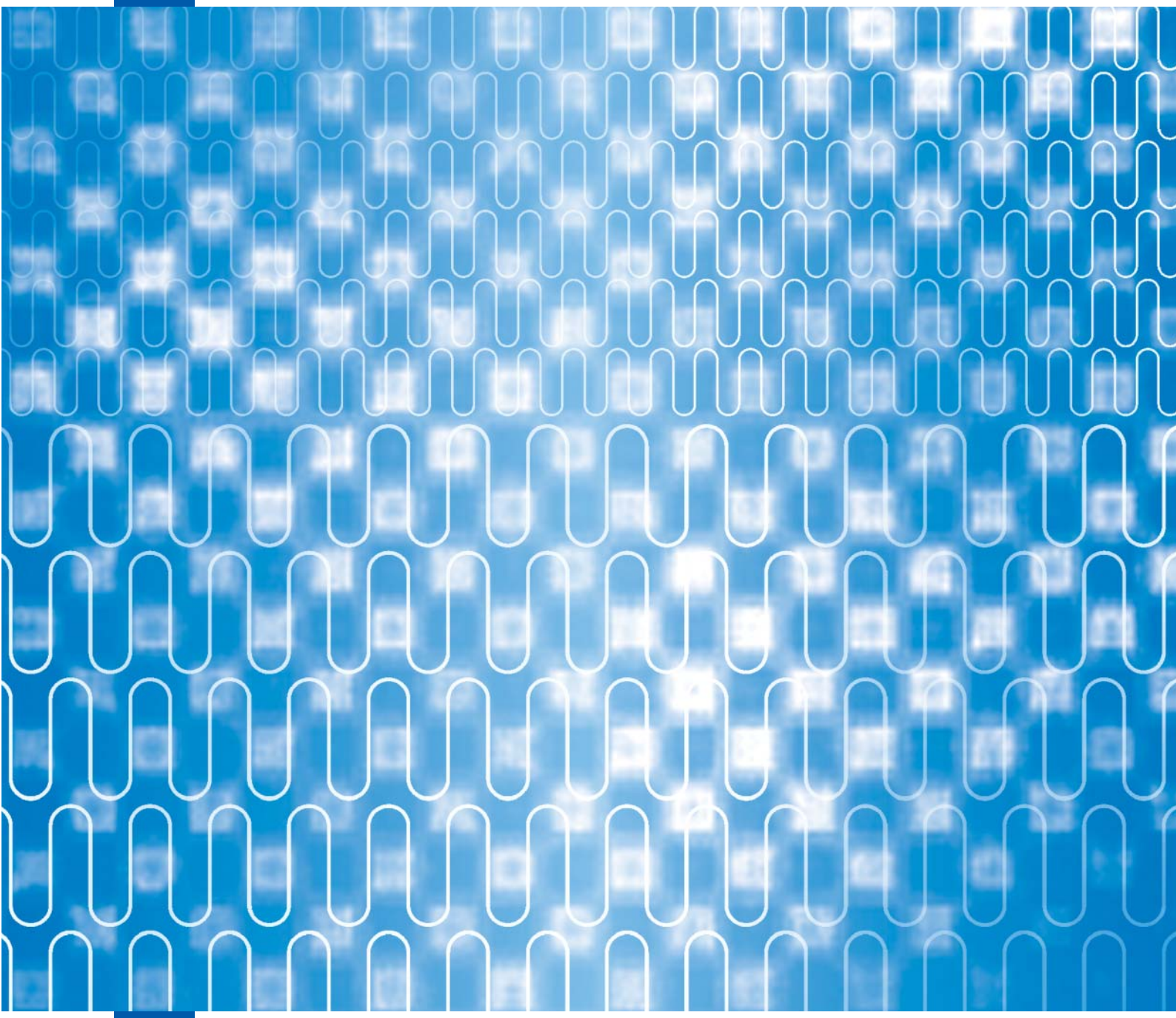
JFE

JFE20-5USR, JFE18-3USR

Oxidation Resistant Stainless Steel
for Metallic Substrates of Catalyst and Electric Heaters etc.



