SuMPO EPD JAPAN VERIFIED SuMPO EPD
Type III Environmental Declaration (EPD)
Registration number : JR-AW-24032E

Japan EPD Program by SuMPO
Sustainable Management Promotion Organization
14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo Japan
https ://ecoleaf-label.jp

NIPPON STEEL | NIPPON STEEL CORPORATION

Die Forgings (Heat treated)

Crankshafts for passenger cars

Crankshafts for trucks and buses

Front axle beams

Landing gear for aircraft

Functional unit

1 t

System boundary

☐ final products ■intermediate products

Production Stage and optional supplementary infomation

Main specifications of the product

Production sites : Kansai Works(Wakayama,Osaka)

Products : Crankshafts , Front axle beams , Aircraft parts

Main standards :
ISO9001,IATF16949,JISQ9100

Main sizes(unit ㎜ L length)
Crankshafts : L 300-3000mm (<2000kg)
Front axle beams : L 700-2000mm(<150kg)

Company Information

NIPPON STEEL CORPORATION
https ://www.nipponsteel.com/en/product/railway-automotive-machinery-parts/

Registration#	JR-AW-24032E
PCR number	PA-180000-AW-05
PCR name	Steel products except for construction use
Publication date	11/29/2024
Verification date	09/12/2024
Verification method	Product-by-product
Verification#	JV-AW-24032
Expiration date	09/11/2029

PCR review was conducted by:

Approval date	05/10/2023
PCR review panel chair	Yasunari Matsuno (Chiba University)

Third party verifier*

Hiroyuki Uchida

Independent verification of data & declaration in accordance with ISO14025

☐internal ■external

*Auditor's name is stated if system certification has been performed.

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1. Results of life cycle impact assessment (LCIA)

Parameter \ Stage	(1)+(2)+(3)	(1)+(2)	Unit
Global warming IPCC2013 GWP100a	3000	4200	kg-CO_2eq
Acidification	2.0	3.8	kg-SO_2eq
Eutrophication	0.057	0.079	kg-PO_4^{3-}eq

Table Legend
(1)Raw material supply
(2)Production
(3)Recycling potential
(1)+(2):sum of (1)and(2) (cradle to gate)
(1)+(2)+(3): sum of (1),(2)and(3) (cradle to gate with allocation for scrap recycling)

Parameter \ stage	Unit	(1)+(2)	(1)	(2)			(3)
Global warming IPCC2013 GWP100a	kg-CO_2eq	4.2E+03	8.9E+02	3.3E+03			-1.2E+03
Ozone layer destruction	kg-CFC-11eq	3.2E-06	2.2E-07	3.0E-06			-2.1E-07
Acidification	kg-SO_2eq	3.8E+00	9.0E-01	2.9E+00			-1.8E+00
Photochemical ozone	kg-C_2H_4eq	6.0E-02	9.7E-03	5.1E-02			-2.5E-01
Eutrophication	kg-PO_4^{3-}eq	7.9E-02	1.6E-05	7.9E-02			-2.2E-02

2. Life cycle inventory analysis (LCI)

Parameter		Unit
Non-renewable material resources	1.3E+03	kg
Non-renewable energy	5.0E+04	MJ
Renewable material resources	1.9E+03	kg
Renewable primary energy	-1.2E+03	MJ
Consumption of freshwater	4.8E+00	m^3

3. Material composition

Material		Unit
Fe	**≧95.0**	%
C	**≦1.10**	%
Si	**≦3.00**	%
Mn	**≦3.00**	%
P	**≦0.050**	%
S	**≦0.050**	%

4. Waste to disposal

Parameter		Unit
Hazardous waste	**0.00E+00**	kg
Non-hazardous waste.	1.6E+00	kg

***Data derived from LCA and not assigned to the impact categories of LCIA**

5. Additional explanation

1. Each LCI includes allocation for scrap recycling as an optional supplementary information(3) at table.1 . Recycling rate (RR) used in this calculation is 93.7% (calculated based on ISO 20915/JIS Q20915 and using Japan data in 2022 from Japan Iron and SteelFederation and Japan Steel Can Recycling Association).
2. Scenarios of transport to site follow the PCR.
3. Each item (except iron) in table 3 is the maximum value of all product standards covered by this EPD.However, the iron content in each product is never less than 95%, and the contents of other components are adjusted.
4. Primary data collected in 2022. The source of the unit power consumption is the average of 10 electric power suppliers of Japan in 2014.
5. For the transport of metallurgical coal, the amount is double counted due to the characteristics of the inventory database on which this estimation is based.

6-1. Supplementary environmental information

Each production site is certified to ISO 14001.

6-2. Regulated hazardous substances

Substance	CAS No.	Reference to standards or regulations
Manganese [Mn]	7439-96-5	Industrial Safety and Health Act
Cupper [Cu]	7440-50-8	Industrial Safety and Health Act
Nickel [Ni]	7440-02-0	Industrial Safety and Health Act
Aluminum [Al]	7429-90-5	Industrial Safety and Health Act
Ferrovanadium	12604-58-9	Industrial Safety and Health Act

7. Assumptions of secondary data used

The IDEA2.1.3 data and steel scrap data(JP-AJ-0001) from the Japan Iron and Steel Federation are used.

8. Remarks

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- For data quantification, please refer to PCR and Rules on quantification and declaration.
- Comparative assertion is permitted only when Rules on quantification and declaration are satisfied.
  (Reference URL : https ://ecoleaf-label.jp/regulation/)