is manufactured accordance with EN1124. They are also approved through HACCP Food Safety Programme Australasia, AUS -WMTK00204, HACCP Food Safety Programme Europe, DE - LGA Certificate TUV R60178453 0001, DK - VA 2.12/19349 EuroPipe DS432, DK - VA 2.12/19350, SINTEF-0692, and US - IAPMO File No.3247-EuroPipe.

BLUCHER® EuroPipe can be used above and below ground in a variety of applications. Weighing only a third of cast iron solutions, this push-fit drainage pipework system can be installed by just one person. Every BLUCHER® EuroPipe drainage product is designed to keep up the flow through reliable connections while adding value and longevity to your drainage projects, installations, and business.

Further information can be found at: <https://www.blucher.com/resources/product-selector/product-selector-pipe-fittings>

Product Specifications

Product Classification Codes:	<p>Masterformat - 22 1000 Plumbing Piping and Pumps</p> <p>UNSPSC - 70171800 Drainage Services</p>
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Material Composition

Material/Component Category	Origin	% Mass
Stainless Steel	Europe	99.5
EPDM	Europe	0.5

Packaging Material	Origin	kg Mass
Cardboard	Europe	0.020
PE Film	Europe	0.002
Pallet	Europe	0.0820

Biogenic Carbon Content	kg C per kg
Biogenic carbon content in product	None
Biogenic carbon content in accompanying packaging	0.051

Hazardous Materials

No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year:

2023

Manufacturing Specificity:

- ✗ Industry Average
- ✗ Manufacturer Average
- ✓ Facility Specific

Averaging:

Averaging was conducted by calculating the environmental impacts of the smallest and largest product of EuroPipe at a per kg bases and then averaging the results from the two sizes. Then the GWP-total impact indicators, within each life cycle stage, of the smallest and largest product were compared to the average result. The products within each of the three product categories considered are made with the same materials, manufacturing processes, and in the same facility so the results were expected to be similar.

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	✓
	B2	Maintenance	✓
	B3	Repair	✓
	B4	Replacement	✓
	B5	Refurbishment	✓
	B6	Operational Energy Use	✓
	B7	Operational Water Use	✓
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	✓

Note:

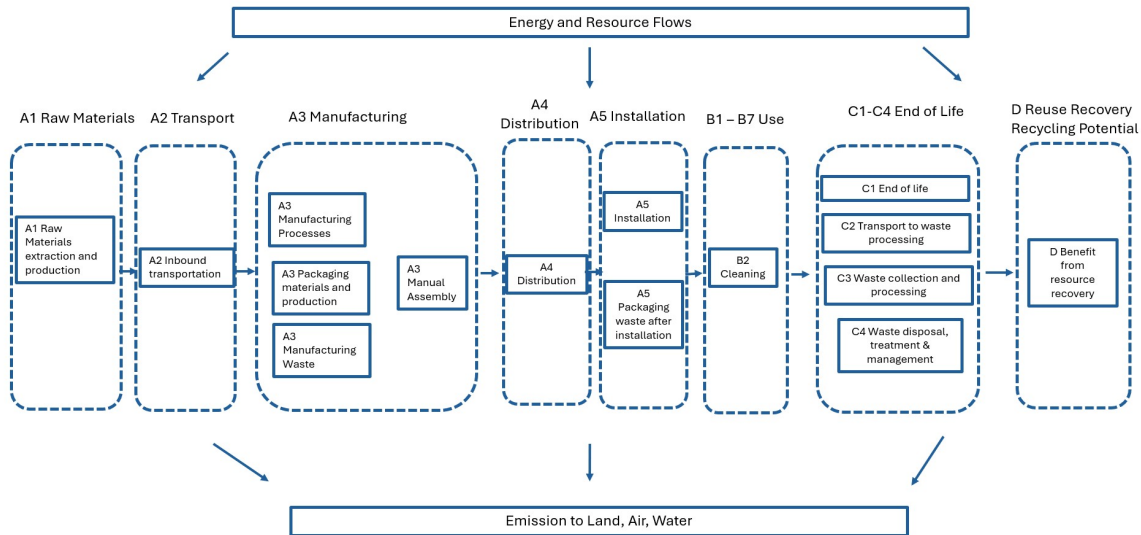
ND = Module not declared

Plants



BLÜCHER A/S
Pugdølvej 1, 7480 Vildbjerg, Denmark

Product Flow Diagram



Software and Database

LCA Software:

