

STAINLESS STEELS



Setting the Standard for Tomorrow JFE Stainless Steel

JFE Steel is a brand new company that has been established in April 2003 as a result of the consolidation of steel divisions of Kawasaki Steel and NKK. Although the company is newly born, we already have a history of 40 years in production of stainless steel.

During the years, demand for stainless steel has shown a tremendous increase and at the same time application has expanded to numerous fields from construction, kitchen equipment, automobile parts to electronic components etc. because of the reliability and attractiveness of the material.

As an integrated stainless steel producer, JFE produces stainless steel from steel making stage, to hot and cold rolling. Responding to the diversifying needs of the market, high quality is ensured to every product through production in our state of art production facilities under latest process technology.

In the recent years, as the leading company in production of chrome type stainless steel, we pride ourselves on becoming even more capable to meet various customer needs including higher corrosion resistance and formability with our wide variety of chrome type stainless steel lineup, as a result of our strategy to concentrate all of our management resources into production and development of chrome type stainless steel.



Features of JFE Stainless Steel

1

Wide Range of Cr-based Stainless Steel Types

2

Cold-tandem Mill Products for Specific Functional Needs 3

Superior Gauge Accuracy and Flatness

Uniform Quality

An integrated quality control system from steelmaking through the final process of cold rolling ensures uniform quality in products with excellent formability and corrosion resistance.

Attractive Finishes

To produce attractive stainless steel finishes, rolls are kept in optimum condition at all times, while automated control equipment is used to guarantee high dimensional accuracy. The beautiful gloss of JFE's bright anneal (BA) stainless has won wide customer acclaim.

Products for Every Application

JFE offers a wide range of Cr-based stainless steel types. Our full line of new Cr-based products includes ultra-low carbon Cr-based stainless steel produced with state-of-the-art refining equipment and technology. We also produce wide stainless foils.

Features of JFE443CT

21Cr Stainless Steel

Features

- 1. Excellent corrosion resistance
 - a) With the increase of chromium(Cr) content to 21% and addition of 0.4%Cupper(Cu), JFE443CT exhibits similarly excellent corrosion resistance compared with type 304.
 - b) In particular, the atmospheric corrosion resistance is noticeable.
 - c) JFE443CT is not susceptible to stress corrosion cracking(SCC).
 - d) Due to the reduction in carbon and nitrogen content and the addition of Titanium, corrosion resistance of the welded area is good.
- 2. Price competitiveness and stability
 - a) Price competitiveness: Without the addition of nickel(Ni), the price of JFE443CT is cheaper.
 - b) Price stability: Without the addition of nickel and molybdenum(Mo), the price of JFE443CT is stable even when the price of raw materials of nickel and molybdenum soars.
- 3. Good formabillity
 - a) Equal or better formability, compared with other conventional Cr-type stainless steel
 - b) Better drawing formability than 304
 - c) Less working load for shearing and pressing as less work hardening than Type 304.
 - d) No cracking(season cracking, delayed cracking) like as Type 304 after pressing
- 4. Excellent physical properties
 - a) Higher thermal conductivity (about 40%) than type304
 - b) Smaller thermal expansion coefficient (about 40%) than type304
 - c) Less material weight for same size because of the smaller density than Type 304
 - d) Possible magnetic separation and handling by magnetism
- 5. Line up of various surface finish 2B and other finishes, 2BW(white surface), KB, KD

Chemical Composition

(mass %)

Steel grade	C (carbon)	Si (Silicon)	Mn (Manganese)	P (Phosphorus)	S (Sulfur)	Cr (chromium)	Cu (Copper)	N (Nitrogen)	Others
JFE Standard	0.025 Max.	1.00 Max.	1.00 Max.	0.040 Max.	0.030 Max.	20.00~ 23.00	0.30 ~ 0.80	0.025 Max.	Ti 8 x (C%+N%)∼ 0.80%
Typical	0.01	0.1	0.2	0.03	0.002	20.8	0.4	0.01	Ti/0.3

Mechanical property

Typical values. Specimen thickness: 0.8mm.

Steel grade	0.2% proof stress (N/mm²)	Tensile stress (N/mm²)	Elongation (%)	Mean r-value
JFE443CT	305	483	31	1.3
SUS430	320	490	29	1.0
SUS304	260	645	60	1.0

2006 Nikkei
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Nikkei Business Daily Awards
for Excellence

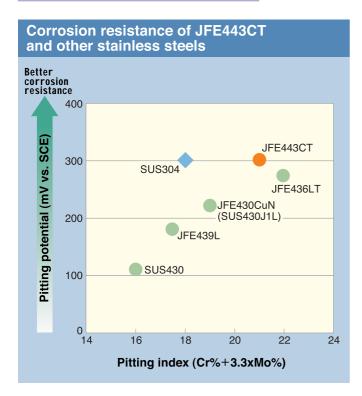
The Ichimura Prize in Industry

Meritorious

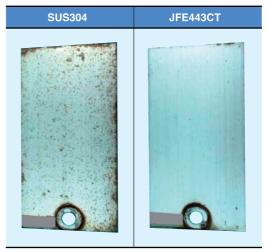
Achievement

Prize

Corrosion resistance



Field exposure test for 14 months at seashore of Okinawa, southern of Japan



Sample size: 75 x 150mm #800 polished surface Distance from beach: 20m

2BW surface

2B finish of JFE443CT has the higher brightness and not so much whiteness than 304 similar to other Cr-type stainless steel.

In order to get anti-dazzling surface and make defects unclear, 2BW is newly established with white surface like as Type 304.



Features of JFE's SUS430

Features

- Excellent Formability :
 Excellent formability because of relative softness.
- 2. Supreme Surface Gloss
 - 1) Hot Rolled Products: Supreme surface gloss available after re-rolling due to high quality surface.
 - 2) Cold Rolled Products: Supreme surface gloss available from JFE Steel 2B-finish products.
- 3. Perfect Surface Finish/cleanliness of Steel:

 JFE Steel's SUS430 has perfect surface finish and superior cleanliness.

1. Mechanical Properties of JFE Steel's SUS430

 Thickness: 1.0mm

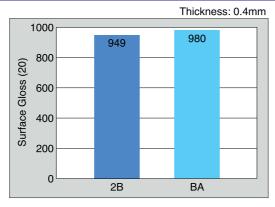
 0.2% Proof Stress (N/mm²)
 Tensile Strength (N/mm²)
 Elongation (%)

 JIS Standard
 Spec.
 205≦
 420≦
 22≦

 JFE Steel's SUS430
 Spec./ Typical value
 270≦/315
 420≦/486
 26≦/30

2. Surface Gloss of 2B Finished Cold Roll

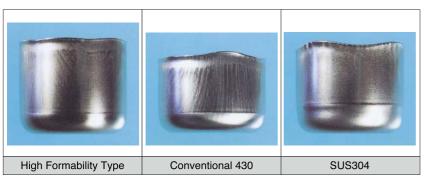
Surface gloss of 2B finished cold roll of thinner gauge is almost equivalent to BA finished cold roll.





JFE's SUS430-2B

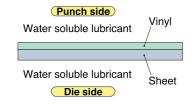
High Formability Quality Available for Severe Forming Application



●Experimental Conditions
Sheet thickness: 0.7mm
33mm dia. flat-tipped cylindrical punch
Blank holding force: Type 430; 0.5ton
Type 304: 1.0ton

10mm

Thickness: 0.7mm	LDR	Mean r-value
High Formability SUS430	2.06	1.12
Conventional SUS430	1.91	0.80
SUS304	2.00	1.00



Functional (Cold-Tandem Mill) Products

Features

Quality and cost performance

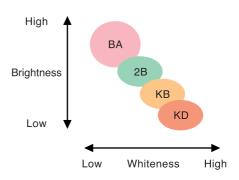
Functional products provide the corrosion resistance and mechanical properties of stainless steel with lower cost than 2B and BA materials, because they are produced in highly productive cold-tandem mill and continuous annealing line (CAL).

JFE has various experiences to provide these functional products for application where the material is painted, polished or used at invisible places.

