Sumpo Sumpo VERIFIED Type III Environmental Declaration (EPD)

Japan EPD Program by SuMPO Sustainable Management Promotion Organization 14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo Japan

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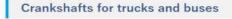
Registration number: JR-AW-24031E

## NIPPON STEEL | NIPPON STEEL CORPORATION

# Die Forgings (Non heat treated)

Crankshafts for passenger cars







#### Landing gear for aircraft

Registration#

PCR number

PCR name

Publication date

Verification date

Verification#

Expiration date

PCR review panel chair

Third party verifier\*

with ISO14025

Hiroyuki Uchida



Steel products except for construction use

JR-AW-24031E PA-180000-AW-05

11/29/2024

09/12/2024

JV-AW-24031

Yasunari Matsuno

(Chiba University)

Independent verification of data & declaration in accordance

09/11/2029

Verification method Product-by-product

PCR review was conducted by:

Approval date 05/10/2023

## Functional unit

Front axle beams

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 mm 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/

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

external

Registration number: JR-AW-24031E

internal

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1. Results of the cycle impact assessment (LCTA)			
Stage Parameter	(1)+(2)+(3)	(1)+(2)	Unit
Global warming IPCC2013 GWP100a	2500	3700	kg-CO <sub>2</sub> eq
Acidification	1.9	3.7	kg-SO₂eq
Eutrophication	0.057	0.079	kg-PO4 <sup>3-</sup> 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)

stage						
Parameter	Unit	(1)+(2)	(1)	(2)		(3)
Global warming IPCC2013 GWP100a	kg-CO <sub>2</sub> eq	3.7E+03	8.9E+02	2.8E+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 <sub>2</sub> eq	3.7E+00	9.0E-01	2.8E+00		-1.8E+00
Photochemical ozone	kg-C₂H₄eq	5.5E-02	9.7E-03	4.5E-02		-2.5E-01
Eutrophication	kg-PO <sub>4</sub> <sup>3-</sup> 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	3.9E+04	MJ	
Renewable material resources	1.9E+03	kg	
Renewable primary energy	-1.2E+03	MJ	
Consumption of freshwater	4.8E+00	m³	

3. Material composition		
Material		Unit
Fe	95.0	%
С	1.10	%
Si	3.00	%
Mn	3.00	%
Р	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

#### 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 O20915 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.

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6-1. Supplementary environmental informatio 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/)

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