JFE Steel Corporation

1 Preface

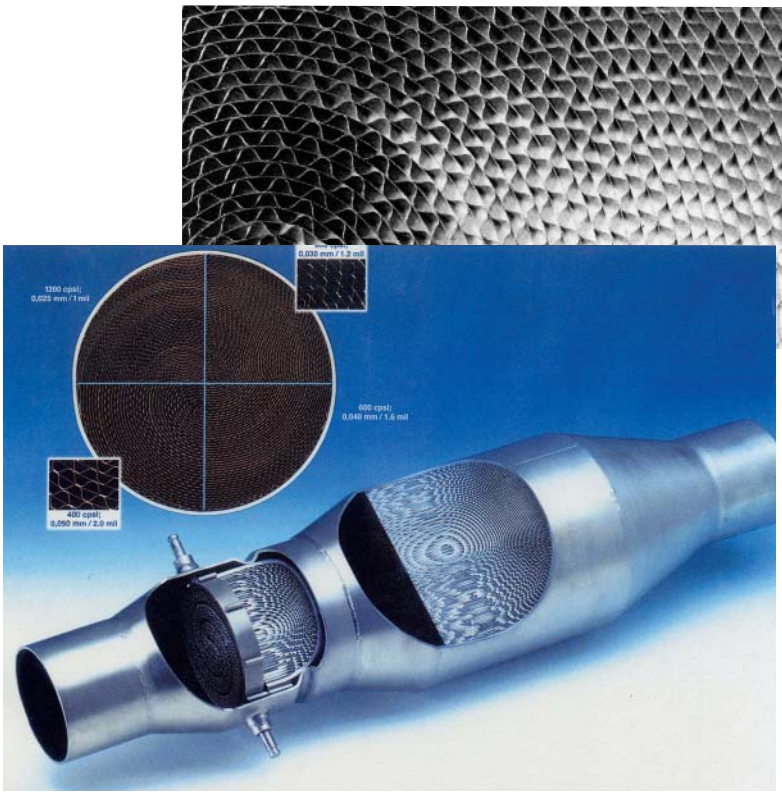
JFE20-5USR and JFE18-3USR introduced here are super oxidation-resistant ferritic stainless steels. These steels contain chromium, aluminum, and lanthanum, which improve oxidation resistance. The oxidation resistance of JFE20-5USR is the highest in the world.

Features

1. Super oxidation resistance by Cr, Al, and La composition design
2. High and stable electrical resistivity
3. Ultra wide foils in coil form

Suitable applications

1. Metallic substrates for catalytic converters (gasoline / diesel automobiles, motorcycles, and other generally used engines)
2. Diesel particular filters
3. Electric heaters ex.) Cooking heaters, panel heaters for hot-water jugs, etc.
4. Other high-temperature applications ex.) Patio heaters, furnace panels, etc.



Example of catalytic converter with metal honeycomb substrate

Example of cooking heater

2 Chemical Composition

(mass %)

Steel		C	Si	Mn	Al	Cr	La
JFE20-5USR	Specification	≦0.015	≦1.0	≦1.0	5.0 ~ 6.0	19 ~ 21	0.06 ~ 0.12
	Typical value	0.005	0.1	0.1	5.5	20.0	0.08
JFE18-3USR	Specification	≦0.010	≦1.0	≦1.0	3.0 ~ 4.0	17 ~ 19	0.06 ~ 0.12
	Typical value	0.003	0.1	0.1	3.4	18.0	0.08

3 Properties

1 Physical properties (Typical value)

Steel	Temp. (℃)	Electrical Resistivity ($\mu\Omega$· cm)	Specific Heat (10^3J/kg·℃)	Thermal Diffusivity (cm^2/sec)	Thermal Conductivity (W/m·℃)	Temp. (℃)	Thermal Coef. expansion (10^{-6}/ ℃)	TS* (N/mm^2)
JFE20-5USR	20	142	0.48	0.034	11.8	—	—	650
	100	142	0.52	0.035	13.1	20 ~ 100	11.1	—
	300	143	0.61	0.036	15.7	20 ~ 300	12.0	—
	600	145	0.73	0.038	19.9	20 ~ 600	13.3	200
	900	148	0.69	0.046	22.5	20 ~ 900	14.9	35
	1200	148	0.70	0.053	26.5	20 ~ 1,200	16.0	—
JFE18-3USR	20	115	0.48	0.041	14.4	—	—	540
	100	117	0.51	0.041	15.7	20 ~ 100	10.3	—
	300	122	0.60	0.041	18.3	20 ~ 300	11.3	—
	600	132	0.89	0.043	22.7	20 ~ 600	12.5	170
	900	138	0.69	0.049	25.1	20 ~ 900	13.9	30
	1200	140	0.71	0.056	29.6	20 ~ 1,200	15.1	—

