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# NIPPON STEEL

# **ZINKOTE**<sup>™</sup>

Electrolytic zinc-coated steel sheet and strip



## **ZINKOTE**<sup>TM</sup>

Recent years have seen a rapidly broadening range of applications for coated steel sheets. This is largely due to the fact that the numerous characteristics of these sheets-in terms of the quality and economy of the various types of coated steel sheets developed by NIPPON STEEL-match the needs of the times, including the need for labor savings and quality improvement. That these characteristics are widely and highly rated among users also contributes to their expanded use.

ZINKOTE, NIPPON STEEL's electrogalvanized steel sheet, is used over a wide range of fields, extending from various electric appliances, office machines, and steel furniture to automobiles, building materials, and components for railway vehicles.

As we seek your continued patronage, we recommend that customers refer to this leaflet when choosing the optimum type of ZINKOTE for an intended application and to use the appended note on ZINKOTE properties.

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#### NIPPON STEEL CORPORATION

Surface treatment
QS1, QF1
QM
QR

Surface treatment

Zinc (Zn)

Galvanizing

Base steel sheet

Galvanizing

Surface treatment

Cold-rolled sheet

NSECC

NSEC270D

NSEC270E

NSEC270G

NSEC390R NSEC440R

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20/20, 10/10, ....



![](_page_2_Figure_1.jpeg)

**Electrogalvanizing Line** 

![](_page_2_Figure_3.jpeg)

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## **Standards**

### Type (JIS)

#### Base Metal (Cold-rolled Coil)

Туре	Designation	Nominal thickness (mm)
Commercial quality	SECC	$0.4 \leq t \leq 3.2$
Commercial quality	SECCT	$0.4 \leq t \leq 3.2$
Drawing quality	SECD	$0.4 \leq t \leq 3.2$
Deep drawing quality	SECE	0.4 ≦ t ≦ 3.2
	SEFC340	$0.6 \leq t \leq 2.3$
High-strength quality	SEFC390	$0.6 \leq t \leq 2.3$
ioi diatting	SEFC440	0.6 ≦ t ≦ 2.3

Notes1) For SECC, SECD and SECE, the nominal thickness other than listed in the table at left may be agreed upon between the producer and the purchaser.2) The symbol of SECC tempering class is as shown in Table a.

#### Table a Tempering Grade

Tempering grade	Symbol
Standard tempering	S
1/8 hardening	8
1/4 hardening	4
1/2 hardening	2
Hardening	1

#### Base Metal (Hot-rolled Coil)

Туре	Designation	Nominal thickness (mm)			
Commercial quality	SEHC	1.6 ≦ t ≦ 4.5			
Drawing quality	SEHD	1.6 ≦ t ≦ 4.5			
Deep drawing quality	SEHE	1.6 ≦ t ≦ 4.5			
Ligh strongth quality	SEPH400	1.6 ≦ t ≦ 4.5			
	SEPH440	1.6 ≦ t ≦ 4.5			

### Type (NIPPON STEEL Standards)

### Base Metal (Cold-rolled Coil)

#### Base Metal (Hot-rolled Coil)

	-
Туре	Designation
Commercial quality	NSECC
Drawing quality	NSEC270D
Deep drawing	NSEC270E
Futue de se duouie e	NSEC270F
Extra deep drawing	NSEC270G
	NSEC390N
L Pada a bas a sub- su a Phu	NSEC440N
High-strength quality	NSEC490N
for automotive forming	NSEC540N
	NSEC590N
Bake-hardening quality	NSEC340BH
Lligh strongth quality	NSEC340R
figh-strength quality	NSEC390R
for drawing	NSEC440R
Lligh strongth quality	NSEC340E
Figh-Strength quality	NSEC390E
for deep drawing	NSEC440E
	NSEC490D
	NSEC540D
High-strength quality of	NSEC590D
low yield ratio-type	NSEC780D
	NSEC980D
	NSEC1180D

ase Metal (Hot-rolled Coll)								
Base sheet	Туре	Designation						
Hot-rolled	Commercial quality	NSEHC						
	Drawing quality	NSEH270D						
	Deep drawing quality	NSEH270E						
	High strongth quality	NSEH400						
	righ-strength quality	NSEH440						

