

Rails



Functional unit

1 t

System boundary

final products intermediate products

Production Stage and optional supplementary information

Main specifications of the product

Production Site : Kyusyu Works – Yawata area

Specification: Standard/Head hardened Rails for Railway, Special Rails for Turnout, Standard/Head Headend Rails for Industrial use such as Crane Rails.

Dimension : Vignole Rail

※Rails mainly use for High Speed Railway, Passenger/Fright Railway, Metro project.

Specification shall be decided through discussion with train operator based on International standards.

Company Information

NIPPON STEEL CORPORATION

About Us:

<https://www.nipponsteel.com/en/index.html>

Contact Us:

<https://www.nipponsteel.com/en/product/contact/structuralsteel.html>

Registration#	JR-AW-22016E-B
PCR number	PA-180000-AW-05
PCR name	Steel products except for construction
Publication date	10/11/2022
Verification date	01/10/2024
Verification method	Product-by-product
Verification#	JV-AW-24001
Expiration date	1/9/2029
PCR review was conducted by:	
Approval date	05/10/2023
PCR review panel chair	Yasunari Matsuno Chiba University

Third party verifier*

Tetsuya Okuyama

Independent verification of data & declaration in accordance with ISO14025

internal external

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

1. Results of life cycle impact assessment (LCIA)

Parameter	Stage	[A1~A3] + [D]	[A1~A3]	Unit
Global warming IPCC2013 GWP100a		1300	2500	kg-CO ₂ eq
Acidification		-0.75	1.1	kg-SO ₂ eq
Eutrophication		0.029	0.051	kg-PO ₄ ³⁻ eq

Be sure to refer to “6-1. Supplementary environmental information” for Scope 3 and carbon footprint calculations.

Table Legend

【A1】: Raw material supply

【A2】: Transport to factory

【A3】: Manufacturing

【D】: Recycling potential

【A1~A3】: sum of 【A1】,【A2】and【A3】 (cradle to gate)

Parameter	stage	Unit	[A1~A3]	[A1]	[A2]	[A3]	[D]
Global warming IPCC2013 GWP100a		kg-CO ₂ eq	2.5E+03	6.1E+02	1.3E+02	1.7E+03	-1.2E+03
Ozone layer destruction		kg-CFC-11eq	8.8E-07	1.5E-07	8.3E-10	7.3E-07	-2.2E-07
Acidification		kg-SO ₂ eq	1.1E+00	5.9E-01	7.6E-02	4.3E-01	-1.8E+00
Photochemical ozone		kg-C ₂ H ₄ eq	1.5E-02	5.1E-03	1.3E-03	8.2E-03	-2.6E-01
Eutrophication		kg-PO ₄ ³⁻ eq	5.1E-02	1.4E-05	7.5E-13	5.1E-02	-2.2E-02

2. Life cycle inventory analysis (LCI)

Parameter		Unit
Non-renewable material resources	1.0E+03	kg
Renewable material resources	1.0E+03	kg
Non-renewable energy resources	2.8E+04	MJ
Renewable primary energy	-5.8E+02	MJ
Consumption of freshwater	3.3E+01	m ³

3. Material composition

Material		Unit
iron [Fe]	≥92.7	%
carbon [C]	≤1.2	%
silicon [Si]	≤1.5	%
manganese [Mn]	≤1.5	%
phosphorus [P]	≤0.05	%
sulfur [S]	≤0.05	%
chrominium [Cr]	≤3	%

4. Waste to disposal

Parameter		Unit
Hazardous waste	-	kg
Non-hazardous waste.	1.80E+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 [D]. Recycling rate (RR) used in this calculation is 93.0% (calculated based on ISO 20915/JIS Q 20915 and using Japan data in 2018 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 the standards of the products.
- Primary data collected in 2018. The average grid power supply of 10 electric power suppliers of Japan in 2014 is used in the LCI calculation for grid electricity.

6-1. Supplementary environmental information

Kyusyu Works - Yawata area is certified to ISO 14001.

Note on Global warming IPCC2013 GWP100a: When purchasers of this product calculate GHG emissions under GHG Protocol Scope 3, Category 1 for their organization, or when calculating the carbon footprint of products manufactured using this product, they must check the following URL:

<https://www.nipponsteel.com/en/product/cfp/certificate.html>

(The content of the above URL is not subject to EPD verification.)

6-2. Regulated hazardous substances

Substance	CAS No.	Reference to standards or regulations
Manganese [Mn]	7439-96-5	Industrial Safety and Health Act
chrominium [Cr]	7440-47-3	Industrial Safety and Health Act

7. Assumptions of secondary data used

We use the IDEA2.1.3 database and steel scrap LCI data from the Japan Iron and Steel Federation.

8. Remarks

January 2024; Modification about allocation method of by-product gases

April 2026; Additional explanatory notes added to "6-1. Supplementary environmental information".

- 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/>)