☰ SimaPro v. 9.5

LCI Foreground Database(s):

☰ Ecoinvent v. 3.9.1 | 📍 ReR | 🗑️ Cut-Off by Classification

LCI Background Database(s):

☰ Ecoinvent v. 3.9.1 | 📍 ReR | 🗑️ Cut-Off by Classification

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

Completeness Check

Detailed information on the inputs and outputs of the products were gathered with every effort made to perform a comprehensive analysis. An attempt was made to include as much detail as possible, even for processes that were found to be largely negligible in the environmental impact assessment. Processes were mass balanced before allocation to ensure all waste and emissions were captured. This was done to ensure completeness. Furthermore, all energy consumption for the comparison was included. For quality purposes, each material process used in the model is marked with a grade in table 4.5.5. For older processes, each is labeled with an F for Fair to ensure transparency about older data sets. These data sets were selected because they fit our material description and needs the best and was the best option available on Ecoinvent. The data quality was high as we either used data direct from a supplier EPD or were able to find SimaPro unit processes that well represented the material or process used by BLUCHER. The one process where this was not the case was the pickling liquid so for this we looked at the SDS of the product, found the chemical breakdown by percentage, and created a SimaPro process with unit processes representing the chemicals found in the pickling fluid at the corresponding percentages.

Consistency Check

The products were modeled in a consistent manner. System boundaries for all products were defined in a similar manner. Therefore, any differences in overall potential environmental impacts should not be due to inconsistent modeling or data.

Sensitivity Check

The SimaPro software used allows the calculation of life cycle inventories and impact assessment, contribution analysis, parameterization, and related sensitivity analysis.

Data Sources

Material/Process Category	Module	Material/Process Name	Inventory Dataset Name	Dataset Geographic Region	Reporting Period/Year Dataset Represents	Reference	Amount (if relevant)	Unit
Raw Material	A1	Stainless Steel	EPD Based	Finland	2023	https://www.outokumpu.com/en/sustainability/sustainable-stainless-steel/environmental-product-declarations	ND	ND
Raw Material	A1	EPDM	Synthetic rubber (RER) synthetic rubber production Cut-off, U	Europe	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/75d77967-7743-4eac-9878-30bd85c05361/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Packaging	A3	Cardboard	Corrugated board box (RER) corrugated board box production Cut-off, U	Europe	2022	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/748ef7a6-3396-4112-bece-d9fc5e0b16ac/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Packaging	A3	Pallet Wood	Sawnwood, board, softwood, raw, dried (u=20%) [Europe without Switzerland] market for sawnwood, board, softwood, raw, dried (u=20%) Cut-off, U	Europe	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/fc43e370-e87f-42ba-b89c-031994c7bcf2/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing	A3	Danish Residual Electricity	Electricity, medium voltage (DK) electricity, medium voltage, residual mix Cut-off, U	Denmark	2022	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing	A3	Natural Gas	Heat, district or industrial, natural gas (DK) heat and power co-generation, natural gas, conventional power plant, 100MW electrical Cut-off, U	Denmark	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/8cf803a8-2f03-4529-bbc3-8728bae3621a/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing	A3	Propane	Propane (GLO) market for propane Cut-off, U	Global	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing Waste	A3	Waste Water	Wastewater, average [Europe without Switzerland] market for wastewater, average Cut-off, U	Europe	2022	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing Waste	A3	Hazardous Waste	Hazardous waste, for incineration [Europe without Switzerland] market for hazardous waste, for incineration Cut-off, U	RoW	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Manufacturing Waste	A3	Non Hazardous Waste	Inert waste, for final disposal (RoW) treatment of inert waste, inert material landfill Cut-off, U	RoW	2023	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Cleaning	B2	Cleaning Solution	Cleaning consumables, without water, in 13.6% solution state (GLO) cleaning consumables, without water, in 13.6% solution state Cut-off, U	Global	2022	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Cleaning	B2	Tap Water	Tap water [Europe without Switzerland] tap water production, conventional treatment Cut-off, U	Europe	2022	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Waste Processing	C2	Sortation and treatment for metal recycling	Iron scrap, sorted, pressed [Europe without Switzerland] treatment of metal scrap, mixed, for recycling,	Europe	2019	https://v391.ecoquery.ecoinvent.org/Detailed/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4cc4-4fa1-b0c8-2cb7f4276dce	ND	ND