#### **Coating Mass**

Designation o	f one-side coating mass	Minimum coating	(Reference) Standard		
JIS	NIPPON STEEL Standards	mass* (one side) g/m <sup>2</sup>	coating mass (one side) g/m <sup>2</sup>		
E8	10	8.5	10		
E16	20	17.0	20		
E24	30	25.5	30		
E32	40	34.0	40		

#### **Surface Treatment**

	Kind of treatment	Designation	(Reference) Product name
No tre	eatment	М	
Finge	rprint-resistant standard	QS1	
Thick (high	-film fingerprint-resistant type corrosion resistance)	QF1	
Finge	rprint-resistant, high tribological type	QFK	ZINKOTE
Inorg	anic film type	QM	
Lubri	cation-treatment standard	QFL	
Chror	nate-free, phosphate	QR	
Color	Black, improved scratch-resistant type	KJ2	
coating	Silver, improved scratch-resistant type	SJ2	ZINKOTE COLOB
treatment	White standard type	HJ1	

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\*Equal coating on both sides

### Standards

### Mechanical Properties (JIS G 3313)

### Base Metal (Cold-rolled Coil)

		Vield point		Tensile		Coating					
Туре		Designation	N/mm <sup>2</sup>	strength N/mm <sup>2</sup>	Nominal thickness 0.4mm≦t<0.6mm	Nominal thickness 0.6mm≦t<1.0mm	Nominal thickness 1.0mm≦t<1.6mm	Nominal thickness 1.6mm≦t<2.3mm	Nominal thickness 2.3mm≦t<2.5mm	Nominal thickness 2.5mm≦t	bake-hardening N/mm <sup>2</sup>
Commorcial quality	SECC	—	(≧270)	(≧34)	(≧36)	(≧37)	(≧38)	(≧38)	(≧39)	—	
Commercia	ai quality	SECCT	—	≧270	≧34	≧36	≧37	≧38	≧38	≧39	—
Drawing quality		SECD	—	≧270	≧36	≧38	≧39	≧40	≧40	≧41	—
Deep drawing quality		SECE	—	≧270	≧38	≧40	≧41	≧42	≧42	≧43	—
	390 N-class	SEFC390	≧235	≧390	_	≧30	≧31	≧31	_	—	—
High-strength	440 N-class	SEFC440	≧265	≧440	_	≧26	≧27	≧27	_	—	—
quality for form-	490 N-class	SEFC490	≧295	≧490	_	≧23	≧24	≧24	_	—	_
ing	540 N-class	SEFC540	≧325	≧540	_	≧20	≧21	≧21	_	—	—
	590 N-class	SEFC590	≧355	≧590	-	≧17	≧18	≧18	_	_	—
	490 N-class	SEFC490Y	≧225	≧490	-	≧24	≧25	≧25	_	—	—
High-strength	540 N-class	SEFC540Y	≧245	≧540	_	≧21	≧22	≧22	_	—	—
quality of low	590 N-class	SEFC590Y	≧265	≧590	_	≧18	≧19	≧19	_	—	—
yield ratio-type	780 N-class	SEFC780Y	≦365	≧780	_	≧13	≧14	≧14	_	—	—
	980 N-class	SEFC980Y	≦490	≧980	_	≧6	≧7	≧7	—	—	—
Bake-harde	ning type	SEFC340H	≦185	≧340	_	≧34	≧35	≧35	—	—	≧30