Finish Symbol	Finishing Method and Finishing Degree
KD,KB	Glossless white surface

Note

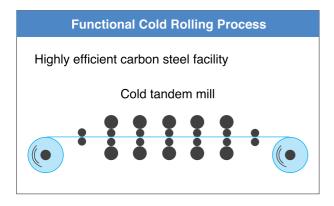
- Interleaf papers (inserted for prevention of scratches on the surface) are not applied in these products.
- No complaints or claims on brightness, lines or scratches on surface will be accepted.
- · KD and KB are the finishing symbol provided only by JFE.

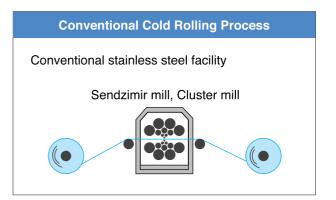


Steel Types and Chemical Composition

Steel Type	JIS Code	Cr	Мо	Ti
JFE409L	SUH409L	10.50 ~ 11.75	_	6×C ~ 0.75
SUS430	SUS430	16.00 ~ 18.00	_	_
JFE430XT	SUS430LX	16.00 ~ 19.00	_	0.10 ~ 1.00
JFE439L	SUS430LX	17.00 ~ 19.00	_	6×(C+N) ~ 0.75
JFE432LTM	SUS436J1L	17.00 ~ 19.00	0.40 ~ 0.80	8×(C+N) ~ 0.80
JFE436LT	SUS436L	16.00 ~ 19.00	0.75 ~ 1.50	11×(C+N) ~ 0.75
JFE443CT	_	20.00 ~ 23.00	_	8×(C+N) ~ 0.80

Manufacturing Process





Examples of Application









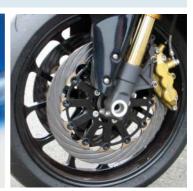






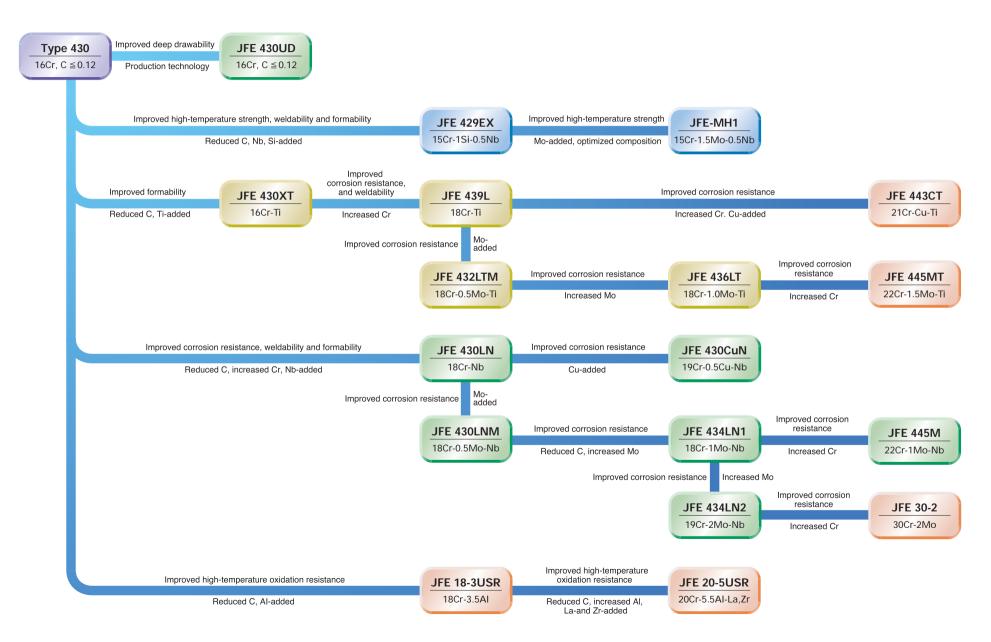






Families of Stainless Steel

Medium and High Cr-based

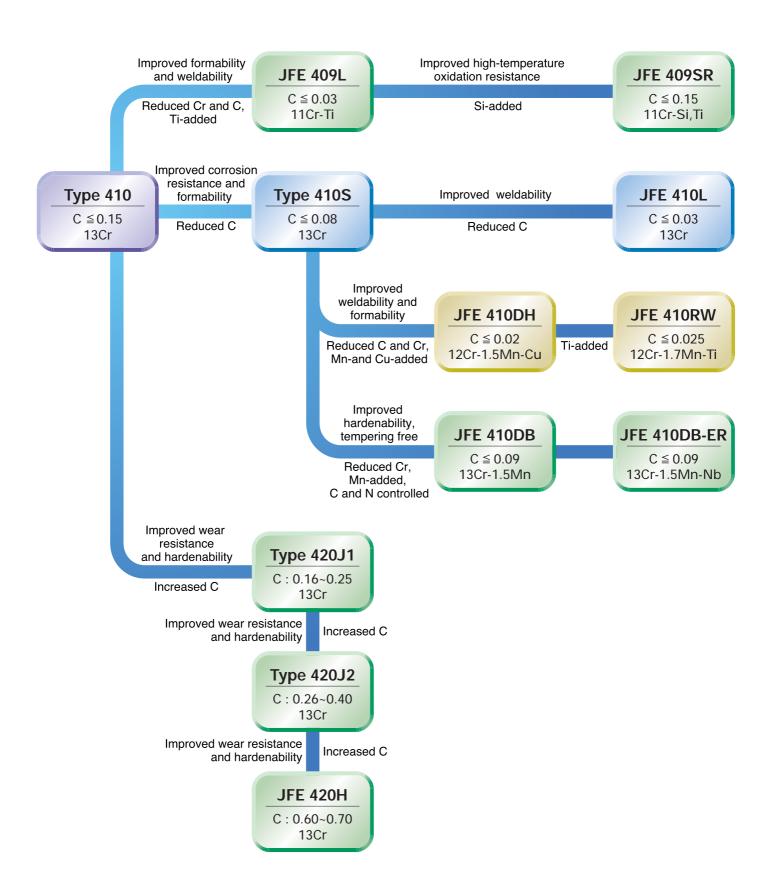


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Families of Stainless Steel

Low Cr-based



Comparison of Corrosion Resistance

Corrosion Resistance JFE's Cr-based Stainless Steels

The representative corrosion resistance of JFE's Cr-based stainless steels is shown in the figure below in terms of pitting potential.



P.I. (Pitting Index)

