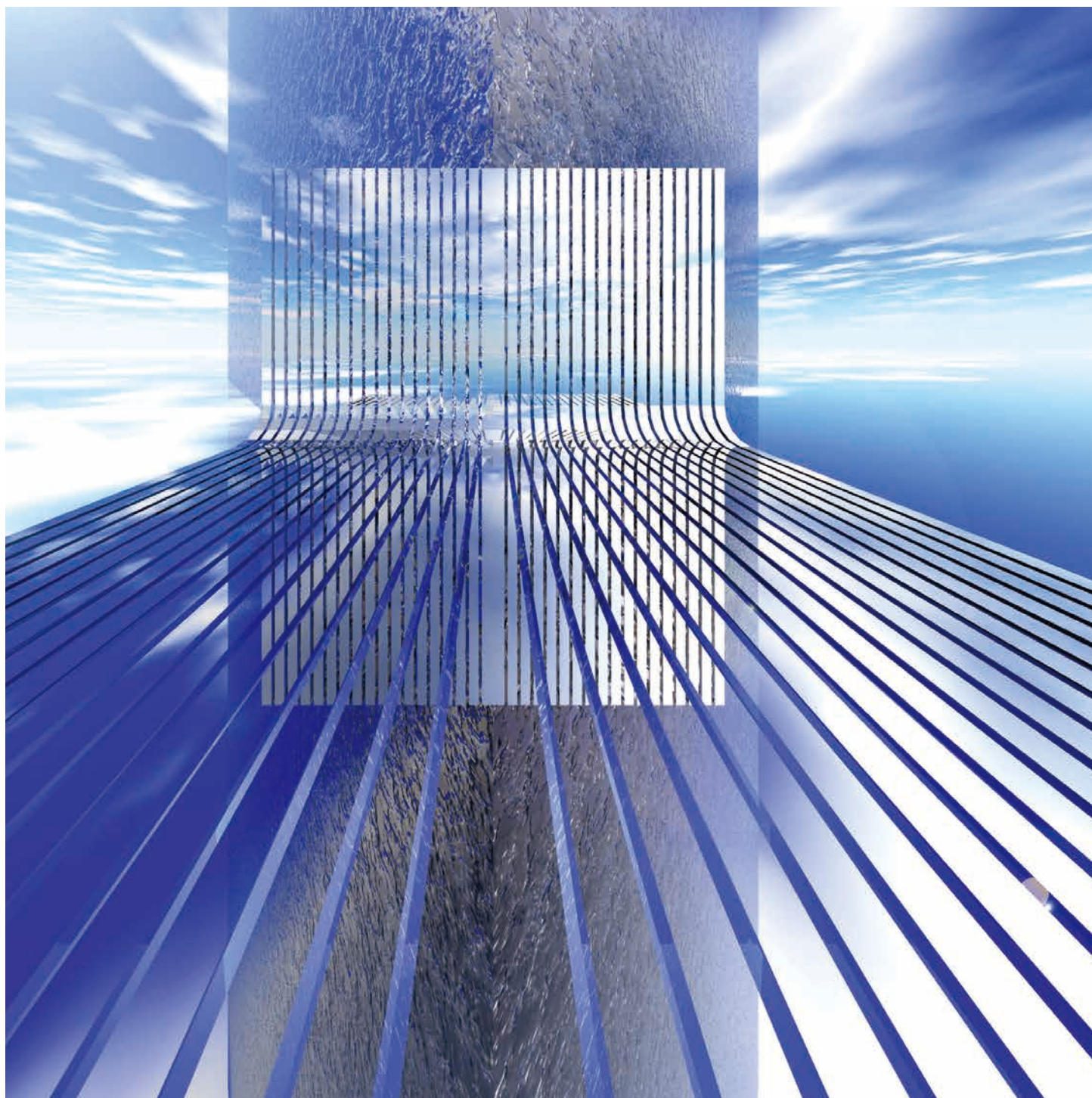




SPECIAL STEEL SHEET



JFE Steel Corporation



East Japan Works (Chiba)

JFE Steel Corporation produces various types of special steel sheets under an integrated quality control system using modern facilities mainly in Chiba and Keihin Area of East Japan Works. JFE's special steel products support technical innovation and improved productivity at customers, and have won an excellent reputation for high dimensional accuracy, quenchability, and workability.

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"SUPERHOT" is a trademark of JFE Steel Corporation registered in Japan.

Characteristics

1. Uniform quality

Integrated operation control and highly computerized production processes ensure a high level of uniformity in product quality.

2. High dimensional accuracy and excellent surface quality

JFE's production plants boast some of the world's most advanced steelmaking, hot rolling, and cold rolling equipment, ensuring high dimensional accuracy and outstanding surface quality.