#### Base Metal (Hot-rolled Coil)

			Malal a sint	Viald point Tensile		Elongation %						
Тур	De	Designation	N/mm <sup>2</sup>	strength N/mm <sup>2</sup>	Nominal thickness 1.6mm≦t<2.0mm	Nominal thickness 2.0mm≦t<2.5mm	Nominal thickness 2.5mm≦t<3.15mm	Nominal thickness 3.15mm≦t<3.2mm	Nominal thickness 3.2mm≦t<4.0mm	Nominal thickness 4.0mm≦t≦4.5mm	Test piece	
Commerci	ial quality	SEHC	—	≧270	≧29	≧29	≧29	≧29	≧31	≧31		
Drawing	quality	SEHD	—	≧270	≧32	≧33	≧35	≧35	≧37	≧39	JIS No. 5, rolling directio	
Deep draw	ing quality	SEHE	_	≧270	≧33	≧35	≧37	≧37	≧39	≧41		
	490 N-class	SEFH490	≧325	≧490	≧22	≧23	≧24	≧24	≧25	≧25	JIS No. 5.	
forming quality	540 N-class	SEFH540	≧355	≧540	≧21	≧22	≧23	≧23	≧24	≧24	perpendicular	
	590 N-class	SEFH590	≧420	≧590	≧19	≧20	≧21	≧21	≧22	≧22	rolling directio	
	310 N-class	SEPH310	(≧185)	≧310	≧33	≧34	≧36	≧38	≧38	≧40		
High-strength	370 N-class	SEPH370	≧225	≧370	≧32	≧33	≧35	≧36	≧36	≧37	JIS No. 5,	
eral forming	400 N-class	SEPH400	≧255	≧400	≧31	≧32	≧34	≧35	≧35	≧36	rolling direction	
	440 N-class	SEPH440	≧305	≧440	≧29	≧30	≧32	≧33	≧33	≧34		

Note: () Reference value

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Test piece

JIS No. 5, rolling direction

JIS No. 5, perpendicular to rolling direction

Note: () Reference value

on

r to on

on

### Standards

### Mechanical Properties (NIPPON STEEL Standards)

### Base Metal (Cold-rolled Coil)

Туре	Thickness			Tensile	Elongation %						
	Designation	Designation	Designation	applied mm	N/mm <sup>2</sup>	strength N/mm <sup>2</sup>	Nominal thickness 0.40mm≦t<0.60mm	Nominal thickness 0.60mm≦t<1.0mm	Nominal thickness 1.0mm≦t<1.6mm	Nominal thickness 1.6mm≦t<2.3mm	Nominal thickness 2.3mm≦t
Commercial quality	NSECC	0.3 ~ 3.2	_	_	-	-	_	-	-		
Drawing quality	NSEC270D	0.4 ~ 2.6	(≦195)	≧270	≧38	≧40	≧42	≧43	≧44		
Deep drawing	NSEC270E	0.4 ~ 2.6	(≦185)	≧270	≧40	≧42	≧44	≧45	≧46	JIS No. 5, rolling directi	
Futre doop drowing	NSEC270F	0.6 ~ 2.3	(≦175)	≧270	-	≧45	≧46	≧47	≧48	Tolling direction	
Extra deep drawing	NSEC270G	0.6 ~ 2.3	(≦175)	≧270	_	≧47	≧48	≧49	≧50		