•Cr-based stainless steel

P.I. = %Cr + 3.3 × %Mo

Ni-based stainless steel

 $P.I. = \%Cr + 3.3 \times \%Mo + 16 \times \%N$

Conforms to JIS G 0577 30°C, 3.5%NaCl solution

Characteristics and Applications by Steel Type

Cr-based

Part			Standard	l Designation				
Service of Policy Signated Service Se	Classification	JFE Standard	JIS Standard	EN Standard Chemical	ASTM, AISI Standard Chemical	Basic Composition	Characteristics	Major Applications
			SUS 410 *	1.4006	410	13Cr	So-called "13-Cr stainless steels."	Cutlery, machinery parts, and valves
Dec	Standard Type		SUS 430	1.4016	430	16Cr	Typical Cr-based stainless steels.	
Part			SUS 410S	1.4000	410S	13Cr - 0.08C	13-Cr stainless steels with improved weld toughness, corrosion resistance and formability.	Table knife, hollow ware
Part	Deep Drawable Type	JFE 430UD	SUS 430	1.4016	430	16Cr	Deep drawability improved over that of 430.	Daily-use durable goods, kitchen equipment, decorative articles, and architectural trimming
PEGAL Microsity Microsit		JFE 430XT	SUS 430LX			16Cr - Ti - ULC	Deep-drawability, anti-ridging property and weldability are improved.	Daily-use durable goods, kitchen equipment
Page		JFE 430LN	SUS 430LX			18Cr - Nb - ULC	Deep-drawability, anti-ridging property and weldability are improved.	Bicycle rims,silos,and central heating pipes
Part		JFE 439L	SUS 430LX	1.4510	439	18Cr - Ti - UL (C,N)	Good resistance to auto exhaust condensate.	Automobile mufflers, elevators, and kitchen equipment
Pacification Paci		JFE 430CuN	SUS 430J1L			19Cr - 0.5Cu - Nb - UL (C,N)	Pitting corrosion resistance, formability and weldability improved over those of 430.	
Vocability and variety and v		JFE 430LNM	SUS 436J1L			18Cr - 0.5Mo - Nb - UL (C,N)		
Package Pack		JFE 432LTM	(SUS 436J1L*)			18Cr - 0.5Mo - Ti - UL (C,N)	High resistance to auto exhaust condensate.	Automobile mufflers
Page			SUS 434 *	1.4113	434	18Cr - 1Mo	Corrosion resistance and pitting corrosion resistance of 430 are improved.	Automobile external panels
Page		JFE 434LN1	SUS 436L			18Cr - 1Mo - Nb - UL (C,N)	Workability and weldability of 434 are improved.	
Part		JFE 436LT	SUS 436L			18Cr - 1.0Mo - Ti - UL (C,N)	Extra-high resistance to auto exhaust condensate.	
Fe 45M SUS 445J1 SUS 445J2 SUS 445		JFE 443CT				21Cr - Cu - Ti - UL (C,N)		
Fe 448MT SUS 445J2 SUS 445J2 SUS 445J2 SUS 447J1 SUS 445J2 SUS 47J1 SUS 445J2 SUS 47J1 SUS 445J2 SUS 47J1 SUS 445J2 SUS 47J1 SUS 447J1 SUS 445J2 SUS 447J1 SUS 447J1 SUS 445J2 SUS 447J1 SUS		JFE 434LN2	SUS 444		444	19Cr - 2Mo - Nb - UL (C,N)	Pitting corrosion resistance is excellent, comparable to that of 316.	Solar heat collector plates and hot water tanks
High Corosion Resistant Type For Machine Parts Sus 447JI Sus 403 Sus 40		JFE 445M	SUS 445J1			22Cr-1Mo-Nb - UL (C,N)	Atmospheric corrosion resistance is excellent, the same as that of SUS316	Heat storage tanks
Feb SUS 4471 SUS 4471 SUS 4471 SUS 4471 SUS 4471 SUS 403 A03 13Cr - 0.1C Sulted to machine parts with excellent corrosion resistance and machinability. Machine parts		JFE 445MT	SUS 445J2			22Cr - 1.5Mo - Ti - UL (C,N)	Atmospheric corrosion resistance of JFE 445MT is improved.	Roof materials, ducts and architectural external panels
For Cuttery For Cuttery For Cuttery For Cuttery Sus 420.1 1.402.1 420 19Cr - 0.2C Suited for parts requiring wear resistance. Turbine blades and parts for elevated-temperature use Sus 420.2 1.402.8 420 13Cr - 0.3C Higher quench hardness than that of 420.1. Cuttery, nozzle valve seats, valves, and linear scales Far higher quenching hardness than that of SUS 420.2. Cuttery Cutt		JFE 30-2	SUS 447J1			30Cr - 2Mo - UL (C,N)		producing organic acids such as acetic acid and lactic
For Cutlery For Lighter Quenching hardness than that of V2011. Cutlery	For Machine Parts		SUS 403		403	13Cr - 0.1C	Suited to machine parts with excellent corrosion resistance and machinability.	Machine parts
JFE 420H JFE 40DH JFE 410DH JFE 41			SUS 420J1	1.4021	420	13Cr - 0.2C	Suited for parts requiring wear resistance.	Turbine blades and parts for elevated-temperature use
JFE 409L SUH 409L 1.4512 11Cr - Ti - ULC Carbon content of 409 is decreased to improve oxidation resistance and formability. Exhaust pipes, manifolds, and converter cases	For Cutlery		SUS 420J2	1.4028	420	13Cr - 0.3C	Higher quench hardness than that of 420J1.	Cutlery, nozzle valve seats, valves, and linear scales
Provided Structure Application Resistant Type Fe 410		JFE 420H				13Cr - 0.6C	Far higher quenching hardness than that of SUS 420J2.	Cutlery
Disk brakes for motorcycles Description Disk brakes for motorcycles		JFE 409L	SUH 409L	1.4512		11Cr - Ti - ULC	Carbon content of 409 is decreased to improve oxidation resistance and formability.	Exhaust pipes, manifolds, and converter cases
Oxidation Resistant TypeTypeJFE 429EX1.459515Cr - 1Si - 0.5Nb - LCHigh resistance to oxidation and thermal fatigue.Automobile exhaust gas manifoldsJFE-MH115Cr - 1.5Mo - 0.5Nb - ULCThermal fatique resistance of JFE 429EX is increased.Automobile exhaust gas manifoldsJFE 18-3USR18Cr - 3.5Al - ULCExcellent oxidation resistance at high temperature.Combustion chambersJFE 20-5USR20Cr - 5.5Al - ULCExcellent oxidation resistance, with no deterioration even in very thin sheets.Metal honeycombs for automobile catalytic convertersFor Welded StructureJFE 410DH12Cr - 1.5Mn - 0.3Cu - L (C,N)Manganese content is increased to improve weld joint performance and weldability.Marine-cargo container frames and water-wheel linersJFE410RW12Cr-1.7Mn-TiAnti-corrosion resistance of weld parts is increasedRail wagonWear Resistant TypeJFE 410DB13Cr - 1.5MnWide range of quenching temperatures can be used to obtain required hardness by quenching alone.Disk brakes for motorcycles		JFE 409SR				11Cr - 1.5Si - Ti - UL (C,N)	Silicon content of 409 is increased to improve oxidation resistance.	Catalytic converters of automobiles and warm air heaters
Type JFE 429EX 1.4595 15Cr - 15l - 0.5Nb - LC High resistance to oxidation and thermal fatigue. Automobile exhaust gas manifolds		JFE 410L	SUS 410L			13C - LC	Softer and better in formability.	Container external panels
JFE-MH1		JFE 429EX		1.4595		15Cr - 1Si - 0.5Nb - LC	High resistance to oxidation and thermal fatigue.	Automobile exhaust gas manifolds
JFE 20-5USR Dyear Resistant Type JFE 410DB JFE 4	1,500	JFE-MH1				15Cr - 1.5Mo - 0.5Nb - ULC	Thermal fatique resistance of JFE 429EX is increased.	Automobile exhaust gas manifolds
For Welded Structure For Welded Structure For Welded Structure JFE 410DH 12Cr - 1.5Mn - 0.3Cu - L (C,N) Manganese content is increased to improve weld joint performance and weldability. Marine-cargo container frames and water-wheel liners Anti-corrosion resistance of weld parts is increased Rail wagon Wear Resistant Type Wear Resistant Type JFE 410DB JFE 410DB Disk brakes for motorcycles		JFE 18-3USR				18Cr - 3.5Al - ULC	Excellent oxidation resistance at high temperature.	Combustion chambers
For Welded Structure JFE410RW JFE410RW 12Cr-1.7Mn-Ti Anti-corrosion resistance of weld parts is increased Rail wagon Wear Resistant Type Wear Resistant Type JFE 410DB JFE 410DB JFE 410DB Disk brakes for motorcycles		JFE 20-5USR				20Cr - 5.5Al - ULC	Excellent oxidation resistance, with no deterioration even in very thin sheets.	Metal honeycombs for automobile catalytic converters
Wear Resistant Type JFE 410DB JFE 410DB JFE 410DB JFE 410DB JFE 410DB JFE 410DB Anti-corrosion resistance of weld parts is increased Wide range of quenching temperatures can be used to obtain required hardness by quenching alone. Disk brakes for motorcycles	F. W.H. C.	JFE 410DH				12Cr - 1.5Mn - 0.3Cu - L (C,N)	Manganese content is increased to improve weld joint performance and weldability.	Marine-cargo container frames and water-wheel liners
Wear Resistant Type OFE 410DB OFE 410	For Welded Structure	JFE410RW				12Cr-1.7Mn-Ti	Anti-corrosion resistance of weld parts is increased	Rail wagon
	Wear Resistant Type	JFE 410DB				13Cr - 1.5Mn		Disk brakes for motorcycles
		JFE 410DB-ER				13Cr - 1.5Mn - Nb	Higher heat-resistance than that of 410DB.	Disk brakes for motorcycles

^{*}Please consult us if you require these types of steel.

Please contact us if you require special steel types other than those shown in the table.
 The proof test is conducted when specified.

Hardness is measured by HV or HRB only, depending upon the sheet thickness.
 Please contact us for mechanical properties if EN, ASTM, or AISI specification is required.