＊Thickness : 1.0mm

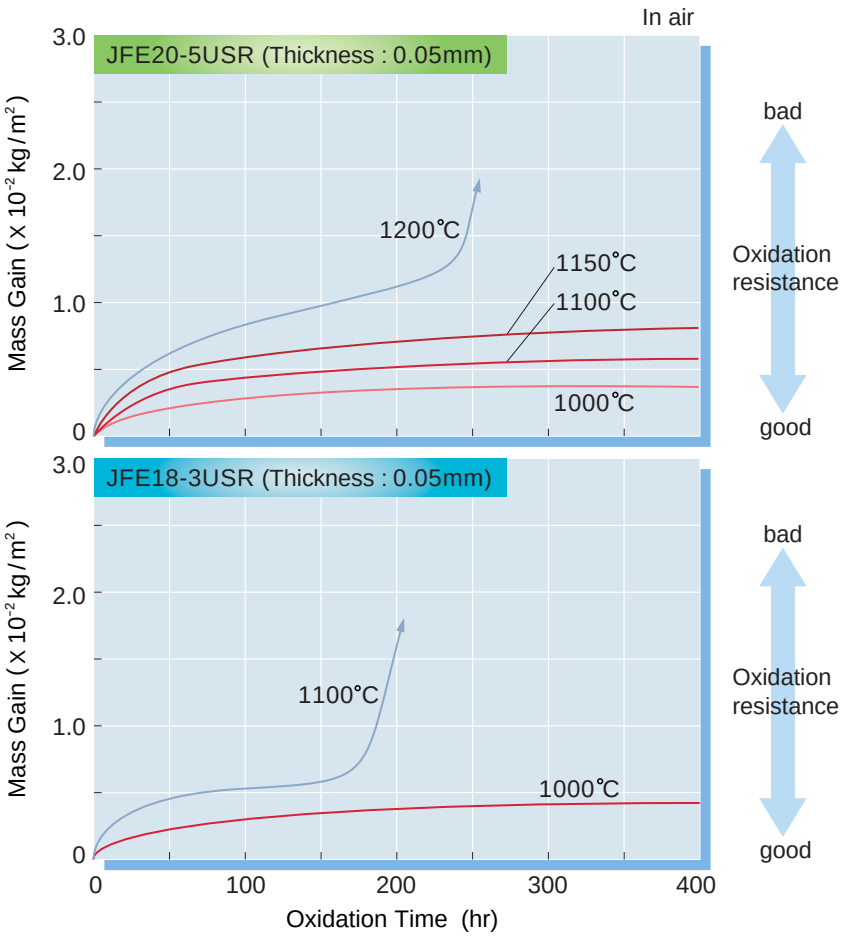
2 Mechanical properties (Typical value)

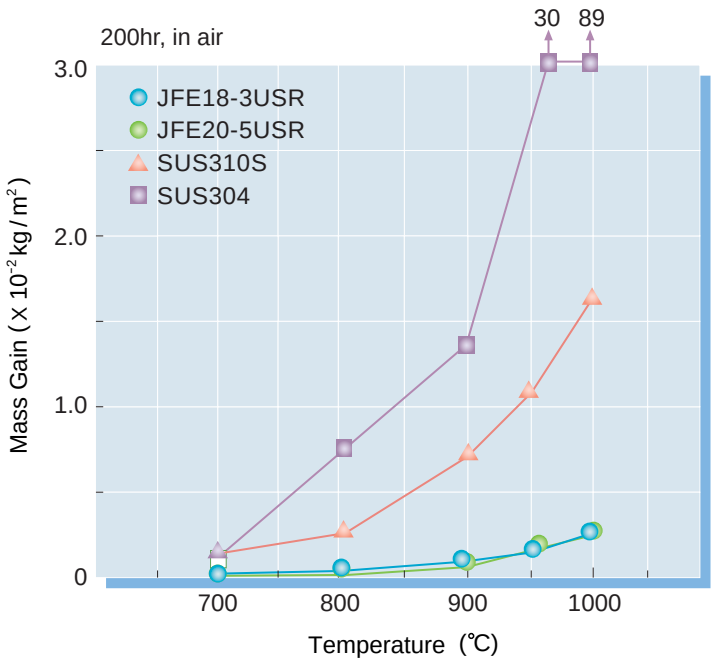
Steel	Finish*	Thickness (mm)	0.2%PS (N/mm^2)	TS (N/mm^2)	El (%)	Hardness Hv
JFE20-5USR	2BTH	0.3	1,052	1,147	< 2	359
		0.05	1,147	1,222	< 2	357
	2BT	0.3	525	652	23	216
		0.05	527	648	25	221
JFE18-3USR	2BTH	0.3	975	1,019	< 2	328
		0.05	1,020	1,084	< 2	331
	2BT	0.3	448	539	30	176
		0.05	438	539	29	178

