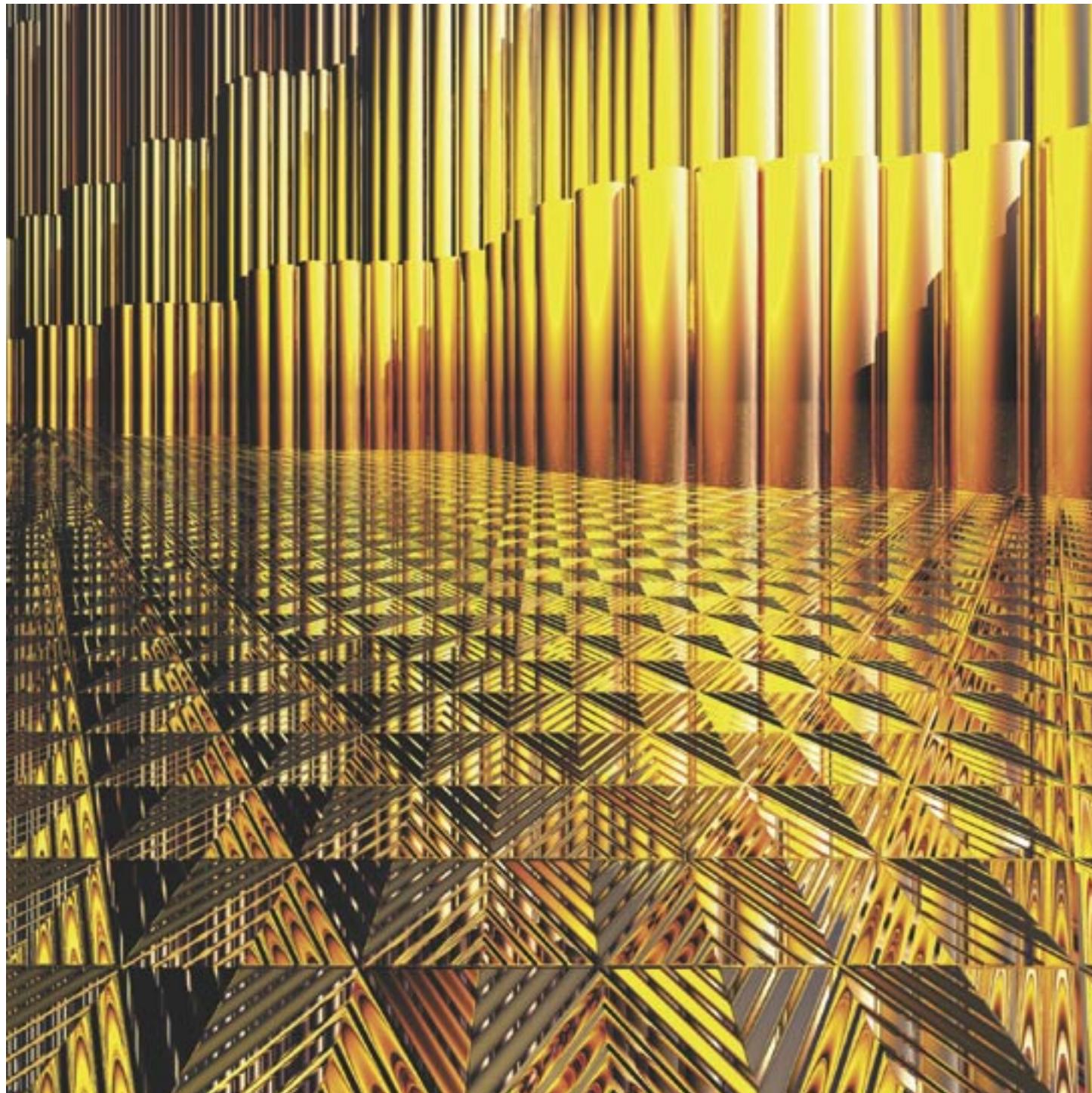




HOT ROLLED STEEL SHEET



JFE Steel Corporation



East Japan Works (Chiba)

JFE Steel Corporation who holds ISO 9001, QS-9000 and ISO 14001 certifications, produces a wide range of hot rolled steel sheets at the world's strongest and most efficient integrated steel works. Supported by advanced facilities, abundant know-how, and a high level of operational technology, JFE has developed a wide range of new products which meet customer requirements for dimensional accuracy, mechanical properties and available size range.

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East Japan Works (Keihin)



West Japan Works (Fukuyama)

Characteristics

1. Consistent high quality

JFE products consistently realize the world's highest levels of quality thanks to an integrated quality control system which extends from order receiving through product shipment. JFE's production system is fully computerized and boasts advanced equipment and technologies.

2. Wide product line-up

Hot rolled products are produced under various public and JFE standards, and include the full line-up from general use to high strength steel. Regarding surface of products, JFE supplies non-pickled and pickled products.

3. Wide size range and superior dimensional accuracy

With a 5-mill production system, JFE produces a wide range of hot strip sizes, including thickness from 1.2mm to 25.4mm and widths from 600mm to 2,300mm, which is the world's widest hot rolled strip. Advanced production technologies ensure high dimensional accuracy.

4. Outstanding technical servicing system

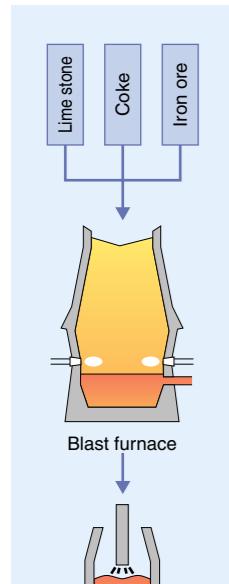
JFE works closely with customers in selecting the optimum material for the user's application, and advises customers on production methods, considering property requirements. The company also cooperates in pre-use trials and provides technical assistance and follow-up on quality information.



West Japan Works (Kurashiki)

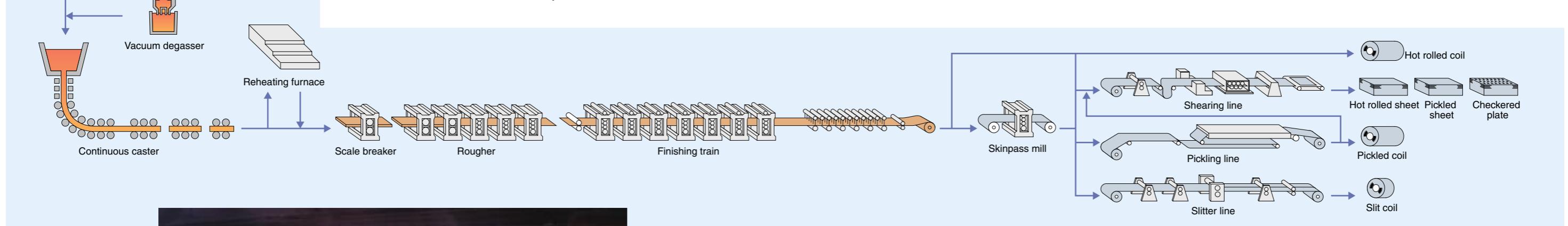
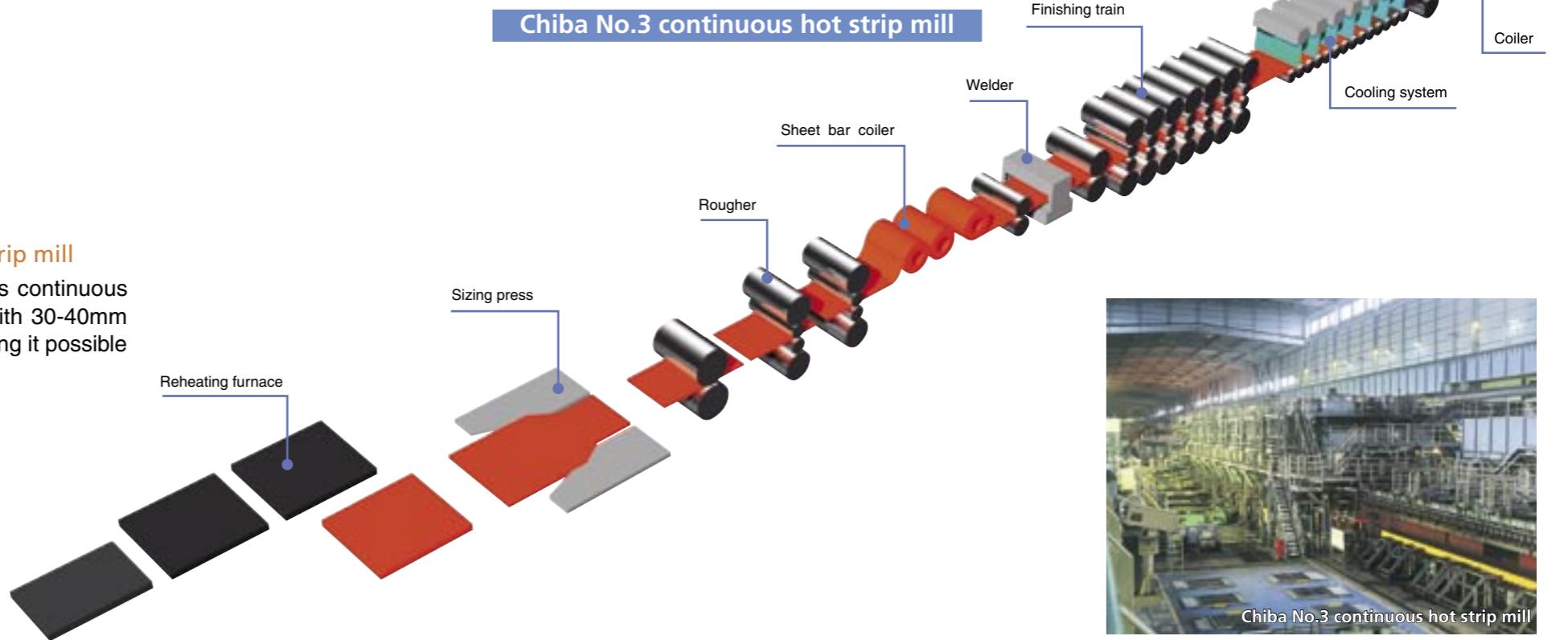
Manufacturing process

JFE produces highest quality products with high end technologies.



"Endless rolling" at Chiba No. 3 continuous hot strip mill

Endless rolling is a "dream technology" which enables continuous rolling of hot strips by in-line welding of sheet bars with 30-40mm thickness, thereby realizing stable rolling and also making it possible to develop new products.



"Super-OLAC H" installed on Fukuyama No.1 continuous hot strip mill

Fukuyama No.1 mill realizes the world highest cooling speed by "Super-OLAC H"

Super-OLAC H at Fukuyama realizes the theoretically marginal world's highest cooling speed (700°C/sec at 3mm thickness) and uniform cooling over the strip surface. The new facility features high accuracy cooling rate control and improves uniformity of material quality such as high strength, high toughness, stable weldability and formability.

"Super-OLAC H" is an abbreviation of Super On-Line Accelerated Cooling for Hot Strip Mill.

Products, characteristics and application

JFE produces various kinds of products based on the public standards (Japanese Industrial Standard, The Japan Iron and Steel Federation Standard, foreign standards and ship's classification standards) and JFE standard.

● Public Standard

Japanese Industrial Standard (JIS)

Classification		Designation	Characteristics and Application
G3101	Rolled steels for general structure	SS	Having each strength level, it is applied to structural materials for architecture, bridge, ship, rolling stock body, etc.
G3103	Carbon steel and molybdenum alloy steel plates for boilers and other pressure vessels	SB	For boiler and pressure vessel using at high temperature.
G3106	Rolled steel for welded structure	SM	Having superior strength and weldability, it is applicable to architecture, bridge, ship, rolling stock body, oil holder and other structures.
G3113	Hot rolled steel plates, sheets and strip for automobile structural uses	SAPH	Having strength and press formability, it is applied to automobile frame, wheel and other parts.
G3114	Hot rolled atmospheric corrosion resisting steels for welded structure	SMA	Having corrosion resistance with strength and weldability, it is applied to bridge, architecture and other structures.
G3115	Steel plates for pressure vessels for intermediate temperature service	SPV	Pressure vessel and high pressure equipment used except at high and low temperature.
G3116	Steel, sheets, plates, and strip for gas cylinders	SG	Welded containers for high pressure gas holder of volume less than 500 l for LPG, acetylene and propane gases.
G3125	Superior atmospheric corrosion resisting rolled steels	SPA-H	Having superior atmospheric corrosion resistance, it is applied to rolling stock body, architecture, steel tower and other structures.
G3131	Hot rolled mild steel plates, sheets and strip	SPHC SPHD SPHE	General steels used for general forming, deep drawing.
G3132	Hot rolled carbon steel strip for pipes and tubes	SPHT	Welded pipes with low and high frequency welding.
G3134	Hot rolled high strength steel sheets with improved formability for automobile	SPFH	Having superior workability of high strength steels, it is applied to automobiles.
G3136	Rolled steels for building structure	SN	Hot rolled steels for architecture structures.
G4051	Carbon steels for machine structure	S-C S-CK	Carbon steels for machinery structure produced by hot process and used with forging, shaving and with heat treatment.
G4104	Chromium steels	SCr	Chromium steels for machinery structure produced by hot process and used with forging, shaving and with heat treatment.
G4105	Chromium molybdenum steels	SCM	Chromium molybdenum steels for machinery structure produced by hot process and used with forging, shaving and with heat treatment.
G4401	Carbon tool steels	SK	Carbon tools steel made by hot rolling and forging.
G4404	Alloy tool steels	SKS	Alloy tools steel made by hot rolling and forging.
C2555	Steel sheets and strip for pole core	PCYH	For magnetic pole of rotating electric machine.