3. Wide product line

A wide range of steel grades and product dimensions are available to meet diverse customer requirements.

4. Strict quality control and inspection system

All products can be used with confidence thanks to scientific quality control and strict testing and inspection.

(JFE's steel sheet production system is certified under ISO 9001.)



East Japan Works (Keihin)

Application

Carbon steels for machine structure

Automotive clutch parts
Chain parts
Automotive seat belt parts
Springs and washers
Sprocket gears
Automotive AT parts

Chains



Alloy steels for machine structure

Automotive reclining seat
Gear parts
Door lock parts
Shock absorber

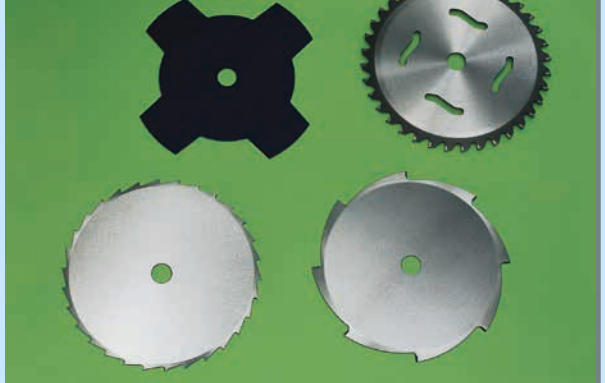
Gears



Alloy tool steels

Knives
Hand saws
Tools

Circular saw blades



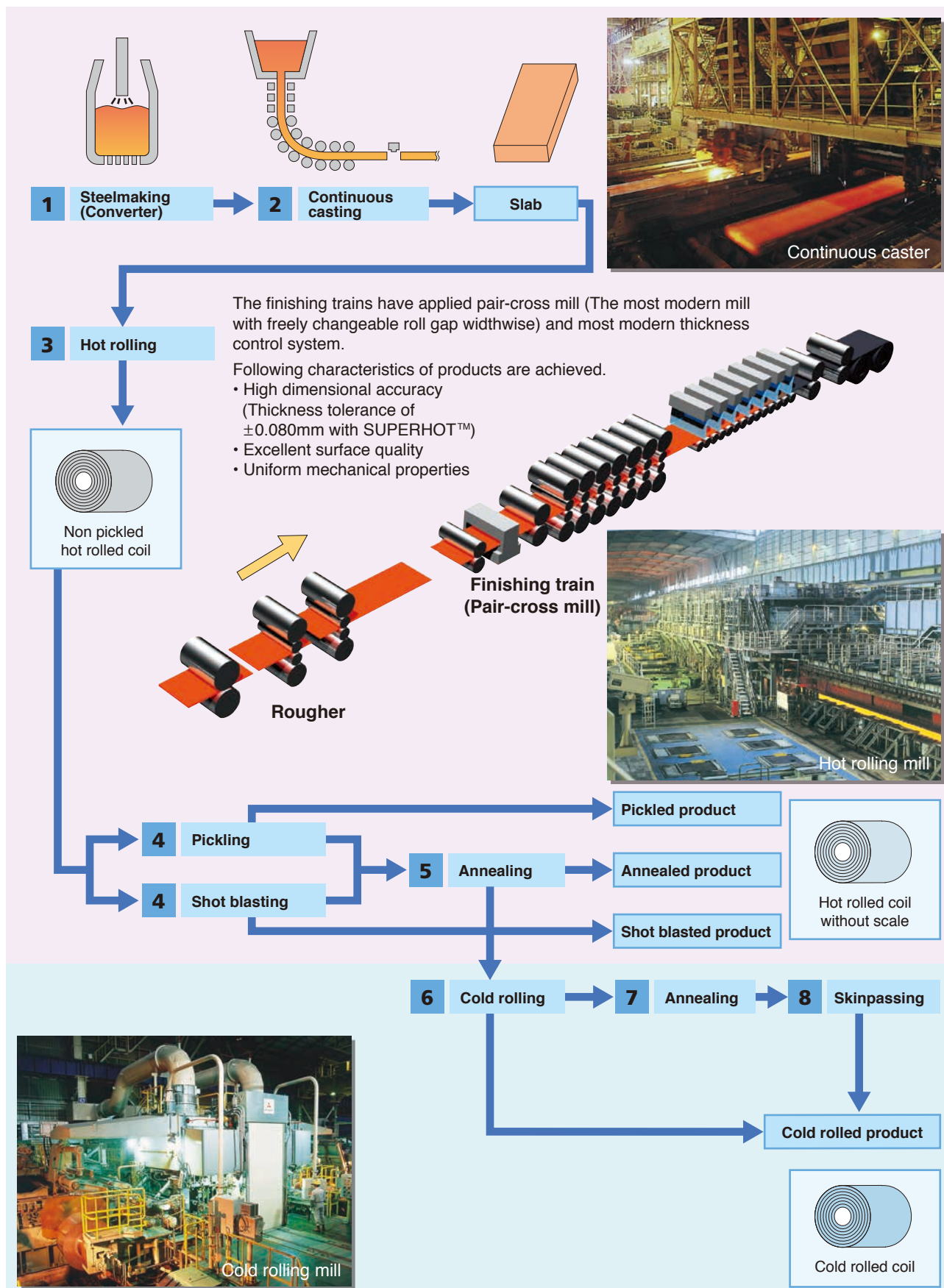
Carbon tool steels

Razor blades
Needles
Springs
Measures
Bearing parts

Hose bands, sheet springs



Manufacturing process



Product types and chemical composition

Hot rolled / cold rolled steel sheets

Carbon steel and carbon steel for machine structural use

JIS	Other standards	JFE standard	Chemical composition (%)									
			C	Si	Mn	P	S	Cu	Ni	Cr	Ni+Cr	B
S17C			0.15-0.20	0.15-0.35	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
S20C			0.18-0.23	0.15-0.35	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
		J22C	0.20-0.25	≤0.10	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	0.10-0.50	–	20-50ppm
S35C			0.32-0.38	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
		J35C	0.32-0.38	≤0.10	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	–	20-50ppm
S40C			0.37-0.43	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
S45C			0.42-0.48	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
		J48C	0.45-0.51	≤0.10	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	–	20-50ppm
