



1. Results of life cycle impact assessment (LCIA)

Parameter	Stage	【A1~A3】 + 【D】	【A1~A3】	Unit
Global warming IPCC2013 GWP100a		1000	2300	kg-CO ₂ eq
Acidification		0.36	2.30	kg-SO ₂ eq
Eutrophication		-0.006	0.018	kg-PO ₄ ³⁻ -eq

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)

【A1 ~ A3】 + 【D】: sum of 【A1】 , 【A2】 , 【A3】 and 【D】 (cradle to gate with allocation for scrap recycling)

Parameter	stage	Unit	【A1~A3】	【A1】	【A2】	【A3】	【D】
Global warming IPCC2013 GWP100a		kg-CO ₂ eq	2.3E+03	1.9E+03	1.1E+01	4.4E+02	-1.3E+03
Ozone layer destruction		kg-CFC-11eq	3.8E-04	1.5E-07	8.8E-11	3.8E-04	-2.3E-07
Acidification		kg-SO ₂ eq	2.3E+00	2.0E+00	2.8E-02	3.2E-01	-2.0E+00
Photochemical ozone		kg-C ₂ H ₄ eq	3.4E-02	1.7E-02	5.1E-05	1.8E-02	-2.7E-01
Eutrophication		kg-PO ₄ ³⁻ -eq	1.8E-02	1.8E-02	7.5E-14	2.8E-05	-2.3E-02

2. Life cycle inventory analysis (LCI)

Parameter	Unit	Unit
Non-renewable material resources	7.9E+02	kg
Non-renewable energy resources	3.3E+04	MJ
Renewable material resources	1.1E+03	kg
Renewable primary energy	-5.8E+02	MJ
Consumption of freshwater	2.4E+00	m ³

3. Material composition

Material	Unit	Unit
iron [Fe]	93.0	%
carbon [C]	1.00	%
silicon [Si]	3.00	%
manganese [Mn]	3.00	%
phosphorus [P]	0.050	%
sulfur [S]	0.050	%
zinc [Zn]	2.50	%
aluminum [Al]	0.13	%

4. Waste to disposal

Parameter	Unit	Unit
Hazardous waste	0.00E+00	kg
Non-hazardous waste.	5.1E+00	kg

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

5. Additional explanation

- 1) This base material is Wire rod made by Nippon Steel(Ecoleaf registration No.:JR-AJ-21009E).
- 2) Because this product is secondary processing product,the indirect effect is evaluated about the base material.Each LCI includes allocation for scrap recycling as an optional supplementary information 【D】 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).
- 3) Transport distance between Nippon Steel (East Nippon Works Kimitsu Area) and Tokyo Rope Mfg. Co., Ltd. (Tsuchiura Plant) is measured by geographic software.
- 4) 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 93.0%, and the contents of other components are adjusted.
- 5) Primary data was collected for one year within 2018-2020. The source of the unit power consumption is the average of 10 electric power suppliers of Japan in 2014.

6-1. Supplementary environmental information

Tsuchiura Plant has ISO 14001 certificate.



EcoLeaf

Type III Environmental Declaration (EPD)

Registration number : JR-AX-23004E

Japan EPD Program by SuMPO

Sustainable Management Promotion Organization

14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo Japan

<https://ecoleaf-label.jp/>

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

7. Assumptions of secondary data used

We use the IDEA v2.1.3 data and steel scrap data(JP-AJ-0001) from the Japan Iron and Steel Federation.

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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