The Japan Iron and Steel Federation Standard (JFS)

Classification		Designation	Characteristics and Application
A1001	Hot rolled steel sheets and strip for automobile uses	JSH	The Japan Iron and Steel Federation Standard of hot rolled steel sheets and strips for automobile use

Foreign Standards

Classification
ASTM Standard
BS Standard
DIN Standard
EN Standard
ISO Standard
SAE Standard
API Standard

Ship's Class Standard

JFE Steel produces the products based on following society's standards.

Society
NK, ABS, BV, CR, LR, DNV

● JFE Standard

Classification	Designation	Page	Characteristics and Application
Hot rolled steel sheets for automobile use	JFE-HA	6	Quality with wide range of formability. Various types of hot rolled steels are available.
Hot rolled steel sheets with good press formability	JFE-HDN JFE-HEN JFE-HFN	8	Because of good formability same as cold rolled one, press formability is improved. Low carbon steel is suitable to extra deep drawing parts like compressor chambers.
Hot rolled anti-sea water corrosion steel sheets	JFE-MARIN	9	High corrosion resistance against seawater splashes. It is applicable to port facilities, quays, off shore structures.
Hot rolled corrosion resistance steel sheets	JFE-ASA	10	High corrosion resistance to sulfuric or hydrochloric acid. It is suitable to equipments exposed to sulfuric corrosion atmosphere. Also it has superior atmospheric corrosion resistance, formability and weldability.
Hot rolled steel sheets for high temperature atmosphere	JFE-HHCR	11	With good formability at room temperature. It has superior anti-oxidation and strength under high temperature atmosphere. It can be applied to boiler skin casing, chimney, duct and other parts which need heat proof property.
Hot rolled flat steel sheets for exposed use	JFE-HDH	11	Steel aiming good flatness and appearance. Having superior surface appearance and shape, it is suitable to application needs good shape and fine appearance as exposed parts.
Hot rolled steel sheets for porcelain enameling	JFE-HPE	12	Both-side porcelain enameling is possible. It has also superior porcelain properties like anti-fish tail, adhesionability and anti-strain during baking.
Hot rolled high strength steel sheets	JFE-HITEN	13	Specifying tensile strength levels. It is used as rolled. It has superior formability and weldability. It contributes to weight saving by inducing higher strength.
Hot rolled checkered plate	JFE-HCP	14	With simple and beautiful stripe patterns , it has good anti-slip and good water-cut property with good weldability and formability.
Hot rolled steel sheets for electric resistance welded pipe and tube	JFE-HP	16	By specifying finer strength levels than JIS, it is suitable to various application.
Hot rolled atmospheric corrosion resistance steel sheets	JFE-HCUP	17	Having superior atmospheric corrosion resistance and corrosion resistance, it has also sufficient strength, weldability and formability for structural uses. Stabilized rust after two years has no progress. It is applied to exposed parts of buildings.



Container



Gas cylinder

JFE Standard (1)

Hot rolled sheets for automobile use JFE-HA

JFE prepares various kinds of hot rolled high strength steels for automobile use with the general processing quality to the quality having same formability as those of cold rolled sheets.

Mechanical Properties

Classification	Designation	Applied Thickness mm (min.-max.)	Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Tensile Test								Test Piece	Hole Expanding Ratio % min.	Other Specification				
					Iongation (%) min														
					Thickness mm														
Commercial quality	JFE-HA···	440	1.2-14.0	255	440	28	29	30	32	33	34	35	35	JIS No.5	Rolling	—			
		490	1.4-14.0	305	490	(24)	25	26	26	27	27	28	28		Transverse	—			
		540	1.4-14.0	345	540	(21)	22	23	23	24	24	25	25						
High yield ratio type (HSLA)	JFE-HA···R	440	1.2-14.0	305	440	25	26	27	27	28	28	29	29	JIS No.5	Transverse	—			
		490	1.4-14.0	345	490	(21)	22	23	23	24	24	25	25						
		540	1.4-14.0	400	540	(18)	19	20	20	21	21	22	22						
		590	1.4-14.0	430	590	(16)	17	18	18	19	19	20	20						
		690	1.4-14.0	585	690	(14)	14	15	16	17	17	18	19						
		780	1.4-14.0	665	780	(13)	(13)	14	14	15	15	16	17						
Low yield ratio type (DP)	JFE-HA···D	540	1.4-6.0	(YR ≤ 75%)	540	23	24	25	25	26	26	—	—	JIS No.5	Transverse	—			
		590	1.4-6.0	(YR ≤ 75%)	590	21	22	23	23	24	24	—	—						
		780	2.0-4.0	(YR ≤ 75%)	780	—	—	16	16	17	17	—	—						
Excellent stretch flange formability type A (Equivalent JFS A)	JFE-HA···SA	440	1.4-6.0	305	440	28	29	30	32	33	34	—	—	JIS No.5	Rolling	80			
		490	1.4-6.0	325	490	21	22	23	24	25	25	—	—						
		540	1.4-6.0	345	540	21	22	23	23	24	24	—	—						
		590	1.4-6.0	400	590	18	19	20	21	22	22	—	—						
Excellent stretch flange formability type B (Equivalent JFS B)	JFE-HA···SB	440	1.4-6.0	305	440	28	29	30	32	33	34	—	—	JIS No.5	Transverse	100			
		490	1.4-6.0	325	490	21	22	23	24	25	25	—	—						
		540	1.4-6.0	345	540	21	22	23	23	24	24	—	—						
		590	1.4-6.0	400	590	18	19	20	21	22	22	—	—						
High elongation type (Retained austenite)	JFE-HA···E	590	1.8-3.2	390	590	—	25	26	27	28	—	—	—	JIS No.5	Transverse	—			
High corrosion resistance type	JFE-HA···C	440	1.6-6.0	305	440	—	29	30	32	33	33	—	—	JIS No.5	Rolling	—			
		490	2.0-6.0	325	490	—	22	23	24	25	25	—	—						
		540	2.0-4.0	355	540	—	21	22	23	24	24	—	—						
		590	2.0-4.0	420	590	—	19	20	21	22	22	—	—						
		780	2.0-4.0	—	780	—	—	14	14	15	15	—	—						
High corrosion resistance type with excellent stretch flange formability	JFE-HA···CS	440	1.6-6.0	305	440	—	29	30	32	33	33	—	—	JIS No.5	Transverse	60			
		490	2.0-6.0	325	490	—	—	23	24	25	25	—	—						
		540	2.0-4.0	355	540	—	—	22	23	24	24	—	—						
		590	2.0-4.0	420	590	—	—	20	21	22	22	—	—						
		780	2.0-4.0	—	780	—	—	14	14	15	15	—	—						
Extra stretch flange formability type NANOHITEN™	JFE-HA···NANO	780	1.4-4.5	685	780	14	14	15	15	16	16	—	—	JIS No.5	Transverse	60			
High fatigue strength type	JFE-HA···H	780	2.3-6.0	500	780	—	—	16	16	17	17	—	—	JIS No.5	Transverse	—			
Bake hardenability type (TS Increase)	JFE-HA···BHT	370	1.2-4.5	205	370	33	34	35	35	36	37	—	—	JIS No.5	Rolling	10%Pre-StrainBHT ≥ 40MPa			
		440	1.2-4.5	265	440	28	29	30	32	33	34	—	—						
		490	1.4-4.5	315	490	24	25	26	26	27	27	—	—						
		590	1.4-4.5	400	590	16	17	18	18	19	19	—	—						

● Dimension tolerance

● Available product size range

JIS G 3131 for thickness and JIS G 3193 for width are applied.

Available product size comes to negotiation.

JFE Standard (2)

Hot rolled steel sheets with good press formability JFE-H * N

Improved press formability is attained by good ductility same as that of cold rolled steel.
This is suitable for deep drawing parts such as a compressor chamber.

● Characteristics

Classification	Designation	Reference
Low carbon steel	JFE-HDN	Drawing quality
Low carbon steel	JFE-HEN	Deep drawing quality
Ultra low carbon steel	JFE-HFN	Extra deep drawing quality

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test									
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation min. (%)							
				Thickness mm							
JFE-HDN	1.6-14.0	—	270	—	35	37	39	41	42	43	44
JFE-HEN	1.2-6.0	—	270	40	41	42	42	43	44	—	—
JFE-HFN	2.0-6.0	—	260	—	—	42	43	45	47	—	—

Reference JIS No.5 test piece for the tensile test taken to the rolling direction.

● Dimension tolerance

JIS G 3131 for thickness and JIS G 3193 for width are applied.

● Available product size range

Available product size comes to negotiation.

Hot rolled anti-sea water corrosion steel sheets JFE-MARIN

JFE-MARIN offers superior weldability and toughness as a structural material for welding, combined with excellent corrosion resistance. The synergistic effects of alloying elements provide corrosion resistance not only in sea water, but also at the splash line, which is most susceptible to seawater corrosion. Suitable for port and harbor facilities, quays, and offshore structures.



● Chemical Composition

Designation	Chemical Composition (wt%)									
	C	Si	Mn	P	S	Cu	Ni	Cr	Nb	Sol.Al
JFE-MARIN	0.15 Max	0.55 Max	1.50 Max	0.030 Max	0.030 Max	0.20 ~0.50	0.40 Max	0.50 ~0.80	0.10 Max	0.15 ~0.55

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test			
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation min. (%)	Test Piece
JFE-MARIN	3.2-6.0	365	490~610	25	JIS No.5

Reference The bend test is available depending on a demand.

● Dimension tolerance

JIS G 3193 is applied.

● Available product size range

Available product size comes to negotiation.

JFE Standard (3)

Hot rolled corrosion resistance steel sheets JFE-ASA

Optimum addition of special alloying elements to SS400 equivalent material secures high corrosion resistance against sulfuric and hydrochloric acids, as well as atmospheric environments, combined with good formability and weldability. Main applications include air preheaters for oil boilers, chimneys, and incinerators.

● Chemical Composition

Designation	Chemical Composition (wt%)										
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Sb	Sn
JFE-ASA400D	0.14 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	—	—	0.05 - 0.20	0.10 max.
JFE-ASA400H	0.14 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	0.50 - 1.00	0.10 max.	—	—
JFE-ASA400W	0.14 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	0.50 - 1.00	0.10 max.	0.05 - 0.20	0.10 max.
JFE-ASA440D	0.17 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	—	—	0.05 - 0.20	0.10 max.
JFE-ASA440H	0.17 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	0.50 - 1.00	0.10 max.	—	—
JFE-ASA440W	0.17 max.	0.55 max.	0.30 - 0.70	0.030 max.	0.020 max.	0.25 - 0.50	0.50 max.	0.50 - 1.00	0.10 max.	0.05 - 0.20	0.10 max.

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test							Testing Direction	
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation min. (%)		Test Piece				
				Thickness mm		Thickness mm				
				≤ 5	5 < ≤ 16	≤ 5	5 < ≤ 16			
JFE-ASA400D	1.6-16.0	245	400	22	18	JIS No.5	JIS No.1A	Transverse to rolling direction		
JFE-ASA400H	1.6-16.0	245	400	22	18					
JFE-ASA400W	1.6-16.0	245	400	22	18					
JFE-ASA440D	1.6-16.0	265	440	22	17					
JFE-ASA440H	1.6-16.0	265	440	22	17					
JFE-ASA440W	1.6-16.0	265	440	22	17					

Reference The bend test is available depending on a demand.

● Dimension tolerance

JIS G 3193 is applied.

● Available product size range

Available product size comes to negotiation.

● Chemical Composition and applied environment of D, H, W type

Designation	Chemicals	Applied environment
JFE-ASA···D	Cu-Ni-Sn-Sb	Surface temperature less than 120-130°C. Mainly considered on the sulfuric acid corrosion.
JFE-ASA···H	Cr-Cu-Ni	Resistance against sulfuric acid corrosion is less than that of JFE-ASA ··· D. Considered on the strength in comparatively high temperature atmosphere.
JFE-ASA···W	Cr-Cu-Ni-Sn-Sb	Condition of the environment is not decisive.

Hot rolled steel sheets for high temperature atmosphere JFE-HHCR

Hot rolled steel sheets for high temperature atmosphere have good formability at room temperature, combined with high temperature oxidation resistance and heat resistance at temperatures of 450-600°C. Suitable for applications which require heat resistance and formability, such as boiler skin casings, chimneys, and ducts.

