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ECO PLATFORM EPD VERIFIED

Owner: INDURA A/S
No.: MD-26075-EN
Issued: 24-09-2026
Valid to: 24-09-2031

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



Owner of declaration
INDURA A/S
Grønlandsvej 1, 7480 Vildbjerg,
Denmark
VAT no.: DK12419201
www.indura.com

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

☐ Product specific
☒ Average
☐ Worst Case

Declared product(s)
Steel flanges: carbon steel, galvanized steel and stainless steel

Number of declared datasets/product variations: 3

Production site
Manufacturing: China, with a small share from European wholesalers and manufacturers.
Storage and repacking (A3): Vildbjerg, Denmark.

Use of Guarantees of Origin
☒ No certificates used
☐ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
1 kg of product

Year of production site data (A3)
Procurement data for the period 1 July 2025 to 29 June 2026, covering sales weighting, product prices and item masses; storage and repacking energy from INDURA's climate account for the 2025 calendar year.

EPD version
1.0

Issued: 24-09-2026
Valid to: 24-09-2031

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

David Althoff Palm, Dalemarken AB

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (X = module declared; ND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D

Life cycle stages and modules (X = module declared; ND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below, as weight-% of the declared unit of 1 kg of product. The sales and transport packaging is additional to the 1 kg of product and is shown separately below; total transported mass is 1.175 kg per kg of product.

Material	Carbon steel flanges	Galvanized steel flanges	Stainless steel flanges
Low-alloyed steel	99.91%	97.81%	-
Stainless steel	-	-	100.00%
Zinc (galvanizing layer)	-	2.10%	-
Naphtha (rust protection)	0.09%	0.09%	0*
Total	**100%**	**100%**	**100%**
*	Rust protection is modelled for stainless steel flanges with an amount of zero, because stainless steel is not rust protected. The zero is a modelled result, not missing data.		

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight of packaging material (kg)	Weight-% of packaging
Cardboard	0.150	85.85%
Pallet wood	0.022	12.59%
Polyethylene mesh	0.00270	1.55%
PVC tape	0.00003	0.02%

Representativity

This declaration, including data collection and the modelled foreground system and results, represents steel flanges supplied by INDURA A/S. Flange manufacturing takes place in China, with a small share from European wholesalers and manufacturers; INDURA's own storage and repacking at Grønlandsvej 1, 7480 Vildbjerg, Denmark is included in module A3. The declared product groups are modelled as sales-weighted averages of the products sold within each group, rather than as a representative product or as individual product variants, since the products are supplied in a wide range of dimensions, geometries, wall thicknesses, pressure classes and steel grades. Product-specific data reflect INDURA's procurement data for the period 1 July 2025 to 29 June 2026, covering the sales weighting, the product prices and the item masses taken from invoice data. Storage energy at the Vildbjerg site is taken from INDURA's climate account for the 2025 calendar year. Background data are based on the ecoinvent 3.12 EN15804 database and are less than 10 years old.

The declared products are placed on the market in Denmark and Northern Europe. The end-of-life scenario in modules C1 to C4 accordingly represents disposal in that market, modelled on European average datasets representing waste processing in the Denmark and Northern Europe market.

Hazardous substances

The declared products do not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

The products are used as components in pipe systems. Flanges are mounted at pipe ends or on equipment to enable bolted assembly, disassembly and inspection of pipe sections, valves, pumps or other connected components. Butt-welded fittings are welded into pipe systems and are used to change direction, change dimension, branch the pipe system or close pipe ends. The products do not have an active function during use and do not require operational energy or water. Their function is mechanical: to provide a durable and tight connection or transition in the pipe system. The actual service conditions depend on the pipe system in which the products are installed, including pressure, temperature, medium, corrosion environment and maintenance conditions.

Essential characteristics

The declared flanges are manufactured to established material norms and product standards. The material norms are EN 10222-2 and EN 10028-2 for carbon steel and galvanized steel flanges, and EN 10222-5 for stainless steel flanges. Carbon steel flanges are manufactured to EN 1092-1, ASME B16.5, ASME B16.47, DIN 2527 /2566 /2576/ 2633 /2641 /2642 /2673 /86030 /86044 and JIS B2220. Galvanized steel flanges are manufactured to the same product standards as carbon steel flanges, with hot-dip galvanizing applied. Stainless steel flanges are manufactured to EN 1092-1, ASME B16.5, DIN 2519 /2576 /2642 /86044, EN 10222-5, EN 10272, EN 10028-7 and ASTM A182 /A182M. The relevant mechanical properties are stated per product group in the material properties table under LCA background.