＊2BTH : Not annealed after cold-rolling
＊2BT : Annealed after cold-rolling

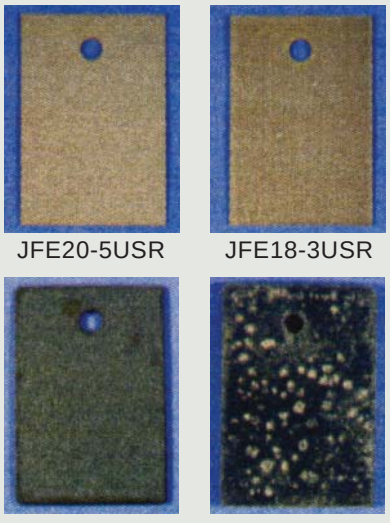
3 Oxidation resistance

3-1 Oxidation resistance of JFE20-5USR and JFE18-3USR





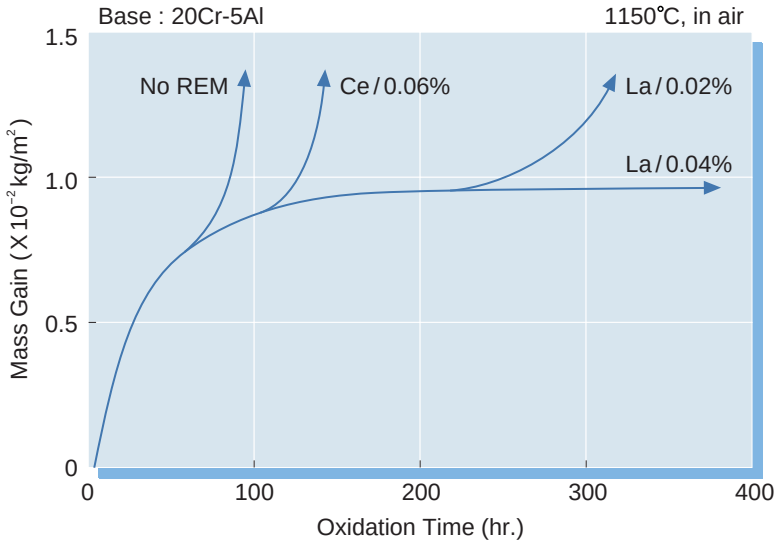
Appearance of specimens after 200hr at 1,000℃

