ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Lindemann GmbH & Co. KG Orion-Eisenverarbeitung
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-LID-20240547-IBC1-EN
Issue date	04.04.2025
Valid to	03.04.2030

Butt Welded Fitting

Lindemann GmbH & Co. KG Orion-Eisenverarbeitung

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

Lindemann GmbH & Co. KG Orion-Eisenverarbeitung

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-LID-20240547-IBC1-EN

This declaration is based on the product category rules:

Steel pipes for pressure applications, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

04.04.2025

Valid to

03.04.2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Butt Welded Fitting

Owner of the declaration

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Albert-Schweitzer-Straße 179
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Germany

Declared product / declared unit

1 metric tonne of average butt-welded fitting

Scope:

A life cycle assessment according to ISO 14040/44 has been performed to calculate the environmental impact of 1 metric tonne of average butt-welded fitting in carbon and low-alloyed steel manufactured by Lindemann GmbH & Co. KG at the production plant in Bünde, Germany.

An average data approach was taken when assumptions were made to take into account the variability in data. Only one manufacturing plant is considered.

For data under control by Lindemann, primary data was used for the material and energy used. Supplier-specific data was used where available, which is the case for the majority of supplied steel. On site consumed electricity is modelled using the energy mix of the electricity provider.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Mrs Dariya Hadzhiyska,
(Independent verifier)

2. Product

2.1 Product description/Product definition

This EPD includes butt-welded fittings/elbows in carbon and low-alloy steel.

This EPD specifically excludes the following products:

- Products in stainless steel
- Reducers, Tees and Caps

The steel types included in this average product are the following:

- S235
- P235 GH TC1 + TC2
- P265 GH TC1 + TC2
- 16 Mo3
- 13CrMo4-5
- 10CrMo9-10
- P215NL
- P355N, P355NH, P355NL1

Butt-welded fittings cover different types of fittings in various shapes and dimensions, such as pipe bends, crosses, welded elbows, saddle elbows, concentric reducers, and eccentric reducers.
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 harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment and the harmonised 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 requirements

The PED-marking takes into account the proof of conformity with the respective harmonised standards based on the legal provisions above. For the application and use the respective national provisions apply.
The products covered in this EPD are classified and traded under the following TARif Intégré Communautaire (TARIC) codes: 73079311 and 73079191.

2.2 Application

Butt-welded fittings are used to connect different pipes with each other and can be used for both transporting oils, gas or water (excluding drinking water) in a closed system.
Butt-welded fittings have no threads, which means that they can only be permanently connected by means of a weld.

2.3 Technical Data

The assessed products follow a range of standards in relation to materials, production and technical properties, depending on the type of flanges. The following standards are relevant for Lindemann's fittings:

- EN 10253-1
- EN 10253-2
- EN 10216-1
- EN 10216-2
- EN 10217-1
- EN 10217-2
- EN ISO 3183
- ASTM A234
- ASTM A333
- ASTM A860
- ASME B16.9
- ASME B16.25

Constructional data

These values are attributed to fittings made of carbon steel.

Name	Value	Unit
Yield strength pipe	min. 235	N/mm^2
Tensile strength pipe	360 - 830	N/mm^2
Hardness	max. 230	HB
Notched-bar impact value	min. 27	Joule
Ductility	min. 14	%

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to

- EN 1092-1:2018, Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges.
- EN 10253-1:2000, Butt-welding pipe fittings – Part 1: Wrought carbon steel for general use and without specific inspection requirements.

2.4 Delivery status

The measurements of the products can vary between different lengths, thicknesses and diameters depending on the intended use and demand.