No harmonised technical specification is referenced in the LCA underlying this EPD, and no declaration of performance is declared in this EPD.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: www.indura.com

Reference Service Life (RSL)

No Reference Service Life is declared. The products have no active function during use and modules B1-B7 are not declared, so EN 15804 does not require an RSL for this declaration. The service life in practice is governed by the pipe system in which the product is installed, including pressure, temperature, medium, corrosion environment and maintenance conditions.

Picture of product(s)



LCA background

Declared unit

The LCI and LCIA results in this EPD relate to 1 kg of product. The declared products are steel flanges in carbon steel, galvanized steel and stainless steel, declared as three separate sets of results. Modules A1-A3, C1-C4 and D are declared. Modules A4, A5 and B1-B7 are not declared and are marked ND. The declared total is A1-A3 plus C1-C4; module D is reported separately and is not included in that total.

Name	Value	Unit
Declared unit	1	kg of product

Functional unit

Not defined. The declared products have no use-stage function that can be expressed as a functional unit, so only a declared unit is used.

Material properties

The declaration covers a large number of item numbers within each product group, spanning dimensions, pressure classes, geometries and steel grades. The relevant material properties are therefore stated per product group as ranges, together with the product standards the group is manufactured to. The ranges are taken from the previously verified EPDs for the same product groups.

Property	C steel	Galv.	Stainl.
Yield strength [N/mm²]	165–355	165–355	205–220
Tensile strength [N/mm²]	330–630	330–630	520–860
Elongation [%]	15–30	15–30	min. 40
Impact energy [J]	27–48	27–48	min. 27–40
Hardness [HV10]	-	-	140–220
Density [kg/m³]	7850	7850	7900
Mass factor [kg/DU]	1	1	1
Metal input	1 (low-alloyed steel)	0.979 steel + 0.021 zinc	1 (stainless steel)
C steel = carbon steel flanges; Galv. = galvanized steel flanges; Stainl. = stainless steel flanges. Metal input in kg per kg of product.			

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019. No product-specific PCR or cPCR exists for steel flanges. The governing rules for this EPD are therefore EPD Denmark's PCR-A and the accompanying Technical Rules and Guidelines, applied together with EN 15804:2012+A2:2019.

Conversion factors

No conversion factors are needed. The declared unit is 1 kg of product and no alternative reference flow is declared.

Energy modelling principles

Foreground system: Manufacturing electricity is modelled using the national electricity market dataset for the country of manufacture, being China with a small share from European wholesalers and manufacturers. Storage and repacking at INDURA's own site in Vildbjerg, which is included in module A3, is modelled using the Danish residual grid mix for electricity and natural gas heat. No green electricity or biogas certificates are used in the LCA model, and no guarantees of origin are applied.

Information about the energy mix in the foreground system:

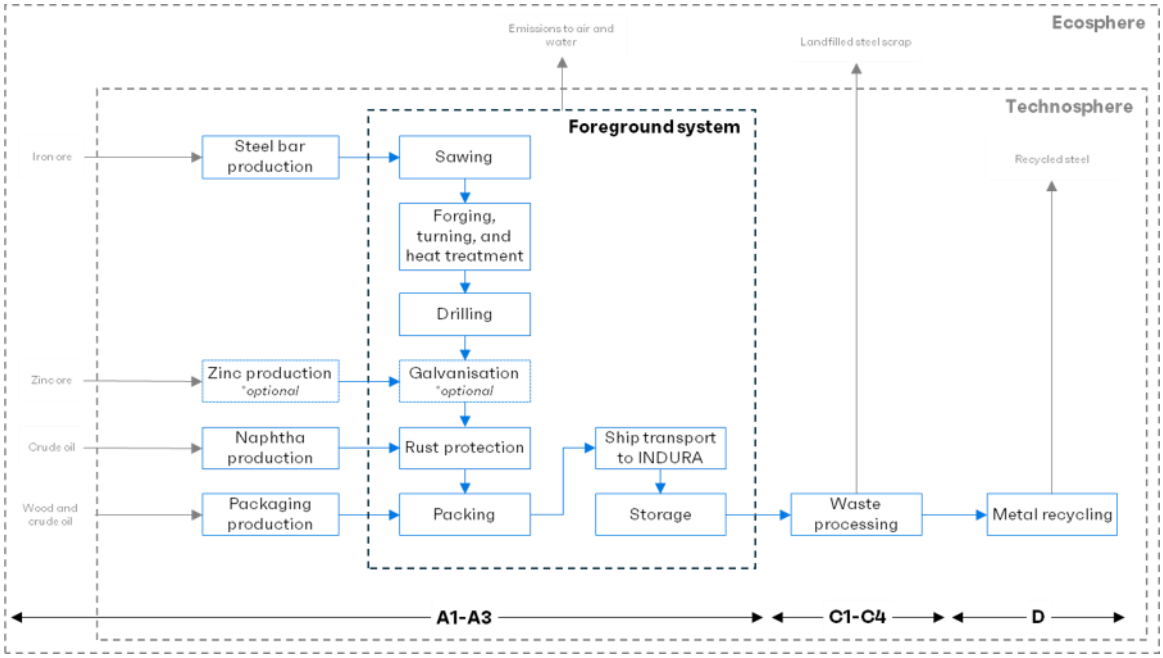
Energy mix	EF	Unit
Residual grid mix, Denmark, medium voltage	0.6467	kg CO2e/kWh
Natural gas heat, RER	0.07774	kg CO2e/MJ
Electricity, low voltage, China	0.9567	kg CO2e/kWh
Electricity, medium voltage, China	0.9449	kg CO2e/kWh