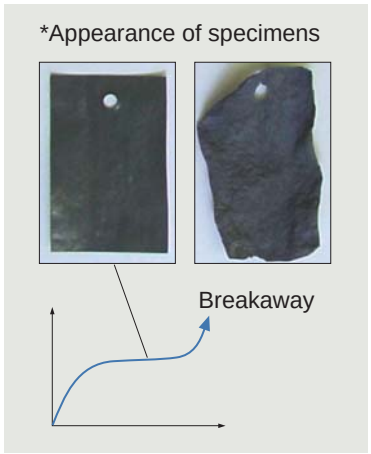


* scale spalled partially

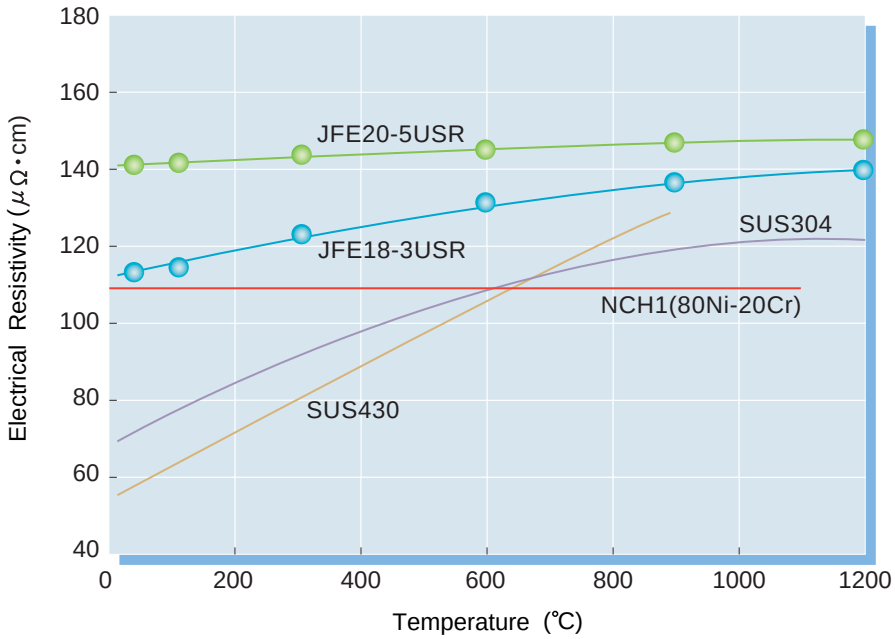
3 Oxidation resistance

3-2 Effect of REM on the oxidation resistance

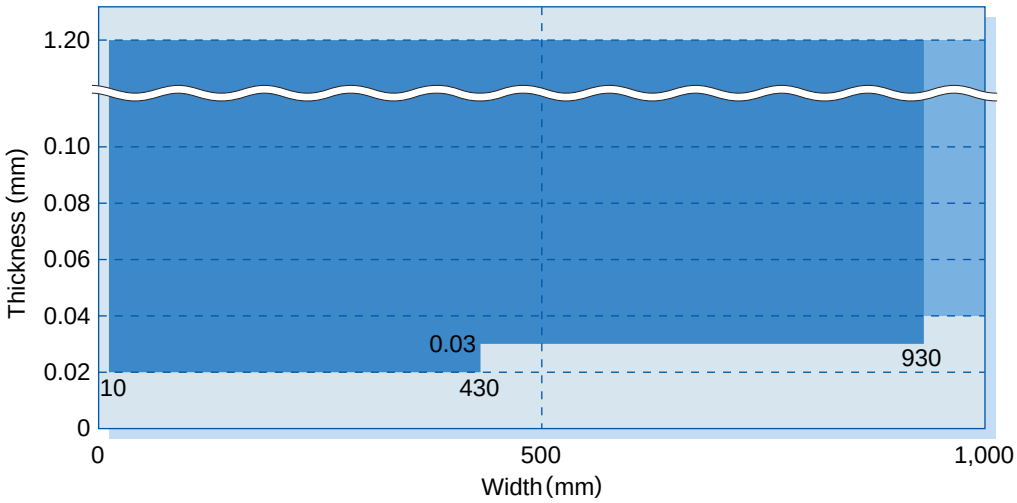




4 Electrical resistivity at elevated temperature



4 Available Size Range



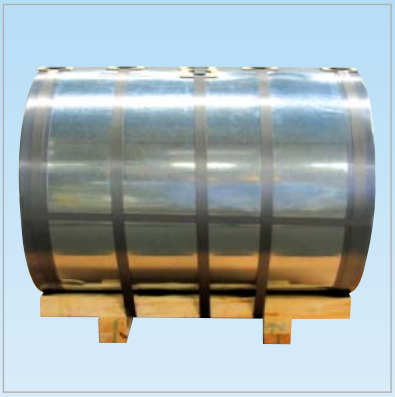
- Dimensions not specified above are available subject to negotiation.
- Standard internal diameters of coils are 500 or 300 mm.
- Thickness tolerance : ±6% for t ≧ 50μ ; ±10% for t ＜ 50μ

＊ Narrower thickness tolerances are available subject to negotiation.