2.5 Base materials/Ancillary materials

Name	Value	Unit
Steel (Carbon and low-alloyed, primary)	42.6	%
Steel (Carbon and low-alloyed, Secondary)	57.4	%

1) This product contains substances listed in the Candidate List of substances of very high concern (date: 21.06.2024) exceeding 0.1 percentage by mass: **no**

2) This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: **no**

3) Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **no**

2.6 Manufacture

The manufacturing on site includes the following processes:

- Cutting of steel pipes
- Hot-forming steel into desired shape
- Heat treatment to achieve material requirements
- Calibration, turning, chamfering, milling
- Surface processing, e.g. shot blasting

The hot forming process utilises the Hamburg bending process where the pipe is being pressed over a mandrel with a certain geometry. Heating is done via induction heating and additional gas heating for large parts. The process is displayed in the following image:

2.7 Environment and health during manufacturing

During the entire manufacturing process, no other health protection measures are required extending beyond the legally specified industrial protection measures for commercial enterprises.

2.8 Product processing/Installation

Steels can be welded manually or automatically. Industrial safety measures are required during processing/installation. No significant environmental pollution is triggered by processing/assembling these products. No special measures are required to protect the environment.
Residue and packaging materials must be collected separately in the construction site. The specifications of local waste authorities must be followed during processing.

2.9 Packaging

All shipping materials used in one year are allocated to the reference flow.
The modelled packaging material consists of:

- Cardboard (recycled material, recycleable)
- Plastic film (recycleable)
- EUR-flat pallet (reusable)
- Steel wire (recycleable)

2.10 Condition of use

Environmental effects of the usage stage are not considered in the scope of this study. Nevertheless, the product does not require any maintenance, repair or renewal during usage. As a general rule, the material composition of the product does not change over its lifetime, though depending on the application, corrosion prevention measures might need to be taken to ensure the full service life. Possible measures are not modelled in this EPD.

2.11 Environment and health during use

There are no health risks for users of steel pipes or persons manufacturing or processing steel pipes. From an environmental perspective, there are no restrictions governing the use of steel pipes.

2.12 Reference service life

The life cycle of steel pipe is dependent on the respective structural design, use and maintenance.
The use phase for steel pipe is not depicted as they involve maintenance-free and generally durable products.

2.13 Extraordinary effects

Fire

Steel pipe fittings comply with the requirements of construction product class A1 'nonflammable' in accordance with DIN 4102, Part 1 and EN 13501-1. No smoke gas develops.

Fire protection

Name	Value
Building material class	A1
Burning droplets	None
Smoke gas development	None

Water

Influence of water on the steel pipe fittings does not cause any negative environmental effects.

Mechanical destruction

High mechanical durability prevents the steel pipe fittings from any major damage due to most mechanical impacts.

2.14 Re-use phase

Theoretically, steel is 100 % recyclable. For this EPD, a recycling quota of 95 % is assumed.

2.15 Disposal

At most, 5 % of steel is assumed to be disposed in landfills due to recycling losses.
Waste code in accordance with the European List of Wastes (EWC), as per the European List of Wastes Ordinance is "17 04 05 Iron and Steel".

2.16 Further information

More information can be found at:
https://lindemann-buende.de/

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 metric tonne of average Butt-Welded Fitting.
The average was generated using a wide range of products with varying thicknesses and diameters, as seen in the following table. The Fittings can have 2D, 3D, 5D or individual pipe bend radii.