Background system: Background data are based on the ecoinvent 3.12 EN15804 database. Upstream steel production is modelled on rest-of-world proxy datasets, since the steel is bought on the steel market rather than produced to order. The end-of-life modules C1-C4 and the module D recovery are modelled using European average datasets representing waste processing in the Denmark and Northern Europe market, defined as the reference market for the end-of-life stage.

Data quality

Data quality has been assessed in accordance with Table E.2 of Annex E of EN 15804+A2, evaluating each dataset on geographical, technical and time representativeness with classifications from Very good to Very poor. Twenty-nine datasets are applied to the flange products. Time representativeness is Very good throughout, since all datasets run to 2025. Geographical representativeness is Good for most datasets, reflecting the use of rest-of-world data for Asian production, and Very good where the dataset geography covers the area under study. Technical representativeness is Very good or Good for all but two datasets, which are Fair because the dataset itself specifies no technology; these are the two lorry transport datasets. No dataset is assessed as Poor or Very poor. Completeness, consistency and precision have been assessed at the level of the study as a whole, as required by EN 15941: the inventory is complete with respect to the declared modules, allocation and cut-off are applied uniformly, and precision is limited by the use of generic background data for upstream steel production, with higher-precision foreground data taken from INDURA's own records. Two plausibility cross-checks were carried out and both passed.

Flowdiagram



Flow diagram for flanges. The diagram shows the included life cycle stages A1-A3, C1-C4 and D. Galvanisation and zinc production are marked optional, since they apply only to the galvanized steel flanges. Rust protection likewise applies only to the carbon steel and galvanized steel flanges; it is modelled with an amount of zero for the stainless steel flanges.

System boundary

This EPD is based on a cradle-to-gate LCA with modules C1-C4 and D.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5% of energy usage and mass and 1% of energy usage and mass for unit processes. The only quantified exclusion is the calorific value of the naphtha used for rust protection, at 0.0418 MJ/kg, which is below the threshold. This exclusion applies to the carbon steel and galvanized steel flanges only, since the stainless steel flanges are not rust protected.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Manufacturing (A3) starts from hot-rolled steel bar or forging stock, which is sawn to length and then forged, turned and heat treated to form the flange body. The faces and the bore are machined to the dimensional and surface requirements of the relevant product standard, and the bolt holes are drilled. Galvanized steel flanges then pass through hot-dip galvanising, which applies 0.021 kg of zinc per kg of finished product; this step applies only to the galvanized product group and is not part of the carbon steel or stainless steel routes. Carbon steel and galvanized steel flanges then receive a naphtha-based rust-protection coating at 0.00094 kg naphtha per kg of coated product before packing. Stainless steel flanges are not rust protected, since stainless steel is corrosion-resistant by composition; rust protection is modelled for the stainless steel group with an amount of zero, and the associated transport to and from the rust-protection site, 0.024 tkm for carbon steel and galvanized steel flanges, is not included for stainless steel. Manufacturing takes place in China, with a small share supplied by European wholesalers and manufacturers.

Finished flanges are shipped to INDURA's site at Grønlandsvej 1, 7480 Vildbjerg, Denmark, where they are received, stored and repacked for order fulfilment. This storage and repacking is included in module A3 and is modelled from INDURA's own energy consumption for the site, using the Danish residual grid mix for electricity and natural gas for heating. No green electricity or biogas certificates are applied. Sales packaging is added at this stage: 0.150 kg cardboard, 0.022 kg pallet wood, 0.00270 kg polyethylene mesh and 0.00003 kg PVC tape per kg of finished product.