● Chemical Composition

Designation	Chemical Composition (wt%)				
	C	Si	Mn	P	S
JFE-HHCR	0.10 max.	—	0.40 max.	0.035 max.	0.035 max.

Reference Other special elements are included.

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test				
		Yield Point (N/mm ²)	Tensile Strength (N/mm ²)	Elongation min. (%)	Test Piece	Testing Direction
JFE-HHCR	1.2-12.7	—	330～430	37	JIS No.5	Rolling direction

Reference The bend test is available depending on a demand.

● Dimension tolerance

JIS G 3193 is applied.

● Available product size range

Available product size comes to negotiation.

Hot rolled flat steel sheets for exposed use JFE-HDH

The steel sheet mainly produced in the stand point of flatness and attractive appearance. It has superior attractive appearance and strip shape. It is suitable for application which require good shape and appearance as exposed parts.

● Chemical Composition and Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Chemical Composition (wt%)	
		P	S
JFE-HDH	1.6-4.5	0.040 max.	0.040 max.

Reference The bend test is available depending on a demand.

● Dimension tolerance

JIS G 3193 is applied.

● Flatness tolerance

The half of the value in Table 9 of JIS G 3193 is the aiming of flatness.

Details come to negotiation.

● Available product size range

Available product size comes to negotiation.

JFE Standard (4)

Hot rolled steel sheets for porcelain enameling JFE-HPE

It is possible to apply both-side porcelain enameling and it has superior anti-fish tail property, excellent adhesionability, and less distortion during baking.

● Characteristics

1. Superior anti-fish tail property
2. Good adhesionability
3. Less distortion and residual strain during baking
4. Superior formability
5. Superior weldability

● Chemical Composition

Designation	Applied Thickness mm (min.-max.)	Chemical Composition (wt%)					
		C	Si	Mn	P	S	Others
JFE-HPE	1.2 - 13.0	0.10 max.	0.10 max.	0.70 max.	0.035 max.	0.035 max.	Special additives

● Dimension tolerance

JIS G 3131 is applied

● Available product size range

The available product size range of JFE-HPE steel sheets for porcelain enameling is strip width of 610 mm to 1,925 mm, strip thickness of 1.2 mm to 13.0 mm.

Available product size comes to negotiation.

● Typical Chemical Composition (wt%)

Designation	C	Si	Mn	P	S	SiAl	Ti
JFE-HPE	0.025	0.02	0.25	0.012	0.008	0.010	0.17

● Typical Mechanical Properties

Typical mechanical properties are shown below. The strength level comes to negotiation.

Designation	Thickness mm	Yield Point (N/mm ²)	Tensile Strength (N/mm ²)	Elongation %
JFE-HPE	3.2	436	512	23

Hot rolled high strength steel sheets JFE-HITEN

Used as-rolled in applications which require high strength with specified tensile strength levels.
Also has superior formability and weldability. High strength contributes to weight reduction.

● Chemical Composition

Designation	Chemical Composition (wt%)				
	C	Si	Mn	P	S
JFE-HITEN490	0.18 max.	0.50 max.	1.50 max.	0.035 max.	0.035 max.
JFE-HITEN540	0.20 max.	0.50 max.	1.60 max	0.035 max.	0.035 max.
JFE-HITEN590	0.20 max.	0.50 max.	1.60 max	0.035 max.	0.035 max.
JFE-HITEN690	0.20 max.	0.60 max.	2.00 max.	0.030 max.	0.015 max.
JFE-HITEN780	0.20 max.	0.60 max.	2.00 max.	0.020 max.	0.010 max.

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test						
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation (%) min.				
				Thickness mm	1.6 ≤ < 2.3	2.3 ≤ < 3.0	3.0 ≤ < 6.3	6.3 ≤ ≤ 8.0
JFE-HITEN490	1.6-10.0	305	490	22	22	24	25	25
JFE-HITEN540		345	540	20	20	22	23	23
JFE-HITEN590	1.6-8.0	430	590	16	16	18	20	—
JFE-HITEN690		550	690	14	15	16	18	—
JFE-HITEN780	2.3-8.0	665	780	—	14	15	16	—

Reference : 1. JIS No.5 test piece for the tensile test taken transverse to the rolling direction.
2. JIS No.3 test piece for the bend test taken transverse to the rolling direction.
3. The bend test is available depending on a demand.

● Dimension tolerance

JIS G 3193 is applied.

● Available product size range

Available product size comes to negotiation.

JFE Standard (5)

Hot rolled checkered plate JFE-HCP

JFE checkered plate is available in a single-stripe or triple-stripe pattern. Both have an attractive design and good anti-slip and water draining properties, combined with excellent dimensional accuracy, weldability, and formability. Suitable for floors, stairs, and landings, and for rolling stock bodies. Tight-scale type checkered plate with excellent scale peeling resistance is available upon request.

● Characteristics

1. Attractive stripe pattern
2. Excellent anti-slip property
3. Excellent water draining property
4. High weldability and formability

● Chemical Composition

Designation	Application	Chemical Composition (wt%)	
		P	S
JFE-HCP-1	General use	—	—
JFE-HCP-3	General use	—	—
JFE-HCP400-1	Structural use	0.050 max.	0.050 max.
JFE-HCP400-3	Structural use	0.050 max.	0.050 max.

● Mechanical Properties

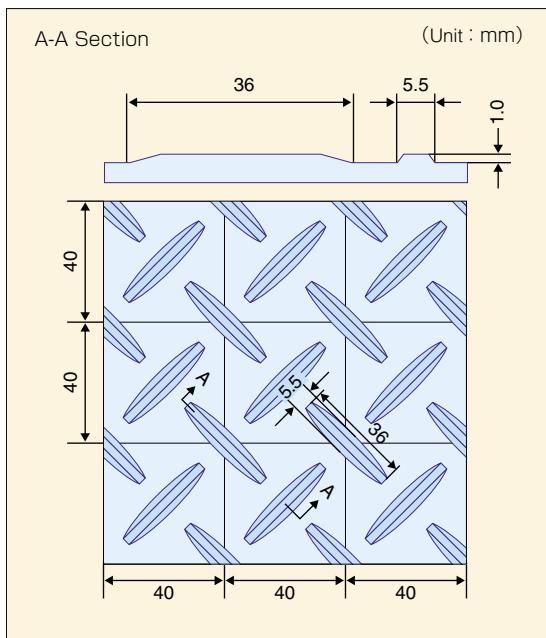
Designation	Applied Thickness mm (min.-max.)	Tensile Test								Testing Direction	
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation min. (%)		Test Piece					
				Thickness mm		Thickness mm					
				≤ 5	5 < ≤ 13	≤ 5	5 < ≤ 13				
JFE-HCP-1	2.3-13.0	—	—	—	—	—	—	—	—	—	
JFE-HCP-3		—	—	—	—	—	—	—	—	—	
JFE-HCP400-1		245	400～510	(21)	(17)	JIS No.5	JIS No.1A	Rolling			
JFE-HCP400-3											

Reference : 1. The figures in the parentheses are the reference values.
2. The bend test is available depending on a demand.

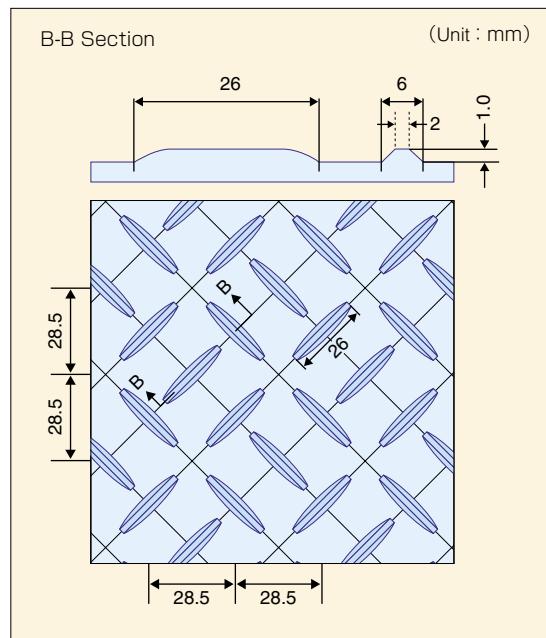
● Mass of cut sheet

Thick-ness mm	Single-striped					Triple-striped				
	W × L mm	914 × 1,829	1,219 × 2,438	1,524 × 3,048	1,829 × 9,144	W × L mm	914 × 1,829	1,219 × 2,438	1,524 × 3,048	1,829 × 9,144
		Area m ²	1.672	2.972	4.645		Area m ²	1.672	2.972	4.645
Unit mass kg/m ²						Unit mass kg/m ²				
2.3	19.42	32.5	57.7	—	—	19.77	33.0	58.7	—	—
3.2	26.48	44.3	78.7	123	443	26.83	44.9	79.7	125	—
4.5	36.69	61.3	109	170	613	37.04	61.9	110	172	619
6	48.46	81.0	144	225	810	48.81	81.6	145	227	816
8	64.16	107	191	298	1,073	64.51	108	192	300	1,079
9	72.01	120	214	334	1,204	72.36	121	215	336	1,210
12	95.56	160	284	444	1,598	95.91	160	285	446	1,604

**Single-striped surface pattern
of JFE-HCP-1 and JFE-HCP400-1**



**Triple-striped surface pattern
of JFE-HCP-3 and JFE-HCP400-3**

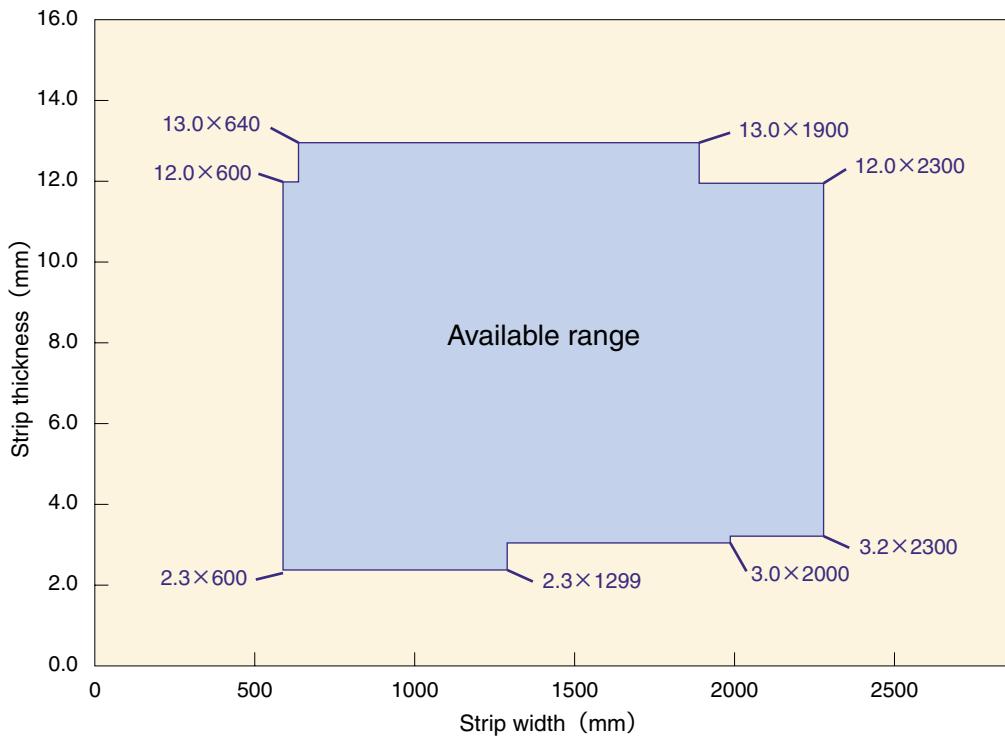


● **Dimension tolerance**

JIS G 3193 is applied.

● **Available product size range**

Size outside of the available range is subject to negotiation.



JFE Standard (6)

Hot rolled steel sheets for electric resistance welded pipe and tube JFE-HP

By specifying finer strength levels than JIS, it is suitable to various applications.

● Chemical Composition

Designation	Chemical Composition (wt%)					
	C	Si	Mn	P	S	Al total
JFE-HP290	0.10 max.	0.35 max.	0.50 max.	0.035 max.	0.035 max.	—
JFE-HP320	0.18 max.	0.35 max.	0.60 max.	0.035 max.	0.035 max.	—
JFE-HP340	0.18 max.	0.35 max.	0.60 max.	0.035 max.	0.035 max.	—
JFE-HP370	0.25 max.	0.35 max.	0.30 - 0.90	0.035 max.	0.035 max.	—
JFE-HP410	0.25 max.	0.35 max.	0.30 - 0.90	0.035 max.	0.035 max.	—
JFE-HP440	0.30 max.	0.35 max.	0.30 - 1.00	0.035 max.	0.035 max.	—
JFE-HP490	0.30 max.	0.35 max.	0.30 - 1.00	0.035 max.	0.035 max.	—
JFE-HP540	0.23 max.	0.35 max.	1.50 max.	0.035 max.	0.035 max.	0.080 max.