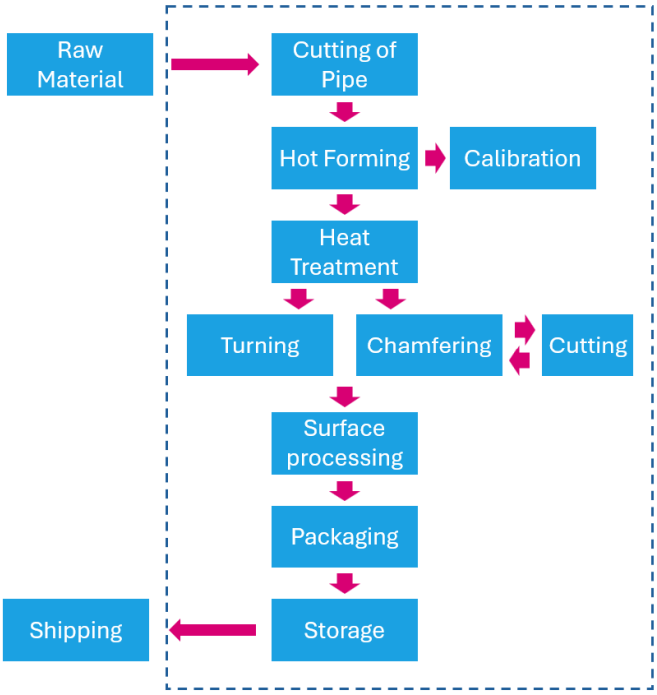
Declared unit and mass reference

Name	Value	Unit
Declared unit (Butt-Welded Fitting)	1	t
Thickness (min - max)	1.8 - 32	mm
Density	-	kg/m^3
Diameter (min - max)	17.2 - 610.0	mm

3.2 System boundary

Type of the EPD: cradle to gate with Modules C1–C4 and Module D

The fore- and background processes of the manufacturing process are displayed in the following graphic with foreground processes inside of the blue box. Beyond that, the end-of-life is modelled including the transportation to waste handling, waste processing and disposal. Further, the benefits and loads due to recycling and reuse potentials are included in the EPD.



A1 - A3
The modules A1-A3 include the production of raw materials, auxiliary materials and packaging materials, transportation, the energy demand, and take into account any losses during manufacture.
In A1, the raw material for the product under assessment is derived from two manufacturers with up to date EPDs, so only 43.6 % of the carbon steel data was generic. The ecoinvent data set 'steel production, electric, low-alloyed | steel, low-alloyed | EN15804 - Europe without Switzerland and Austria' was used to generate this data point.
In module A2, transportation distances were assumed. The transportation distance for the majority of steel from supplier to Lindemann is known and the transportation distances for auxiliary products were calculated from average transportation data sets in ecoinvent.
Modul A3 includes the production of the following auxiliary materials:

- Welding materials (brass, copper, silver, steel)
- Lubricating oils
- Graphite coating

For packaging, cardboard, wooden pallets, plastic film and steel wire are used and modelled. Energy from renewable electricity as well as from oil is included in the model.

C1 - C4
Manual deconstruction was assumed at the end of life, therefore C1 was set to 0 for all impact categories.
Module C2 includes the transport to waste handling. The transport to waste handling was assumed to be 500km.
The preparation for recycling of steel is included in C3 and the disposals of 5 % of steel are modelled in C4.

D
In Module D, for the end-of-life, steel is assumed to be recycled by 95 % due to collecting and melting losses, which is in line with a 2019 study by the Karlsruhe Institute of Technology (https://www.worldstainless.org/news/global-life-cycle-of-stainless-steel/). The recycling potential of steel resources was modelled by using the EPD results of these.

3.3 Estimates and assumptions
The raw material for the product under assessment is carbon steel, modelled as low-alloyed steel using the generic ecoinvent 3.8 data set.

- steel production, low-alloyed, hot rolled | steel, low-alloyed, hot rolled | EN15804, U - RER

A majority of steel is derived from manufacturers with up to date EPDs, so only about 50 % of the carbon steel data was generic with the rest being supplier-specific.

In module A2, transportation distances were assumed. The transportation distance for the majority of steel from the supplier to Lindemann is known and the transportation distances for auxiliary products were calculated from average transportation data sets in ecoinvent.

The transport to waste handling was assumed to be 100 km.

In Module D, for the end-of-life, steel is assumed to be recycled by 95 % even if it is 100 % recyclable. Because collecting and melting loss is assumed to be 5 % in total. Therefore, 5 % of steel is assumed to be disposed of in landfill at module C4.

3.4 Cut-off criteria
All inputs and outputs to a (unit) process are included in the calculation, for which data were available. The applied cut-off criteria is 1 % of the total mass input of that unit process in case of insufficient input data or data gaps for a unit process. The total of neglected input flows is a maximum of 5 % mass.

3.5 Background data
The background data base is ecoinvent, Allocation, cut-off by classification, ecoinvent database version 3.8 (2021).
The electricity mix has a GWP of 0.086 kg CO_2e/kWh and is produced from a mix of photovoltaic, wind turbine, hydropower, and biogas.

