

**NIPPON STEEL | NIPPON STEEL CORPORATION**

# Wheel and Axle



## Functional unit

1 t

## System boundary

final products                      intermediate products

Production Stage and optional supplementary information

## Main specifications of the product

Production sites : Kansai Works(Wakayama,Osaka)

Main standards :

JIS E4504, EN13260

Main sizes(unit mm)

φ1000 × L2400

## Company Information

**NIPPON STEEL CORPORATION**

<https://www.nipponsteel.com/en/product/railway-automotive-machinery-parts/>

Registration#	JR-AW-24029E
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-24029
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.

Registration number : JR-AW-24029E

### 1. Results of life cycle impact assessment (LCIA)

Parameter	Stage	(1)+(2)+(3)	(1)+(2)	Unit
Global warming IPCC2013 GWP100a		2000	3200	kg-CO <sub>2</sub> eq
Acidification		1.0	2.9	kg-SO <sub>2</sub> eq
Eutrophication		0.039	0.061	kg-PO <sub>4</sub> <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)

Parameter	stage	Unit	(1)+(2)	(1)	(2)	(3)
Global warming IPCC2013 GWP100a		kg-CO <sub>2</sub> eq	3.2E+03	6.6E+02	2.5E+03	-1.2E+03
Ozone layer destruction		kg-CFC-11eq	3.2E-06	1.6E-07	3.0E-06	-2.2E-07
Acidification		kg-SO <sub>2</sub> eq	2.9E+00	6.7E-01	2.2E+00	-1.8E+00
Photochemical ozone		kg-C <sub>2</sub> H <sub>4</sub> eq	5.7E-02	7.2E-03	5.0E-02	-2.6E-01
Eutrophication		kg-PO <sub>4</sub> <sup>3-</sup> eq	6.1E-02	1.2E-05	6.1E-02	-2.2E-02

### 2. Life cycle inventory analysis (LCI)

Parameter	Unit	Unit
Non-renewable material resources	9.8E+02	kg
Non-renewable energy	3.9E+04	MJ
Renewable material resources	1.4E+03	kg
Renewable primary energy	-8.6E+02	MJ
Consumption of freshwater	9.3E+00	m <sup>3</sup>

### 3. Material composition

Material	Unit	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	Unit
Hazardous waste	0.00E+00	kg
Non-hazardous waste.	1.2E+00	kg

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

### 5. Additional explanation

- 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 Steel Federation and Japan Steel Can Recycling Association).
- Scenarios of transport to site follow the PCR.
- 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.
- Primary data collected in 2022. The source of the unit power consumption is the average of 10 electric power suppliers of Japan in 2014.
- 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
Copper [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
Ferrovandium	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/> )