SuMPO EPD Japan

Third party verified

Environmental Product Declaration

In conformance with

ISO14025 | ISO14040 | ISO14044

NIPPON STEEL

NIPPON STEEL CORPORATION

Hot Extruded Steel Shapes/ Stainless steel/ (SUS304)

Registration number	Verification date	Publication date	Expiration date	EPD type
SuMPO-EPD-2604-129-1	2026/4/2	2026/4/23	2031/4/1	Multiple Products EPD

* First publication date

Additional standards in conformance

ISO21930:2007

EPD can be updated or withdrawn during the validity period. To confirm the validity of this EPD, check the following website: https://ecoleaf-label.jp/epd/search

●General Information

＞Programme

Programme name	SuMPO EPD Japan
Programme operator	Sustainable Management Promotion Organization (SuMPO)
Address	KANDA SQUARE GATE 4F, 14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo, 101-0047, Japan
Website	https://ecoleaf-label.jp

＞GPI and PCR

GPI	SuMPO EPD Japan General Program Instructions v.2.0.1
PCR name	Stainless steel products
PCR registration number	PA-187000-BO-03
PCR publication date	2023/12/4
PCR review panel chair	Ken Yamagishi（Sustainable Management Promotion Organization (SuMPO)）
PCR valid until	2028/12/3
PCR issuer	Sustainable Management Promotion Organization (SuMPO)

＞Verification

Verification Type	Third-party verification in conformance with ISO14025 and ISO21930:2017		
	☐ Internal	■ External	
	■ Third-party verification by individual verifier	☐ Third-party verification by verification body	☐ Third-party verification by system certification
選択してください	Akiko Futuya（E&E Solutions Inc.）		

＞Standards

Standards in conformance with;	■ ISO14040:2006	■ ISO14044:2006	☐ ISO14067:2018
	☐ ISO14025:2006	■ ISO21930:2007	☐ ISO21930:2017
	☐ EN15804+A2	☐ EN50693:2019	☐ ISO/IEC63366:2025

EPD owner is responsible for the information contained in the EPD and for environmental claims related to the information. For any inquiries or requests regarding the content of the EPD, please contact the EPD owner.

EPDs are comparable only if they comply with the same standards, use the same sub-PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works. Comparability of EPDs is limited to those applying a functional unit.

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceedance of thresholds, safety margins or risks.

When using weighted averages for calculation, the life cycle impact assessment results, life cycle inventory analysis-related information, waste-related information, and environmental information on output flows do not correspond to information about a specific product.

●EPD Owner's Information

Name of company and dept.	NIPPON STEEL CORPORATION
Address	2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071, Japan
Contact	+81-3-6867-4932
LCA practitioner	NIPPON STEEL TECHNOLOGY Co.,Ltd.
Company description	Steelmaking and steel fabrication / Engineering / Chemicals / New materials / System solutions

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●Product Information

Product name		Hot Extruded Steel Shapes/ Stainless steel/ (SUS304)		
Product /model number		SUS304		
Product sepcification	Function	Supply of stainless steel used in components for machinery parts, industrial machinery components, civil engineering and construction components, shipbuilding components, heat exchanger components, food and medical machinery components, and semiconductor machinery components.		
	Mass	1 t	Conversion factor	-
	Applications	Components for machinery parts, components for industrial machinery, components for civil engineering and construction, components for shipbuilding, heat exchange components, components for food and medical machinery, components for semiconductor machinery		
	TS*	Manufacturing complex-shaped structural steel through integral moulding, preventing deterioration in weld quality by reducing machining and welding processes		
Service life	Service life	5～50 years		
	In-use conditions	Building materials, machinery and equipment, fixtures and fittings		
	reference	The useful life was set as being equivalent to that of the building. Please note that this period may vary depending on usage, environment and purpose, and therefore does not definitively indicate this product's service life. Source: National Tax Agency, 'Table of Useful Lives for Major Depreciable Assets' (2022), Japan.		
Manufacturing site(s)		Nippon Steel Corporation Yamaguchi Works 3434 Shimada, Hikari City, Yamaguchi Prefecture		
Product description		Hot-rolled structural steel (stainless steel) manufactured by hot extrusion		
Website		https://www.nipponsteel.com/product/pipe/list/06.html		

* TS: technical specifications,

●Product Content

Product components	Propotion (%)	Mass (unit)	
C	≦0.08	≦0.80	kg
Si	≦1.00	≦10.0	kg
Mn	≦2.00	≦20.0	kg
P	≦0.045	≦0.45	kg
S	≦0.03	≦0.30	kg
Ni	≦10.50	≦105.0	kg
C	≦20.00	≦200.0	kg
Fe	≧66.345	≧663.45	kg
Packaging materials	Propotion (%)	Mass (unit)	
-	0.0	0.00	kg