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Tensile Test							Test Piece and Testing Direction
		Yield Point min. (N/mm ²)	Tensile Strength min. (N/mm ²)	Elongation min. (%)					
				Thickness mm	11.2 ≤ < 1.6	1.6 ≤ < 3.0	3.0 ≤ < 6.0	6.0 ≤ < 13.0	13.0 ≤ ≤ 16
JFE-HP290	1.2-16.0	—	290	30	32	35	37	38	JIS No.5 Rolling Direction
JFE-HP320	1.2-16.0	175	320	28	30	33	36	37	
JFE-HP340	1.2-16.0	205	340	26	28	31	34	36	
JFE-HP370	1.6-16.0	215	370	—	25	28	31	33	
JFE-HP410	1.6-16.0	245	410	—	22	25	28	30	
JFE-HP440	1.6-16.0	305	440	—	21	24	27	29	
JFE-HP490	1.6-16.0	345	490	—	19	23	25	27	
JFE-HP540	3.0-16.0	390	540	—	—	18	20	22	

Reference The bend test is available depending on a demand.

In addition to above materials, JFE-HP *** B for boiler tubes is also available.

JFE-HP290B, JFE-HP320B, JFE-HP340B, JFE-HP370B, JFE-HP410B

● Dimension tolerance

JIS G 3132 is applied for thickness tolerance and JIS G 3193 is applied for other tolerances.
Strip thickness thicker than 13mm comes to negotiation.

● Available product size range

Available product size comes to negotiation.

Hot rolled atmospheric corrosion resistance steel sheets JFE-HCUP

Superior atmospheric corrosion resistance and general corrosion resistance, combined with adequate strength, weldability, and formability for structural applications. Rust stabilizes and does not progress after approximately 2 years. Suitable for exposed parts of buildings and structures.



● Chemical Composition

Designation	Chemical Composition (wt%)							
	C	Si	Mn	P	S	Cu	Ni	Cr
JFE-HCUP	0.12 max.	0.25 - 0.75	0.20 - 0.50	0.07 - 0.15	0.035 max.	0.25 - 0.55	0.45 max.	0.30 - 1.00

● Mechanical Properties

Designation	Applied Thickness mm (min.-max.)	Thickness mm	Tensile Test					Testing Direction
			Yield Point min. (N/mm²)	Tensile Strength min. (N/mm²)	Elongation min. (%)	Test Piece		
JFE-HCUP	1.6-16.0	1.6 ≤ ≤ 6.0	345	480	22	JIS No.5	Rolling direction	
		6.0 < ≤ 16.0	355	490	15	JIS No.1A		

Reference : 1. JIS No.3 test piece for the bend test can be used in case of sheet thickness equal to or less than 5mm.
2. In case of the sheet thicker than 6.0mm of JFE-HCUP, maximum Mn content becomes 0.60%.
3. The bend test is available depending on a demand.

● Dimension tolerance

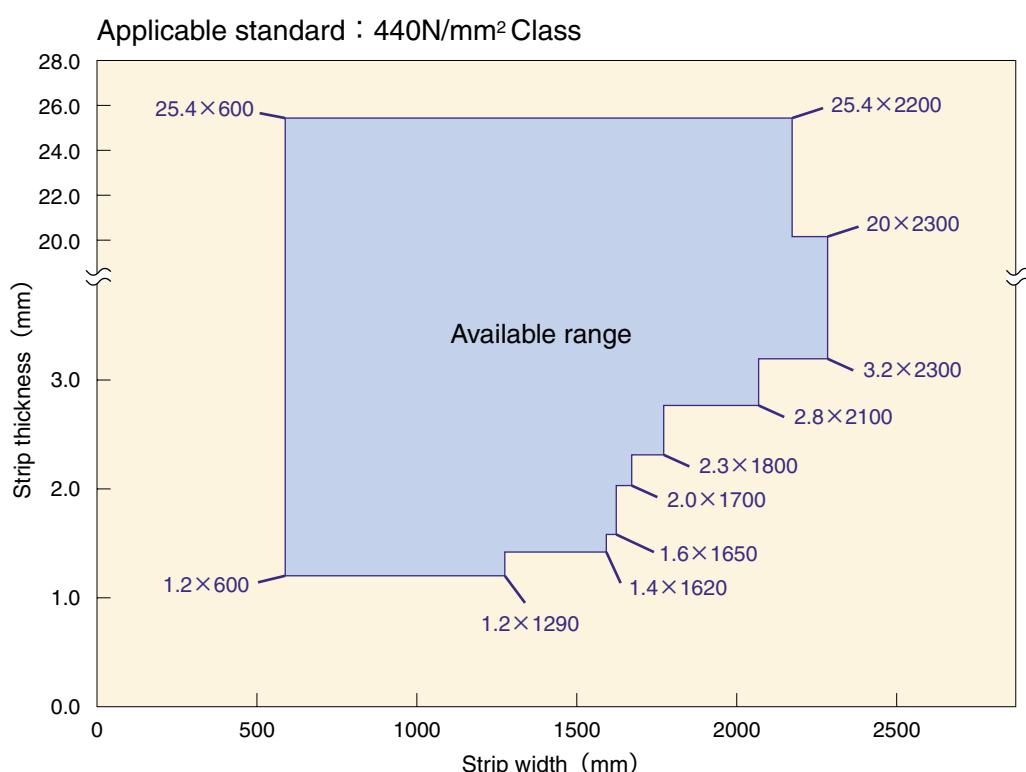
JIS G 3193 is applied.

● Available product size range

Available product size comes to negotiation.

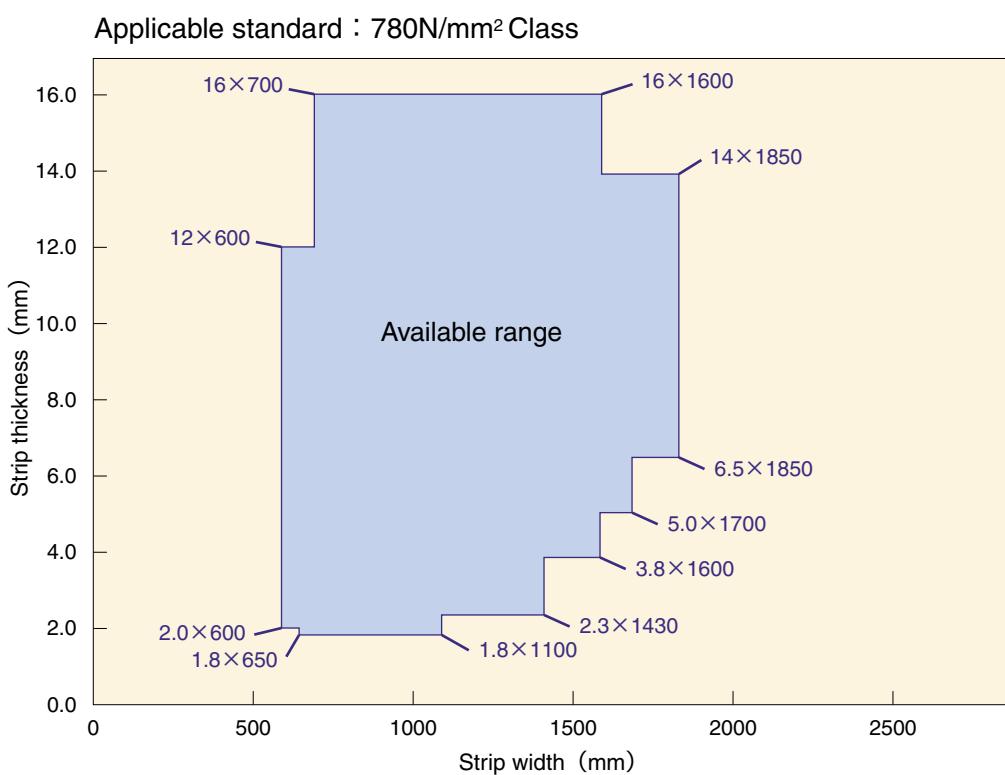
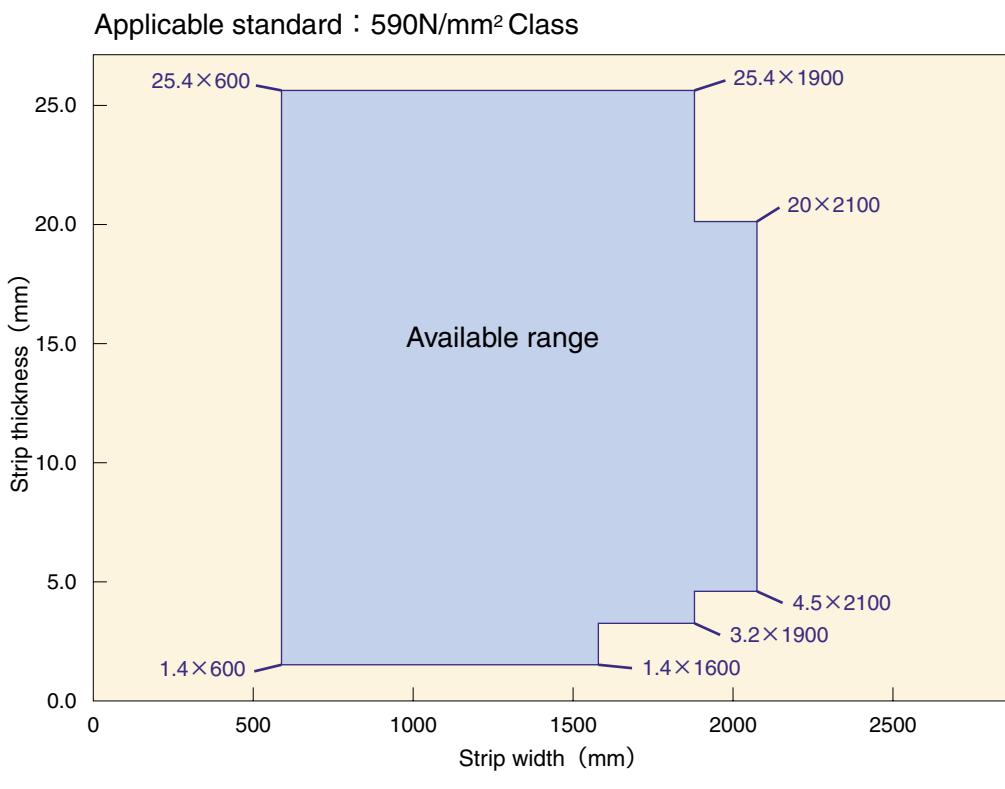
Available product size range

Non pickled coil



As there may be minor changes of the available product size range according to standard, application and method of working, contact and negotiation will be welcomed.

Size outside the available range is subject to negotiation. Available size for cut-length sheets or slit coil is also subject to negotiation.



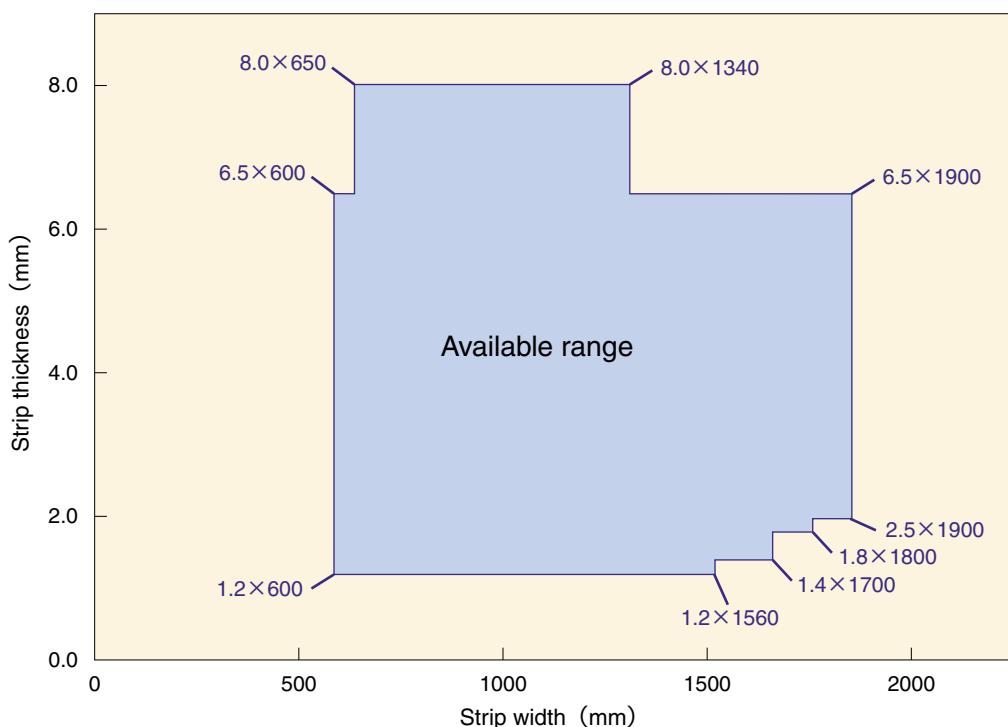
As there may be minor changes of the available product size range according to standard, application and method of working, contact and negotiation will be welcomed.