		Thickness applied mm		Tensile	DU								
Туре	Designation		Vield point N/mm <sup>2</sup>	strength N/mm <sup>2</sup>	BH N/mm <sup>2</sup>	Nominal thickness 0.4mm≦t<0.6mm	Nominal thickness 0.6mm≦t<1.0mm	Nominal thickness 0.80mm≦t<1.0mm	Nominal thickness 1.0mm≦t<1.2mm	Nominal thickness 1.2mm≦t<1.6mm	Nominal thickness 1.6mm≦t<2.0mm	Nominal thickness 2.0mm≦t≦2.3mm	Test piece
	NSEC390N	0.4 ~ 2.3	≧235	≧390	_	≧28	≧30	≧30	≧31	≧31	≧32	≧33	
	NSEC440N	$0.4 \sim 2.3$	≧275	≧440	_	≧24	≧26	≧26	≧27	≧27	≧28	≧29	
High-strength quality for general forming	NSEC490N	$0.6 \sim 2.3$	≧315	≧490	_	_	≧23	≧23	≧24	≧24	≧24	≧25	
gono. di totting	NSEC540N	$0.6 \sim 2.3$	≧355	≧540	_	_	≧20	≧20	≧21	≧21	≧21	≧22	
	NSEC590N	0.6 ~ 2.3	≧390	≧590	_	-	≧17	≧17	≧18	≧18	≧18	≧19	
	NSEC340R	0.4 ~ 2.3	≧185	≧340	_	≧32	≧34	≧35	≧36	≧37	≧38	≧39	JIS No. 5, perpendicular to rolling direction
High-strength quality for drawing	NSEC390R	0.4 ~ 2.3	≧225	≧390	_	≧29	≧31	≧32	≧33	≧34	≧35	≧36	
diaming	NSEC440R	0.4 ~ 2.3	≧265	≧440	_	≧27	≧29	≧30	≧30	≧31	≧31	≧32	
	NSEC340E	0.6 ~ 2.3	≧165	≧340	_	-	≧34	≧35	≧36	≧37	≧38	≧39	
High-strength quality for deep drawing	NSEC390E	0.6 ~ 2.3	≧205	≧390	_	-	≧31	≧32	≧33	≧34	≧35	≧36	
	NSEC440E	0.6 ~ 2.3	≧240	≧440	_	-	≧29	≧30	≧30	≧31	≧32	≧33	
Bake-hardening type	NSEC340BH	0.4 ~ 2.3	≧195	≧340	≧30	_	≧35	≧35	≧36	≧37	≧38	≧39	
	NSEC490D	$0.6 \sim 2.3$	≦335	≧490	_	_	≧27	≧	28	≧29	≧29	≧29	
	NSEC540D	$0.6 \sim 2.3$	≦375	≧540	_	_	≧25	≧	26	≧27	≧27	≧27	
High-strength quality of	NSEC590D	$0.6 \sim 2.3$	≦410	≧590	_	_	≧17	≧18	≧19	≧20	≧21	≧21	
low yield ratio-type	NSEC780D	0.6 ~ 2.3	≦645	≧780	-	-	≧12	≧13	≧14	≧15	≧16	≧16	
	NSEC980D	0.8 ~ 2.3	(≦885)	≧980	_	-	_	≧9	≧10	≧11	≧	12	
	NSEC1180D	0.8 ~ 2.3	(≦1130)	≧1180	_	_	_		≧6	≧7	2	≧8	

### Base Metal (Hot-rolled Coil)

		Thickness applied mm	Tensile strength N/mm <sup>2</sup>						
Туре	Designation			Nominal thickness 1.6mm≦t<2.0mm	Nominal thickness 2.0mm≦t<2.5mm	Nominal thickness 2.5mm≦t<3.2mm	Nominal thickness 3.2mm	Test piece	
	NSEHC	$1.4 \sim 3.2$	—	_	—	_	_		
Ordinary steel (mild steel sheet)	NSEH270D	1.6 ~ 3.2	≧270	≧32	≧33	≧35	≧39	JIS No. 5, rolling direction	
	NSEH270E	1.6 ~ 3.2	≧270	≧33	≧35	≧37	≧41		

		Thickness	Yield point N/mm <sup>2</sup>	Tensile strength N/mm <sup>2</sup>					
Туре	Designation	applied mm			Nominal thickness 1.6mm≦t<2.0mm	Nominal thickness 2.0mm≦t<2.5mm	Nominal thickness 2.5mm≦t<3.2mm	Nominal thickness 3.2mm	, Test piece
High strength quality	NSEH400	1.6 ~ 3.2	≧225	≧400	≧31	≧32	≧34	≧35	JIS No. 5,
Figh-strength quality	NSEH440	1.6 ~ 3.2	≧305	≧440	≧29	≧30	≧32	≧33	rolling direction

### NIPPON STEEL CORPORATION

tion

## Available Sizes

#### Size

#### **Base Metal (Cold-rolled Coil)**

![](_page_6_Figure_3.jpeg)

![](_page_6_Figure_4.jpeg)

#### **Base Metal (Hot-rolled Coil)**

![](_page_6_Figure_6.jpeg)

## **Characteristic Properties**

#### **Protective Effects of Coating**

- and other sites where the base metal is exposed.