Steel scrap arising during sawing, machining and drilling is accounted for by economic allocation within modules A1 and A2 and is not credited in module D. Because the declared products span a wide range of dimensions, pressure classes, geometries and steel grades, and may be supplied by different manufacturers through different production routes, the three product groups are modelled as average product groups based on representative product and supplier data rather than as individual product variants.

End of Life (C1-C4) includes:

The end-of-life scenario reflects current practice for steel construction products in Europe. Flanges and fittings are collected separately as scrap metal, since they are segregated by grade at demolition and have an established scrap value, and the scenario applies a 95% recycling rate with the remaining 5% landfilled or lost. The 95% rate corresponds to the end-of-life recycling rate applied in the World Steel Association's LCA eco-profiles for European construction steel products, which the industry reports as representative of current practice for those products. The scenario is therefore one of the most likely alternatives rather than a best case, and the 5% loss is retained as a deliberate conservatism against declaring full recovery. No reuse and no energy recovery are assumed, since neither is established practice for these products. Per 1 kg of declared product, 1 kg is collected separately, 0.95 kg goes to recycling and 0.05 kg to final disposal; no reuse and no energy recovery are assumed. C1 covers de-construction, C2 transport of the collected scrap, C3 waste processing of the recovered steel and C4 disposal of the residual fraction.

Re-use, recovery and recycling potential (D) includes:

Module D covers only the end-of-life recovery declared in module C3. Of the 1 kg declared product, 0.950 kg of steel is recovered for recycling in C3, and the resulting benefit beyond the system boundary is modelled as avoided production of pig iron, using the ecoinvent process market for pig iron, RoW. Module D is not a credit for manufacturing scrap: scrap arising in production is accounted for by economic allocation within modules A1 and A2 and is therefore excluded from module D. Module D is reported separately and is not included in the declared total of A1-A3 plus C1-C4.

LCA results

Carbon steel flanges

ENVIRONMENTAL IMPACTS PER 1 KG OF CARBON STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	4.82E+00	0.00E+00	9.29E-03	2.15E-02	3.13E-04	-9.30E-01
GWP-fossil	[kg CO_2 eq.]	4.68E+00	0.00E+00	8.80E-03	2.15E-02	3.13E-04	-9.33E-01
GWP-biogenic	[kg CO_2 eq.]	1.39E-01	0.00E+00	1.54E-04	0.00E+00	9.91E-08	3.56E-03
GWP-luluc	[kg CO_2 eq.]	7.41E-03	0.00E+00	3.30E-04	2.35E-05	1.78E-07	-2.19E-04
ODP	[kg CFC 11 eq.]	3.62E-08	0.00E+00	3.38E-10	3.03E-10	9.14E-12	-5.15E-09
AP	[mol H^+ eq.]	2.54E-02	0.00E+00	3.89E-05	2.53E-04	2.16E-06	-2.90E-03
EP-freshwater	[kg P eq.]	1.69E-03	0.00E+00	7.65E-07	1.46E-05	2.76E-08	-3.71E-04
EP-marine	[kg N eq.]	7.11E-03	0.00E+00	1.75E-05	5.67E-05	8.54E-07	-7.87E-04
EP-terrestrial	[mol N eq.]	7.45E-02	0.00E+00	1.61E-04	6.39E-04	9.29E-06	-8.44E-03
POCP	[kg NMVOC eq.]	2.22E-02	0.00E+00	5.79E-05	1.89E-04	3.36E-06	-2.90E-03
ADPm[1]	[kg Sb eq.]	2.55E-05	0.00E+00	3.26E-08	1.51E-06	4.75E-10	-5.61E-07
ADPf[1]	[MJ]	5.27E+01	0.00E+00	1.29E-01	2.84E-01	7.64E-03	-9.78E+00
WDP[1]	[m^3 world eq. deprived]	1.27E+00	0.00E+00	9.92E-04	5.45E-03	3.36E-04	-6.36E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.					
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.					
	Each flange declaration covers a large number of item numbers within the product group, spanning dimensions, pressure classes, geometries and steel grades, and the declared results are sales-weighted averages across those variants. The variability arises between suppliers rather than between dimensions: suppliers producing the same product type report different raw material input per kg of finished product, and where a supplier differentiates internally the driver is product type and forming route rather than nominal diameter. For carbon steel flanges, five suppliers covering 70.7% of the group tonnage report input factors from 1.45 to 1.80, and 86.2% of that covered tonnage lies within a 10% band around the weighted average. A declaration split by flange type would therefore not reduce the spread.					