Size outside the available range is subject to negotiation. Available size for cut-length sheets or slit coil is also subject to negotiation.

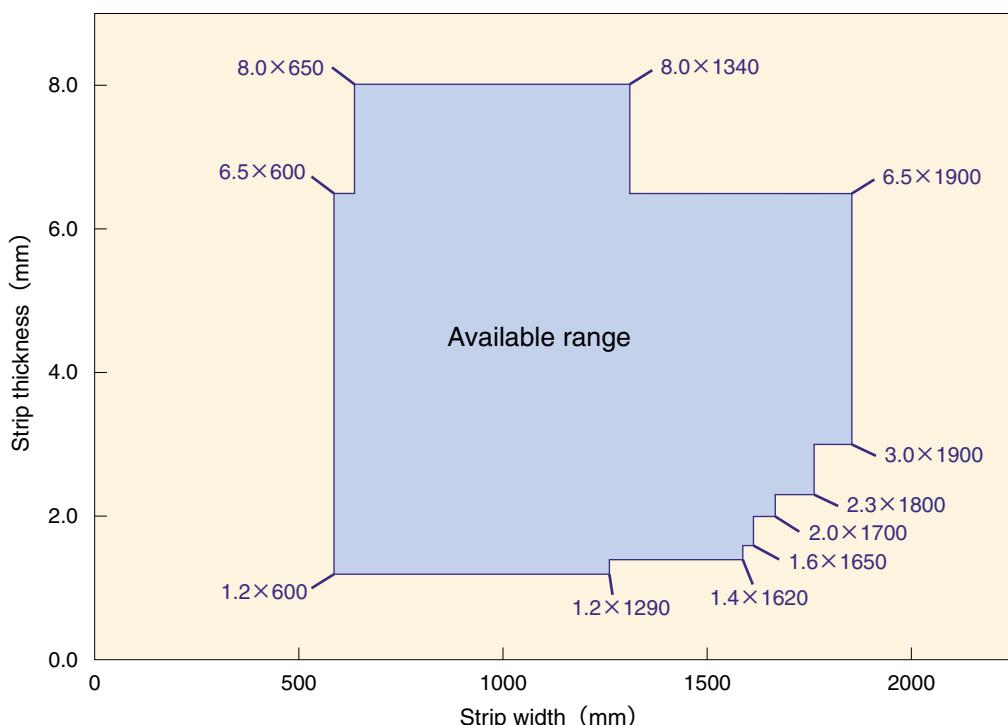
Available product size range

Pickled coil

Applicable standard : 270N/mm² Class (Pickled)

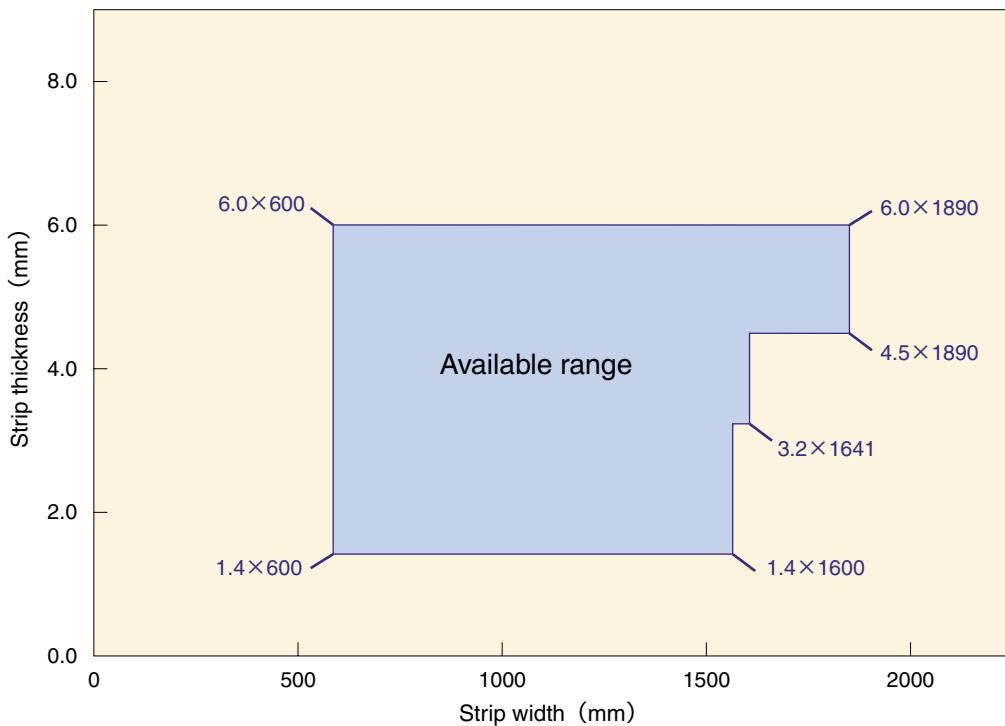
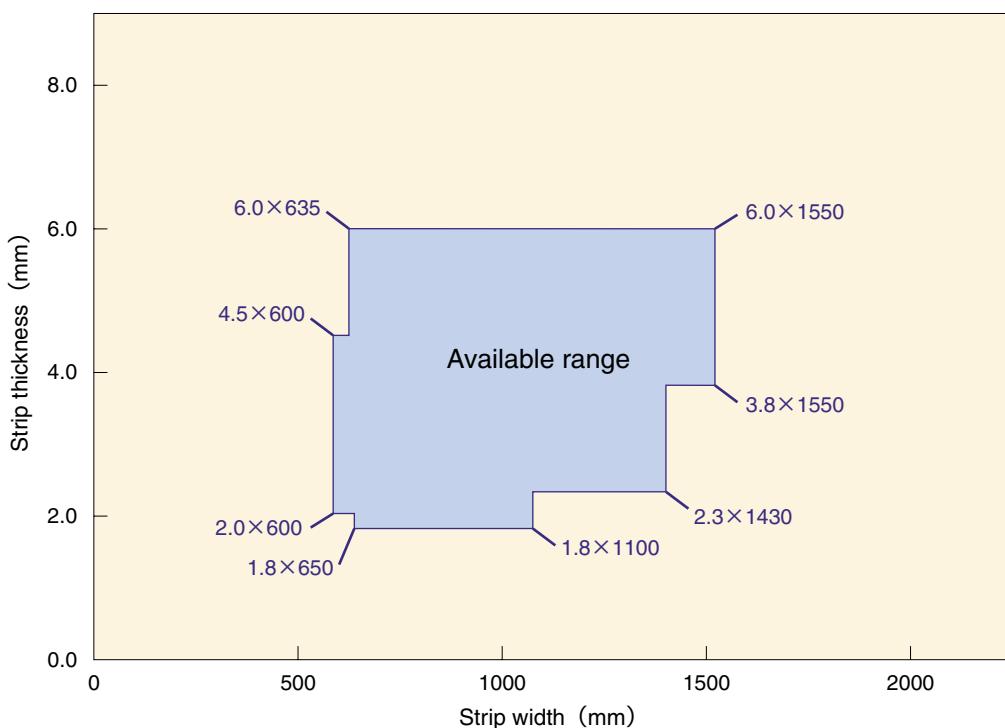


Applicable standard : 440N/mm² Class (Pickled)



As there may be minor changes of the available product size range according to standard, application and method of working, contact and negotiation will be welcomed.

Size outside the available range is subject to negotiation. Available size for cut-length sheets or slit coil is also subject to negotiation.

Applicable standard : 590N/mm² Class (Pickled)Applicable standard : 780N/mm² Class (Pickled)

As there may be minor changes of the available product size range according to standard, application and method of working, contact and negotiation will be welcomed.

Size outside the available range is subject to negotiation. Available size for cut-length sheets or slit coil is also subject to negotiation.

Dimensional tolerance (1)

● Strip thickness tolerance

Table : Thickness tolerance specified in JIS G 3131, JIS G 3132 (Tensile strength less than 490N/mm²), JIS G 3113 and JIS G 3116 (Tensile strength less than 490N/mm²)

Strip thickness mm	Strip width mm	Tolerance mm			
		< 1,200	1,200 ≤ < 1,500	1,500 ≤ < 1,800	1,800 ≤ < 2,300
< 1.60	—	± 0.14	± 0.15	± 0.16 ⁽¹⁾	—
1.60 ≤ , < 2.00	—	± 0.16	± 0.17	± 0.18	± 0.21 ⁽²⁾
2.00 ≤ , < 2.50	—	± 0.17	± 0.19	± 0.21	± 0.25 ⁽²⁾
2.50 ≤ , < 3.15	—	± 0.19	± 0.21	± 0.24	± 0.26
3.15 ≤ , < 4.00	—	± 0.21	± 0.23	± 0.26	± 0.27
4.00 ≤ , < 5.00	—	± 0.24	± 0.26	± 0.28	± 0.29
5.00 ≤ , < 6.00	—	± 0.26	± 0.28	± 0.29	± 0.31
6.00 ≤ , < 8.00	—	± 0.29	± 0.30	± 0.31	± 0.35
8.00 ≤ , < 10.0	—	± 0.32	± 0.33	± 0.34	± 0.40
10.0 ≤ , < 12.5	—	± 0.35	± 0.36	± 0.37	± 0.45
12.5 ≤ , ≤ 14.0	—	± 0.38	± 0.39	± 0.40	± 0.50

Notes: (1) The value shall be applied to the steel sheet and coil up to and excluding 1,600mm in width.

(2) The value shall be applied to the steel sheet and coil up to and excluding 2,000mm in width.

Remarks: 1. The thickness shall be measured at any point on the steel sheet and coil not less than 20mm from a side edge.

For the steel sheet and coil under 40mm in width, measurement shall be made at the mid width thereof.

2. The value specified in Table shall not be applied to the irregular portions of both ends of the steel coil.

3. The tolerances on the thickness of the steel sheet which is not manufactured from the steel coil may be agreed between the purchaser and supplier.

Table : Thickness tolerance specified in JIS G 3132 (Tensile strength 490N/mm² and more), JIS G 3116 (Tensile strength 490N/mm² and more) and JIS G 3134

Strip thickness mm	Strip width mm	Tolerance mm			
		< 1,200	1,200 ≤ < 1,500	1,500 ≤ < 1,800	1,800 ≤ < 2,300
< 1.60	—	± 0.14	± 0.15	± 0.16 ⁽³⁾	—
1.60 ≤ , < 2.00	—	± 0.16	± 0.19	± 0.20	—
2.00 ≤ , < 2.50	—	± 0.18	± 0.22	± 0.23	± 0.25 ⁽⁴⁾
2.50 ≤ , < 3.15	—	± 0.20	± 0.24	± 0.26	± 0.29
3.15 ≤ , < 4.00	—	± 0.23	± 0.26	± 0.28	± 0.30
4.00 ≤ , < 5.00	—	± 0.26	± 0.29	± 0.31	± 0.32
5.00 ≤ , < 6.00	—	± 0.29	± 0.31	± 0.32	± 0.34
6.00 ≤ , < 8.00	—	± 0.32	± 0.33	± 0.34	± 0.38
8.00 ≤ , < 10.0	—	± 0.35	± 0.36	± 0.37	± 0.44
10.0 ≤ , < 12.5	—	± 0.38	± 0.40	± 0.41	± 0.49
12.5 ≤ , ≤ 13.0	—	± 0.41	± 0.44	± 0.45	± 0.54

Notes: (3) The value shall be applied to the steel sheet and coil up to and excluding 1,600mm in width.

(4) The value shall be applied to the steel sheet and coil up to and excluding 2,000mm in width.

Remarks: 1. The thickness shall be measured at any point not less than 20mm inside from a side edge of the steel strip.

For the steel strip under 40mm in width, measurement shall be made at the mid width of the steel strip.

2. The value specified in Table shall not be applied to the irregular portions of both ends of the steel strip.

Table :Thickness tolerance specified in JIS G 3193

Strip thickness mm	Tolerance mm		
	< 1,600	1,600 ≤ < 2,000	2,000 ≤ < 2,300
< 1.25	± 0.16	—	—
1.25 ≤ , < 1.60	± 0.18	—	—
1.60 ≤ , < 2.00	± 0.19	± 0.23	—
2.00 ≤ , < 2.50	± 0.20	± 0.25	—
2.50 ≤ , < 3.15	± 0.22	± 0.29	± 0.29
3.15 ≤ , < 4.00	± 0.24	± 0.34	± 0.34
4.00 ≤ , < 5.00	± 0.45	± 0.55	± 0.55
5.00 ≤ , < 6.30	± 0.50	± 0.60	± 0.60
6.30 ≤ , < 10.0	± 0.55	± 0.65	± 0.65
10.0 ≤ , < 16.0	± 0.55	± 0.65	± 0.65
16.0 ≤ , < 25.0	± 0.65	± 0.75	± 0.75
25.0 ≤ , ≤ 40.0	± 0.70	± 0.80	± 0.80

Reference : 1. Either plus or minus side of the thickness tolerances given in Table may be limited on request. The total tolerances in this case shall be equal to those given in Table.