			unsorted, sorting Cut-off, U					
Waste Processing	D	Recycling Processing and Remelting	Steel, low-alloyed [Europe without Switzerland and Austria] steel production, electric, low-alloyed Cut-off, U	Europe	2023	https://391.ecoquery.ecoinvent.org/Details/PDF/e367de35-b09f-490c-b8f4-e9b653bb1010/290c1f85-1cc4-4fa1-b0c8-2cb7f4276dce	ND	ND
Waste	C4	Landfilling	Inert waste, for final disposal (RoW) treatment of inert waste, inert material landfill Cut-off, U	RoW	2023	https://391.ecoquery.ecoinvent.org/Details/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4c-4-4fa1-b0c8-2cb7f4276dce	ND	ND
Transport	Various	Truck Transport	Transport, freight, lorry 16-32 metric ton, EURO6 (RER) transport, freight, lorry 16-32 metric ton, EURO6 Cut-off, U	Europe	2022	https://391.ecoquery.ecoinvent.org/Details/PDF/13bc387c-afcd-48aa-800f-fd2cfde21a0f/290c1f85-4c-4-4fa1-b0c8-2cb7f4276dce	ND	ND
Material	D	Steel	Steel, unalloyed (GLO) market for steel, unalloyed Cut-off, U	Global	2023	https://391.ecoquery.ecoinvent.org/Details/PDF/56b1b7e3-81a1-40f4-8bc7-1f98844bceec/290c1f85-1cc4-4fa1-b0c8-2cb7f4276dce	ND	ND

Life Cycle Module Descriptions

A1: the raw material extraction and processing of secondary material (e.g. recycling processing). In this assessment the raw materials include stainless steel sourced from our supplier in Finland with 70% post-consumer recycled content, as shown in the Stainless Steel Supplier EPD linked in References and primary EPDM sourced from Denmark.

A2: the transportation distances were determined based on the distance from the material supplier to the facility in Vildbjerg, DK. Our stainless steel is sourced from a supplier in Finland and the EPDM components were sourced from a local supplier in Denmark.

A3: all impacts associated with manufacturing at the Vildbjerg facility. Various metal working processes occur at the Vildbjerg facility along with manual assembly using hand tools and manual placement of product into packaging. The utilities included in A3 are electricity, natural gas, propane, water, wastewater, hazardous waste/incineration and non-hazardous waste. A3 also includes all production aids, such as degreasing agents and pickling liquids.

A4: transportation to construction sites across Europe from the Vildbjerg, Denmark facility via truck transport.

A5: installation process, which is manual using hand tools that don't consume energy. Therefore, only products' packaging waste is included in this module.

B1: There are no additional impacts associated with Use (B1)

B2: The products are assumed to be cleaned yearly using 0,325 kg of water and 0,00955 kg of soap or detergent per declared unit of 1kg product.

B3: There are no impacts associated with Repair (B3).

B4: The products referenced in this EPD do not need to be replaced as they have a 60 year RSL while buildings are assumed to have a 50 year ESL/RSP (Reference Study Period)

B5: There are no impacts associated with Refurbishment (B5).

B6-B7: There are no impacts associated with energy and water consumption (B6 + B7) as the products do not require energy or water to function.

C1: No impacts from demolition (C1) are included as deconstruction is done manually.

C2: Transportation of the products to the end-of-life facility.

C3: Product being sorted and then recycled at a waste management facility.

C4: Products are assumed to have a 90% recycling rate and 10% landfill rate. Therefore the C4 phase takes into account the impacts from the 10% of the product that is being landfilled.

D: Includes credits for the substitution of 30% virgin stainless steel production by recycled stainless steel scrap in future product systems as well as the processing and remelting needed for the recycling

LCA Discussion

Allocation Procedure

Economic allocation was chosen as the allocation method for A3 due to the difference in economic revenue per declared unit being more than 25%.

Economic allocation of plant overhead utility consumption, resources used, and waste generation was applied for Vildbjerg facility, where all products in this study are manufactured. Operational manufacturing energy and water inputs and waste stream at the Vildbjerg plant are allocated based on BLUCHER's revenue of product output per product category based on earned hours, then to the declared unit of 1 kilogram of product. Product manufacturing scrap is determined based on the scrap rate provided by the Vildbjerg plant.

