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# NIPPON STEEL

# **Feluce**<sup>TM</sup>

A HAIRLINE FINISHED ELECTROLYTIC ZINC-NICKEL ALLOY PLATED STEEL SHEET



#### [Notice]

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- Measurement examples of other materials for comparison are based on our test results. They do not represent general performance.

- This product is not intended for use in salt-damaged outdoor areas. Pay attention to corrosion along the edges.

- Handle products with care. Do not damage the plating films or surface treatment films.









Design brand special website

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# New potential in product design

Is the beauty inherent in materials compatible with the functionality that final products must have? We have pursued the answer to this question for many years in the manufacturing of steel sheets.

By appreciating the superior properties of the metal itself instead of adding decorations, we have created exquisitly designed steel sheets that are without precedent in the market.

Toward realizing the additional potential of sheet materials with metallic texture, flexibility, and smoothness—we would like to introduce the novel light, FeLuce.











# Exquisite, functional steel sheets— Available in two colors

Hairlines are applied directly to the plating layer to achieve a beautiful brushed metallic texture.

By pursing the "principle of no decoration," we have succeeded in acquiring the combination of beauty and functionality. We offer FeLuce in two standard colors. Black FeLuce provides high-quality and subdued atmosphere; silver FeLuce's rich reflection fits well into the surrounding space. Both colors provide new possibilities for final products and everyday lifestyles.

## Design by eliminating decoration

How to keep the beauty, inherent in metal materials, while achieving the functionality of final products without increasing cost—

This challenge always accompanies the work of product design.

Instead of the conventional method that adds decorations to material surfaces, we invented a new production method that applies designs directly to plating layers to achieve corrosion resistance. As a result, we developed a novel steel sheet that is superior in perceived quality, cost, and workability.

In our pursuit of steel sheets that respond to the market's various needs, FeLuce is one unique answer that we struggled to create.

FeLuce's positioning in the market Perceived quality



ce <sup>™</sup>	AL Aluminum SUS Stainless steel
VCM inated steel sheets	

Price range

## Splendor supported by superior design and technology

The splendor of FeLuce, zinc-nickel alloy electroplated steel sheet with hairline surface finish, is obtained by the hairline-finished plating layer which has a thickness as thin as approximately 3  $\mu$ m. In addition, the newly developed special pellicular resin coating not only maintains the metallic luminance produced by the hairline surface but satisfies various other functional requirements.

This structure ensures both beauty and functionality as well as excellent workability for flexible, sophisticated steel sheets.



#### Surface treatment technology



Pellicular resin coating contributes to maintain metallic texture as well as acquiring various functions such as anti-fingerprint, chemical resistance, and excellent formability. The design properties require thin films, while chemical resistance requires thick films.

Zinc-nickel alloy plating ensures both the design properties (metallic texture) and corrosion resistance. We have selected the optimal plating film and achieved polishing conditions for this plating film as thin as approx. 3  $\mu$ m.

# of our important sites for supplying steel sheet products.

Feluce<sup>™</sup>

#### [Hirohata Area of Setouchi Works]

This facility is located in Setouchi Nishi-Harima, where "Tatara" ironmaking has flourished since ancient times. This resource-recycling mill dedicated to steel sheets enjoys good relations with the local community. The high-functionality and high-quality steel manufacturing site continues to strive to establish world-first manufacturing processes in order to respond to various market needs.

### Manufacturing process



Appearance after plating

\*Hairline finish is applied only to the front. The rear surface features a zinc-nickel alloy plating film and a primary rust-resistant film.

## Manufacturing facilities for

FeLuce is manufactured in the Hirohata Area of Setouchi Works, which is one





#### Performance

# Excellent functionality in terms of corrosion resistance and fingerprint resistance

ltem	Testing conditions	<b>Feluce</b> ™ BLACK	<b>Feluce</b> ™ SILVER	SUS304 (BA)	Aluminum (1050)
Surface hardness	Scratch hardness (pencil method) JIS K 5600-5-4 750g	н	н	_	_
Corrosion resistance	Flat sheet (sealed on the edge and rear) Salt spray testing (compliant with JIS Z 2371) 72h	No abnormalities	No abnormalities	No abnormalities	White rust generated
Fingerprint resistance	Dipped in 0.5%-Vaseline (20°C, 5s) Color difference ΔE*	1.5 0.4 Fingerprints not noticeable		3.7 Fingerprints	3.4 conspicuous
Chemical resistance	Acid resistance Dipped in 1%-acetic acid at 20° for 24h	No abnormalities	No abnormalities	No abnormalities	No abnormalities
	Alkali resistance Dipped in 1%-NaOH aqueous solution at 20°C for 24h	No abnormalities	No abnormalities	No abnormalities	Material loss
Contamination resistance	Felt pen (red) Wiping off ink with ethanol 24h after marking with a felt pen	No abnormalities	No abnormalities	No abnormalities	No abnormalities
	Felt pen (black) Wiping off ink with ethanol 24h after marking with a felt pen	No abnormalities	No abnormalities	No abnormalities	No abnormalities
Thermal resistance	Cross-cut adhesion test with tape 70°C, 168h	100/100	100/100	100/100	100/100
Weather resistance	SWOM 150h color difference ∆E* Gloss retention	≦3 40 to 80%	≦3 50 to 80%	_	_

\*This data was obtained by testing FeLuce with a resin coat (see page 6), SUS304 (BA/no coating), and aluminum (1050/no surface treatment).

Corrosion resistance [Salt spray testing 72 h compliant with JIS Z 2371] FeLuce exhibits good corrosion resistance under environments that corrode aluminum.