Chemical Composition and Mechanical Properties

Cr-based (1)

		Standard	Designation				Che	mical Com	position%						Mechan	ical Propert	ies		
			Corresponding	Corresponding ASTM, AISI										Tensile Test		Hardne	ss Test	Bei	nd Test
Classification	JFE Standards	JIS Standards	EN Standard Chemical Composition	Standard Chemical Composition #	С	Si	Mn	Р	S	Cr	Мо	Others	Yield Strength N /mm²	Tensile Strength N /mm²	Elongation %	HV	HRB	Bending Angle	Inside Radius t: Thickness
Standard Type		SUS 410 *	1.4006	410	0.15 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.50 ~ 13.50			205 min.	440 min.	20 min.	210 max.	93 max.	180°	1.0 × t
Standard Type		SUS 430	1.4016	430	0.12 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 18.00			205 min.	420 min.	22 min.	200 max.	88 max.	180°	1.0 × t
		SUS 410S	1.4000	4108	0.08 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.50 ~ 13.50			205 min.	410 min.	20 min.	200 max.	88 max.	180°	1.0 × t
Deep Drawable Type	JFE 430UD	SUS 430	1.4016	430	0.12 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 18.00			205 min.	420 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE 430XT	SUS 430LX			0.030 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 19.00		Ti 0.10 ~ 1.00	175 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE 430LN	SUS 430LX			0.030 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 19.00		Nb 0.10 ~ 1.00	175 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE 439L	SUS 430LX	1.4510	439	0.030 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	17.00 ~ 19.00		N 0.020 max. Ti 6×(C+N)~0.75	175 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE 430CuN	SUS 430J1L			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 20.00		N 0.025 max. Nb 8 × (C + N) ~ 0.80 Cu 0.30 ~ 0.80	205 min.	390 min.	22 min.	200 max.	90 max.	180°	1.0 × t
	JFE 430LNM	SUS 436J1L			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	17.00 ~ 20.00	0.40 ~ 0.80	N 0.025 max. Nb 8×(C+N) ~ 0.80	245 min.	410 min.	20 min.	200 max.	90 max.	180°	1.0 × t
	JFE 432LTM	(SUS 436J1L*)			0.025 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	17.00 ~ 19.00	0.40 ~ 0.80	N 0.015 max. Ti 8× (C+N) ~ 0.80	205 min.	390 min.	25 min.	180 max.	88 max.	180°	1.0 × t
Weldability and Corrosion		SUS 434 *	1.4113	434	0.12 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 18.00	0.75 ~ 1.25		205 min.	450 min.	22 min.	200 max.	88 max.	180°	1.0 × t
Resistant Type	JFE 434LN1	SUS 436L			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 19.00	0.75 ~ 1.50	N 0.025 max. Nb 8× (C+N) ~ 0.80	245 min.	410 min.	20 min.	230 max.	96 max.	180°	1.0 × t
	JFE 436LT	SUS 436L			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 ~ 19.00	0.75 ~ 1.50	N 0.025 max. Ti 11× (C+N) ~ 0.75	245 min.	410 min.	20 min.	230 max.	96 max.	180°	1.0 × t
	JFE 443CT				0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	20.00 ~ 23.00		N 0.025 max. Ti 8× (C+N) ~ 0.80 Cu 0.30 ~ 0.80	205 min.	390 min.	22 min.	200 max.	90 max.	180°	1.0 × t
	JFE 434LN2	SUS 444		444	0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	17.00 ~ 20.00	1.75 ~ 2.50	N 0.025 max. Nb 8× (C+N) ~ 0.80	245 min.	410 min.	20 min.	230 max.	96 max.	180°	1.0 × t
	JFE 445M	SUS 445J1			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	21.00 ~ 24.00	0.70 ~ 1.50	N 0.025 max. Nb 8×(C+N) ~ 0.80	245 min.	410 min.	20 min.	230 max.	96 max.	180°	1.0 × t
	JFE 445MT	SUS 445J2			0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	21.00 ~ 24.00	1.50 ~ 2.50	N 0.025 max.	245 min.	410 min.	20 min.	230 max.	96 max.	180°	1.0 × t
High Corrosion Resistant Type	JFE 30-2	SUS 447J1			0.010 max.	0.40 max.	0.40 max.	0.030 max.	0.020 max.	28.50 ~ 32.00	1.50 ~ 2.50	N 0.015 max. Cu 0.20 max.	295 min.	450 min.	22 min.	220 max.	95 max.	180°	1.0 × t

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●The proof test is conducted when specified.

●Hardness is measured by HV or HRB only, depending upon the sheet thickness.

●Please contact us for mechanical properties if EN, ASTM, or AISI specification is required.

Chemical Composition and Mechanical Properties

Cr-based (2)

		Standard	Designation				Cher	nical Comp	osition%						Mechan	ical Properti	ies		
a			Corresponding	Corresponding ASTM, AISI										Tensile Test		Hardnes	s Test	Bei	nd Test
Classification	JFE Standards	JIS Standards	EN Standard Chemical Composition	Standard Chemical Composition #	С	Si	Mn	Р	S	Cr	Мо	Others	Yield Strength N /mm²	Tensile Strength N /mm²	Elongation %	HV	HRB	Bending Angle	Inside Radius t: Thickness
For Machine Parts		SUS 403		403	0.15 max.	0.50 max.	1.00 max.	0.040 max.	0.030 max.	11.50 ~ 13.00			205 min.	440 min.	20 min.	210 max.	93 max.	180°	1.0 × t
		SUS 420J1	1,4021	420	0.16 ~ 0.25	1.00 max.	1.00 max.	0.040 max.	0.030 max.	12.00 ~ 14.00			225 min.	520 min.	18 min.	234 max.	97 max.	_	-
For Cutlery		SUS 420J2	1.4028	420	0.26 ~ 0.40	1.00 max.	1.00 max.	0.040 max.	0.030 max.	12.00 ~ 14.00			225 min.	540 min.	18 min.	247 max.	99 max.	_	_
	JFE 420H				0.60 ~ 0.70	1.00 max.	1.00 max.	0.040 max.	0.030 max.	12.50 ~ 14.00			_	540 min.	15 min.	220 max.	95 max.	_	-
	JFE 409L	SUH 409L	1.4512		0.030 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	10.50 ~ 11.75		Ti 6 × C ~ 0.75	175 min.	360 min.	25 min.	175 max.	80 max.	180°	1.0 × t
	JFE 409SR				0.015 max.	1.00 ~ 2.50	1.00 max.	0.040 max.	0.030 max.	10.00 ~ 12.00		N 0.012 max. Ti 0.50 max.	-	440 min.	20 min.	170 max.	80 max.	180°	1.0 × t
	JFE 410L	SUS 410L			0.030 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.00 ~ 13.50			195 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
Heat Resistant and Oxidation Resistant Type	JFE 429EX		1.4595		0.030 max.	1.50 max.	1.00 max.	0.040 max.	0.030 max.	13.00 ~ 16.00		Nb 0.30 ~ 0.70	195 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE-MH1				0.015 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	14.00 ~ 16.00	1.50 ~ 1.80	Nb 0.40 ~ 0.60	195 min.	360 min.	22 min.	200 max.	88 max.	180°	1.0 × t
	JFE 18-3USR				0.030 max.	1.50 max.	1.00 max.	0.040 max.	0.030 max.	17.00 ~ 19.00		AI 3.00 ~ 4.80 La, Zr added	295 min.	450 min.	20 min.	230 max.	96 max.	_	_
	JFE 20-5USR				0.015 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	19.00 ~ 21.00		AI 4.5 ~ 6.0 La 0.06 min. Zn added	-	490 min.	15 min.	250 max.	100 max.	_	_
For Welded	JFE 410DH				0.020 max.	0.50 max.	1.00 ~ 2.50	0.040 max.	0.030 max.	10.75 ~ 13.50		Cu 1.0 max. N 0.020 max.	195 min.	410 min.	18 min.	210 max.	90 max.	180°	1.0 × t
Structures	JFE 410RW				0.025 max.	1.00 max.	1.00 ~ 2.00	0.040 max.	0.030 max.	10.90 ~ 12.50		Ti 4× (C+N) ~ 0.30 N 0.020 max.	340 min.	460 min.	20 min.	_	96 max.	_	_
Wear Resistant	JFE 410DB				0.09 max.	0.50 max.	1.00 ~ 2.50	0.040 max.	0.030 max.	10.00 ~ 14.50		C + N 0.04 ~ 0.10	175 min.	360 min.	20 min.	240 max.	98 max.	180°	1.0 × t
Туре	JFE 410DB-ER				0.09 max.	0.50 max.	1.00 ~ 2.50	0.040 max.	0.030 max.	10.00 ~ 14.50		Nb added	175 min.	360 min.	20 min.	240 max.	98 max.	180°	1.0 × t

^{*}Please consult us if you require these types of steel.