S50C			0.47-0.53	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
	SAE1050		0.48-0.55	0.15-0.35	0.60-0.90	≤0.030	≤0.035	–	–	–	–	–
S55C			0.52-0.58	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
	SAE1055		0.50-0.60	0.15-0.35	0.60-0.90	≤0.030	≤0.035	–	–	–	–	–
		J55C	0.52-0.58	≤0.10	0.30-0.60	≤0.030	≤0.035	≤0.30	≤0.20	0.10-0.50	–	20-50ppm
S60C			0.55-0.65	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
	SAE1060		0.55-0.65	0.15-0.35	0.60-0.90	≤0.030	≤0.035	–	–	–	–	–
S65C			0.60-0.70	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
	SAE1065		0.60-0.70	0.15-0.35	0.60-0.90	≤0.030	≤0.035	–	–	–	–	–
S70C			0.65-0.75	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–
	SAE1070		0.65-0.75	0.15-0.35	0.60-0.90	≤0.030	≤0.035	–	–	–	–	–
	SAE1074		0.70-0.80	0.15-0.35	0.50-0.80	≤0.030	≤0.035	–	–	–	–	–
S75C			0.70-0.80	0.15-0.35	0.60-0.90	≤0.030	≤0.035	≤0.30	≤0.20	≤0.20	≤0.35	–

Note: The components shown in hatched boxes are component ranges specific to JFE standards.

Hot rolled / cold rolled steel sheets

Carbon tool steel

JIS	Other standards	Chemical composition (%)							
		C	Si	Mn	P	S	Cu	Ni	Cr
SK85		0.80-0.90	0.10-0.35	0.10-0.50	≤0.030	≤0.030	≤0.25	≤0.25	≤0.30
SK95		0.90-1.00	0.10-0.35	0.10-0.50	≤0.030	≤0.030	≤0.25	≤0.25	≤0.30

Hot rolled steel sheets

Alloy steel for structural use

JIS	Other standards	Chemical composition (%)								
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo
SCr420		0.18-0.23	0.15-0.35	0.60-0.90	≤0.030	≤0.030	≤0.30	≤0.25	0.90-1.20	–
SCM415		0.13-0.18	0.15-0.35	0.60-0.90	≤0.030	≤0.030	≤0.30	≤0.25	0.90-1.20	0.15-0.25
SCM420		0.18-0.23	0.15-0.35	0.60-0.90	≤0.030	≤0.030	≤0.30	≤0.25	0.90-1.20	0.15-0.25
SCM435		0.33-0.38	0.15-0.35	0.60-0.90	≤0.030	≤0.030	≤0.30	≤0.25	0.90-1.20	0.15-0.30
	SAE1541	0.36-0.44	0.15-0.35	1.35-1.65	≤0.030	≤0.030	–	–	–	–

