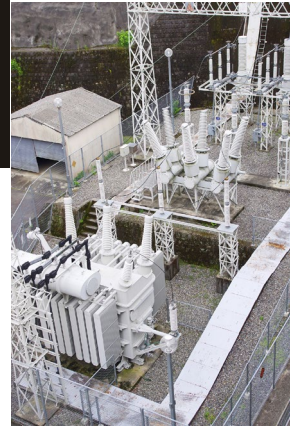
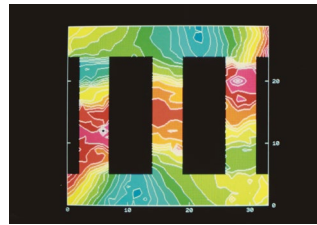


NIPPON STEEL | NIPPON STEEL CORPORATION

Grain-Oriented Electrical Steel Sheets



Functional unit

1 t

System boundary

final products intermediate products

Production Stage and optional supplementary information

Main specifications of the product

Production sites : Setouchi Works, Kyushu Works

Main standards :

NIPPON STEEL Grade (ZH,ZDKH etc.)

See Table 8.Remarks for details.

Type : Coil, Hoop, Sheet

Main sizes (unit: mm, t: thickness)

t=0.15~0.35

Company Information

NIPPON STEEL CORPORATION

<https://www.nipponsteel.com/en/product/sheet/list/>

Registration#	JR-AW-22020E-B
PCR number	PA-180000-AW-05
PCR name	Steel products except for construction use
Publication date	11/25/2022
Verification date	01/10/2024
Verification method	Product-by-product
Verification#	JV-AW-24004
Expiration date	10/24/2027
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	(1)+(2)+(3)	(1)+(2)	Unit
Global warming IPCC2013 GWP100a		2800	3800	kg-CO ₂ eq
Acidification		0.77	2.4	kg-SO ₂ eq
Eutrophication		0.062	0.081	kg-PO ₄ ³⁻ eq

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

Table Legend
 (1)Raw material supply
 (2)Production
 (3)Recycling potential

Parameter	stage	Unit	(1)+(2)	(1)	(2)	(3)
Global warming IPCC2013 GWP100a		kg-CO ₂ eq	3.8E+03	9.3E+02	2.9E+03	-1.0E+03
Ozone layer destruction		kg-CFC-11eq	1.1E-06	1.9E-07	9.3E-07	-1.9E-07
Acidification		kg-SO ₂ eq	2.4E+00	9.0E-01	1.5E+00	-1.6E+00
Photochemical oxidant		kg-C ₂ H ₄ eq	3.4E-02	1.1E-02	2.3E-02	-2.2E-01
Eutrophication		kg-PO ₄ ³⁻ eq	8.1E-02	7.8E-04	8.0E-02	-1.9E-02

2. Life cycle inventory analysis (LCI)

Parameter		Unit
Non-renewable material resources	5.8E+02	kg
Renewable material resources	2.1E+03	kg
Non-renewable energy resources	4.7E+04	MJ
Renewable energy resources	8.0E+02	MJ
Consumption of freshwater	1.6E+01	m ³

4. Waste to disposal

Parameter		Unit
Hazardous waste	-	kg
Non-hazardous waste.	2.1E+00	kg

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

3. Material composition

Material		Unit
Fe	≥90	%
C	≤0.1	%
Si	≤5	%
Mn	≤4	%
P	≤0.05	%
S	≤0.05	%
Al	≤3	%
Ni	≤4	%
Sn	≤1	%
Cu	≤2	%
Cr	≤0.2	%

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 93.0% (calculated based on ISO 20915/JIS Q20915 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 all product standards covered by this EPD. However, the iron content in each product is never less than 90%, and the contents of other components are adjusted.
- Primary data collected in 2018. 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 area has ISO 14001 certificate.

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
Nickel [Ni]	7440-02-0	Industrial Safety and Health Act
Chromium [Cr]	7440-47-3	Industrial Safety and Health Act
Copper [Cu]	7440-50-8	Industrial Safety and Health Act
Tin [Sn]	7440-31-5	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

NIPPON STEEL Grade

ORIENTCORE (e.g. 30Z120, 35Z135) , ORIENTCORE·HI-B™ (e.g. 23ZH85, 27ZH95) ,

ORIENTCORE·HI-B™·LS (e.g. 20ZDKH75, 23ZDKH85) , ORIENTCORE·HI-B™·PM (e.g. 23ZDMH85)

*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/>)