Please contact us if you require special steel types other than those shown in the table.

The proof test is conducted when specified.

Hardness is measured by HV or HRB only, depending upon the sheet thickness.

Please contact us for mechanical properties if EN, ASTM, or AISI specification is required.

Corrosion Resistance

Because of their superior anti-corrosion properties under all kinds of corrosive conditions, JFE stainless steels are widely used in the chemical, paper, dyeing, oil-refinery, rolling stock and food-processing industries, as well as for kitchen utensils, home appliances, architectural metal fittings, etc.

In selecting a stainless steel, it is essential to determine the type of steel best suited to the given corrosive conditions and type of fabrication. The wrong selection may reduce the actual performance of these products, in spite of their intrinsic corrosion resistance.

The following table shows data for various solutions and atmospheric gases measured in the laboratory.

	Cond	itions		Туре с	of Steel	
Solution	Concentration %	Temperature °C	Type 430	Type 444	Type 304	Type 316
Hydrochloric Acid	≦ 0.2	R.T.	△ *	Δ *	0 *	O *
Trydrocilione Acid	> 0.2	R.T.	△ *	△ *	Δ *	<u></u> *
	1~20	R.T.	0	0	0	0
Nitric Acid	1~20	B.P.	0	0	0	0
Nille Acid	40.00	R.T.	0	0	0	0
	40~60	B.P.	O *1	O *1	O *1	O *1
	< 0.05	R.T.		0	0	0
	≦ 0.25	B.P.			Δ	0
Sulfuric Acid	20, 60	R.T.			0	0
Sulfulle Acid	30~60	B.P.			Δ	Δ
	05.400	R.T.			0	0
	95~100	100			Δ	Δ
Cultura va Aaid	10	R.T.	Δ		0	0
Sulfurous Acid	10	B.P.			0	0
		R.T.	0	0	0	0
	10	B.P.	0	0	0	0
Phosphoric Acid		R.T.	0	0	0	0
	80	B.P.			Δ	0
Fluoric Acid		R.T.	Δ	Δ	Δ	Δ
Boric Acid	sat	B.P.	O *		© *	O *
Obversion A. C.		R.T.	0	0	0	0
Chromic Acid	10	B.P.	0	0	0	0
		R.T.	0		0	0
Chlorine		100	Δ		Δ	Δ
Carbonic Acid Gas		R.T.	0	0	0	0
Sulfurous Acid Gas	wet	R.T.	Δ	O *2	◎-○*²	◎ *2
Acetic Acid	0~100	R.T.	0	0	0	0

	Cond	itions		Туре	of Steel	
Solution	Concentration %	Temperature °C	Type 430	Type 444	Type 304	Type 316
Oxalic Acid	10	R.T.	0	0	0	0
Citric Acid	15	B.P.	0	0	0	0
Tartaric Acid	50	R.T.	0	0	0	0
Lactic Acid	5	R.T.	0	0	0	0
Butyric Acid	5	R.T.	0		0	0
Stearic Acid	sat	100	0		0	0
Fruit & Vegetable		Hot			0	0
Butter & Milk		Hot			0	0
Milk		60			0	0
Sodium Carbonate	50	B.P.	0	0	0	0
Hydrogen Peroxide	30	R.T.	◎-○*³		◎ *3	0
Potassium Bichromate	25	B.P.		0	0	0
Potassium Permanganate	10	B.P.		0	0	0
Sodium Chloride	10	B.P.	© *	© *	O *	© *
Ferric Chloride	1	R.T.	© *	O *	O *	O *
Ammonium Sulfate	5	R.T.	0	0	0	0
Sodium Sulfate	5	R.T.	0		0	0
Silver Nitrate	5	R.T.	0	0	0	0
Methyl Alcohol		R.T.	O *4	0	O *4	O *4
Ethyl Alcohol		R.T.	0	0	0	0
Acetone		R.T.	0		0	0
Ether		R.T.	0	0	0	0
Benzol		R.T.	0		0	0
Crude Oil		R.T.	O *5	O *5	O *5	◎ *5
Gasoline		R.T.	0	0	0	0
Vegetable Oil		R.T.	0		0	0
Mineral Oil		R.T.	0	0	0	0
Sugar Syrup	conc	100	0	0	0	0
Carbon Tetrachloride	pure	R.T.	0	0	0	0

Notes: 1. ⊚: 0.1mm/year, unaffected.

2. sat : Saturated solution \bigcirc : 0.1 to 1.0mm/year, slightly affected. conc : Concentrated solution \triangle : 1.0 mm/year, affected. R.T.: Room Temperature B.P. : Boiling Point P: Pitting corrosion is possible

Remarks: * P

*3 △ When involving H₂SO₄ *1 △ Under high pressure *4 P at high temperature

*2 Use care when H₂SO₄ coexists. *5 Affected by impurities during refining.

Physical Properties

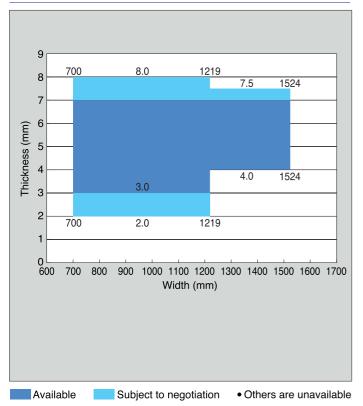
	Density	Electric *1 Resistance	Magnetism	Specific Heat	Thermal C	onductivity	Thermal E Coeff	xpansion icient	Young's Modulus
Type of Steel		ricolotarioc	(0~100°C J/kg⋅°C	100°C	500°C n •°C	20~100°C	20~650°C	×10³
	g /cm³	10 ⁻⁶ Ω • cm	(Annealed Material)	(Cal /g·°C)		m·sec·°C)	10-6	?/°C	N/mm²
JFE 409L	7.74	59	Magnetic	468 (0.11)	32.9 (7.87)	30.5 (7.29)	11.4	12.3	201
JFE 409SR	7.70	59	Magnetic	502 *1 (0.12)	16.7 *1 (4.00)	_	11.4	11.9 *6	200
Type 410	7.75	57	Magnetic	460 (0.11)	24.9 (5.95)	25.7 (6.86)	9.9	11.7	200
JFE 429EX	7.70	67	Magnetic	460 (0.11)	26.8 (6.40)	28.8 * ³ (6.88)	10.9	12.2	225
JFE MH-1	7.72	61	Magnetic	460 (0.11)	26.4 (6.31)	_	10.3	12.0	216
Type 430	7.70	60	Magnetic	460 (0.11)	26.1 (6.24)	26.3 (6.28)	10.4	11.9	200
JFE 430LN	7.70	60.5	Magnetic	460 (0.11)	23.1 (5.53)	26.3 (6.28)	10.5	12.2	196
JFE 430LNM	7.72	54	Magnetic	460 (0.11)	29.7 (7.10)	_	10.3	11.8	226
JFE 432LTM	7.73	_	Magnetic	433 (0.10)	24.0 (5.74)	_	10.4	11.6	206
JFE 436LT	7.73	48	Magnetic	433 (0.10)	23.6 (5.63)	_	10.4	11.6	212
JFE 443CT	7.74	62	Magnetic	444 (0.11)	22.5 (5.38)	25.1 (6.00)	10.5	11.5	204
JFE 434LN2	7.75	62	Magnetic	460 (0.11)	21.1 (5.04)	25.2 (6.02)	10.1	11.6	206
JFE 445M	7.67	62	Magnetic	470 (0.11)	20.4 (4.87)	24.9 (5.95)	10.1	12.2	211
				419 *1 (0.10) 586 *3	11.7 *1	11.7 *3 (2.80)		13.0	
JFE 20-5USR	7.30	142	Magnetic	(0.14) 628 *4 (0.15)	(2.80)	22.6 *4 (5.40)	11.0	14.0 *6	196 ^{*5}
JFE 30-2	7.64	64	Magnetic	502 (0.12)	18.8 *1 (4.50)	_	9.6	11.1	230
Type 301	7.93	72	Non- magnetic	502 (0.12)	16.2 (3.88)	21.4 (5.12)	16.9	18.7	193
Type 304	7.93	72	Non- magnetic	502 (0.12)	16.2 (3.88)	21.5 (5.13)	17.3	18.7	193
Type 316	7.98	74	Non- magnetic	502 (0.12)	16.2 (3.88)	21.5 (5.13)	16.2	18.5	193
SS400 common Steel	7.87	13	Magnetic	460 (0.11)	57.7 (13.80)	41.1 (9.80)	12.6	15.0 * ⁷	206

