Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804

Butt welded Fittings

Registration number:	EPD-Kiwa-EE-193584-EN
Issue date:	17-03-2025
Valid until:	17-03-2030
Declaration owner:	DÖLING Fittings GmbH & Co. KG
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Butt welded Fittings

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-193584-EN

1.3 VALIDITY

Issue date: 17-03-2025

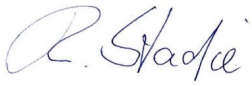
Valid until: 17-03-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Manufacturer: DÖLING Fittings GmbH & Co. KG

Address: Industriestraße 1, 26802 Moormerland/Neermoor, Germany

E-mail: post@doeling.de

Website: https://www.doeling-kg.com/

Production location: DÖLING Fittings GmbH & CO KG

Address production location: Industriestraße 1, 26802 Moormerland/Neermoor

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Gaurav Das, Gaurav Das

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

General PCR: Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

Specific PCR: Institut Bauen und Umwelt e.V. (IBU) - Requirements on the EPD for Steel pipes for pressure applications (2024-01-08, V11)

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.1

Characterization method: EN 15804 +A2 Method v1.0

LCA database profiles: EcoInvent version 3.6

Version database: v3.19 (20250306)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Butt welded Fittings ' with the calculation identifier ReTHiNK-93584.

2 Product

2.1 PRODUCT DESCRIPTION

This EPD is an average EPD. This approach was chosen due to many different product sizes being available, which all require a different number of processing steps. The EPD includes weld fittings made of seamless steel pipes. The product portfolio consists of tees, concentric and eccentric reducers, saddles and flange tube ends. The products covered in this EPD are classified and traded under the following TARif Intégré Communautaire (TARIC): HS Code 73079319.

TEEs: These products are pipe fittings in the shape of a "T". They allow three pipes to be connected, creating a main pipe and a branch.

Concentric reducers: These special pipe fittings are used in piping systems to connect two pipes with different diameters where the center points of the pipes are on the same axis.

Eccentric reducers: These special pipe fittings are used in piping systems to connect two pipes with different diameters, where the center points of the pipes are not on the same axis but are offset to one another.

Flange tube ends: These special pipe fittings are used in piping systems to enable a flange to be connected to the pipe. In the process, parts of a pipe are flanged and thus create a contact surface for the flange.

Saddle fittings: A steel saddle fitting is a pipe fitting used to create a branch from a main line. The saddle fitting usually has one side that is welded onto a pipe and one open side that opens into another pipe or fitting.

For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the following legal provisions apply: 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment and the harmonized standards based on these provisions:

- EN 10253-1:2000, Butt-welding pipe fittings – Part 1:
Wrought carbon steel for general use and without specific inspection requirements

- EN 10253-2:2021, Butt-welding pipe fittings – Part 2:
Non alloy and ferritic alloy steels with specific inspection

Material	Share in composition
Steel	100%

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The areas of application are diverse and include all applications in which media such as liquids, gases or vapors are transported through pipelines. These include pipeline construction, the chemical industry, the oil and gas industry, mechanical engineering and power generation.

Weld fittings are used to adjust the pressure or flow of the medium in the pipeline. For example, pressure losses can be compensated without causing turbulence or a disruption in the flow. Flange tube ends create the contact surface for a flange.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The reference service life of tees, concentric reducers, eccentric reducers and saddle fittings depend on various factors such as structural design, area of use and maintenance. As the use phase is not included in the EPD, the reference service life is not declared.

USED RSL (YR) IN THIS LCA CALCULATION:

99

2.4 TECHNICAL DATA

Characteristic	Value	Unit
Yield strength	min. 235	N/mm²
Tensile strength	360-655	N/mm²
Hardness	max. 192	HB
Notched-bar impact value	min. 27	Joule
Ductility	min. 16	%

The assessed products follow a range of standards in relation to materials, production and technical properties, depending on the type of fittings. The following standards are relevant for fittings produced by Döling Fittings:

- EN 10253-1, Butt-welding pipe fittings – Part 1
- EN 10253-2, Butt-welding pipe fittings – Part 2
- EN 10216-1, Seamless steel tubes for pressure purposes – Technical delivery conditions - Part 1