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG OF CARBON STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	3.99E-07	0.00E+00	1.05E-09	3.48E-09	5.06E-11	-7.07E-08
IRP[2]	[kBq U235 eq.]	1.43E-01	0.00E+00	1.20E-04	2.28E-03	4.41E-06	-1.03E-02
ETP-fw[1]	[CTUe]	2.68E+01	0.00E+00	4.92E-02	1.74E-01	9.54E-04	-2.63E+00
HTP-c[1]	[CTUh]	3.09E-09	0.00E+00	2.41E-12	1.85E-11	5.48E-14	-1.34E-09
HTP-nc[1]	[CTUh]	1.66E-07	0.00E+00	1.31E-10	1.39E-09	3.03E-12	-1.56E-08
SQP[1]	-	3.01E+01	0.00E+00	1.68E-01	5.55E-01	1.51E-02	-2.05E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	[2] 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.						

RESOURCE USE PER 1 KG OF CARBON STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.21E+00	0.00E+00	2.89E-03	5.34E-02	7.11E-05	-2.15E-01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.21E+00	0.00E+00	2.89E-03	5.34E-02	7.11E-05	-2.15E-01
PENRE	[MJ]	5.23E+01	0.00E+00	1.31E-01	2.84E-01	7.64E-03	-9.78E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.23E+01	0.00E+00	1.31E-01	2.84E-01	7.64E-03	-9.78E+00
SM	[kg]	7.52E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	1.80E-02	0.00E+00	7.81E-07	1.64E-05	3.98E-08	-1.24E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	5.26E-03	0.00E+00	3.21E-05	1.25E-04	7.89E-06	-1.76E-03
Caption	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						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG OF CARBON STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	3.20E+00	0.00E+00	9.14E-04	4.33E-02	2.48E-05	-1.69E-01
NHWD	[kg]	1.82E+01	0.00E+00	1.66E-02	8.26E-02	5.02E-02	-1.89E+00
RWD	[kg]	1.04E-05	0.00E+00	8.36E-09	1.38E-07	3.03E-10	-6.38E-07
CRU	[kg]	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	7.09E-01	0.00E+00	3.58E-06	9.50E-01	2.56E-07	-1.11E-03
MER	[kg]	1.69E-05	0.00E+00	8.33E-09	4.64E-08	1.38E-10	-3.17E-07
EEE	[MJ]	1.37E-02	0.00E+00	1.37E-05	4.16E-04	4.72E-07	-1.41E-03
EET	[MJ]	1.42E-02	0.00E+00	1.58E-05	5.03E-05	2.63E-07	-1.22E-03
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

BIOGENIC CARBON CONTENT PER 1 KG OF CARBON STEEL FLANGES		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	0.0755
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2 Module A5 is not declared, because installation depends on the individual project and is not representative at product level. The end of life of the packaging is therefore modelled in module A3, and the declared A1-A3 results include the forced balance reporting of the biogenic CO2 from the packaging that would otherwise be disposed of in module A5. The biogenic carbon in the packaging is 0.0755 kg C per kg of product, equivalent to 0.27683 kg CO2 eq., which is the quantity included in A1-A3 but belonging in A5. The packaging biogenic carbon content exceeds 5% of the declared unit, so the conversion to CO2 equivalent is declared.	

Galvanized steel flanges

ENVIRONMENTAL IMPACTS PER 1 KG OF GALVANIZED STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	5.24E+00	0.00E+00	9.29E-03	2.15E-02	3.13E-04	-1.29E+00
GWP-fossil	[kg CO_2 eq.]	5.09E+00	0.00E+00	8.80E-03	2.15E-02	3.13E-04	-1.30E+00
GWP-biogenic	[kg CO_2 eq.]	1.40E-01	0.00E+00	1.54E-04	0.00E+00	9.91E-08	4.96E-03
GWP-luluc	[kg CO_2 eq.]	7.66E-03	0.00E+00	3.30E-04	2.35E-05	1.78E-07	-3.04E-04
ODP	[kg CFC 11 eq.]	3.93E-08	0.00E+00	3.38E-10	3.03E-10	9.14E-12	-7.16E-09
AP	[mol H^+ eq.]	2.74E-02	0.00E+00	3.89E-05	2.53E-04	2.16E-06	-4.04E-03
EP-freshwater	[kg P eq.]	2.10E-03	0.00E+00	7.65E-07	1.46E-05	2.76E-08	-5.16E-04
EP-marine	[kg N eq.]	7.42E-03	0.00E+00	1.75E-05	5.67E-05	8.54E-07	-1.09E-03
EP-terrestrial	[mol N eq.]	7.98E-02	0.00E+00	1.61E-04	6.39E-04	9.29E-06	-1.17E-02
POCP	[kg NMVOC eq.]	2.36E-02	0.00E+00	5.79E-05	1.89E-04	3.36E-06	-4.03E-03
ADPm[1]	[kg Sb eq.]	8.27E-05	0.00E+00	3.26E-08	1.51E-06	4.75E-10	-7.80E-07
ADPf[1]	[MJ]	5.67E+01	0.00E+00	1.29E-01	2.84E-01	7.64E-03	-1.36E+01
WDP[1]	[m^3 world eq. deprived]	1.29E+00	0.00E+00	9.92E-04	5.45E-03	3.36E-04	-8.85E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.					
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.					