Remarks: *1 20°C, *2 0~300°C, *3 600°C, *4 900°C, *5 Estimated value, *6 RT~700°C, *7 RT~500°C

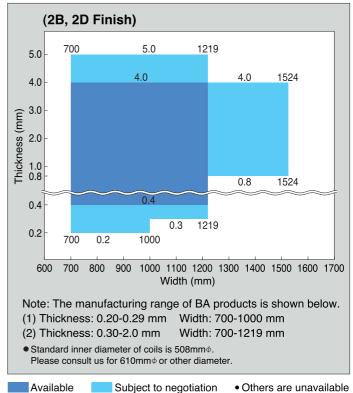
Note: The density shown in the table is the actually measured value as a physical property. Calculations of mass for commercial transactions are based on JIS G4310 'Method of calculating mass of stainless steel sheets and heat-resistant steel sheets.'

Available Sizes

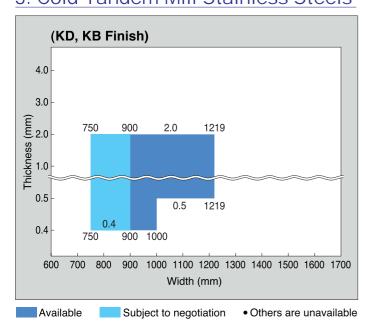
1. Hot Rolled Stainless Steels



2. Cold Rolled Stainless Steels



3. Cold Tandem Mill Stainless Steels



4. Stainless Steel Foils

Standard thicknesses are 100, 80 and 50 μ m; while widths up to 1000mm are possible.

Please consult us for specific dimensions you require for use.

Dimensional Tolerances

1. JIS G4304 and G4305 Tolerances

Thickness Tolerances for Hot Rolled and Cold Rolled Strip and Sheets in Coils

(unit: mm)

	JIS G	4304 for Hot Rolled Pr	JIS G4305 for Cold Rolled Products		
Specified Thickness		Specified Width	Specified Width		
	Less than 1000	1000 to 1250, excl.	1250 to 1600, excl.	Less than 1250	1250 to 1600, excl.
$0.16 \le t < 0.25$				± 0.03	_
$0.25 \le t < 0.30$				± 0.04	_
$0.30 \le t < 0.60$				± 0.05	± 0.08
0.60 ≦ t < 0.80				± 0.07	± 0.09
0.80 ≦ t < 1.00				± 0.09	± 0.10
1.00 ≦ t < 1.25				± 0.10	± 0.12
1.25 ≦ t < 1.60				± 0.12	± 0.15
1.60 ≦ t < 2.00				± 0.15	± 0.17
2.00 ≦ t < 2.50	± 0.25	± 0.30	_	± 0.17	± 0.20
2.50 ≦ t < 3.15	± 0.30	± 0.35	± 0.40	± 0.22	± 0.25
3.15 ≦ t < 4.00	± 0.35	± 0.40	± 0.45	± 0.25	± 0.30
4.00 ≦ t < 5.00	± 0.40	± 0.45	± 0.50	± 0.35	± 0.40
5.00 ≦ t < 6.00	± 0.50	± 0.55	± 0.60	± 0.40	± 0.45
6.00 ≦ t ≦ 8.00	± 0.60	± 0.65	± 0.65		

Width Tolerances for Hot Rolled and Cold Rolled Strip and Sheets in Coils

(unit: mm)

Edge Type		JIS G430	04 for Hot Rolled I	Products	JIS G4305 for Cold Rolled Products Specified Width			
	Specified Thickness		Specified Width					
		Less than 400	400 to 1000, excl.	1000 and over	Less than 1000	1000 to 1524, excl.	1524 and over	
Mill Edge	_	_	_	+30 0	+25 0	+30	+30	
	t < 6.00	+5 0	+10	+10 0				
Cut Edge	t ≧ 6.00	+10 0	+10 0	+15 0				
	_				+5 0	+5 0	+10 0	

[•]JIS tolerances of thickness, width and length for sheets in cut lengths are also applicable subject to negotiation.

2. AISI and ASTM A480 Tolerances

Thickness Tolerances

Permitted Variations in Thickness of Cold-Rolled, Wide, Coil-Processed Product as Coil and Cut Length

Specified Thickness ^{A, B} ,	Permitted Variation, Over and Under, in. [mm], for Specified Width (w), w in in.						
in. [mm]	w ≤ 40 [1000]	40 [1000] < w ≤ 50 [1300]	50 [1300] < w ≤ 84 [2100]				
0.012 [0.30]	0.001 [0.030]	-	-				
0.016 [0.40]	0.0015 [0.04]	0.0015 [0.04]	-				
0.020 [0.50]	0.0015 [0.04]	0.0015 [0.04]	-				
0.024 [0.60]	0.002 [0.05]	0.002 [0.05]	-				
0.032 [0.80]	0.002 [0.05]	0.002 [0.05]	-				
0.040 [1.00]	0.0025 [0.06]	0.0025 [0.06]	0.003 [0.08]				
0.047 [1.20]	0.003 [0.08]	0.003 [0.08]	0.003 [0.08]				
0.059 [1.50]	0.003 [0.08]	0.003 [0.08]	0.004 [0.10]				
0.079 [2.00]	0.004 [0.10]	0.004 [0.10]	0.0045 [0.11]				
0.098 [2.50]	0.004 [0.10]	0.004 [0.10]	0.005 [0.13]				
0.118 [3.00]	0.005 [0.13]	0.005 [0.13]	0.006 [0.15]				
0.157 [4.00]	0.007 [0.17]	0.007 [0.17]	0.007 [0.17]				
0.197 [5.00]	0.007 [0.17]	0.007 [0.17]	0.0075 [0.19]				

^A. Thickness measurements are taken at least 3/8in. [9.52mm] from the edge of the sheet.

Permitted Variations in Thickness of Hot-Rolled, Wide, Coil-Processed Product as Coil and Cut Lengths

Specified Thickness ^A , in. [mm]	Permitted Variations, in. [mm], Over and Under, Except as Indicated Otherwise, for Specified Width (w), in. [mm]
0.072 [1.83]	0.006 [0.15]
> 0.072 [1.83] to 0.083 [2.11]	0.007 [0.18]
> 0.083 [2.11] to 0.098 [2.49]	0.008 [0.20]
> 0.098 [2.49] to 0.114 [2.90]	0.009 [0.23]
> 0.114 [2.90] to 0.130 [3.30]	0.011 [0.27]
> 0.130 [3.30] to 0.145 [3.68]	0.012 [0.30]
> 0.145 [3.68] to 0.1875 [4.76]	0.013 [0.33]
> 0.1875 [4.76] to 0.250 [6.35]	-0.010 [0.25], +0.020 [0.50]
> 0.250 [6.35] to 0.3125 [7.94]	-0.010 [0.25], +0.022 [0.55]
> 0.3125 [7.94]	-0.010 [0.25], +0.030 [0.75]

 $^{^{\}rm A}.$ Thickness measurements are taken at least 3/8in. [9.52mm] from the edge of the sheet.

^B. For specified thickness other than those shown, the tolerances for the next higher thickness shall apply.

