

**NIPPON STEEL | NIPPON STEEL CORPORATION**

## Spiral welded pipe piles / Spiral welded pipe sheet piles



### Functional unit

1 t

### System boundary

final products     intermediate products

Production Stage and optional supplementary information

### Main specifications of the product

Production Site: East Nippon Works\_Kimitsu Area,  
Kyushu Works\_Yawata Area, Nippon Steel Spiral Pipe  
Company, Ltd.(OEM)

Main product models: Steel pipe piles / Steel pipe sheet  
piles

Main standards: JIS A 5525, JIS A 5530

※The other available product models and standards are listed  
on page 3(8.Remarks).

Type: Steel pipe piles

Registration#	JR-AJ-24027E
PCR number	PA-180000-AJ-06
PCR name	Steel products for construction
Publication date	4/10/2024
Verification date	3/28/2024
Verification method	Product-by-product
Verification#	JV-AJ-24027
Expiration date	3/27/2029

### PCR review was conducted by:

Approval date	5/10/2023
PCR review	Yasunari Matsuno
panel chair	Chiba University

### Third party verifier\*

Hiroyuki Uchida

Independent verification of data & declaration in accordance  
with ISO14025 and ISO 21930.

internal     external

### 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>

\*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		1400	2700	kg-CO <sub>2</sub> eq
Acidification		0.29	2.2	kg-SO <sub>2</sub> eq
Photochemical ozone		-0.25	0.020	kg-C <sub>2</sub> H <sub>4</sub> 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 <sub>2</sub> eq	2.7E+03	4.7E+02	1.2E+02	2.1E+03	-1.2E+03
Ozone layer destruction		kg-CFC-11eq	1.0E-05	8.0E-06	8.1E-10	2.1E-06	-2.2E-07
Acidification		kg-SO <sub>2</sub> eq	2.2E+00	4.5E-01	7.1E-02	1.7E+00	-1.9E+00
Photochemical ozone		kg-C <sub>2</sub> H <sub>4</sub> eq	2.0E-02	4.6E-03	1.2E-03	1.4E-02	-2.7E-01
Eutrophication		kg-PO <sub>4</sub> <sup>3-</sup> eq	5.4E-02	1.6E-05	7.2E-13	5.4E-02	-2.3E-02

## 2. Life cycle inventory analysis (LCI)

Parameter		Unit
Non-renewable material resources	6.8E+02	kg
Non-renewable energy resources	2.9E+04	MJ
Renewable material resources	1.2E+03	kg
Renewable primary energy	2.6E+01	MJ
Consumption of freshwater	2.7E+00	m <sup>3</sup>

## 3. Material composition

Material		Unit
iron [Fe]	> 97.0	%
carbon [C]	≦ 0.25	%
silicon [Si]	≦ 0.75	%
manganese [Mn]	≦ 1.90	%
phosphorus [P]	≦ 0.04	%
sulfur [S]	≦ 0.04	%

## 4. Waste to disposal

Parameter		Unit
Hazardous waste	0.0E+00	kg
Non-hazardous waste.	1.8E+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) at table.1 . Recycling rate (RR) used in this calculation is 93.8%(calculated based on JIS Q 20915 and using Japan data in 2022 from Japan Iron and Steel Federation and Japan Steel Can Recycling Association).
- The transportation scenario for raw materials follows the PCR. However, the loading rate for scrap transport uses the default value.
- 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 97.0%, and the contents of other components are adjusted.
- In NS-PACT™ steel pipe piles and NS-PACT™ steel sheet pile products, the composition (by weight ratio) of urethane elastomer is kept below 2%.
- Primary data collected in 2022. The corrosion protection process for NS-PACT™ was based on the data from 2018 and 2021.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.
- The calculated results represent the average, including NS-PACT™ steel pipe piles and NS-PACT™ steel sheet pile products with corrosion protection. Compared to products without corrosion protection, NS-PACT™ steel pipe piles and NS-PACT™ steel sheet pile products exhibit a certain level of increased environmental load.



SuMPO EPD

Type III Environmental Declaration (EPD)

Registration number : JR-AJ-24027E

Japan EPD Program by SuMPO

Sustainable Management Promotion Organization  
14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo Japan  
<https://ecoleaf-label.jp/>

### 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
Urethane	51-79-6	Industrial Safety and Health Act

### 7. Assumptions of secondary data used

We use the IDEA2.1.3 database. Additionally, scrap primary units (Scrap LCI) are based on the primary unit registration number: JP-AJ-0001.

### 8. Remarks

Additional information

Following Product model examples and Steel grade standard examples are available in addition to what are listed on page 1. The main pipe section shall be made of spiral welded steel pipe:

1. Product Model Examples:

- Steel Pipe Pile, NS-PAC™ Steel Pipe Pile, Steel Pipe Sheet Pile, NS-PAC™ Steel Pipe Sheet Pile, NS ECO-PILE™, Gantetsu Pile™, RS Plus™, Ribed Steel Pipe, Weld Forming Ribed Steel Pipe, High-Strength Steel Pipe Pile (NSPP™540 and 570N Grade)

2. Steel Grade Standard Examples:

- JIS A 5525: SKK400, SKK400-IR, SKK400-OR, SKK490, SKK490-IR, SKK490-OR
- JIS A 5530: SKY400, SKY490
- JIS G 3106: SM400A, SM490A, SM490YA
- MSTL-0356, MSTL-0411, MSTL-0412 (Ministerial Certification No.) : NSPP540

- For data quantification, please refer to the PCR and the Rules on Quantification and Declaration.
- Comparative assertion is permitted only when the Rules on Quantification and Declaration are satisfied.  
(Reference URL : <https://ecoleaf-label.jp/regulation/>)

Registration number : JR-AJ-24027E