2. Thickness shall be measured at any point on the steel strip not less than 25mm from a side edge for the mill edge strip 50mm or over in width and cut lengths therefrom, and on the center line for those less than 50mm in width. For the cut edge steel strip 30mm or over in width and cut lengths therefrom, measurement shall be made at any point no less than 15mm from a side edge, and on the center line for those less than 30mm in width.

Thickness shall be measured at any point inward the scheduled cutting line concerning width for the as-rolled steel plate (with untrimmed edge), and any point not less than 15mm from the aforementioned line for the cut edge plate.

Dimensional tolerance (2)

● Strip width tolerance

Table : Width tolerance specified in JIS G 3193.

Width mm	Thickness mm	Tolerance mm					
		Mill edge		Cut edge			
		Steel sheets as rolled (steel sheets with untrimmed edge)	Steel coils and steel sheets in cut length therefrom	A Normal cut edge	B Resheared or fine cut edge	C Slitted edge	
< 160	< 3.15	—	±2	5	0	2.0	±0.3
	3.15 ≤ , < 6.00			5		3.0	
	6.00 ≤ , < 20.00			10		4.0	
	20.00 ≤			10		—	
	< 3.15			5	0	2.0	±0.4
160 ≤ < 250	3.15 ≤ , < 6.00	—	±2	5		3.0	
	6.00 ≤ , < 20.00			10		4.0	
	20.00 ≤			15		—	
	< 3.15	0 + Not specified	±5	5	0	2.0	±0.5
250 ≤ < 400	3.15 ≤ , < 6.00			5		3.0	
	6.00 ≤ , < 20.00			10		4.0	
	20.00 ≤			15		—	
	< 3.15			10	0	3.0	±0.5
400 ≤ < 630	3.15 ≤ , < 6.00	0 + Not specified	+20	10		3.0	
	6.00 ≤ , < 20.00			10		5.0	
	20.00 ≤			15		—	
	< 3.15			10		4.0	
630 ≤ < 1,000	3.15 ≤ , < 6.00	0 + Not specified	+25	10	0	4.0	—
	6.00 ≤ , < 20.00			10		6.0	
	20.00 ≤			10		—	
	< 3.15			15		—	
1,000 ≤ < 1,250	3.15 ≤ , < 6.00	0 + Not specified	+30	10	0	4.0	—
	6.00 ≤ , < 20.00			10		6.0	
	20.00 ≤			15		—	
	< 3.15			15		—	
1,250 ≤ < 1,600	3.15 ≤ , < 6.00	0 + Not specified	+35	10	0	4.0	—
	6.00 ≤ , < 20.00			10		6.0	
	20.00 ≤			15		—	
	< 3.15			15		—	
1,600 ≤	3.15 ≤ , < 6.00	0 + Not specified	+40	10	0	4.0	—
	6.00 ≤ , < 20.00			10		6.0	
	20.00 ≤			1.2%		—	
	< 3.15			1.2%		—	

Remarks: For the mill edge steel strip less than 400mm in width than cut lengths therefrom, the width tolerance on minus side may be limited to zero. In this case, the tolerance on plus side shall be twice the values given in Table.

● Length tolerance

Table : Length tolerance specified in JIS G 3193.

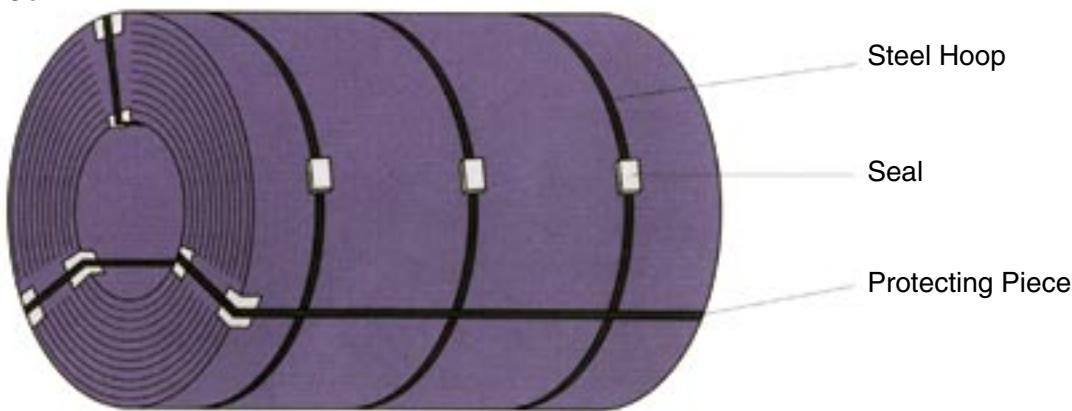
Length mm	Thickness mm	Tolerance mm	
		A Normal cut edge	B Reshered or fine cut edge
< 6,300	< 6.00	+ 25 mm 0 mm	+ 5 mm 0 mm
	6.00 ≤	+ 25 mm 0 mm	+ 10 mm 0 mm
6,300 ≤	< 6.00	+ 0.5 % 0 %	+ 10 mm 0 mm
	6.00 ≤	+ 0.5 % 0 %	+ 15 mm 0 mm

Packaging and labeling

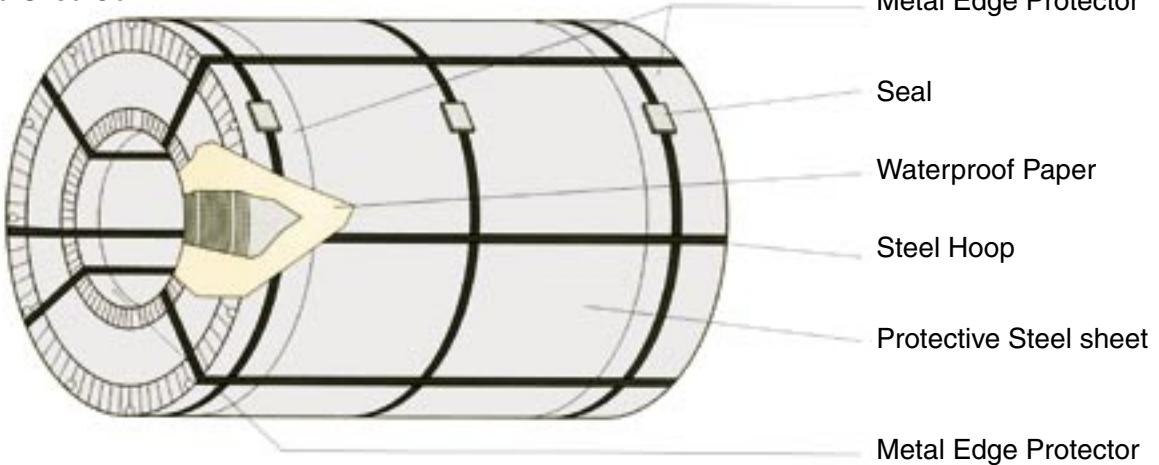
Packaging

Products are packaged according to applicable standards and preserved in a properly controlled environment until shipment.

Hot-Rolled Coil



Picked and Oiled Coil



Labels showing the product standard, dimensions, weight, and product serial no. are attached to the product

Instructions for ordering

When ordering, please give detailed information, including the following.

Detailed information on product requirements;

Standard, dimensions, quantity, surface finish, packaging specifications (inner and outer diameter, mass conditions), delivery date requirements

Application and processing method

Intended application, processing method, any heat treatments, welding, and/or surface treatment to be applied, and any other requirements.

Excerpts from public standards (1)

Japanese Industrial Standard (JIS) (1)

JIS G 3131 – 1996 Hot-Rolled Mild Steel Plates, Sheets and Strip

● Chemical Composition

Unit : %

Symbol	Chemical Composition			
	C	Mn	P	S
SPHC	0.15 max.	0.60 max.	0.050 max.	0.050 max.
SPHD	0.10 max.	0.50 max.	0.040 max.	0.040 max.
SPHE	0.10 max.	0.50 max.	0.030 max.	0.035 max

Informative Reference : Grade SPHE is manufactured by a special process,
such as made of killed steel to improve drawability

● Mechanical Properties

Symbol	Tensile Strength N/mm ²	Elongation %						Tensile Test Piece	Bendability			Test Piece		
		Thickness 1.2mm or over to and excl. 1.6mm	Thickness 1.6mm or over to and excl. 2.0mm	Thickness 2.0mm or over to and excl. 2.5mm	Thickness 2.5mm or over to and excl. 3.2mm	Thickness 3.2mm or over to and excl. 4.0mm	Thickness 4.0mm or over		Bending Angle	Inside Radius				
										Thickness up to and excl. 3.2mm	Thickness 3.2mm or over			
SPHC	270 min.	27min.	29min.	29min.	29min.	31min.	31min.	No.5 in rolling direction	180°	Flat on itself	Thickness X 0.5	No.3 in rolling direction		
SPHD	270 min.	30min.	32min.	33min.	35min.	37min.	39min.		—	—	—			
SPHE	270 min.	31min.	33min.	35min.	37min.	39min.	41min.		—	—	—			

JIS G 3101 – 1995 Rolled Steels for General Structure

● Chemical Composition

Unit : %

Symbol	Chemical Composition			
	C	Mn	P	S
SS 330	—	—	0.050max.	0.050max.
SS 400	—	—	0.050max.	0.050max.
SS 490	—	—	0.050max.	0.050max.
SS 540	0.30max.	1.60max.	0.040max.	0.040max.

Remarks : Alloy elements other than those given in the above table may be added as necessary.

● Mechanical Properties

Symbol	Yield point or Yield Strength N/mm ²		Tensile Strength N/mm ²	Thickness of rolled steel mm	Test Piece	Elongation %	Bendability						
	Thickness of rolled steel mm						Angle of Bending	Inside Radius	Test Piece				
	16 or under	Over 16 up to 40											
SS 330	205min.	195min.	330 to 430	5 or under in thickness	No.5	26min.	180°	Half of thickness	No1				
				Over 5 up to 16 in thickness	No.1A	21min.							
				Over 16 up to 50 in thickness	No.1A	26min.							
SS 400	245min.	235min.	400 to 510	5 or under in thickness	No.5	21min.	180°	1.5 times the thickness	No1				
				Over 5 up to 16 in thickness	No.1A	17min.							
				Over 16 up to 50 in thickness	No.1A	21min.							
SS 490	285min.	275min.	490 to 610	5 or under in thickness	No.5	19min.	180°	2.0 times the thickness	No1				
				Over 5 up to 16 in thickness	No.1A	15min.							
				Over 16 up to 50 in thickness	No.1A	19min.							
SS 540	400min.	390min.	540min.	5 or under in thickness	No.5	16min.	180°	2.0 times the thickness	No1				
				Over 5 up to 16 in thickness	No.1A	13min.							
				Over 16 up to 50 in thickness	No.1A	17min.							

Remarks : 1. The values given in the table shall not be applied to the both ends of the steel coil.

2. No.3 test piece may be used for the bend test for the steel product 5mm or under in thickness.

Excerpts from public standards (2)

Japanese Industrial Standard (JIS) (2)

JIS G 3106 – 1999 Rolled Steels for Welded Structure

● Chemical Composition

Unit : %

Symbol	Thickness of steel	Chemical Composition				
		C	Si	Mn	P	S
SM 400 A	Up to and inc. 50mm	0.23 max.	—	2.5 x C min.(1)	0.035 max.	0.035 max.
SM 400 B	Up to and inc. 50mm	0.20 max.	0.35 max.	0.60 to 1.40	0.035 max.	0.035 max.
SM 400 C	Up to and inc. 100mm	0.18 max.	0.35 max.	1.40 max.	0.035 max.	0.035 max.
SM 490 A	Up to and inc. 50mm	0.20 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.
SM 490 B	Up to and inc. 50mm	0.18 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.
SM 490 C	Up to and inc. 100mm	0.18 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.
SM 490 YA	Up to and inc. 100mm	0.20 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.
SM 490 YB						
SM 520 B	Up to and inc. 100mm	0.20 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.
SM 520 C						
SM 570	Up to and inc. 100mm	0.18 max.	0.55 max.	1.60 max.	0.035 max.	0.035 max.

Note (1) : The value of carbon shall be applied the values of actual ladle analysis.

Remarks : Alloy elements other than those given in Table may be added as necessary.