Dimensional Tolerances

Width Tolerances for Trimmed Edges

Permissible Variations in Width for Cold-Rolled Wide, Coil-Processed Product as Cut Lengths (Not Resquared) and Coil

Specified Thickness, - in. [mm] ^A	Permitted Variation in Width (w), in. [mm], for Specified Width (w), in. [mm]								
	w ≤ 6 [150]	6 [125] < w ≤ 12 [300]	12 [300] < w ≤ 24 [600]	24 [600] < w < 48 [1200]	48 [1200] ≦ w				
0.040 [1.00]	+0.02 [0.5], -0	+ 0.02 [0.5], - 0	+0.03 [0.7], -0	+ 1/16 [1.6], -0	+ 1/8 [3.2], -0				
0.059 [1.50]	+0.03 [0.7], -0	+ 0.03 [0.7], - 0	+0.04 [1.0], -0	+ 1/16 [1.6], -0	+ 1/8 [3.2], -0				
0.098 [2.50]	+0.04 [1.0], -0	+ 0.04 [1.0], - 0	+ 0.05 [1.2], - 0	+ 1/16 [1.6], - 0	+ 1/8 [3.2], -0				
0.138 [3.50]	+0.05 [1.2], -0	+ 0.05 [1.2], - 0	+ 0.06 [1.5], - 0	+ 1/16 [1.6], - 0	+ 1/8 [3.2], -0				
0.3125 [8.00]	+0.08 [2.0], -0	+0.08 [2.0], -0	+0.08 [2.0], -0	+0.16 [4.0], -0	+0.16 [4.0], -0				

^A. For specified thicknesses and other than those shown, the tolerances for the next higher thickness shall apply.

Permitted Variations in Width of Hot-Rolled, Wide, Coil-Processed Product as Cut Lengths (Not Resquared) and Coil

Specified Thickness, t, in. [mm]	Width (w), in. [mm]	Tolerances on Width, in. [mm], for Trimmed Edges	
t < 3/16 [4.76]	w < 48 [1219]	+1/16 [1.59], -0	
(< 3/10 [4.70]	w ≧ 48 [1219]	+ 1/4 [6.35], - 0	
$3/16 \ [4.76] \le t < 3/8 \ [9.5]$	w < 48 [1219]	+ 5/32 [3.97], - 0	
3/10 [4.70] <u>≅</u> (\ 3/0 [3.3]	w ≧ 48 [1219]	+ 3/8 [9.5], -0	

Finishes

Finish Designation	Finishing Method and Degree of Finish			
No. 1	Hot-rolled, annealed and descaled. Generally used in industrial applications, where heat or corrosion resistance is required but surface smoothness is not particularly important.			
No. 2D	Dull, smooth finish produced by cold rolling, annealing and pickling. Steel is soft and has a silver white surface, suited for deep drawing as well as general use.			
No. 2B Bright, smooth cold-rolled finish obtained by skinpass rolling of No. 2D. Specified for general use.				
No. 3 Intermediate polished finish obtained with rather coarse abrasives (#100 to #120 mesh). A higher lust attained by further polishing after fabrication.				
No. 4	A standard polished finish produced with finer abrasives (#150 to #180 mesh). Widely specified for restaurant and kitchen equipment and dairy processing equipment.			
#240	Polished finish of about #240. Used when finer finish than No. 4 finish is desired, such as in equipment for restaurants and household kitchens.			
#320	Polished finish of about #320.			
#400	High luster finish produced by polishing No. 2B with #400 buffing sisal cloth. Suited for general use.			
HL Special polished finish having continuous lines produced with abrasives of an appropriate grain size. Main used in architectural applications.				
ВА	Highly reflective finish produced by cold rolling, bright annealing and temper rolling. Used where a lustrous surface is required.			

Remarks: Upon request, strip surface protection is provided by applying vinyl sheets.

Protective Films

The following types of protective films are available to meet the requirements of various applications:

Designation	Thickness (µm)	Color	Features and Applications
PT PH	60	Transparent	Eacy to pool off. Lies the strip quieldy because of the inferior weethershillty of costing
PW	110	White	Easy to peel off. Use the strip quickly because of the inferior weatherability of coating.

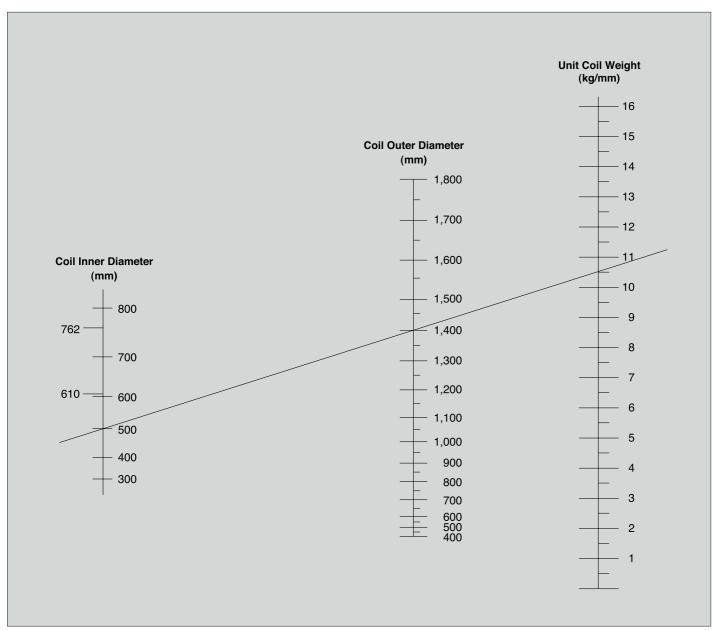
[•] Because the protective films can deteriorate due to aging, quick use of the product is recommended. For storage, avoid a location exposed to direct sunlight; keep the storage area well-ventilated.

Mass Table

(unit: kg)

Type of Steel	Type 41	0 Basic Mas	s: 7.75	Type 43	0 Basic Mas	ss: 7.70	Type 30	4 Basic Mas	ss: 7.93
Dimensions (mm) Thickness (mm)	1000 x 2000	1219 x 2438 (4' x 8')	1524 x 3048 (5' x 10')	1000 x 2000	1219 x 2438 (4' x 8')	1524 x 3048 (5' x 10')	1000 x 2000	1219 x 2438 (4' x 8')	1524 x 3048 (5' x 10')
0.2	3.10	4.61	_	3.08	4.58	_	3.17	4.71	_
0.3	4.65	6.91	<u> </u>	4.62	6.87	_	4.76	7.07	_
0.4	6.20	9.21	_	6.16	9.15	_	6.34	9.43	_
0.5	7.75	11.5	18.0	7.70	11.4	17.9	7.93	11.8	18.4
0.6	9.30	13.8	21.6	9.24	13.7	21.5	9.52	14.1	22.1
0.7	10.8	16.1	25.2	10.8	16.0	25.0	11.1	16.5	25.8
0.8	12.4	18.4	28.8	12.3	18.3	28.6	12.7	18.9	29.5
0.9	14.0	20.7	32.4	13.9	20.6	32.2	14.3	21.2	33.2
1.0	15.5	23.0	36.0	15.4	22.9	35.8	15.9	23.6	36.8
1.1	17.0	25.3	39.6	16.9	25.2	39.3	17.4	25.9	40.5
1.2	18.6	27.6	43.2	18.5	27.5	42.9	19.0	28.3	44.2
1.3	20.2	29.9	46.8	20.0	29.7	46.5	20.6	30.6	47.9
1.4	21.7	32.2	50.4	21.6	32.0	50.1	22.2	33.0	51.6
1.5	23.2	34.5	54.0	23.1	34.3	53.6	23.8	35.4	55.3
1.6	24.8	36.9	57.6	24.6	36.6	57.2	25.4	37.7	58.9
1.7	26.4	39.2	61.2	26.2	38.9	60.8	27.0	40.1	62.6
1.8	27.9	41.5	64.8	27.7	41.2	64.4	28.5	42.4	66.3
1.9	29.4	43.8	68.4	29.3	43.5	68.0	30.1	44.8	70.0
2.0	31.0	46.1	72.0	30.8	45.8	71.5	31.7	47.1	73.7
2.5	38.8	57.6	90.0	38.5	57.2	89.4	39.7	58.9	92.1
3.0	46.5	69.1	108	46.2	68.6	107	47.6	70.7	111
3.5	54.3	80.6	126	53.9	80.1	125	55.5	82.5	129
4.0	62.0	92.1	144	61.6	91.5	143	63.4	94.3	147
4.5	69.8	104	162	69.3	103	161	71.4	106	166
5.0	77.5	115	180	77.0	114	179	79.3	118	184
6.0	93.0	138	216	92.4	137	215	95.2	141	221
7.0	109	161	252	108	160	250	111	165	258
8.0	124	184	288	123	183	286	127	189	295

Coil Weight/Outer Diameter Table



• This relationship may very slightly, depending on product thickness and interleaved paper.