2 Product

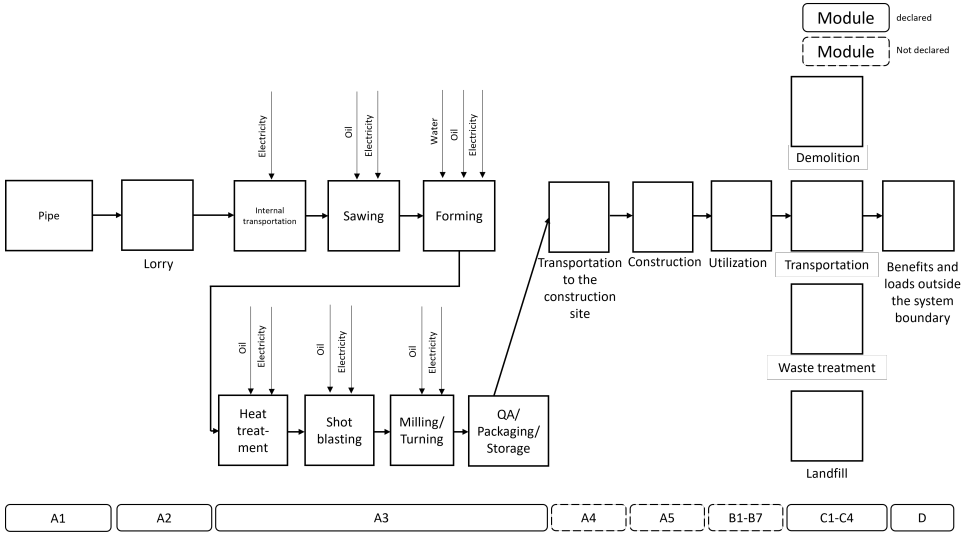
- EN 10216-2, Seamless steel tubes for pressure purposes – Technical delivery conditions - Part 2
- EN 10217-1, Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1
- EN 10217-2, Welded steel tubes for pressure purposes - Technical delivery conditions - Part 2
- EN ISO 3183, Petroleum and natural gas industries — Steel pipe for pipeline transportation systems
- DIN 28011, Torispherical heads
- DIN 2609, Steel butt-welding pipe fittings; technical delivery conditions
- DIN 2641, Weld on collars
- DIN 2642, Loose flange

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any substances from the “Candidate List of Substances of Very High Concern” (SVHC) in amounts greater than 0,1% (1.000 ppm).

2.6 DESCRIPTION PRODUCTION PROCESS

First, a steel pipe is transported internally by crane and trolley. The pipe is then sawn into the desired length and cold or hot formed several times depending on the exact product and size. Some of the forming processes may use water. The next step consists of a heat treatment. Finally it is shot blasted to clean and treat its surface and readying it for the end finishing. Lastly, the product is labeled and put into storage until it is being transported to the customer.



3 Calculation rules

3.1 DECLARED UNIT

kg

1 kilogram of butt welded fittings

Reference unit: kilogram (kg)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	kg
Conversion factor to 1 kg	1.000000	kg

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for an average of multiple product variants of Butt welded Fittings, products of DÖLING Fittings GmbH & Co. KG. The results of this EPD are representative for Germany.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)
All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

3 Calculation rules

Excluded processes are:

- Long-term emissions
- The manufacture of equipment used in production, buildings or any other capital goods
- The transport of personnel to the plant
- The transportation of personnel within the plant
- Research and development activities
- Blasting media and sawblades

End of life stage (C1-C4)
All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)
All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

Allocations were avoided as far as possible. There are no coproducts or by-product in the manufacturing of the examined products. Based on the overall energy and ancillary material consumption measurements, the energy requirements of the production were allocated to the individual products. Specific information about allocations within the background data is included in the documentation of the ecoinvent datasets.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was collected for the 2023 operating year from 01.01.2023 to 31.12.2023. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged over the entire 2023 operating year. The reference area is Germany.