● Mechanical Properties

Symbol	Yield Point or Proof Stress N/mm ²		Tensile Strength N/mm ²	Elongation		
	Thickness of steel mm			Thickness of steel mm	Test Piece	%
	16 or under	Over 16 up to 40	100 or under			
SM 400 A SM 400 B SM 400 C	245min.	235min.	400 to 510	Up to and incl. 5	No.5	23min.
				Over 5, up to and incl. 16	No.1A	18min.
				Over 16, up to and incl. 50	No.1A	22min.
SM 490 A SM 490 B SM 490 C	325min.	315min.	490 to 610	Up to and incl. 5	No.5	22min.
				Over 5, up to and incl. 16	No.1A	17min.
				Over 16, up to and incl. 50	No.1A	21min.
SM 490 YA SM 490 YB	365min.	355min.	490 to 610	Up to and incl. 5	No.5	19min.
				Over 5, up to and incl. 16	No.1A	15min.
				Over 16, up to and incl. 50	No.1A	19min.
SM 520 B SM 520 C	365min.	355min.	520 to 640	Up to and incl. 5	No.5	19min.
				Over 5, up to and incl. 16	No.1A	15min.
				Over 16, up to and incl. 50	No.1A	19min.
SM 570	460min.	450min.	570 to 720	Up to and incl. 16	No.5	19min.
				Over 16	No.5	26min.
				Over 20	No.4	20min.

Remarks : Table does not apply to both ends of strip.

● Charpy Absorption Energy

Symbol of grade	Test Temperature °C	Charpy Absorption Energy J	Test Piece
SM 400 B	0	27min.	No.4 in rolling direction
SM 400 C	0	47min.	
SM 490 B	0	27min.	
SM 490 C	0	47min.	
SM 490 YB	0	27min.	
SM 520 B	0	27min.	
SM 520 C	0	47min.	
SM 570	-5	47min.	

Remarks : 1. The steel products over 12mm in thickness shall be tested.

2. The Charpy absorption energy in this case shall be expressed by the average of measured values of three test pieces.

JIS G 3113 – 1990 Hot-Rolled Steel Plates, Sheets and Strip for Automobile Structural Uses

● Chemical Composition

Unit : %

Symbol	Chemical Composition	
	P	S
SAPH 310, SAPH370, SAPH400, SAPH440	0.040max.	0.040max.

● Mechanical Properties

Symbol	Tensile Strength N/mm ²	Yield Point N/mm ²			Elongation (rolling direction) %					Bendability			Test Piece	
		Thickness up to and excl. 6mm	Thickness 6mm or over to and excl. 8mm	Thickness 8mm or over to and incl. 14mm	No.5 Test Piece					No.1 A Test Piece	Inside Radius			
					Thickness 1.6 or over to and excl. 2.0mm	Thickness 2.0 or over to and excl. 2.5mm	Thickness 2.5 or over to and excl. 3.15mm	Thickness 3.15 or over to and excl. 4.0mm	Thickness 4.0 or over to and excl. 6.3mm					
SAPH 310	310min.	(185)min.	(185)min.	(175)min.	33min.	34min.	36min.	38min.	40min.	26min.	180°	Flat on itself	Thickness × 1.0	No.3 transversely to rolling direction
SAPH 370	370min.	225min.	225min.	215min.	32min.	33min.	35min.	36min.	37min.	25min.	180°	Thickness × 0.5	Thickness × 1.0	
SAPH 400	400min.	255min.	235min.	235min.	31min.	32min.	34min.	35min.	36min.	24min.	180°	Thickness × 1.0	Thickness × 1.0	
SAPH 440	440min.	305min.	295min.	275min.	29min.	30min.	32min.	33min.	34min.	22min.	180°	Thickness × 1.0	Thickness × 1.5	

Remarks : 1. The values specified in the above table shall not be applied to the irregular portions of both ends of the steel coil.

2. The figures in () are given for informative reference.

JIS G 3116 – 2000 Steel sheets, plates and strip for gas cylinders

● Chemical Composition

Unit : %

Symbol	Chemical Composition				
	C	Si	Mn	P	S
SG 255	0.20 max.	—	0.30 max.	0.040 max.	0.040 max.
SG 295	0.20 max.	0.35 max.	1.00 max.	0.040 max.	0.040 max.
SG 325	0.20 max.	0.55 max.	1.50 max.	0.040 max.	0.040 max.
SG 365	0.20 max.	0.55 max.	1.50 max.	0.040 max.	0.040 max.

Remarks : Alloying elements other than those shown in the table may be added if necessary.

● Mechanical Properties

Symbol	Yield Point or Proof Stress N/mm ²	Tensile Strength N/mm ²	Elongation %	Tensile Test Piece	Bendability			Test Piece	
					Bending Angle	Inside Radius			
SG 255	255min.	400min.	28min.	No.5 in rolling direction	180°	Thickness × 1.0		No.3 in rolling direction	
SG 295	295min.	440min.	26min.		180°	Thickness × 1.5			
SG 325	325min.	490min.	22min.		180°				
SG 365	365min.	540min.	20min.		180°				

Remarks : The values specified shall not be applied for irregular portions on each end of steel strip.

Excerpts from public standards (3)

Japanese Industrial Standard (JIS) (3)

JIS G 3125 – 1987 Superior Atmospheric Corrosion Resisting Rolled Steels

● Chemical Composition

Unit : %

Symbol	Chemical Composition							
	C	Si	Mn	P	S	Cu	Cr	Ni
SPA-H	0.12 max.	0.25 to 0.75	0.20 to 0.50	0.070 to 0.150	0.040 max.	0.25 to 0.60	0.30 to 1.25	0.65 max.

Remarks : 1. For the steel over 6.0mm in thickness, the upper limit of manganese content shall be 0.60%.

2. Alloy elements other than those in the above table may be added as required.

● Mechanical Properties

Symbol	Thickness	Yield Point or Proof Stress N/mm ²	Tensile Strength N/mm ²	Tensile Test Piece	Elongation %	Bendability		
						Bending Angle	Inside Radius	Test Piece
SPA-H	6.0 mm or under	345min.	480min.	No.5	22	180°	0.5 × thickness (1)	No.1 in the direction of rolling
	over 6.0 mm	355min.	490min.	No.1A	15	180°	1.5 × thickness	

Note (1) For SPA-H steel sheet and strip of 6.0mm and under in thickness, inside radius for bend ability may be 1.0 times as large as the thickness subject to agreement between the parties concerned.

JIS G 3132 – 1990 Hot-Rolled Carbon Steel Strip for Pipes and Tubes

● Chemical Composition

Unit : %

Symbol	Chemical Composition				
	C	Si	Mn	P	S
SPHT 1	0.10 max.	0.35 max. (1)	0.50 max.	0.040 max.	0.040 max.
SPHT 2	0.18 max.	0.35 max.	0.60 max.	0.040 max.	0.040 max.
SPHT 3	0.25 max.	0.35 max.	0.30 to 0.90	0.040 max.	0.040 max.
SPHT 4	0.30 max.	0.35 max.	0.30 to 1.00	0.040 max.	0.040 max.

Note (1) The maximum silicon content may be modified to 0.04% max. by agreement between the purchaser and the supplier.

● Mechanical Properties

Symbol	Tensile Strength N/mm ²	Elongation %				Tensile Test Piece	Bendability			Test Piece		
		1.2mm or over to and excl. 1.6mm in thickness	1.6mm or over to and excl. 3.0mm in thickness	3.0mm or over to and excl. 6.0mm in thickness	6.0mm or over up to and incl. 13mm in thickness		Bending Angle	Inside Radius				
								3.0mm or under in thickness	Over 3.0mm up to and incl. 13mm in thickness			
SPHT 1	270min.	30min.	32min.	35min.	37min.	No.5 Test Piece taken in rolling direction	180°	Flat on itself	Thickness × 0.5	No.3 taken in rolling direction		
SPHT 2	340min.	25min.	27min.	30min.	32min.		180°	Thickness × 1.0	Thickness × 1.5			
SPHT 3	410min.	20min.	22min.	25min.	27min.		180°	Thickness × 1.5	Thickness × 0.5			
SPHT 4	490min.	15min.	18min.	20min.	22min.		180°	Thickness × 1.5	Thickness × 2.0			

Remarks : The values given in the above table are not applicable to the irregular portions at the either end of the steel strip.

JIS G 3134 – 1990 Hot Rolled High Strength Steel Sheets with Improved Formability for Automobile Structural Uses

● **Chemical Composition**

The chemical composition shall be agreed upon by the purchaser and supplier, if necessary.

● **Mechanical Properties**

Symbol	Tensile Strength N/mm ²	Yield Point or Proof Stress N/mm ²	Elongation %				Test Piece	Bendability				
			Thickness mm					Bending Angle	Inside Radius		Test Piece	
			1.6 or over to and excl. 2.0	2.0 or over to and excl. 2.5	2.5 or over to and excl. 3.25	3.25 or over up to and incl. 6.0			Thickness mm	1.6 or over to and excl. 3.25	3.25 or over up to and incl. 6.0	
SPFH 490	490min.	325min.	22min.	23min.	24min.	25min.	No.5 test piece taken in transverse direction	180°	Thickness × 0.5	Thickness × 1.0	No.3 test piece taken in transverse direction	
SPFH 540	540min.	355min.	21min.	22min.	23min.	24min.			Thickness × 1.0	Thickness × 1.5		
SPFH 590	590min.	420min.	19min.	20min.	21min.	22min.			Thickness × 1.5	Thickness × 1.5		
SPFH 540 Y	540min.	295min.	—	24min.	25min.	26min.			Thickness × 1.0	Thickness × 1.5		
SPFH 590 Y	590min.	325min.	—	22min.	23min.	24min.			Thickness × 1.5	Thickness × 1.5		

Excerpts from public standards (4)

ASTM Standard (1)

ASTM A36 – 2001 Carbon Structural Steel

● Chemical Requirements

Unit : %

Thickness, in [mm]	Chemical Composition					
	C	Si	Mn	P	S	Cu
To 3/4 [20], incl.	0.25 max.	0.40 max.	—	0.04 max.	0.05 max.	0.20 min, when specified.
Over 3/4 to 1 ^{1/2} [20 to 40], incl.	0.25 max.	0.40 max.	0.80-1.20	0.04 max.	0.05 max.	0.20 min, when specified.

● Tensile Requirements

Yield Point, min. ksi [MPa]	Tensile Strength, ksi [MPa]	Elongation in 2 in. [50mm]	Bend Test
36 [250]	58-80 [400-550]	23 min.	—

Remarks : For plates wider than 24in.[600mm], the elongation requirement is reduced two percentage points.

ASTM A283 - 2000 Low and Intermediate Tensile Strength Carbon Steel Plates

● Chemical Requirements

Unit : %

Symbol	Chemical Composition					
	C	Si	Mn	P	S	Cu
Grade A	0.14 max.	0.40 max.	0.90 max.	0.035 max.	0.040 max.	0.20 min. ,when required
Grade B	0.17 max.	0.40 max.	0.90 max.	0.035 max.	0.040 max.	0.20 min. ,when required
Grade C	0.24 max.	0.40 max.	0.90 max.	0.035 max.	0.040 max.	0.20 min. ,when required
Grade D	0.27 max.	0.40 max.	0.90 max.	0.035 max.	0.040 max.	0.20 min. ,when required

● Mechanical Requirements

Symbol	Yield Point min. ksi [MPa]	Tensile Strength ksi [MPa]	Elongation in 2 in. [50mm] %	Bending Property
Grade A	24[165]	45-60 [310-415]	30 min.	—
Grade B	27[185]	50-65 [345-450]	28 min.	—
Grade C	30[205]	55-75 [380-515]	25 min.	—
Grade D	33[230]	60-80 [415-550]	23 min.	—

Remarks : For plates wider than 24in. [600mm], the elongation requirement is reduced two percentage points.

ASTM A572 - 2001 High-Strength Low-Alloy Columbium-Vanadium Structural Steel

● Chemical Requirements

Unit : %

Symbol	Thickness in, [mm]	Chemical Composition					
		C	Si	Mn (1)	P	S	Cu
Grade 42 [290]	6 [150] max.	0.21 max.	0.40 max.	1.35 max.	0.04 max.	0.05 max.	0.20 min. When specified
Grade 50 [345]	4 [100] max.	0.23 max.	0.40 max.	1.35 max.	0.04 max.	0.05 max.	0.20 min. When specified
Grade 55 [380]	2 [50] max.	0.25 max.	0.40 max.	1.35 max.	0.04 max.	0.05 max.	0.20 min. When specified
Grade 60 [415]	11/4 [32] max.	0.26 max.	0.40 max.	1.35 max.	0.04 max.	0.05 max.	0.20 min. When specified
Grade 65 [450]	Over 1/2 to 11/4 [13-32] excl.	0.23 max.	0.40 max.	1.65 max.	0.04 max.	0.05 max.	0.20 min. When specified
	Under 1/2 [13] incl. (2)	0.26 max.	0.40 max.	1.35 max.	0.04 max.	0.05 max.	0.20 min. When specified

Remarks : (1) Manganese, minimum, by heat analysis of 0.80% (0.75% by product analysis) shall be required for all plates over 3/8in. [10mm] in thickness; a minimum of 0.50% (0.45% by product analysis) shall be required for plates 3/8in.[10mm] and less in thickness, and for all products. The manganese to carbon ratio shall not be less than 2 to 1.