3.6 Data quality
For foreground data, data from the year 2023 and from manufacturing processes on site are used. The processes do not differ significantly between product sizes and steel types, so a high geographical, temporal and technical correlation can be assumed for these data points.

The LCA results from steel pipes used in production is in large part derived from EPDs of these steel pipes. These EPDs are drafted in accordance with EN 15804+A2, verified in accordance with ISO 14025 and published at EPD International.

All foreground data is from the production of the year 2023 and directly from the site in Germany. The country or region in which the declared product system is manufactured, used or handled at the end of the product's lifespan is set as Europe for all other data sets where localization to Germany was not possible. For the background data, the time-related coverage, geography coverage and technology coverage are according to the version of ecoinvent used.

3.7 Period under review
For manufacturing data, the energy and material used in the year 2023 were assessed.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

For background data, allocation is performed according to the data set.

Waste material for recycling is allocated as open-loop recycling with the avoided burden of production being modelled in life cycle stage D.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The used background database was ecoinvent, Allocation, cut-off by classification, ecoinvent database version 3.8 (2021)

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

No biogenic carbon is included in the product. For wood and cardboard packaging material, a carbon content of 14.88 kg per declared unit was calculated.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	14.88	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The composition of packaging material per ton of product is as follows: 21.23 kg cardboard, 28.75 kg wood (EUR-flat pallet), 86.85 kg plastic film, 2.44 kg steel.

The following assumptions are the basis for the calculated scenarios of included modules.

End of life (C1-C4)

Name	Value	Unit
Recycling	950	kg
Landfilling	50	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Collection Rate	95	%

5. LCA: Results

The declared unit of this LCA study is 1 metric tonne of average Steel Pipe Fitting.

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

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 tonne Steel Pipe Fitting

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	1.78E+03	0	8.16E+01	1.01E+00	2.64E-01	-4.93E+02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.78E+03	0	8.14E+01	9.75E-01	2.63E-01	-4.96E+02
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	6.77E+00	0	1.45E-01	3.2E-02	7.54E-04	4.05E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	1.14E+00	0	3.26E-02	2.09E-03	2.43E-04	-5.99E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	1.7E-04	0	1.89E-05	6.14E-08	1.07E-07	-4.03E-06
Acidification potential of land and water (AP)	mol H^+ eq	7.28E+00	0	2.31E-01	5.88E-03	2.47E-03	-1.68E+00
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	2.69E-01	0	5.37E-03	8.97E-04	2.43E-05	-8.11E-03
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.36E+00	0	4.71E-02	1.19E-03	8.61E-04	-3.23E-01
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.39E+01	0	5.12E-01	1.13E-02	9.42E-03	-3.56E+00
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	4.32E+00	0	1.91E-01	3.1E-03	2.68E-03	-6.87E-01
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	2.8E-02	0	2.77E-04	8.73E-06	5.66E-07	-2.48E-03
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.99E+04	0	9.41E+01	9.19E+00	5.51E-01	-4.11E+03
Water use (WDP)	m^3 world eq deprived	3.09E+04	0	6E+00	6.86E-01	3.39E-01	-1.21E+01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 tonne Steel Pipe Fitting

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	4.26E+03	0	1.33E+01	3.24E+00	4.25E-02	2.21E+02
Renewable primary energy resources as material utilization (PERM)	MJ	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	4.26E+03	0	1.33E+01	3.24E+00	4.25E-02	2.21E+02
Non renewable primary energy as energy carrier (PENRE)	MJ	2.32E+04	0	1.2E+02	1.8E+01	6.26E-01	-4.78E+03
Non renewable primary energy as material utilization (PENRM)	MJ	1.11E+04	0	1.12E+03	5.51E+00	6.77E+00	0
Total use of non renewable primary energy resources (PENRT)	MJ	3.42E+04	0	1.24E+03	2.35E+01	7.4E+00	-5.66E+03
Use of secondary material (SM)	kg	1.54E+03	0	1.26E+00	2.32E-01	3.95E-03	2.19E+02
Use of renewable secondary fuels (RSF)	MJ	1.51E+02	0	3.77E-01	1.31E-01	6.99E-04	0
Use of non renewable secondary fuels (NRSF)	MJ	2.26E+01	0	1.53E+00	8.99E-02	1.01E-03	0
Use of net fresh water (FW)	m^3	1.97E+01	0	1.43E-01	1.6E-02	7.93E-03	-3.31E-01