3.8 ESTIMATES AND ASSUMPTIONS

It is assumed that the disassembly for the de-construction is carried out manually by hand, which leads to no processes being added to the module C1.

The NMD is the Netherlands' national environmental database, providing standardized data for assessing the environmental impact of building materials. The NMD waste scenario for "Steel, piping civil constructions (NMD ID 72)" is
considered representative for the life cycle of Butt welded Fittings and used in the calculation. The process "Scrap steel {Europe without Switzerland}| treatment of scrap steel, inert material landfill" is used
for landfilling and To be left, whereby the dataset "Materials for recycling, no waste processing taken into account" is used for
recycling. The recycled waste is reused as benefits in the process "World Steel method (Steel production, electric, low-alloyed - Steel production, converter, unalloyed)".

3.9 DATA QUALITY

The determination of data quality is based on ISO EN 15804+A2 Annex E.

The quality level of geographical representativeness can be considered “good”.
The quality level of technical representativeness can be considered “good”.
The time representativeness can also be regarded as “good”.

The overall data quality for this EPD can, therefore, be described as “good”. All relevant process-specific data were collected during data collection.

This allows for a precise LCA result with little assumptions about input-data being made.

In all possible cases, primary data from customers was used, which has very good data quality because it comes directly from the source. In addition, secondary data from the EcoInvent database (2019, version 3.6) was used when no primary data could be supplied. The database is checked regularly and, therefore, meets the requirements of DIN EN ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804+A2. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged over the entire operating year.

The general rule that specific data from certain production processes or average data derived from certain processes must take precedence when calculating an EPD or LCA was adhered to. Data for processes over which the manufacturer has no influence were assigned to generic data/scenarios. When selecting these, care was taken to always choose the data set/scenario that most realistically represents the processes.

3 Calculation rules

3.10 POWER MIX

As DÖLING Fittings is equipped with PV-modules, part of the electricity used is directly produced on-site (~25%), while the rest of the electricity is being bought (~75%).

The GWP-total of the generated electricity is 0.031 kg CO2 eqv. per kWh.

For the bought electricity the “residual mix” was taken into account for this Environmental Product Declaration.

The GWP-total of the bought electricity mix is 0.725 kg CO2 eqv. per kWh.

4 Scenarios and additional technical information

4.1 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.2 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.6) Steel, piping civil constructions (NMD ID 72)	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.3 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.6) Steel, piping civil constructions (NMD ID 72)	NL	95	1	0	4	0

4 Scenarios and additional technical information

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.6) Steel, piping civil constructions (NMD ID 72)	0.950	0.010	0.000	0.040	0.000
Total	**0.950**	**0.010**	**0.000**	**0.040**	**0.000**

4.4 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.6) Steel, piping civil constructions (NMD ID 72)	0.040	0.000
Total	**0.040**	**0.000**

5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER KILOGRAM

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.93E+0	6.54E-2	1.74E-1	2.17E+0	0.00E+0	4.05E-4	0.00E+0	5.06E-3	-5.69E-2
GWP-f	kg CO_2 eq.	1.58E+0	6.53E-2	1.65E-1	1.81E+0	0.00E+0	4.05E-4	0.00E+0	5.05E-3	-5.70E-2
GWP-b	kg CO_2 eq.	4.12E-3	2.63E-5	-5.27E-4	3.62E-3	0.00E+0	1.63E-7	0.00E+0	3.19E-6	8.50E-5
GWP-luluc	kg CO_2 eq.	2.92E-4	2.40E-5	6.54E-5	3.81E-4	0.00E+0	1.49E-7	0.00E+0	1.41E-6	4.21E-5
ODP	kg CFC 11 eq.	2.16E-7	1.44E-8	2.05E-8	2.51E-7	0.00E+0	8.94E-11	0.00E+0	2.08E-9	-1.39E-9
AP	mol H+ eq.	6.12E-3	3.79E-4	4.71E-4	6.97E-3	0.00E+0	2.35E-6	0.00E+0	4.80E-5	-2.20E-4
EP-fw	kg P eq.	2.55E-5	6.58E-7	4.19E-6	3.04E-5	0.00E+0	4.08E-9	0.00E+0	5.67E-8	-2.01E-6
EP-m	kg N eq.	1.24E-3	1.34E-4	9.00E-5	1.46E-3	0.00E+0	8.28E-7	0.00E+0	1.65E-5	-4.08E-5
EP-T	mol N eq.	1.38E-2	1.47E-3	1.02E-3	1.63E-2	0.00E+0	9.12E-6	0.00E+0	1.82E-4	-4.76E-4
POCP	kg NMVOC eq.	4.56E-3	4.20E-4	6.30E-4	5.61E-3	0.00E+0	2.60E-6	0.00E+0	5.29E-5	-3.24E-4
ADP-mm	kg Sb-eq.	5.32E-5	1.66E-6	3.29E-6	5.81E-5	0.00E+0	1.03E-8	0.00E+0	4.63E-8	-3.85E-8
ADP-f	MJ	3.16E+1	9.85E-1	2.72E+0	3.53E+1	0.00E+0	6.11E-3	0.00E+0	1.41E-1	-3.98E-1
WDP	m3 world eq.	7.48E+1	3.52E-3	2.10E+0	7.69E+1	0.00E+0	2.18E-5	0.00E+0	6.34E-3	-1.09E-2