#### Surface Treatment

![](_page_6_Figure_19.jpeg)

#### **Extensive Application of ZINKOTE in High-performance Home Electric Appliances and OA Equipment**

ZINKOTE of NIPPON STEEL is a chromate-free electrogalvanized steel sheet used for thin-screen televisions, copying machines, printers, etc.

#### Comparing Coated Steel Sheet to Sushi.....

Everyone likes sushi very much. To tell the truth, coated steel sheets resemble sushi in that each sheet consists of "steel + coating + surface treatment." Similarly to sushi..

#### • The steel corresponds to sushi rice.

meet diverse tastes-large to small rice balls, sticky to long-grain rice etc. Further, you can enhance your enjoyment by varying the brand of vinegar and the amount used (≒ ingredients) and by altering your method of cooking the rice and how much you compress the rice balls (≒ manufacturing method).

• The coating corresponds to toppings. The taste (≒ feeling of the finish) changes by adjusting the "thickness." Further, improvement in taste (corrosion resistance) can be achieved by adding wasabi (alloying element).

#### Sushi rice can be prepared in many ways to . Is the surface treatment a kind of soy sauce?

Various kinds of soy sauce (≒surface treatment) are used in finishing sushi balls (coated sheet)-sweet to spicy or straight to hard ( $\doteq$  various surface treatment methods). In fact, soy sauces play an important role in

#### Main End Products Adopting ZINKOTE

Products (examples)	Application areas
Flat panel display	Chassis, various components
Copying machines, printers	Various components

adding the appropriate taste (properties). What kinds of sushi (coated sheet) do you want?

![](_page_6_Picture_36.jpeg)

### **Precautions in Use**

When inappropriate handling and application methods are used, coated steel sheets cannot demonstrate their characteristic properties. It is recommended that attention be paid to the following precautions regarding use.

#### Storage and Loading/Unloading

 Water leakage during loading/unloading and storage constitutes a cause of corrosion. Strictly avoid loading/ unloading during rain and prevent exposure to seawater and dew condensation. Also, avoid storage in atmospheres of high humidity or sulfur-dioxide. Indoor storage under dry, clean conditions is recommended.

② Broken or torn packaging paper must be repaired.

- NS ZINKOTE has a lower friction coefficient and more easily causes slippage than conventional chromatetreated sheets. Therefore, due care should be paid to prevent the falling or rolling of coils and the collapse of piled sheets.
- Falling and rollin g coils are very dangerous, as is the collapse of piled sheets.
- To prevent such accidents during storage, due care should be paid to storing products in a stable, secure state.

#### Handling

- When coated sheets are rubbed using organic solvents, there are cases in which the organic coating film on the sheet surface will wear or peel off. Due care should be taken to prevent this.
- ② Contamination due to deposits of oil and other foreign substances may cause the deterioration of paintability. Due care should be taken to prevent this.

#### **Press Forming**

(1) When applying severe press forming, there are cases in which the coating film is damaged. Prior confirmation is requested when such press forming is applied.

②In press forming, some types of extreme pressure additives contained in lubricating oil can cause melting and corrosion of the surface coating films and base metals.

Prior confirmation is requested when such additives are used. Use of the lubricating oils shown in this catalog is recommended.\*

Excessive damage to surface layers during press forming will adversely affect paintability and corrosion resistance.