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 tonne Steel Pipe Fitting

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.32E+03	0	2.77E+01	4.46E+00	1.21E-01	-2.27E-04
Non hazardous waste disposed (NHWD)	kg	2.22E+02	0	6.41E+01	6.11E-02	5E+01	-5.51E+00
Radioactive waste disposed (RWD)	kg	1.07E+00	0	2.48E-02	5.44E-03	9.31E-05	3.79E-02
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	6.06E+02	0	0	9.5E+02	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 tonne Steel Pipe Fitting

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND

Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

For most environmental impacts, the life cycle stage A1 Raw Material Supply is responsible for 80 - 90 % of impacts. When considering the whole product stage A1 - A3, the share of impacts is even greater and lies between 90 - 99 % for most categories. This is to be expected since not much energy and material is needed to recycle or dispose of the product compared to its production. A major improvement in environmental performance can be therefore identified in the purchased steel pipes with reduced environmental impacts.

The recycled content of the main steel suppliers is comparatively high (57.4 %), which is reflected in the results of this EPD. Further improving the content of secondary steel or increasing the use of renewable energy in steel production would have a noticeable effect on the impacts of the butt welded fitting production.

7. Requisite evidence

This EPD concerns butt-welded fittings for oil/gas or water pipelines made from structural steel in a closed system. Further processing depends on the respective application.

Evidence of tests in line with the technical conditions governing delivery is provided by works test certificates. The application does not include the transport of drinking water.

8. References

Standards

ASTM A 234
ASTM A 234:2024, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A 333
ASTM A 333:2024, Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness

ASTM A 860
ASTM A 860:2022, Standard Specification for Wrought High-Strength Ferritic Steel Butt-Welding Fittings

ASME B 16.9
ASME B16.9:2018, Factory-Made Wrought Buttwelding Fittings

ASME B 16.25
ASME B16.25:2022, Buttwelding Ends

DIN 4102-1
DIN 4102-1:1998-05, Fire behaviour of building materials andbuilding components - Part 1: Building materials; concepts,requirements and tests

EN 10253-1
DIN EN 10253-1:1999-11, Butt-welding pipe fittings - Part 1: Wrought carbon steel for general use and without specific inspection requirements

EN 10253-2
DIN EN 10253-2:2021-11, Butt-welding pipe fittings - Part 2: Non alloy and ferritic alloy steels with specific inspection requirements

EN 10216-1
DIN EN 10216-1:2014-03, Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steel tubes with specified room temperature properties

EN 10216-2
DIN EN 10216-2:2023-05, Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties

EN 10217-1
DIN EN 10217-1:2019-08, Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties

EN 10217-2
DIN EN 10217-2:2019-08, Welded steel tubes for pressure purposes - Technical delivery conditions - Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties

EN 13501-1
DIN EN 13501-1:2019-05, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN ISO 3183

DIN EN ISO 3183:2020-02, Petroleum and natural gas industries - Steel pipe for pipeline transportation systems (ISO 3183:2019)

EN ISO 14025
EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

EN ISO 14040/44
EN ISO 14040:2006, Environmental Management – Life Cycle Assessment - Principles and Framework; English version EN ISO 14040:2006
EN ISO 14044:2006, Environment Management – Life Cycle Assessment – Requirements and Instructions; English version EN ISO 14044:2006.

PCR Part A
Institut Bauen und Umwelt e.V. (IBU). (2024) PCR Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019. Version 1.4. Date of issue: 14.04.2024.

PCR Part B
Institut Bauen und Umwelt e.V. (IBU). (2024) PCR Part B: Requirements on the EPD for Steel pipes for pressure applications, 01.08.2024

Further References

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