●Biogenic Carbon Content

Item	Content (kg-C)	Content (kg-CO_2 eq)
Biogenic carbon content per product	0.00	0.00
Biogenic carbon content in packaging	0.00	0.00

●LCA-related Information

＞EPD Type Information

EPD type	Product type	☐ Single product EPD	■ Multiple products EPD	☐ Industry-wide EPD	
	Site type	■ Single site	☐ Multiple sites		
	Value	☐ Specific	■ Average	☐ Representative	☐ Worst case
Geographical coverage		Global			
Description of representativeness for multiple-products/sites EPD		The target products are hot-extruded structural steel sections with varying final shapes depending on extrusion specifications. As they are produced using identical manufacturing processes, raw material composition, and quality control standards, the calculation results are considered sufficiently representative. Accordingly, they are treated as a single product group.			
Description of variation for multiple-products/sites EPD		The target products are hot-extruded structural steel sections with final shapes that vary according to extrusion specifications. As all products are manufactured at the same site using fundamentally identical processes and material composition ratios, differences in life cycle impact assessment results are expected to remain within 10%.			
Description of products covered in the multiple products EPD		EPDs are disclosed for products manufactured at the same site using the same steel grade and construction method but with different shapes, and the results are converted to a per-tonne basis.			

＞LCA Information

Declared unit		1t	
Mass per declared unit (Conversion factor to mass)		-	
Reference flow (number of products required to fulfil the function)		-	
System boundary		■ Cradle-to-Gate	☐ Cradle-to-Gate with options ☐ Cradle-to-Grave
LCA software		Cloud MiLCA	
LCI database		AIST-IDEA ver3.4	
Characterization model		Climate Change: IPCC Fifth Assessment Report (IPCC, 2021), Other Impact Areas: LIME2	
Use of other background data		worldsteel Life Cycle Inventory Methodology Report	
Secondary data quality		The calculation was performed using data that met the secondary data quality requirements specified by GPI. The data quality assessment was conducted in accordance with clause 4.2.3.6 of ISO 14044:2006 (Environmental management – Life cycle assessment – Requirements and guidelines).	
Primary data collection sites		Nippon Steel Corporation Yamaguchi Works 3434 Shimada, Hikari City, Yamaguchi Prefecture	
Primary data collection period		From 2022 April to 2023 March	
Biogenic carbon		☐ 0/0 approach	■ -1/+1 approach
Information about electricity	Use	■ Average consumption mix	☐ Others
	Type	-	
	Purchase date	-	
	Issuing body	-	

＞Modules

Production stage			Construction stage		Use stage							End-of-life stage				Suppl. info
					Use					Operation						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste	Potential net benefits
■	■	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–

■ : declared module　– : module not declared

＞Allocation

In this manufacturing process, electric furnace dust, electric furnace slag, and scrap iron are generated as by-products. For the handling of these by-products, system extensions were applied in accordance with PCR 6-6, based on the form in which each by-product is generated and its actual utilisation status.

■Steel scrap

Steel scrap is generated continuously across the manufacturing process and cannot be assigned to a specific process or product. Therefore, allocation avoidance through process segmentation was not applicable. A system extension was applied, using the most plausible alternative production route as the substitute system, reflecting scrap's role in replacing virgin raw materials in melting. The environmental benefits of scrap use were not included in the results.

■EAF dust and EAF slag

System extension was also applied to electric furnace dust and slag as process segmentation is not feasible. Electric furnace dust is reused in zinc oxide production and electric furnace slag is used as a road base material. Zinc oxide production and crushed stone were selected as the alternative systems, respectively. For the electric furnace slag, the IDEA Annex conversion factor was applied to convert the units from kilograms to yen (JPY). The calculated avoided environmental impact was included in the results as a negative value.

＞Cut-off rules

Under PCR (PA-187000-BO-03) for Stainless Steel Products (Intermediate Goods), the 1% cut-off criterion specified in Section 5-2 was applied. Accordingly, packaging and transport materials used for procuring external inputs were excluded from the calculation.

Cut-off items

①Covering powder (powdered lubricant)

Weight ratio: 1.01 kg/2,119 kg = 0.05% (less than 1.0%)

This material consists of inorganic compounds adjusted according to continuous casting conditions and contains no heavy metals or highly toxic substances.