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP minerals&metals) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PM	disease incidence	0.00E+0	5.86E-9	2.02E-9	7.87E-9	0.00E+0	3.63E-11	0.00E+0	9.33E-10	-3.30E-9
IR	kBq U235 eq.	0.00E+0	4.13E-3	5.99E-3	1.01E-2	0.00E+0	2.56E-5	0.00E+0	5.80E-4	9.74E-4
ETP-fw	CTUe	0.00E+0	8.78E-1	7.85E-1	1.66E+0	0.00E+0	5.44E-3	0.00E+0	9.17E-2	-1.91E+0
HTP-c	CTUh	0.00E+0	2.85E-11	7.08E-11	9.93E-11	0.00E+0	1.77E-13	0.00E+0	2.12E-12	-7.37E-12
HTP-nc	CTUh	0.00E+0	9.63E-10	2.51E-9	3.47E-9	0.00E+0	5.97E-12	0.00E+0	6.52E-11	1.10E-8
SQP	Pt	0.00E+0	8.54E-1	3.89E-1	1.24E+0	0.00E+0	5.30E-3	0.00E+0	2.96E-1	-8.80E-2

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 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 / level 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 / level 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 water consumption (WDP)	2

5 Results

ILCD classification	Indicator	Disclaimer
	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 experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	7.03E-1	1.23E-2	7.44E-2	7.90E-1	0.00E+0	7.64E-5	0.00E+0	1.14E-3	1.16E-2
PERM	MJ	0.00E+0	0.00E+0	6.37E-3	6.37E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	7.03E-1	1.23E-2	8.08E-2	7.96E-1	0.00E+0	7.64E-5	0.00E+0	1.14E-3	1.16E-2
PENRE	MJ	3.52E+1	1.05E+0	2.41E+0	3.87E+1	0.00E+0	6.48E-3	0.00E+0	1.50E-1	-4.13E-1
PENRM	MJ	6.24E-3	0.00E+0	4.93E-1	4.99E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	3.52E+1	1.05E+0	2.90E+0	3.92E+1	0.00E+0	6.48E-3	0.00E+0	1.50E-1	-4.13E-1
SM	Kg	1.21E+0	0.00E+0	3.76E-2	1.25E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	1.84E-2	1.20E-4	1.23E-3	1.97E-2	0.00E+0	7.44E-7	0.00E+0	1.51E-4	-2.06E-4

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 resources | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
HWD	Kg	1.17E-2	2.50E-6	1.45E-2	2.62E-2	0.00E+0	1.55E-8	0.00E+0	2.11E-7	-6.83E-6
NHWD	Kg	7.42E-3	6.25E-2	3.57E-2	1.06E-1	0.00E+0	3.87E-4	0.00E+0	9.60E-1	-5.58E-3
RWD	Kg	0.00E+0	6.49E-6	8.40E-6	1.49E-5	0.00E+0	4.02E-8	0.00E+0	9.28E-7	3.37E-7