Cut-off Procedure

For the processes within the system boundary, this study includes 100% of the products' raw material flows. Results from manufacturing are limited to the primary data obtained from product throughput and annual reports showing all utilities used at the Vildbjerg facility, including electricity, natural gas, propane, water, wastewater, hazardous waste, and non-hazardous waste. Production aides, which are substances or materials that are used in production but will not be part of the final product shipped to the customer, were included in the data collection and calculated in A3, Manufacturing. All upstream and downstream activities are included using a combination of primary and secondary data.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results: ✘ No

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Vehicle Type:	16-32 metric ton, EURO6 Truck
Transport Distance:	1000 km
Capacity Utilization:	37 %
Packaging Mass:	0.104 kg
Assumptions for scenario development:	All products were produced in the Vildbjerg, Denmark facility and transported to construction sites across Europe via truck transport. The distance used is based on an average transport distance from the manufacturing plant in Vildbjerg to the construction site.

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	0 %
Mass of Packaging Waste Specified by Type:	0.104 kg
Biogenic Carbon Contained in Packaging (kg C):	0.051 kg
Assumptions for scenario development:	The installation process is manual using hand tools that don't consume energy. Therefore, only product packaging waste is included in this module.

Maintenance (B2)

B2 Module

Maintenance Cycle:	60 Cycles/RSL 60 Cycles/ESL
Net Fresh Water Consumption Specified by Water Source and Fate:	0.325 m3
Other Resources:	.00955 kg detergent per cycle kg
Waste Materials from Maintenance:	0.3345 kg
Maintenance Process Information:	The products are assumed to be cleaned yearly using 0.325 kg of water and 0.00955 kg of soap or detergent per declared unit of 1kg product.

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected with Mixed Construction Waste: 1 kg

Recovery

Recycling: .90 kg

Landfill: .10 kg

Disposal

Product or Material for Final Disposal: .10 kg

Assumptions for scenario development:

EuroPipe is assumed to have a 90% recycling rate and 10% landfill rate

Results

Environmental Impact Assessment Results

EF3.1

per 1 kg of product of product plus packaging.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Method	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP- total	EF3.1	kg CO2 eq	3.49e+0	2.04e-1	1.58e-2	0	7.73e-1	0	0	0	0	0	0	1.85e-2	6.43e-2	3.04e-4	-6.94e-1
GWP- fossil	EF3.1	kg CO2 eq	3.46e+0	2.04e-1	2.99e-3	0	7.62e-1	0	0	0	0	0	0	1.85e-2	3.17e-2	3.04e-4	-6.92e-1
GWP-biogenic	EF3.1	kg CO2 eq	2.55e-2	1.87e-4	1.28e-2	0	9.54e-3	0	0	0	0	0	0	1.69e-5	3.26e-2	1.74e-7	-1.07e-3
GWP-luluc	EF3.1	kg CO2 eq	2.89e-3	1.01e-4	1.13e-6	0	9.06e-4	0	0	0	0	0	0	9.12e-6	2.27e-5	1.83e-7	-4.72e-4
ODP	EF3.1	kg CFC11 eq	2.23e-5	4.44e-9	4.66e-11	0	8.52e-8	0	0	0	0	0	0	4.02e-10	4.13e-10	8.79e-12	-1.31e-8
AP	EF3.1	mol H+ eq	1.01e-2	4.46e-4	6.22e-6	0	3.88e-3	0	0	0	0	0	0	4.04e-5	1.46e-4	2.29e-6	-2.75e-3
PM	EF3.1	disease incidence	5.37e-8	1.51e-8	1.62e-10	0	3.40e-8	0	0	0	0	0	0	1.37e-9	2.59e-9	5.01e-11	-5.74e-8
IRP	EF3.1	kBq U235 eq	4.05e-2	1.47e-3	1.77e-5	0	2.73e-2	0	0	0	0	0	0	1.33e-4	8.90e-4	2.00e-6	-1.74e-2
POCP	EF3.1	kg NMVOC eq	7.93e-3	6.92e-4	1.11e-5	0	2.74e-3	0	0	0	0	0	0	6.27e-5	1.48e-4	3.28e-6	-3.18e-3
EP-fw	EF3.1	kg P eq	6.06e-4	1.66e-6	2.01e-8	0	7.68e-5	0	0	0	0	0	0	1.50e-7	9.20e-7	2.96e-9	-3.21e-5
EP-marine	EF3.1	kg N eq	2.02e-3	1.10e-4	1.01e-5	0	8.99e-4	0	0	0	0	0	0	9.94e-6	5.75e-5	8.74e-7	-5.93e-4
EP-terrestrial	EF3.1	mol N eq	2.20e-2	1.14e-3	1.69e-5	0	7.35e-3	0	0	0	0	0	0	1.04e-4	4.61e-4	9.42e-6	-6.77e-3
SQP	EF3.1	dimensionless	6.23e+0	1.75e+0	2.06e-2	0	2.35e+0	0	0	0	0	0	0	1.59e-1	9.44e-1	1.50e-2	-1.41e+0
WDP	EF3.1	m3 world eq deprived	9.56e-1	1.19e-2	2.64e-4	0	5.10e-1	0	0	0	0	0	0	1.08e-3	3.51e-3	3.34e-4	-7.85e-2
ADP-fossil	EF3.1	MJ, net calorific value	3.28e+1	2.90e+0	3.01e-2	0	1.40e+1	0	0	0	0	0	0	2.62e-1	3.07e-1	7.57e-3	-5.41e+0
ADP-minerals&metals	EF3.1	kg Sb eq	4.38e-5	6.67e-7	6.82e-9	0	7.74e-6	0	0	0	0	0	0	6.04e-8	4.15e-7	4.22e-10	-8.64e-7
ETP-fwio	EF3.1	CTUe	3.25e+1	1.38e+0	4.02e-2	0	1.37e+1	0	0	0	0	0	0	1.25e-1	2.71e-1	3.35e-3	-3.31e+0
HTP-cio	EF3.1	CTUh	9.14e-8	9.30e-11	1.18e-12	0	4.36e-10	0	0	0	0	0	0	8.42e-12	4.08e-11	1.29e-13	-1.14e-8
HTP-ncio	EF3.1	CTUh	1.11e-8	2.06e-9	4.40e-11	0	1.17e-8	0	0	0	0	0	0	1.86e-10	7.56e-10	1.62e-12	-6.65e-9

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicators

per 1 kg of product of product plus packaging.

Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	-6.81e-1	1.12e-2	1.30e+0	0	2.48e-1	0	0	0	0	0	0	1.02e-3	1.18e-2	1.89e-5	-1.12e-1
PERM	MJ	1.30e+0	0	-1.30e+0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	6.18e-1	1.12e-2	0	0	2.48e-1	0	0	0	0	0	0	1.02e-3	1.18e-2	1.89e-5	-1.12e-1
PENRE	MJ	3.28e+1	2.90e+0	3.01e-2	0	1.40e+1	0	0	0	0	0	0	2.62e-1	3.06e-1	7.57e-3	-7.61e+0
PENRM	MJ	2.59e-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	3.28e+1	2.90e+0	3.01e-2	0	1.40e+1	0	0	0	0	0	0	2.62e-1	3.06e-1	7.57e-3	-7.61e+0
SM	kg	6.99e-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2.02e-1	4.17e-4	8.46e-6	0	1.34e-2	0	0	0	0	0	0	3.78e-5	1.50e-4	8.04e-6	-5.05e-3

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators
per 1 kg of product of product plus packaging.

Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	6.25e-1	7.25e-5	2.21e-5	0	4.40e-4	0	0	0	0	0	0	6.57e-6	4.49e-3	9.32e-8	-1.85e-4
NHWD	kg	1.23e+0	1.44e-1	1.12e-1	0	8.66e-2	0	0	0	0	0	0	1.30e-2	2.57e-2	5.00e-2	-2.32e-1
RWD	kg	7.93e-5	9.52e-7	1.14e-8	0	1.93e-5	0	0	0	0	0	0	8.63e-8	6.93e-7	1.12e-9	-1.33e-5
CRU	kg	7.87e-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	5.77e-3	0	2.00e-2	0	0	0	0	0	0	0	0	0	9.50e-1	0	0
MER	kg	6.71e-8	0	2.00e-3	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	1.09e-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	1.46e-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note:
Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.
Abbreviations:
HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Impact Scaling Factors

