

Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

[Groove fittings]

EPD of multiple products, based on average results of the included products
Products included are listed in Appendix 1.

from

[JINAN MEIDE CASTING CO., LTD.]



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0022898
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>PCR 2019:14, Construction Products, Version 1.3.4 valid until: 2025.6.20</i>
PCR review was conducted by: <i>The technical Committee of the International EPD System. Review chair: Maurizio Feschi. The review panel may be contacted via info@environdec.com</i>
Life Cycle Assessment (LCA)
LCA accountability: <i>JINAN MEIDE CASTING CO., LTD.</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ EPD verification by accredited certification body
Third-party verification: <Pin Tian, Bureau Veritas Certification Sweden AB> is an approved certification body accountable for the third-party verification
The certification body is accredited by: < Bureau Veritas Certification Sweden AB, accredited by SWEDEC with accreditation number 1236>
Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☒ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: JINAN MEIDE CASTING CO., LTD.

Contact: Joe Zuo, zhiqiang.zuo@meide-casting.com

Description of the organisation: JINAN MEIDE CASTING CO., LTD. (Meide Group), established in 1961, is a global leader in fluid conveyance solutions with diversified operations across 140+ countries. Specializing in water supply, fire protection, gas systems, and infrastructure projects (e.g., New York World Trade Center, Shanghai Tower), the group operates nine manufacturing bases in China (Jinan, Linyi, Tai'an, etc.) and overseas (Thailand, Vietnam, Poland), supported by 22 digital factories and 2 overseas representative offices. Spanning 3.8 km² with 12,000+ employees (2,000+ overseas), it drives innovation through its national R&D center, 900+ patents, and leadership in drafting 100+ industry standards. Recognized as a "Top 100 Chinese Light Industry Enterprise" and "Green Foundry Demonstration Company," Meide Group holds 400+ honors for technological excellence and operational integrity.

Product-related or management system-related certifications: JINAN MEIDE CASTING CO., LTD.

International is certified for: ISO 9001, ISO 14001, ISO 45001 [

Name and location of production site(s): JINAN MEIDE CASTING CO., LTD., Yashangcun, Tuanlin Town, Lingang Economic Development Zone (Intersection of Lushan East Road and Jinxiu 3 Road), Linyi Shandong 276616 CN

Product information

Product name: Groove fittings

Product identification: Groove fittings

Product description: Groove fittings are an innovative steel pipe connection method that tightly connects steel pipes and fittings through mechanical connectors, with the characteristics of easy operation and excellent seal-ing performance. Its working principle is to use special mechanical connectors such as sealing rubber rings, clamps, and locking bolts to connect steel pipes and fittings together. The specific installation steps include: inserting the grooved steel pipe into the saddle shaped sealing ring, rotating the sealing ring to the center of the interface, then installing upper and lower clamps on the outside of the sealing ring, tightening the clamp ears and alternately tightening the nuts to ensure the sealing effect.

UN CPC code: 412

Geographical scope: Global

LCA information

Functional unit / declared unit: 1 kg of Groove fittings

Reference service life: Not applicable

Time representativeness: Data input was collected in January 2024 - December 2024.

Database(s) and LCA software used: Ecoinvent v3.11, SimaPro 10.2.0.0

Description of system boundaries: Cradle to gate, with options (A1-A3, A4, A5, C1-C4, D)

The following information describes the scenarios in the different modules of the EPD.

Module A1-A3 = Sourcing of raw materials from China. Prioritize using primary data and use database data when the quality of primary data is poor or missing. Electricity is matched based on regions, and the emission factor of State Grid electricity used is refer to "Electricity, medium voltage {CN-NCGC}| market for electricity, medium voltage | Cut-off, U". Photovoltaic power emission factor is refer to "Electricity, low voltage {CN-SD}| electricity production, photovoltaic, 570kWp open ground installation,

multi-Si | Cut-off, U”.

Module A4 = Global transportation refers to the actual sea freight distance. Domestic transportation is calculated based on an average of 1000km. For road transportation, calculations are made based on trucks with a carrying capacity of 16-32 tons. For sea transportation, calculations are made based on container ship.

Module A5 = Manual installation without energy consumption.