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	2.16E-1	0.00E+0	7.17E-3	2.23E-1	0.00E+0	0.00E+0	4.00E-2	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	1.53E-1	1.53E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	8.87E-2	8.87E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER KILOGRAM

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per kilogram:

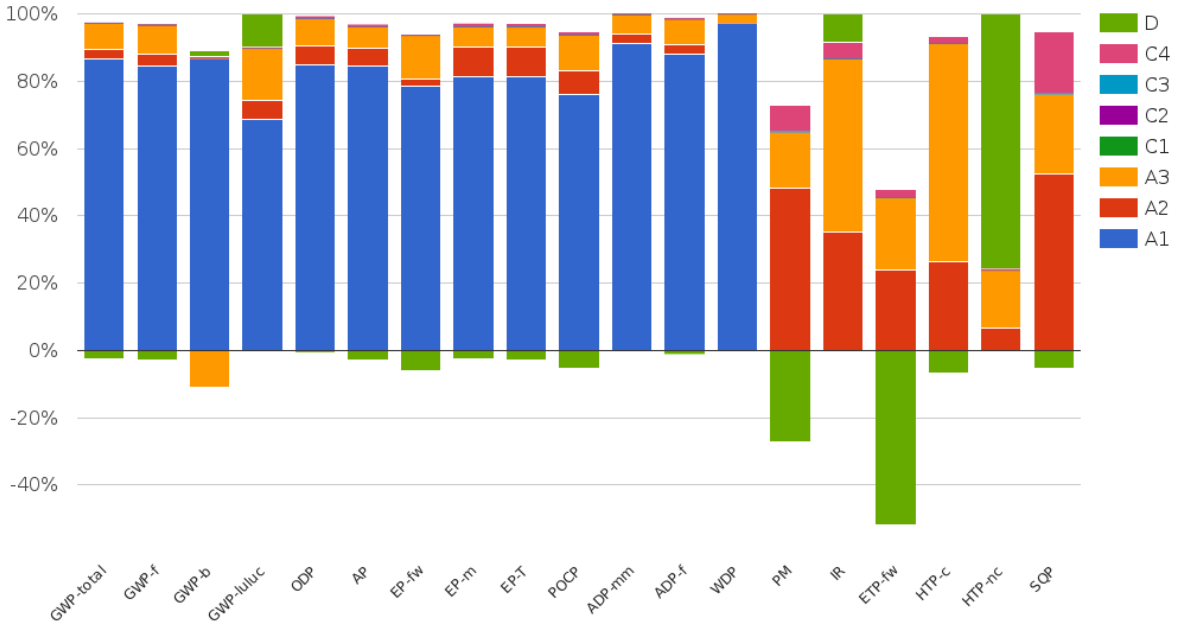
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.0001969	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.0007215	kg CO2 (biogenic)

6 Interpretation of results



The majority of the products impact stems from the steel pipe used in A1.
Also apparent is module D in ETP-fw and PM. Through the recycling potential declared in the waste profiles for the used steel, processes in the steel production with a high impact on particulate matter and the Ecotoxicity potential for freshwater, can be reduced, resulting in a high negative D value.

The majority of the CO2 emissions within the impact category GWP-biogenic originate from the packaging in A3. Since the module A5, which includes the waste processing of packaging, is not declared, there seems to be a disbalance of biogenic CO2 emissions. If A5 would be declared, this imbalance would disappear.

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

General PCR Ecobility Experts
Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

Specific PCR
Requirements on the EPD for Steel pipes for pressure applications (2024-01-08, V11)

NMD Waste Scenarios
Lump sum values for processing end-of-life scenarios belonging to: Method of Determination Environmental Performance of Buildings (March 2022)

REACH Directive (EU) 2023/1132
Commission Regulation (EU) 2023/1132 of 8 June 2023 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council as regards carcinogenic, mutagenic or reproductive toxicant substances subject to restrictions

ECO Platform Verification Guidelines
ECO Platform Standards - Verification Guidelines_V7.1_clean.pdf

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