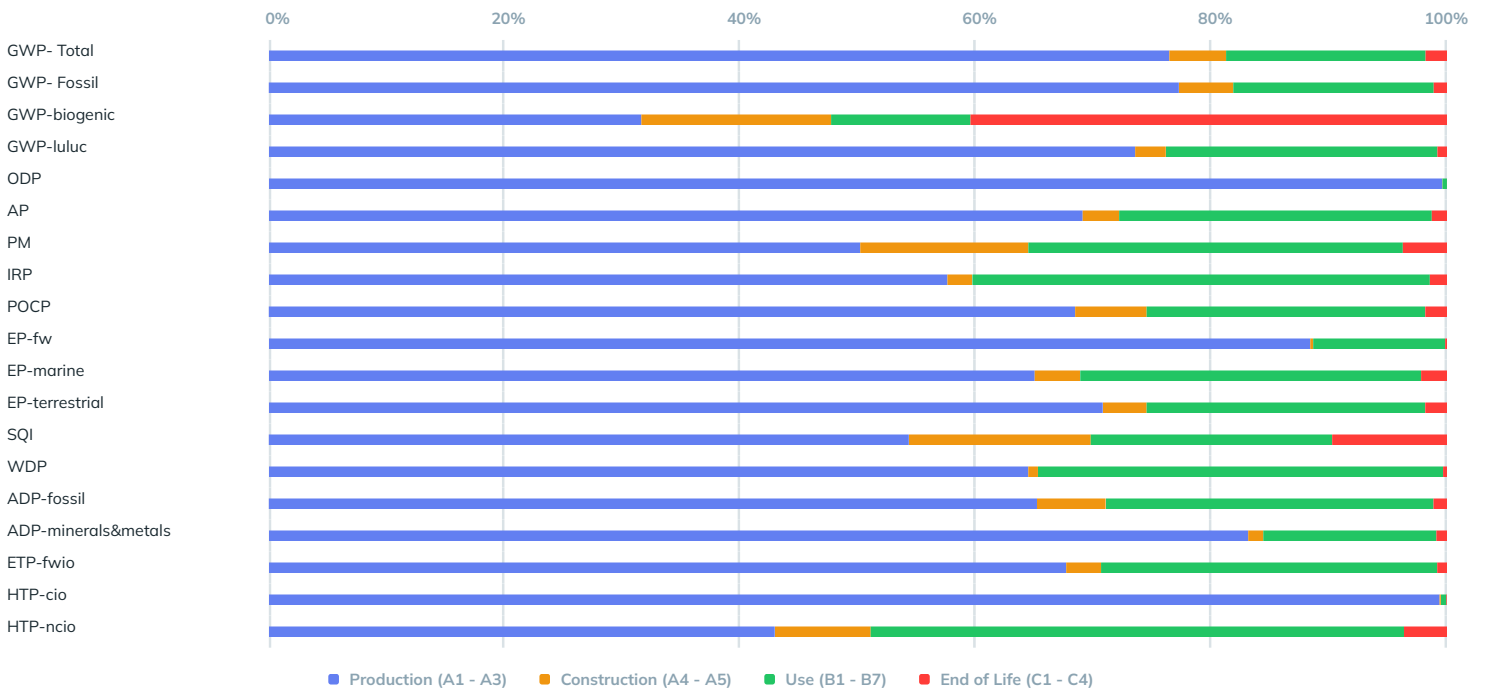
Product Name and/or Product Attribute	Product Specific Functional/Declared Unit Multiplier
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Interpretation

The analysis of BLUCHER products provides useful insights regarding the cradle-to-grave environmental impacts. The LCA results also identify where substantial impacts are occurring to allow further process and materials improvements to be implemented by BLUCHER.

The cradle-to-grave impacts for EuroPipe had the largest contributions from A1 Raw Materials Extraction and Processing and A3 Manufacturing, and B3 Maintenance. For GWP-total, A1 has the largest percent contribution for EuroPipe at 41.3%.

For all other impact categories the A1 or A3 phase had the largest contribution. This is to be expected as the Use Phase has minimal activities and we expected the Raw Materials and Manufacturing to have the largest contribution to the environmental impacts.



Environmental Activities and Certifications

Certification

REACH and Substances of Very High Concern (SVHC), regulation (EC) No. 1907/2006

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