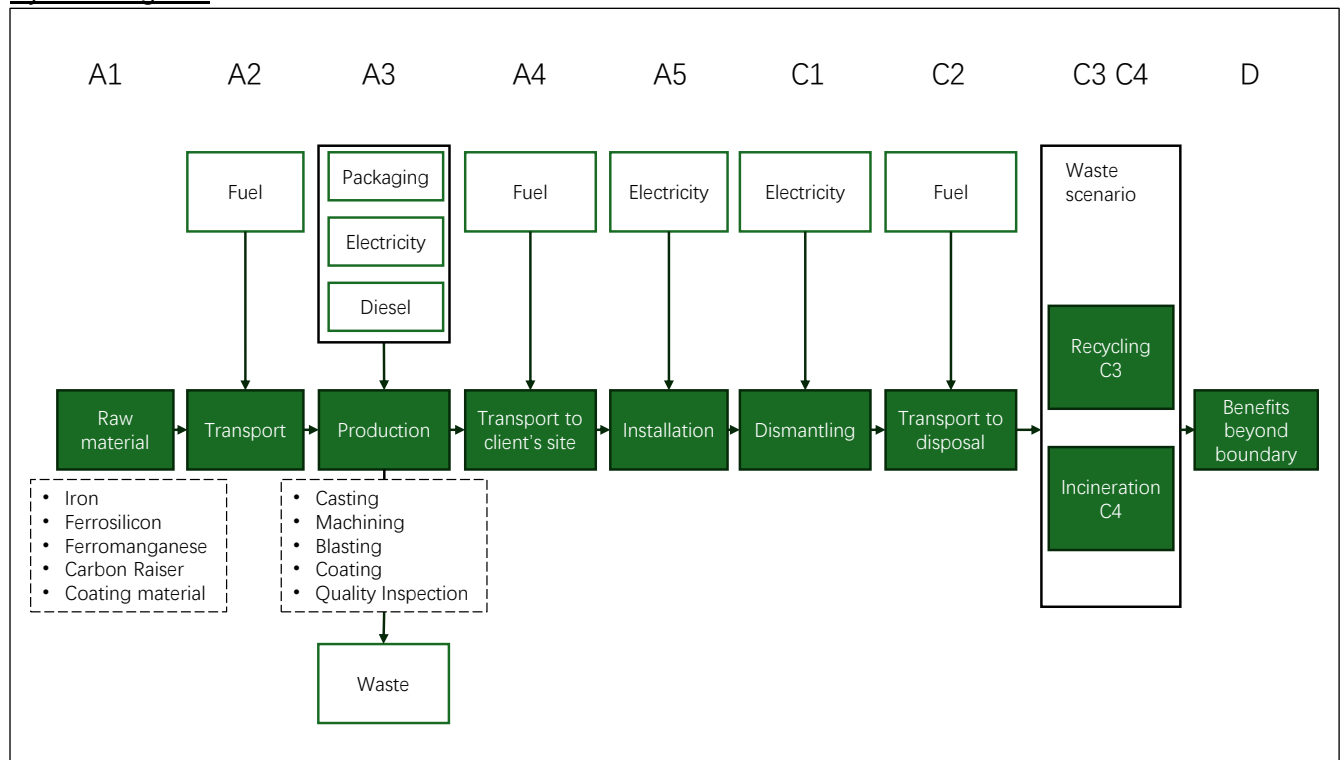
Module C1 = The removal process of the product aligns with its installation phase.

Module C2 = Transportation from dismantling site to waste treatment facility with an average of 50 km. For road transportation, calculations are made based on trucks with a carrying capacity of 16-32 tons.

Module C3, and C4 = Waste treatment of the product. The main component of the product is metal, assuming 85% goes into recycling disposal and 15% goes into incineration disposal without energy recovery. The assumption of 85% recycling rate is referred to the “Annual Research and Consultation Report of Panorama survey and Investment strategy on China Industry”-CIRN and Sweden scenario.

Module D = Benefits beyond the system are tied to the recycling of metals, and the subsequent substitution of iron cf. Annex D in 15804+A2.

System diagram:



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	CN	CN	CN	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	34.6%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Specific data used - the proportion of primary data in the raw material acquisition stage is 31.6%, the proportion of primary data transported upstream to the manufacturing site is 0.7%, the proportion of primary data in the manufacturing stage is 2.2%, and the total proportion of primary data in stages A1-A3 is 34.6%

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Iron	9.52E-01	13%	0
Ferrosilicon	2.92E-02	0	0
Ferromanganese	5.03E-03	0	0
Carbon Raiser	3.37E-03	0	0
Coating	1.02E-02	0	0
TOTAL	1		
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Wood	4.71E-02	4.7%	0
Plastic	3.01E-04	0.03%	0
Corrugated box	3.10E-02	3.1%	0
TOTAL	7.85E-02		