#### ▲ Attention

- When removing (cutting) coil binding hoops (bands) for use, make certain that the end of the coil is directly beneath the coil center in order to prevent the end of the coil from sudden springing out of the coil end; or, be certain to conduct the removal in a place where safety can be assured and no danger is posed if the coil end were to spring out upon release.
- Coils are formed by winding flat sheets. When the binding hoops or other external forces that keep the sheet in coil form are removed and the coil end is freed, the coil end will spring outward to return to a flat state. Further, there are also cases when the coil bindings become loose, allowing the coil to spring out. Such cases may endanger nearby workers and cause damage.

#### Welding and Brazing

- In resistance welding, because the electrodes are soiled, they should be properly maintained and replaced at regular intervals. In seam welding, the service life of electrodes can be extended by using a knurl-gear driving system.
- ② In welding, fumes consisting mainly of zinc oxides are generated. Although the effect of these fumes will differ depending on the coating mass and working environment, it is recommended that welding be conducted in a well-ventilated place.
- ③ In brazing, avoid high-temperature brazing using silver and other brazing fillers. Penetration of zinc alloy into crystal boundaries can occur, thereby causing brittle fracture in some cases.

#### Degreasing

- ① The use of weak alkaline-type and organic solvents and nonionic-type neutral detergents is recommended for degreasing. Some types of degreasing agents such as strong alkaline agents cause melting of the coating films and corrosion of the zinc. Prior confirmation is requested when such agents are used.
- (2) In the case of degreasing at high temperatures (more than 60°C) or using ultrasonic cleaning, there are cases in which the coating film is damaged. Due care should be taken to prevent this.
- ③ Conduct sufficient drying after degreasing. Handling in an insufficiently dry state may cause the coating film to peel off.
- ④ In alkali ion cleaning, there are cases in which oily substances remaining in the cleaning water may adversely affect the coating film. Prior confirmation is requested when such cleaning is applied.

#### Aging

Generally, steel sheets tend to show deterioration in quality over time–e.g. degraded formability, stretcher stains, and coil breaks. To avoid this, usage at the earliest possible time is recommended. However, this problem can be avoided if products with aging resistance are selected.

#### Others

- Because of the coating film on NSZINKOTE, prior confirmation is requested when this product is exposed to a high-temperature environment for a long time.
- ② Avoid using in acid and strong alkaline environments. (There are cases in which phosphate zinc and other chemical treatments used for treating the base steel sheets for painting can have high acidity and cause the film to melt.)
- ③ There are cases in which the film will peel off when highly adhesive tape is used.

#### \* Examples of Recommended Lubricating Oils and Degreasing Agents

	Quick drying oil
Oil	Press oil
	Tap oil
Degreasing	Water weak alkaline

## Packaging and Labeling

The finished product is packaged and shipped as per normal procedure for steel to ensure that it is handled and stored with care prior to its use. The external layer of packaging consists of a packaging label that contains details of the finished product that it is affixed to. Furthermore, the Package Card is also included, which is the warranty for the product in question.

The Package Card is used when taking receipt of the product and confirming its condition. The information contained on the Package Card and labels is detailed herein. An Example of Packaging

![](_page_8_Figure_5.jpeg)

### Packaging Labels and Package Cards

	Itom	Title name	Notation method			
	item	Packaging label	Notation method			
	Product name	Not shown	Product name is displayed			
	Class/Grade	Not shown	Class and grade of materials used are displayed			
©	JIS certification mark, JIS certifying body, JIS certification number	Not shown	Only the applicable materials are displayed.			
D	Spec designation	Specification	The spec code for the finished product is displayed (see note below)			
6	Dimensions	Dimensions	The dimensions are displayed			
	Number of sheets	Number of sheets	Only for cut sheets			
•	Quantity	Net quantity	This is displayed depending on the contractual arrangements (actual quantity or estimated value)			
	Length	Length	Contractual estimate or specific coil length is displayed			
0	Inspection number	Inspection number	Displayed on each package			
9	Coil number	Coil number	Displayed for each production lot			
	Customer name	Not shown	The customer name is displayed			
8	Shipping mark	Not shown	Shipping mark is displayed			
90	Company and works name	Not shown	(Location Name) WORKS (or AREA), NIPPON STEEL CORPORATION is displayed			
	Month and date of manufacture	-	The date of manufacture is displayed			