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG OF GALVANIZED STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	4.30E-07	0.00E+00	1.05E-09	3.48E-09	5.06E-11	-9.83E-08
IRP[2]	[kBq U235 eq.]	1.56E-01	0.00E+00	1.20E-04	2.28E-03	4.41E-06	-1.44E-02
ETP-fw[1]	[CTUe]	4.06E+01	0.00E+00	4.92E-02	1.74E-01	9.54E-04	-3.65E+00
HTP-c[1]	[CTUh]	3.84E-09	0.00E+00	2.41E-12	1.85E-11	5.48E-14	-1.87E-09
HTP-nc[1]	[CTUh]	1.08E-07	0.00E+00	1.31E-10	1.39E-09	3.03E-12	-2.17E-08
SQP[1]	-	3.24E+01	0.00E+00	1.68E-01	5.55E-01	1.51E-02	-2.85E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	[2] 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.						

RESOURCE USE PER 1 KG OF GALVANIZED STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	3.01E+00	0.00E+00	2.89E-03	5.34E-02	7.11E-05	-2.99E-01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.01E+00	0.00E+00	2.89E-03	5.34E-02	7.11E-05	-2.99E-01
PENRE	[MJ]	5.63E+01	0.00E+00	1.31E-01	2.84E-01	7.64E-03	-1.36E+01
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.63E+01	0.00E+00	1.31E-01	2.84E-01	7.64E-03	-1.36E+01
SM	[kg]	3.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	1.80E-02	0.00E+00	7.81E-07	1.64E-05	3.98E-08	-1.72E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.46E-02	0.00E+00	3.21E-05	1.25E-04	7.89E-06	-2.45E-03
Caption	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						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG OF GALVANIZED STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	4.77E+00	0.00E+00	9.14E-04	4.33E-02	2.48E-05	-2.36E-01
NHWD	[kg]	1.08E+01	0.00E+00	1.66E-02	8.26E-02	5.02E-02	-2.63E+00
RWD	[kg]	1.21E-05	0.00E+00	8.36E-09	1.38E-07	3.03E-10	-8.87E-07
CRU	[kg]	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	5.49E-01	0.00E+00	3.58E-06	9.50E-01	2.56E-07	-1.55E-03
MER	[kg]	2.41E-05	0.00E+00	8.33E-09	4.64E-08	1.38E-10	-4.41E-07
EEE	[MJ]	1.43E-02	0.00E+00	1.37E-05	4.16E-04	4.72E-07	-1.96E-03
EET	[MJ]	2.08E-02	0.00E+00	1.58E-05	5.03E-05	2.63E-07	-1.70E-03
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

BIOGENIC CARBON CONTENT PER 1 KG OF GALVANIZED STEEL FLANGES		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	0.0755
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2 Module A5 is not declared, because installation depends on the individual project and is not representative at product level. The end of life of the packaging is therefore modelled in module A3, and the declared A1-A3 results include the forced balance reporting of the biogenic CO2 from the packaging that would otherwise be disposed of in module A5. The biogenic carbon in the packaging is 0.0755 kg C per kg of product, equivalent to 0.27683 kg CO2 eq., which is the quantity included in A1-A3 but belonging in A5. The packaging biogenic carbon content exceeds 5% of the declared unit, so the conversion to CO2 equivalent is declared.	