②Transport

Transport processes already included in IDEA base units were excluded to avoid double counting. Inputs supplied within the premises were assumed to have a transport distance of 0 km and were also cut off. In addition, transport processes contributing less than 1.0% to GWP in Stage A2 were excluded.

Row materials	tkm/t-steel	GWP kg-CO2eq	contribution rate to A2	contribution rate to Total LCA
Aluminium dross/aluminium oxides	0.97	0.19	0.2%	0.00%
Ferrosilicon	25.03	0.25	0.3%	0.00%
Manganese	0.12	0.02	0.0%	0.00%
Nickel	0.04	0.01	0.0%	0.00%
Silicomanganese	2.36	0.46	0.5%	0.01%
Dolomite (CaO.MgO, calcined)	1.43	0.28	0.3%	0.00%
Refractories (magnesia, lime, carbor	2.98	0.57	0.6%	0.01%
Refractories (silica, alumina)	0.55	0.11	0.1%	0.00%
Lubricating oil	0.96	0.19	0.2%	0.00%
Argon	0.39	0.08	0.1%	0.00%
Nitric acid	1.37	0.26	0.3%	0.00%
Hydrofluoric acid	2.64	0.51	0.5%	0.01%
Fluorite	2.73	0.53	0.6%	0.01%
Electrodes (carbon)	1.09	0.21	0.2%	0.00%
Greer	0.03	0.01	0.0%	0.00%
Welding materials	0.00	0.00	0.0%	0.00%
Paint (extruding lubricant)	0.12	0.02	0.0%	0.00%

＞System Boundary

Based on the Product Category Rules (PCR) [PA-187000-BO-03, Target Product: Stainless Steel Products (Intermediate Goods), the processes specified in the GPI and PCR relating to the procurement of raw materials, their transportation and the manufacturing process have been defined as the system boundary for this product (Cradle to Gate: A1, A2 and A3). Calculations include waste generated within this boundary, while activities outside it (Category D) are excluded from the assessment.

The manufacturing process for this product generates by-products (co-products), such as process-derived scrap.
These co-products are difficult to separate, either physically or in terms of the manufacturing process, from the declared product, even when the manufacturing process is subdivided. Therefore, in accordance with PCR 6-6, the system extension concept was applied to avoid allocation. Details are provided in the 'Allocation' section.

In accordance with GPI A.9.2, the point at which waste ceases to be treated as waste was defined as the point at which final treatment, such as incineration or landfill, is completed.

The temporal system boundary was set at 100 years.

＞Scenario

Modules	Description
A2	The raw material procurement stage saw the use of the PCR transport scenario for scrap transport (land transport 200 km, 10-tonne lorry).

＞Electricity Modelling

This steelworks uses a combination of self-generated coal-fired power and purchased electricity to manufacture EPD-covered products. As the electricity from these sources is supplied in a mixed manner and cannot be distinguished by source, separation is not possible.
Accordingly, secondary data representing actual conditions were applied in accordance with GPI A.11.1. For self-generated electricity, the value of 335111021 pJPN Electricity, Coal-Fired, Japan Average, FY2021 was used. For purchased electricity, the value of 331131220 pJPN Electricity, Japan Average, FY2021 was applied. No environmental value is sold externally and there is no double counting.