![](_page_8_Figure_8.jpeg)

![](_page_8_Figure_9.jpeg)

#### **Note: Notation Used for Specifications**

For JIS Standards	;				
<u>JIS G 3313 SI</u>	ECC	: <u>S</u>	D	GS1	X
1	2	3	4	5	6
1: Spec number	④: Sur	face fini	sh co	de	
2: Spec designation	5: Sur	face tre	atmer	nt code	
3: Skin-pass code	6: Oilir	ng desig	gnatio	n (when	no oils
	are	used, th	is is g	jiven the	value X)

For NIPPON STEE	LS	pec	ifica	ations	
NSECC ①	:	<u>S</u> 2	<b>D</b> 3	<u>QS1</u> ④	<b>X</b> 5
<ol> <li>Spec number</li> <li>Skin-pass code</li> <li>Surface finish code</li> </ol>	<ul> <li>4:3</li> <li>5:0</li> <li>6:0</li> </ul>	Surfa Oiling are us Code	ice tr g des sed, t for the	eatment of ignation ( this is give e amount of	code (when no oils en the value X) of oil to be applied

Note: In the event of no specific skin-pass being defined, all items following the surface finishing code are displayed on the left.

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NIPPON STEEL U.S.A. NIPPON STEEL U.S.A. STEEL/A12303 NO NO OWORKS (or AREA) MADE IN JAPAN

### Guide to Ordering

When placing orders, confirmation is required as to the following items for each intended application.

#### **Specifications**

Select the most suitable material quality from among the specifications described in this leaflet according to the severity and methods of fabrication.

#### **Coating Mass**

Select an appropriate coating mass according to the required corrosion

Sizes

The size of galvanized steel sheets (thickness, width and length) is the basic condition for product yield. Design the product by referring to the range of available sizes described in this leaflet. Sizes are available in 0.05-mm increments for thickness and 1-mm increments for width and length.

#### Coils

Select coils or cut-length sheets according to shear and fabrication conditions.

The selection of coils will effectively improve product yield and will benefit continuous and automated operation. In the case of coils, however, some defective parts may unavoidably be included because their removal, based on inspection, is impossible.

#### **Edge Finish**

Specify either mill edges or slit edges according to the application conditions.

#### **Surface Treatment**

Select the most suitable surface treatment from among those described in this leaflet according to the treatment method after fabrication and the application conditions.

#### Oiling

The decision whether or not to apply rust-preventive oil can be made separately from the kind of surface treatment. Oiling is recommended in order to improve intermediate rust resistance, to mitigate fingerprints and damage during handling, and to maintain lubrication during press forming. Meanwhile, oiling is indispensable for galvanized steel sheets lacking surface treatment.

#### Package Mass

Specify the package mass according to the local loading/ unloading capacity and work efficiency. The heavier the coil mass, the higher the work efficiency. In the case of coils, specify the maximum mass (unit minimum mass, too, if necessary).

#### Inside and Outside Coil Diameters

In the case of coils, specify the inside and outside coil diameters according to the specifications of the uncoilers on the shearing line. When selecting inside diameters, it is necessary to consider the occurrence of break and reel marks on the areas of the inside diameter, depending on the thickness.

#### Dimensional Accuracy (Thickness, Width, and Length)

Dimensional accuracy of thickness, width, and length is guaranteed within the range of sizes described in this leaflet. However, there are cases that require stricter size specifications with respect to assembly accuracy and dimensional accuracy of the parts, depending on the application conditions of the finished products. In such cases, consult us in advance to clarify the size specifications required.

#### Applications, Fabrication Methods, and Others

Clearly indicate the intended application, fabrication method, and as many other requirements as possible. NIPPON STEEL implements materials design and quality control to better suit the intended application and application conditions.

#### MEMO

#### NIPPON STEEL CORPORATION