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#### Fingerprint resistance [Dipped in 0.5%-Vaseline at 20°C for 5 s]

FeLuce exhibits good fingerprint resistance compared to SUS and aluminum, which show changes in color in dipped areas.



\*This data was obtained by testing FeLuce with a resin coat (see page 6), SUS304 (BA/no coating), and aluminum (1050/no surface treatment).

#### Examples of processing (press-formed articles)



Drawing a rectangular shell (

Sheet thickness: 0.6 mm Outer radius R: 3.75 mm Height of drawing: 15 mm



Sheet thickness: 0.6 mm Drawing ratio: 2.1 Height of drawing: 36 mm



Hemming Sheet thickness: 0.6 mm

#### Related standards

#### Mechanical characteristics

Category	Standard code	Thickness (mm)	Yield point or yield strength (N/mm²)	Tensile strength (N/mm²) a	Indicated thickness 0.40 mm or more and less than 0.60 mm	Elonga Indicated thickness 0.60 mm or more and less than 1.0 mm	tion (%) Indicated thickness 1.0 mm or more and less than 1.6 mm	Indicated thickness 1.6 mm
For general use	NSNCC	0.4~1.6	_	_	_	-	-	_
For drawing	NSNC270D	0.4~1.6	_	270 or higher	36 or larger	38 or larger	39 or larger	40 or larger
For non-aging deep drawing	NSNC270E	0.4~1.6	_	270 or higher	38 or larger	40 or larger	41 or larger	42 or larger
For non-aging extra-deep drawing	NSNC270F	0.6~1.6	(175 or less)	270 or higher	_	45 or larger	46 or larger	47 or larger
For non-aging ultra-extra deep drawing	NSNC270G	0.6~1.6	(175 or less)	270 or higher	_	47 or larger	48 or larger	49 or larger

## Coating

Code for coating	Minimum adhesion Equal thickness plating (g/m²)	amount (single side) Differential thickness plating (g/m²)	For reference Plating film thickness (single side) (µm)
10	8.5	8	1.4
20	17	16	2.8
30	25.5	24	4.2

### Non-combustible material certification

FeLuce has obtained non-combustible material certification as a steel sheet product. Non-combustible material certification by the Minister of Land, Infrastructure, Transport and Tourism: No. NM-5700

#### [Introduction of repair paint and repair spray for FeLuce]

Sunyou Chemical Industry Co., Ltd. manufactures and sells two types of repair paint—a can type and a spray type—for repairing minor processing defects and scratches on the surface of FeLuce so that they are not noticeable.

[Contact for inquiries]

Sunyou Chemical Industry Co., Ltd. 1-5-10 Awajimachi, Chuo Ward, Osaka, 541-0047, Japan Tel: +81-6-6222-5241

## Producible range



- Hairlines are formed perpendicular to the sheet width direction (longitudinal direction).

- For specifications outside the producible range, please contact us.



### Application examples

The high quality of FeLuce, which achieves a natural steel texture, combines a high level of design quality and functionality to bring new possibilities to final products and everyday lifestyle scenes. Here are some application examples. Coin laundry equipment (1 Electrical installation materials (raceway) (2 Entrance (digital signage) (3 Exhibition booth/showroom (4 Interior materials (elevator peripheral panels) (5 Interior materials (store interior) (6 Store fixtures/lighting shades (7 Library shelving (8



(1) (2) (3)		(1)	(6)
(4) (5)	(2)	(3)	(7)
(6) (7) (8)	(4)	(5)	(8)



Nippon Steel's high-functionality products and solution technologies to help reduce CO<sub>2</sub> emissions in society as a whole



Nippon Steel offers a variety of high-functionality products and solution technologies that contribute to reducing CO2 emissions in society as a whole. These are organized as "NSCarbolex Solutions," and we will continue to engage in initiatives and provide information that will be more useful to our customers than ever before, while expanding our lineup through further product and technology development, contributing even more to reducing CO<sub>2</sub> emissions for our customers and society as a whole.

FeLuce is included in the NSCarbolex Solution lineup as an environmentally friendly material that can be used to eliminate post-processing in customers' manufacturing processes, helping to reduce CO<sub>2</sub> emissions.

#### [Image of CO<sub>2</sub> reduction from post-processing]



#### [Comparison of CO2 emissions with post-painting]

By adding a beautiful design to the electroplating line, post-painting can be eliminated, reducing CO2 emissions.



\*The amount of  $\ensuremath{\text{CO}_{\text{Z}}}$  emitted from post-painting and that per unit mass of the FeLuce material

\*For CO2 emissions of FeLuce, please refer to the SuMPO EPD registration number: JR-AW-22009E-A

"The amount of CO<sub>2</sub> emitted from post-painting is an example of our estimate (please calculate actual emissions according to actual application conditions).

#### [Comparison of CO2 emissions with another material (aluminum)]

It is possible to reduce the amount of CO2 emitted per unit of material with equivalent strength.



\*An example estimate of the amount of CO<sub>2</sub> emitted per unit mass of material with equivalent strength (please calculate actual emissions according to actual application conditions).



[Related Products]

Steel

Steel

Other



RPORATION]	FeLuce (Electroplated Steel Sheet)
RPORATION]	BLACK ZAM (Hot-dip Coated Steel Sheet)
RPORATION]	VIEWKOTE (Pre-coated Steel Sheet)
ET CORPORATION]	Nisc-color Pro
RPORATION]	COR-TEN (Weathering Steel)
RPORATION]	VINCOR (Weathering Steel)
RPORATION]	Designing Titanium TranTixxii (Titanium Material for Design & Luxury)
el Art Corporation]	Fine Color
el Art Corporation]	NEUES
RPORATION]	NSSC FW series
RPORATION]	NSSC 270 (Super Austenitic Stainless Steel)
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