Stainless steel flanges

ENVIRONMENTAL IMPACTS PER 1 KG OF STAINLESS STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	8.78E+00	0.00E+00	1.14E-02	2.15E-02	3.13E-04	-8.48E-01
GWP-fossil	[kg CO_2 eq.]	8.57E+00	0.00E+00	1.14E-02	2.15E-02	3.13E-04	-8.51E-01
GWP-biogenic	[kg CO_2 eq.]	2.00E-01	0.00E+00	6.16E-06	0.00E+00	9.91E-08	3.25E-03
GWP-luluc	[kg CO_2 eq.]	1.28E-02	0.00E+00	3.86E-06	2.35E-05	1.78E-07	-1.99E-04
ODP	[kg CFC 11 eq.]	6.82E-08	0.00E+00	2.60E-10	3.03E-10	9.14E-12	-4.69E-09
AP	[mol H^+ eq.]	5.16E-02	0.00E+00	5.15E-05	2.53E-04	2.16E-06	-2.65E-03
EP-freshwater	[kg P eq.]	6.85E-03	0.00E+00	8.19E-07	1.46E-05	2.76E-08	-3.38E-04
EP-marine	[kg N eq.]	1.14E-02	0.00E+00	2.07E-05	5.67E-05	8.54E-07	-7.17E-04
EP-terrestrial	[mol N eq.]	1.20E-01	0.00E+00	2.25E-04	6.39E-04	9.29E-06	-7.69E-03
POCP	[kg NMVOC eq.]	3.56E-02	0.00E+00	7.98E-05	1.89E-04	3.36E-06	-2.64E-03
ADPm[1]	[kg Sb eq.]	1.87E-04	0.00E+00	3.85E-08	1.51E-06	4.75E-10	-5.11E-07
ADPf[1]	[MJ]	9.91E+01	0.00E+00	1.64E-01	2.84E-01	7.64E-03	-8.92E+00
WDP[1]	[m^3 world eq. deprived]	2.76E+00	0.00E+00	8.98E-04	5.45E-03	3.36E-04	-5.80E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.					
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.					

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG OF STAINLESS STEEL FLANGES

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease incidence]	7.10E-07	0.00E+00	1.12E-09	3.48E-09	5.06E-11	-6.44E-08
IRP[2]	[kBq U235 eq.]	4.57E-01	0.00E+00	1.94E-04	2.28E-03	4.41E-06	-9.41E-03
ETP-fw[1]	[CTUe]	9.49E+01	0.00E+00	2.42E-02	1.74E-01	9.54E-04	-2.39E+00
HTP-c[1]	[CTUh]	6.58E-09	0.00E+00	2.84E-12	1.85E-11	5.48E-14	-1.22E-09
HTP-nc[1]	[CTUh]	1.80E-07	0.00E+00	1.39E-10	1.39E-09	3.03E-12	-1.42E-08
SQP[1]	-	5.64E+01	0.00E+00	1.23E-01	5.55E-01	1.51E-02	-1.87E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	[2] 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.						

RESOURCE USE PER 1 KG OF STAINLESS STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	1.89E+01	0.00E+00	2.75E-03	5.34E-02	7.11E-05	-1.96E-01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.89E+01	0.00E+00	2.75E-03	5.34E-02	7.11E-05	-1.96E-01
PENRE	[MJ]	9.88E+01	0.00E+00	1.64E-01	2.84E-01	7.64E-03	-8.92E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	9.88E+01	0.00E+00	1.64E-01	2.84E-01	7.64E-03	-8.92E+00
SM	[kg]	7.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	1.95E-02	0.00E+00	9.30E-07	1.64E-05	3.98E-08	-1.13E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	6.31E-02	0.00E+00	2.05E-05	1.25E-04	7.89E-06	-1.61E-03
Caption	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						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG OF STAINLESS STEEL FLANGES							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	2.71E+01	0.00E+00	9.76E-04	4.33E-02	2.48E-05	-1.54E-01
NHWD	[kg]	2.04E+01	0.00E+00	1.55E-02	8.26E-02	5.02E-02	-1.72E+00
RWD	[kg]	4.04E-05	0.00E+00	1.16E-08	1.38E-07	3.03E-10	-5.81E-07
CRU	[kg]	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	5.02E-01	0.00E+00	4.70E-06	9.50E-01	2.56E-07	-1.02E-03
MER	[kg]	1.03E-04	0.00E+00	7.80E-09	4.64E-08	1.38E-10	-2.89E-07
EEE	[MJ]	2.94E-02	0.00E+00	3.16E-05	4.16E-04	4.72E-07	-1.28E-03
EET	[MJ]	1.19E-01	0.00E+00	6.87E-05	5.03E-05	2.63E-07	-1.11E-03
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: 1.95*102 or 195, while 1.12E-11 is the same as 1.12*10-11 or 0.0000000000112.						