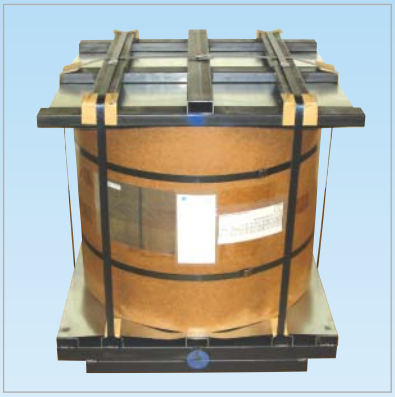
5 Packing and Markings

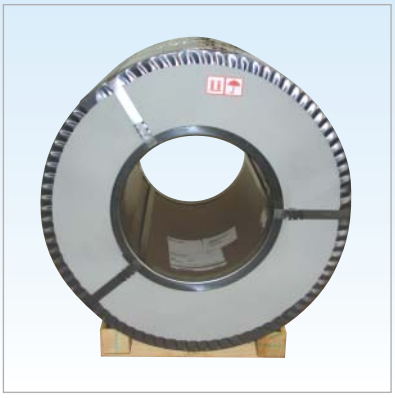
Cold Rolled Coil

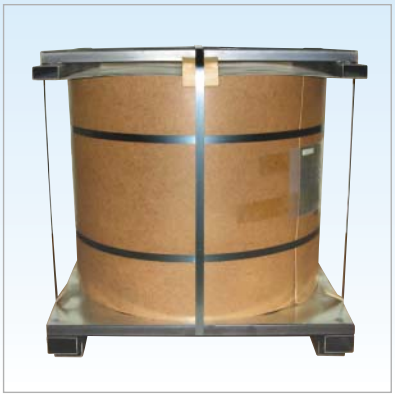
Wide width coils



Narrow width coils

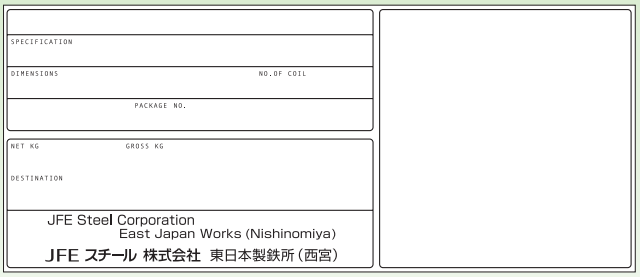




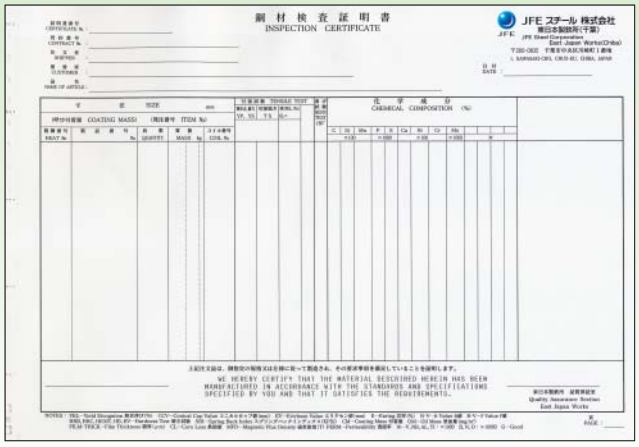


Sample Markings

Shipping Mark

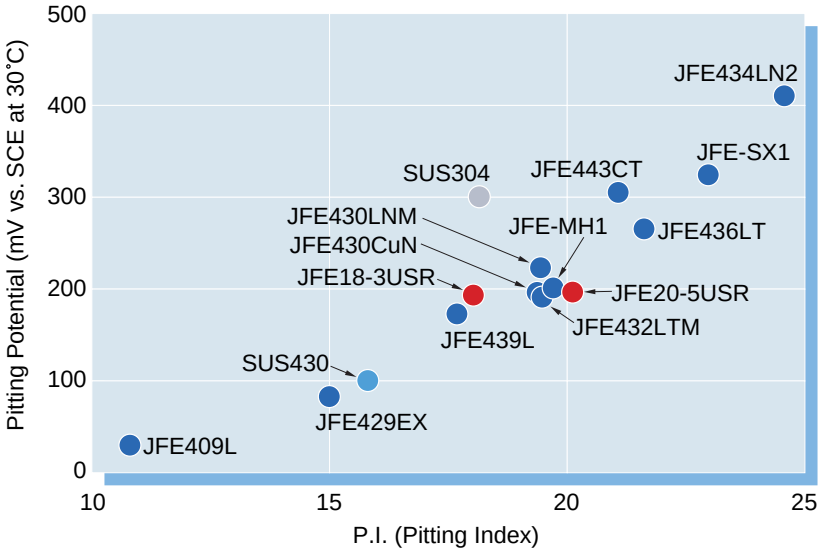


Inspection Certificate



6 Other JFE Stainless Steel products

Pitting Potential (Pitting Resistance)



P.I. (Pitting Index)

P.I. of ferritic stainless steel
= Cr% + 3.3 × Mo%

P.I. of austenitic stainless steel
= Cr% + 3.3 × Mo% + 16 × N%

In addition to JFE20-5USR and JFE18-3USR, JFE Steel also manufactures a wide variety of ferritic stainless steels for various applications. Please contact us when you need other types of ferritic stainless steel.

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

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