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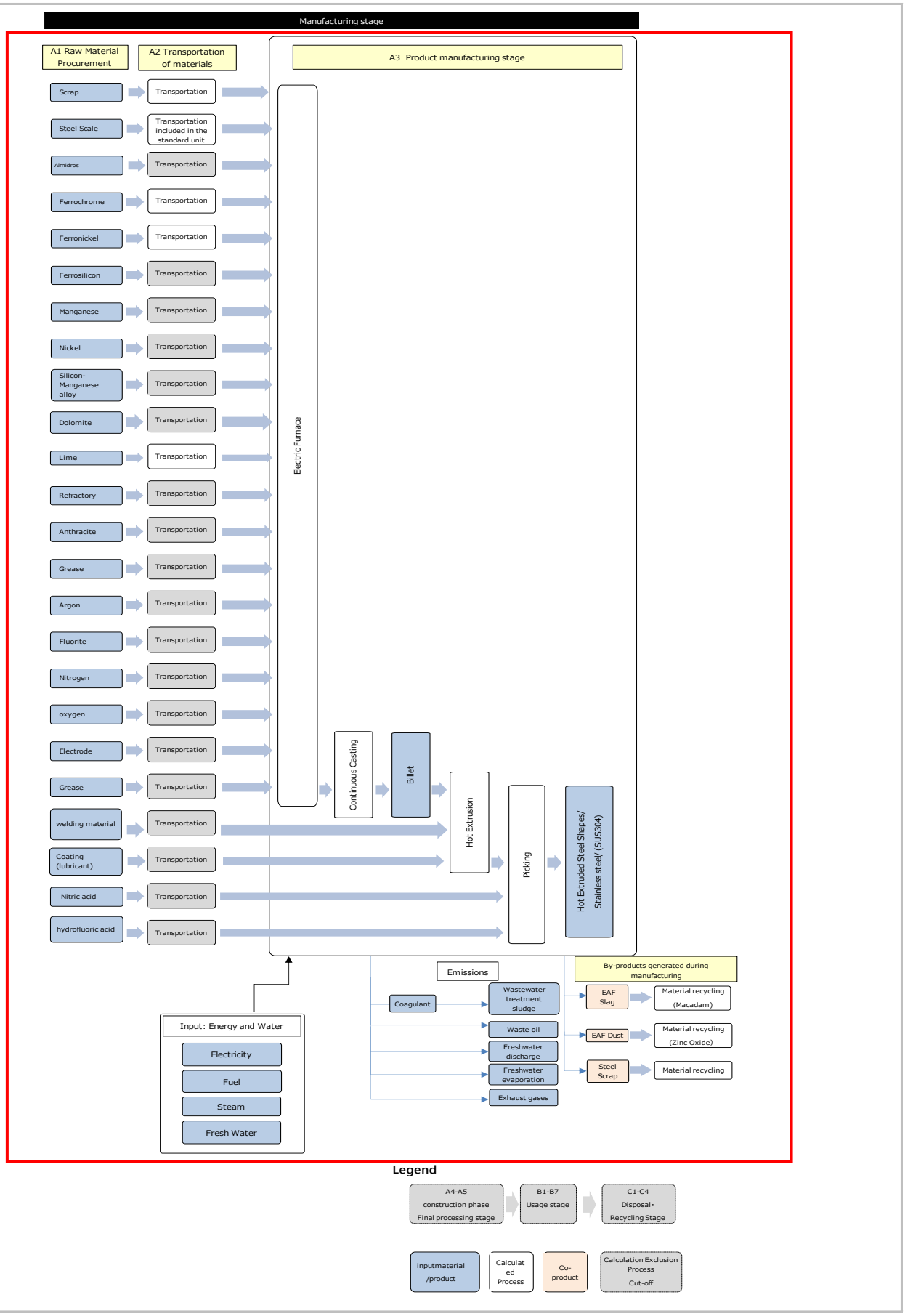
＞Life Cycle Sytem Diagram



＞**Description of LCA Results**

①For constituent elements other than iron, the maximum upper-limit values specified for applicable steel grades were used. The iron content was maintained above the specified minimum, with the ratios of other elements adjusted accordingly.
②Scrap transport followed the PCR-defined transport scenario. Where product-level allocation was not representative due to mixed management, the default scrap transport distance specified in the PCR was applied.
③Transport distances for ferrochrome, ferronickel, ferrosilicon and quicklime were estimated using map software based on assumed routes to the Yamaguchi Works Hikari District.
④At the steelworks, multiple products are produced on shared lines and electricity is sourced from multiple providers, making source-specific electricity allocation impracticable. Therefore, PCR-based unit values were applied to purchased electricity and self-generated coal-fired electricity. The environmental attributes of the electricity are not sold externally to avoid double counting.
⑤ The steam unit consumption was selected based on consistency with the supply form and usage, but there is some uncertainty due to data limitations.
⑥ The primary data collection period was the 2022 financial year.
⑦Note regarding “Climate Change in Life Cycle Impact Assessment”:
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.)

●Additional Environmental Information

＞**Additional Environmental Information not related to LCA**

・The product was manufactured at an ISO 14001-certified factory.

＞**Information on Hazardous Substances**

Hazardous materials name	CAS No.	Standards or regulations
Mn	7439-96-5	Industrial Safety and Health Act
Cu	7440-50-8	Industrial Safety and Health Act
Cr	7440-47-3	Industrial Safety and Health Act
Ni	7440-02-0	Industrial Safety and Health Act

Release of dangerous substances from construction products
Nothing in particular

●Definitions of Terms

Nothing in particular

●References

・ISO14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
・ISO14040:2006 Environmental management - Life Cycle Assessment - Principles and framework
・ISO14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines
・ISO21930:2007 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services
・Nippon Steel Stainless Ltd. Energy Conservation Law Periodic Report Information Disclosure Sheet
[Submission for Fiscal Year 2024 (Fiscal Year 2023 Actual Performance)]

●Version History

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