(2) An alternative chemical requirement with a maximum carbon 0.21% and a maximum manganese of 1.65% is permitted, with the balance of the elements as shown in table.

● Alloy contents

Unit : %

Type	Element Composition				
	Nb (Cb)	V	Nb (Cb) + V	N	Ti
1	0.005-0.05	—	—	—	—
2	—	0.01-0.15	—	—	—
3	0.005-0.05	0.01-0.15	0.02-0.15	—	—
4	—	0.01-0.15	—	0.015 max.	—
5	—	0.06 max.	—	0.003-0.015	0.006-0.04

● Tensile Requirements

Symbol	Yield Point min. ksi [MPa]	Tensile Strength min. ksi [MPa]	Min. Elongation % in 2 in [50mm]
Grade 42 [290]	42 [290]	60 [415]	24
Grade 50 [345]	50 [345]	65 [450]	21
Grade 55 [380]	55 [380]	70 [485]	20
Grade 60 [415]	60 [415]	75 [520]	18
Grade 65 [450]	65 [450]	80 [550]	17

Remarks : For plates wider than 24in.[600mm], the elongation requirement is reduced two percentage points for Grade 42 ,50 and 52 [290, 345 and 380], and three percentage points for Grades 60 and 65 [415 and 450].

ASTM A606 - 2001 Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

● Chemical Requirements

Unit : %

Chemical Composition		
C	Mn	S
0.22 (0.26) max.	1.25 (1.30) max.	0.04 (0.06) max.

● Tensile Requirements

Yield point min ksi [MPa]	Tensile Strength min. ksi [MPa]	Elongation min. % in 2in.[50mm]	Bending Property
50 [340]	70 [480]	22	2½t

Remarks : The figures in () is product analysis.

Excerpts from public standards (5)

ASTM Standard (2)

ASTM A1011 - 2001 Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

● Chemical Composition

Unit : %

Designation	Grade	Type Class	Chemical composition													
			C	Mn	P	S	Al	Si	Cu	Ni	Cr	Mo	V	Cb	Ti	N
CS	Commercial grade	Type A	0.10 max.	0.60 max.	0.030 max.	0.035 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	0.025 max.	—
	Commercial grade	Type B	0.02-0.15	0.60 max.	0.030 max.	0.035 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	0.025 max	—
	Commercial grade	Type C	0.08 max.	0.60 max.	0.10 max.	0.035 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	0.025 max	—
DS	Drawing grade	Type A	0.08 max.	0.50 max.	0.020 max.	0.030 max.	0.01 min.	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	0.025 max	—
	Drawing grade	Type B	0.02-0.08	0.50 max.	0.020 max.	0.030 max.	0.01 min.	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	0.025 max	—
SS	Grade 30[205]		0.25 max.	0.90 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 33[230]		0.25 max.	0.90 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 36[250]		0.25 max.	0.90 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 36[250]		0.25 max.	1.35 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 40[275]		0.25 max.	0.90 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 45[310]		0.25 max.	1.35 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 50[345]		0.25 max.	1.35 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 55[380]		0.25 max.	1.35 max.	0.035 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.008 max.	0.008 max.	—	—
	Grade 45[310]	Class 1	0.22 max.	1.35 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
	Grade 45[310]	Class 2	0.15 max.	1.35 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
HSLAS	Grade 50[340]	Class 1	0.23 max.	1.35 max.	0.04 max.	0.04 max.	—	-	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
	Grade 50[340]	Class 2	0.15 max.	1.35 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
	Grade 55[380]	Class 1	0.25 max.	1.35 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
	Grade 55[380]	Class 2	0.15 max.	1.35 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	—
	Grade 60[410]	Class 1	0.26 max.	1.50 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	-
	Grade 60[410]	Class 2	0.15 max.	1.50 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	0.020 max.
	Grade 65[450]	Class 1	0.26 max.	1.50 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	0.012 max.
	Grade 65[450]	Class 2	0.15 max.	1.50 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	0.020 max.
	Grade 70[480]	Class 1	0.26 max.	1.65 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	0.012 max.
	Grade 70[480]	Class 2	0.15 max.	1.65 max.	0.04 max.	0.04 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	0.01 min.	0.005 min.	—	0.020 max.
HSLAS-F	Grade 50[340] 60[410] 70[480] 80[550]		0.15 max.	1.65 max.	0.020 max.	0.025 max.	—	—	0.20 max.	0.20 max.	0.15 max.	0.06 max.	—	—	—	—

Mechanical Property Requirements

Designation	Grade	Type Class	Yield Strength min. ksi [MPa]	Tensile Strength min. ksi [MPa]	Elongation in 2in.[50mm] min.			
					For CS, DS Grades	Under 0.230 [6.0mm] to 0.097 [2.5mm]	Under 0.097 [2.5mm] to 0.064 [1.6mm]	Under 0.064 [1.6mm] to 0.025 [0.65mm]
CS	Commercial Grade	Type A	30 to 50 [205 to 340]	—	25 and over	—	—	—
	Commercial Grade	Type B				—	—	—
	Commercial Grade	Type C				—	—	—
DS	Drawing Grade	Type A	30 to 45 [205 to 310]	—	28 and over	—	—	—
	Drawing Grade	Type B				—	—	—
SS	Grade 30 [205]		30 [205]	49 [340]		25.0	24.0	21.0
	Grade 33 [230]		33 [230]	52 [360]		23.0	22.0	18.0
	Grade 36 [250]	Type 1	36 [250]	53 [365]		22.0	21.0	17.0
	Grade 36 [250]	Type 2	36 [250]	58-80 [400-550]		21.0	20.0	16.0
	Grade 40 [275]		40 [275]	55 [380]		21.0	20.0	15.0
	Grade 45 [310]		45 [310]	60 [410]		19.0	18.0	13.0
	Grade 50 [345]		50 [340]	65 [450]		17.0	16.0	11.0
	Grade 55 [380]		55 [380]	70 [480]		15.0	14.0	9.0
					Over 0.097 in. [2.5mm]		Up to 0.097 in [2.5mm]	
HSLAS	Grade 45 [310]	Class 1	45 [310]	60 [410]		25.0		23.0
	Grade 45 [310]	Class 2	45 [310]	55 [380]		25.0		23.0
	Grade 50 [340]	Class 1	50 [340]	65 [450]		22.0		20.0
	Grade 50 [340]	Class 2	50 [340]	60 [410]		22.0		20.0
	Grade 55 [380]	Class 1	55 [380]	70 [480]		20.0		18.0
	Grade 55 [380]	Class 2	55 [380]	65 [450]		20.0		18.0
	Grade 60 [410]	Class 1	60 [410]	75 [520]		18.0		16.0
	Grade 60 [410]	Class 2	60 [410]	70 [480]		18.0		16.0
	Grade 65 [450]	Class 1	65 [450]	80 [550]		16.0		14.0
	Grade 65 [450]	Class 2	65 [450]	75 [520]		16.0		14.0
	Grade 70 [480]	Class 1	70 [480]	85 [585]		14.0		12.0
	Grade 70 [480]	Class 2	70 [480]	80 [550]		14.0		12.0
HSLAS-F	Grade 50 [340]		50 [340]	60 [410]		24.0		22.0
	60 [410]		60 [410]	70 [480]		22.0		20.0
	70 [480]		70 [480]	80 [550]		20.0		18.0
	80 [550]		80 [550]	90 [620]		18.0		16.0

Excerpts from public standards (6)

SAE Standard

J403- 2000

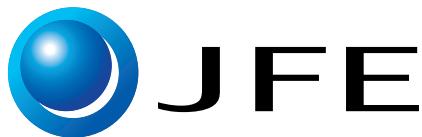
●Chemical Composition

Unit : %

UNS No.	SAE No.	Chemical Composition			
		C	Mn	P, max.	S, max.
G 10050	1005	0.06 max.	0.35 max.	0.030	0.050
G 10060	1006	0.08 max.	0.25 - 0.40	0.030	0.050
G 10080	1008	0.10 max.	0.30 - 0.50	0.030	0.050
G 10090	1009	0.15 max.	0.60 max.	0.030	0.050
G 10100	1010	0.08 - 0.13	0.30 - 0.60	0.030	0.050
G 10120	1012	0.10 - 0.15	0.30 - 0.60	0.030	0.050
G 10130	1013	0.11 - 0.16	0.30 - 0.60	0.030	0.050
G 10150	1015	0.13 - 0.18	0.30 - 0.60	0.030	0.050
G 10160	1016	0.13 - 0.18	0.60 - 0.90	0.030	0.050
G 10170	1017	0.15 - 0.20	0.30 - 0.60	0.030	0.050
G 10180	1018	0.15 - 0.20	0.60 - 0.90	0.030	0.050
G 10190	1019	0.15 - 0.20	0.30 - 0.60	0.030	0.050
G 10200	1020	0.18 - 0.23	0.30 - 0.60	0.030	0.050
G 10210	1021	0.18 - 0.23	0.60 - 0.90	0.030	0.050
G 10220	1022	0.18 - 0.23	0.70 - 1.00	0.030	0.050
G 10230	1023	0.20 - 0.25	0.30 - 0.60	0.030	0.050
G 10250	1025	0.22 - 0.28	0.30 - 0.60	0.030	0.050
G 10260	1026	0.22 - 0.28	0.60 - 0.90	0.030	0.050
G 10290	1029	0.25 - 0.31	0.60 - 0.90	0.030	0.050
G 10300	1030	0.28 - 0.34	0.60 - 0.90	0.030	0.050
G 10330	1033	0.30 - 0.36	0.60 - 0.90	0.030	0.050
G 10350	1035	0.32 - 0.38	0.60 - 0.90	0.030	0.050
G 10370	1037	0.32 - 0.38	0.60 - 0.90	0.030	0.050
G 10380	1038	0.35 - 0.42	0.60 - 0.90	0.030	0.050
G 10390	1039	0.39 - 0.44	0.70 - 1.00	0.030	0.050
G 10400	1040	0.37 - 0.44	0.60 - 0.90	0.030	0.050
G 10420	1042	0.40 - 0.47	0.60 - 0.90	0.030	0.050
G 10430	1043	0.40 - 0.47	0.70 - 1.00	0.030	0.050
G 10440	1044	0.43 - 0.50	0.30 - 0.60	0.030	0.050
G 10450	1045	0.43 - 0.50	0.60 - 0.90	0.030	0.050
G 10460	1046	0.43 - 0.50	0.70 - 1.00	0.030	0.050
G 10490	1049	0.46 - 0.53	0.60 - 0.90	0.030	0.050
G 10500	1050	0.48 - 0.55	0.60 - 0.90	0.030	0.050
G 10530	1053	0.48 - 0.53	0.70 - 1.00	0.030	0.050
G 10550	1055	0.50 - 0.60	0.60 - 0.90	0.030	0.050
G 10600	1060	0.55 - 0.65	0.60 - 0.90	0.030	0.050
G 10650	1065	0.60 - 0.70	0.60 - 0.90	0.030	0.050
G 10700	1070	0.65 - 0.75	0.60 - 0.90	0.030	0.050
G 10740	1074	0.70 - 0.80	0.50 - 0.70	0.030	0.050
G 10750	1075	0.70 - 0.80	0.40 - 0.70	0.030	0.050
G 10780	1078	0.72 - 0.85	0.30 - 0.60	0.030	0.050
G 10800	1080	0.75 - 0.88	0.60 - 0.90	0.030	0.050
G 10840	1084	0.80 - 0.93	0.60 - 0.90	0.030	0.050
G 10850	1085	0.80 - 0.93	0.70 - 1.00	0.030	0.050
G 10860	1086	0.80 - 0.93	0.30 - 0.50	0.030	0.050
G 10900	1090	0.85 - 0.98	0.60 - 0.90	0.030	0.050
G 10950	1095	0.90 - 1.03	0.30 - 0.50	0.030	0.050

Correspondence with JFE standards to public standards

Classification	Designation				
	JFE's standard	JIS		ASTM	Others
Steel Sheets for General Uses and Welded Structural Uses		G3131 G3101 G3106	SPHC SPHD SPHE SS SM	A1011 A36 A283	BS1449 Part1 DIN1614-1 BS EN10025 DIN EN10025 BS EN10113 DIN EN10113
Steel Sheets for Automobile Parts	JFE-HA	G3113 G3134	SAPH SPFH	A1011	
Steel Sheets for Pipes and Tubes	JFE-HP	G3132	SPHT		
Atmospheric Corrosion Resistance Steel Sheets	JFE-HCUP	G3125	SPA-H	A242 A606	BS EN10155 DIN EN10155
Anti-sea Water Corrosion Steel Sheets	JFE-MARIN				
Corrosion Resistance Steel Sheets	JFE-ASA				
Steel Sheets in High Temperature Atmosphere	LFE-HHCR				
Steel Sheets for Porcelain Enameling	JFE-HPE				
Checkered Plate	JFE-HCP			A786	
Anti-aging Steel Sheets	JFE-H*N				
High Strength Steel Sheets	JFE-HITEN				
Flat Steel Sheets for Exposed Uses	JFE-HDH				



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