BIOGENIC CARBON CONTENT PER 1 KG OF STAINLESS STEEL FLANGES		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	0.0755
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2 Module A5 is not declared, because installation depends on the individual project and is not representative at product level. The end of life of the packaging is therefore modelled in module A3, and the declared A1-A3 results include the forced balance reporting of the biogenic CO2 from the packaging that would otherwise be disposed of in module A5. The biogenic carbon in the packaging is 0.0755 kg C per kg of product, equivalent to 0.27683 kg CO2 eq., which is the quantity included in A1-A3 but belonging in A5. The packaging biogenic carbon content exceeds 5% of the declared unit, so the conversion to CO2 equivalent is declared.	

Additional information

LCA interpretation

The steel itself dominates the results for all three products. For carbon steel flanges the product stage A1-A3 is 4.82 kg CO2 eq. per kg, of which raw material supply (A1) is 51.5% and manufacturing (A3) 47.5%; transport to the production site (A2) is around 1%. Galvanized steel flanges are slightly higher at 5.24 kg CO2 eq. per kg, reflecting the zinc coating in addition to the steel. Stainless steel flanges are the highest at 8.78 kg CO2 eq. per kg, and here raw material supply dominates more strongly at 73.5%, because alloying elements make the stainless steel feedstock more impact-intensive than the manufacturing step. The end-of-life modules C1-C4 are minor for all three products at approximately 0.03 kg CO2 eq. per kg, since the products are collected as scrap metal and require no treatment beyond sorting and transport. Module D shows a net benefit of -0.930, -1.29 and -0.848 kg CO2 eq. per kg for carbon, galvanized and stainless steel respectively, from recycling the recovered steel as a substitute for primary pig iron production. Module D is reported separately and is not included in the declared total of A1-A3 plus C1-C4.

Technical information on scenarios

End of life (C1-C4)

Scenario information		Value	Unit
Collected separately		1.00	kg
Collected with mixed waste		0	kg
For reuse		0	kg
For recycling		0.95	kg
For energy recovery		0	kg
For final disposal		0.05	kg
Assumptions for scenario development	The end-of-life scenario reflects current practice for steel construction products in Europe. Flanges and fittings are collected separately as scrap metal, since they are segregated by grade at demolition and have an established scrap value, and the scenario applies a 95% recycling rate with the remaining 5% landfilled or lost. The 95% rate corresponds to the end-of-life recycling rate applied in the World Steel Association's LCA eco-profiles for European construction steel products, which the industry reports as representative of current practice for those products. The scenario is therefore one of the most likely alternatives rather than a best case, and the 5% loss is retained as a deliberate conservatism against declaring full recovery. No reuse and no energy recovery are assumed, since neither is established practice for these products.		

Re-use, recovery and recycling potential (D)

Scenario information/Material	Value	Unit
Displaced material (avoided pig iron production, from 0.950 kg steel recovered in C3)	0.950	kg
Energy recovery from waste incineration	0	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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LCA-practitioner	*Lasse Vinblad Thaisen* *Viegand Maagøe A/S,* *Nørre Søgade 35, 1370* *Copenhagen, Denmark*
LCA software /background data	*Project-specific model built in Excel; no commercial LCA software used.* *Background data: ecoinvent 3.12 EN15804 database, with characterisation factors as supplied with the ecoinvent EN 15804 package EN 15804 reference package 3.1*
3rd party verifier	*David Althoff Palm, Dalemarken AB* Verified according to Verification Checklist 1 v. 2.9.1

General programme instructions
General Programme Instructions, version 3.0, spring 2025
www.epddanmark.dk

Technical Rules and Guidelines
Technical Rules and Guidelines, version 1.0, spring 2025
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product-specific cPCR
Institut Bauen und Umwelt e.V., complementary Product Category Rules for steel pipes for pressure applications. Considered and not applied as governing for these EPDs, for the reasons given in section 1.

Product standards referenced in the EPD
EN 1092-1, "Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated", as the primary product standard for the declared flanges. Material norms EN 10222-2 and

EN 10028-2 for carbon steel and galvanized steel flanges, and EN 10222-5 for stainless steel flanges. The full list of product standards per declared product group is given under Essential characteristics.

Other literature used in the EPD

World Steel Association, LCA eco-profiles for steel products, European construction-sector profiles. The 95% end-of-life recycling rate applied in these eco-profiles is the basis for the end-of-life scenario in modules C3 and C4, as set out in section 4.1.6. https://worldsteel.org/wider-sustainability/life-cycle-thinking/lca-eco-profiles-2026-release/ (accessed 27 August 2026)

Shanghai Metals Market, China Steel Scrap Index. Period average 17 April to 14 August 2026, 82 observations. https://www.metal.com/steel-scrap/202309190196

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EN 15941

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EN 15942

DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025

DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

ISO 14044

DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"