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Product name: Stainless steel sheets

Company information

Company name : JFE Steel Corporation

Address: 2-2-3 Uchisaiwai-cho, Chiyoda-ku, Tokyo, Japan

Contact information

Department in charge: Stainless Steel Sec., Products Design & Quality Control Dept.,

East Japan Works (Chiba), JFE Steel Corporation

Address: 1 Kawasaki-cho, Chuo-ku, Chiba-shi, Chiba Prefecture, Japan

Telephone number : +81-43-262-2291 / 2587
Telefax number : +81-43-262-2980
Issuance reference number : **ES-EA001-Rev.0**

Date of establishment or revision: April 30, 2003

2. COMPOSITION/INFORMATION ON INGREDIENTS

Classification as simple chemical substance or preparation: Preparation (alloy steel)
Chemical nature of chemical substance, etc. (product): Chemically stable solid substance

Ingredients and concentration

Chemical or Generic name	Chemical formula	Concentration range (wt %) 1) 2)	CAS No. 3)
Iron	Fe	Balance	7439-89-6
Chrome	Cr	10~ 40	7440-47-3
Nickel	Ni	0~ 30	7440-02-0
Manganese	Mn	0~ 10	7439-96-5
Molybdenum	Mo	0~ 10	7439-98-7
Copper	Cu	0~ 10	7440-50-8

Notes:

- Composition values will vary within the concentration ranges mentioned above depending on the steel type/standard.
- Depending on the application, the product may include trace elements other than the ingredients mentioned above.
- CAS No.: American Chemical Society, Chemical Abstracts Service Registry
 Number

3. HAZARDS IDENTIFICATION

Summary of hazardous properties

Name of classification : No applicable classification.

Risk of harm: No useful information on the product, as an alloy steel, at the present time.

4. FIRST-AID MEASURES

No situations in which first aid is necessary.

5. FIRE-FIGHTTING MEASURES

The product is in a non-combustible state. There are no restrictions on the use of normal water sprinkling and/or fire-fighting equipment in case of fire in the surrounding area.

6. ACCIDENTAL RELEASE MEASURES

Because the product is a solid with a fixed shaped, this item is not applicable.

7. HANDLING AND STORAGE

Precautions for handling

In case metals or metal compounds (dust, fume, etc.) are generated as a result of processing of this product by heating, melting, grinding, etc., the face, clothing, etc. shall be protected appropriately so as to prevent the effects of dust, fume, etc. which exceed the exposure limits for the ingredient elements.

The hazardous properties of collected substances containing dust, fume, etc., corresponding to the state thereof (oxides of ingredient elements reduced to powder form, etc.), shall be confirmed. For exposure limit values, OSHA PEL4) shall be used for reference purposes. (Iron oxide; 10mg/m³, chrome; 1mg/m³, nickel; 1mg/m³, manganese; 5mg/m³, molybdenum; 15mg/m³, copper fume; 0.1mg/m³, copper dust; 1 mg/m³)

In case metals are dissolved due to pickling, descaling, etc., measures shall be taken to prevent contact with the dissolved substances, inhalation, etc.

Precautions for storage

In the normal condition, there are no applicable items with respect to hazardous properties.

Note: 4) OSHA PEL: Occupational Safety & Health Administration, Permissible Exposure Limits

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Because the product is a solid with a fixed shape, there are no applicable items.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical properties

Shape: Solid in sheet form or band form

Color : Silver-white Odor : Odorless

Specific temperatures and temperature ranges at which changes in physical state occur

Flash point : Not applicable. Density : $7 \sim 9 \text{ g/cm}^3$

Melting point : 1400°C or higher

Chemical properties

- Not soluble in water. Has corrosion resistance to weak acids and alkalis.
- Dissolves to some extent in strong acids (hydrochloric acid, sulfuric acid, etc.) and high temperature alkalis. A passive film is formed by oxidizing acids.
- •In some cases, the dust which is generated by processing may have flammable or explosion properties.

10. STABILITY AND REACTIVITY

Stability: In the normal state, the product is chemically stable.

Hazardous decomposition products: Metal compounds are formed during processing by heating, dissolution, melting, grinding, etc.

11. TOXICOLOGICAL INFORMATION

No useful information on the product, as an alloy steel, at the present time.

12. ECOLOGICAL INFORMATION

No useful information on the product, as an alloy steel, at the present time.

13. DISPOSAL CONSIDERATIONS

Can be recycled as steel scrap.

14. TRANSPORT INFORMATION

No applicable items.

15. REGULATORY INFORMATION

No particular applicable regulations.

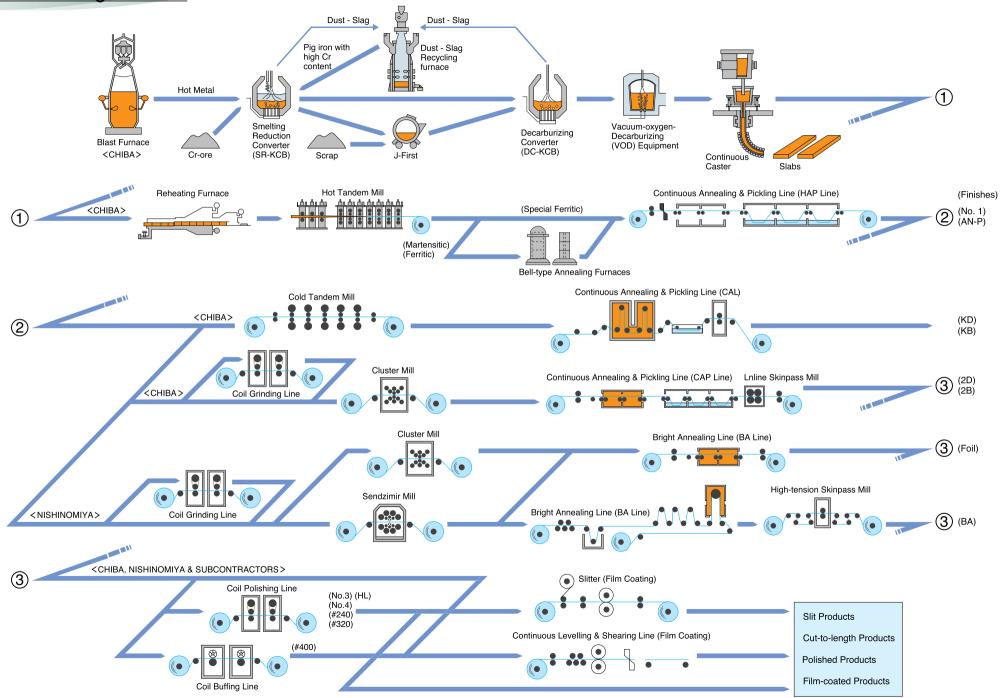
16. OTHER INFORMATION

Reference materials, etc.

- (1) Hazardous Substance Data Book (Tokyo Fire Department, Research Committee)
- (2) Metallic Alloys and Harmonization of Classification Criteria (OECD)
- (3) Safety Data Sheet for Chemical Products (ISO 11014-1)
- (4) Recommended values of the Japan Industrial Hygiene Society, OSHA PEL, ACGIH TLV, etc.

This safety data sheet for chemical products, etc. was prepared based on materials and information which can be obtained at the present time. It is provided to businesses which handle this company1s products as reference material for ensuring chemically safe handling, and is not a guarantee of safety. Businesses which handle these products are requested to apply the contents based on an understanding that it is necessary that the user take appropriate safety measures for the application and method of use.

Manufacturing Process



Packing and Marking

Cold Rolled







Hot Rolled





Sample Documents

Shipping mark for black coil



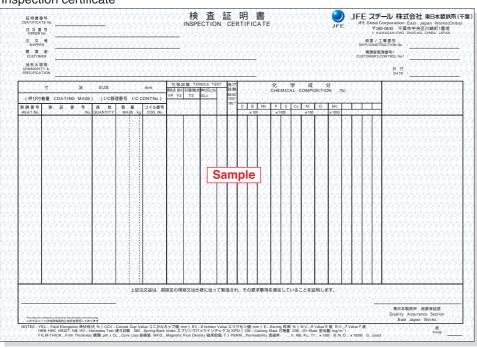
Shipping mark except for black coil



Service card



Inspection certificate



• For further information, please contact our nearest office or send your inquiries directly to :

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