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
NA	NA	NA	NA

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	3.23E+00	1.37E-01	0.00E+00	0.00E+00	7.75E-03	5.36E-02	2.67E-03	-1.83E+00
GWP-biogenic	kg CO ₂ eq.	1.08E-02	6.61E-05	0.00E+00	0.00E+00	2.59E-05	5.48E-06	1.30E-06	-8.18E-04
GWP-luluc	kg CO ₂ eq.	-2.28E-02	4.02E-05	0.00E+00	0.00E+00	1.35E-05	1.08E-05	3.41E-06	-2.66E-03
GWP-total	kg CO ₂ eq.	3.22E+00	1.37E-01	0.00E+00	0.00E+00	7.79E-03	5.36E-02	2.68E-03	-1.84E+00
ODP	kg CFC 11 eq.	9.99E-09	1.91E-09	0.00E+00	0.00E+00	1.24E-10	7.96E-10	5.59E-11	-9.79E-09
AP	mol H ⁺ eq.	1.46E-02	9.94E-04	0.00E+00	0.00E+00	3.57E-05	4.79E-04	1.50E-05	-7.49E-03
EP-freshwater	kg N eq.	7.54E-04	1.34E-05	0.00E+00	0.00E+00	8.31E-07	1.73E-06	1.96E-06	-1.26E-03
EP-marine	kg P eq.	3.13E-03	2.44E-04	0.00E+00	0.00E+00	1.34E-05	2.23E-04	5.73E-06	-1.66E-03
EP-terrestrial	mol N eq.	3.34E-02	2.69E-03	0.00E+00	0.00E+00	1.44E-04	2.44E-03	6.26E-05	-1.78E-02
POCP	kg NMVOC eq.	1.02E-02	9.24E-04	0.00E+00	0.00E+00	4.99E-05	7.30E-04	2.15E-05	-5.96E-03
ADP-minerals&metals*	kg Sb eq.	3.32E-06	3.92E-07	0.00E+00	0.00E+00	2.50E-08	1.91E-08	7.51E-09	-1.67E-05
ADP-fossil*	MJ	3.37E+01	1.90E+00	0.00E+00	0.00E+00	1.10E-01	6.97E-01	4.39E-02	-1.92E+01
WDP*	m ³	2.84E-01	8.55E-03	0.00E+00	0.00E+00	5.46E-04	1.51E-03	1.17E-03	-4.57E-01
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Additional mandatory and voluntary impact category indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	3.24E+00	1.37E-01	0.00E+00	0.00E+00	7.78E-03	5.36E-02	2.68E-03	-1.84E+00

Resource use indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	0	0	0	0	0	0	0	0
PERM	MJ	1.52E+00	2.53E-02	0.00E+00	0.00E+00	1.67E-03	4.39E-03	8.80E-04	-2.15E+00
PERT	MJ	1.52E+00	2.53E-02	0.00E+00	0.00E+00	1.67E-03	4.39E-03	8.80E-04	-2.15E+00
PENRE	MJ	0	0	0	0	0	0	0	0
PENRM	MJ	3.58E+01	2.02E+00	0.00E+00	0.00E+00	1.17E-01	7.42E-01	4.68E-02	-2.04E+01
PENRT	MJ	3.58E+01	2.02E+00	0.00E+00	0.00E+00	1.17E-01	7.42E-01	4.68E-02	-2.04E+01
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m ³	3.07E-01	8.48E-03	0	0	5.43E-04	1.49E-03	1.17E-03	-4.15E-01
Acronyms	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 used as raw materials; 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2.44E-04	1.23E-05	0.00E+00	0.00E+00	7.37E-07	4.86E-06	3.19E-07	-1.67E-04
Non-hazardous waste disposed	kg	1.80E-01	9.66E-02	0.00E+00	0.00E+00	6.98E-03	4.72E-04	1.01E-01	-1.32E-01
Radioactive waste disposed	kg	9.75E-06	3.64E-07	0.00E+00	0.00E+00	2.40E-08	7.30E-08	1.27E-08	-1.64E-05

Output flow indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	1.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E-01	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional environmental information

Cut-off criteria:

The general rules apply for the exclusion of inputs and outputs in the LCA which complies with 15804:2012+A2:2019. 6.3.6. In cases of insufficient input data or data gaps for a unit process, the cutoff criteria shall be 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that. The total neglected input flows, e.g., per module A1-A3, A4-A5, and B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass.

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances. See the PCR and sections 5.4, 7.3 and 7.4 in EN 15804.

Allocation rules:

Allocation is made according to the proportion of the target product's output to the total output of the entire factory. During the calculation process, the consumption of energy/resources and the generation of waste, etc., are all apportioned based on this principle.

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2019:14. CONSTRUCTION PRODUCTS. VERSION 1.3.4

ISO 14040:2006 Environmental management - Life cycle assessment-Principles and Framework

ISO 14044:2006 Environmental management - Life cycle assessment – Requirements and guidelines

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declaration -

Core rules for the product category of construction products

Appendix 1

Included products

No.	Product Model	Size	No.	Product Model	Size
1	90	DN15- DN800	23	131P	DN15- DN800
2	90-1.5D		24	180	
3	90C		25	180X	
4	90R		26	180R	
5	90S		27	180RX	
6	90X		28	181	
7	90CZ		29	181RX	
8	91R		30	220N	
9	105		31	230	
10	110		32	230N	
11	110X		33	240	
12	120		34	240X	
13	120X		35	240N	
14	130		36	240NX	
15	130C		37	240W	
16	130D		38	300	
17	130S		39	300PX	
18	130R		40	321	
19	130X		41	321G	
20	130RX		42	NG	
21	131R		43	NHG	
22	131RX		44	NGG	