Alloy tool steel / spring steel / bearing steel

Product types	JIS	Other standards	Chemical composition (%)									
			C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
Alloy tool steel	SKS5		0.75-0.85	≤0.35	≤0.50	≤0.030	≤0.030	≤0.25	0.70-1.30	0.20-0.50	–	–
	SKS51		0.75-0.85	≤0.35	≤0.50	≤0.030	≤0.030	≤0.25	1.30-2.00	0.20-0.50	–	–
Spring steel	SUP10		0.47-0.55	0.15-0.35	0.65-0.95	≤0.030	≤0.030	≤0.30	–	0.80-1.10	–	0.15-0.25
		SAE6150	0.48-0.53	0.15-0.35	0.70-0.90	≤0.030	≤0.040	≤0.35	≤0.25	0.80-1.10	–	≥0.15-
Bearing steel	SUJ2		0.95-1.10	0.15-0.35	≤0.50	≤0.025	≤0.025	≤0.25	≤0.25	1.30-1.60	≤0.08	–

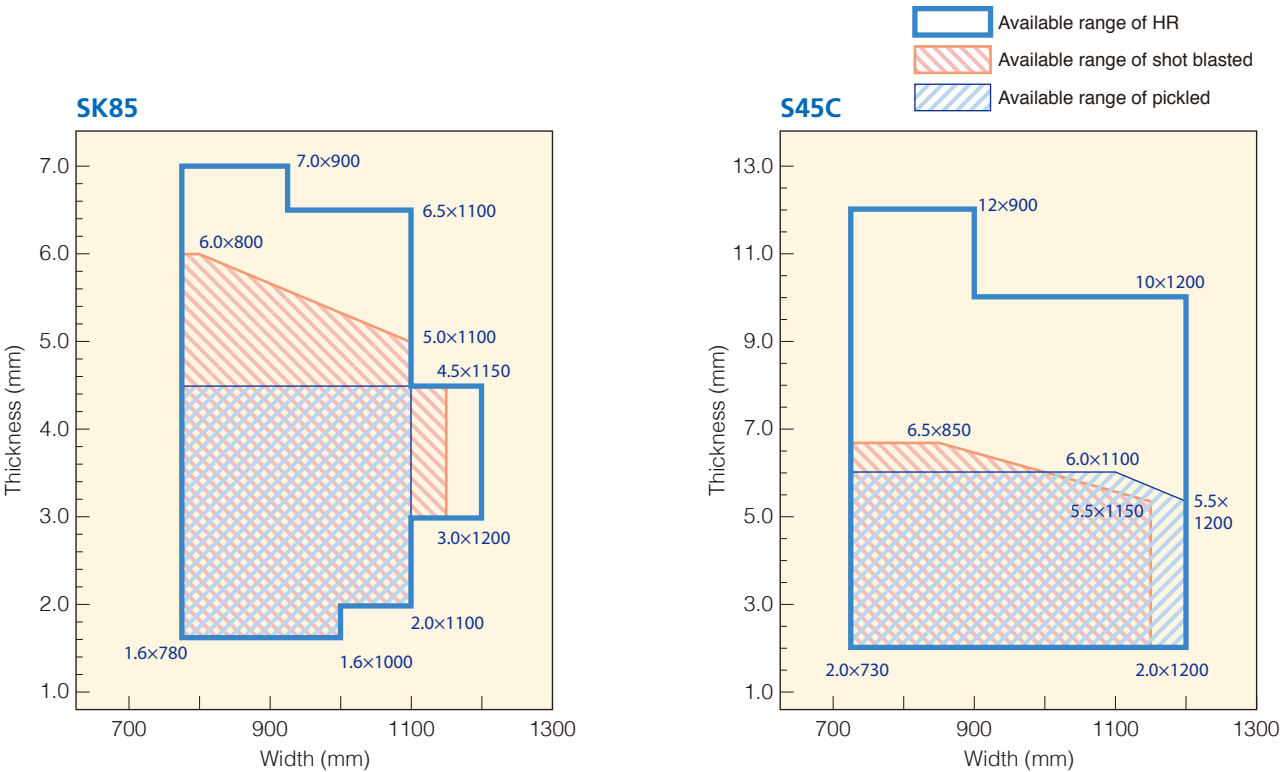
Please consult with us if the standards and components that you require are not shown in the table.

Please contact us for cold rolled alloy steel.

The Si range for SAE standards is 0.15%-0.35% if not specified otherwise.

Available product size range

Hot rolled steel sheet



SK85

Graph for SK85 hot rolled steel sheet. The y-axis represents Thickness (mm) from 1.0 to 7.0, and the x-axis represents Width (mm) from 700 to 1300. The available range of HR is outlined in blue, showing a stepped profile with points: (750, 1.6), (750, 6.0), (900, 6.0), (900, 7.0), (1100, 6.5), (1100, 4.5), (1100, 3.0), (1200, 3.0), (1200, 2.0), (1100, 2.0), (1100, 1.6), (750, 1.6). The available range of shot blasted is shown with red diagonal lines, and the available range of pickled is shown with blue diagonal lines.

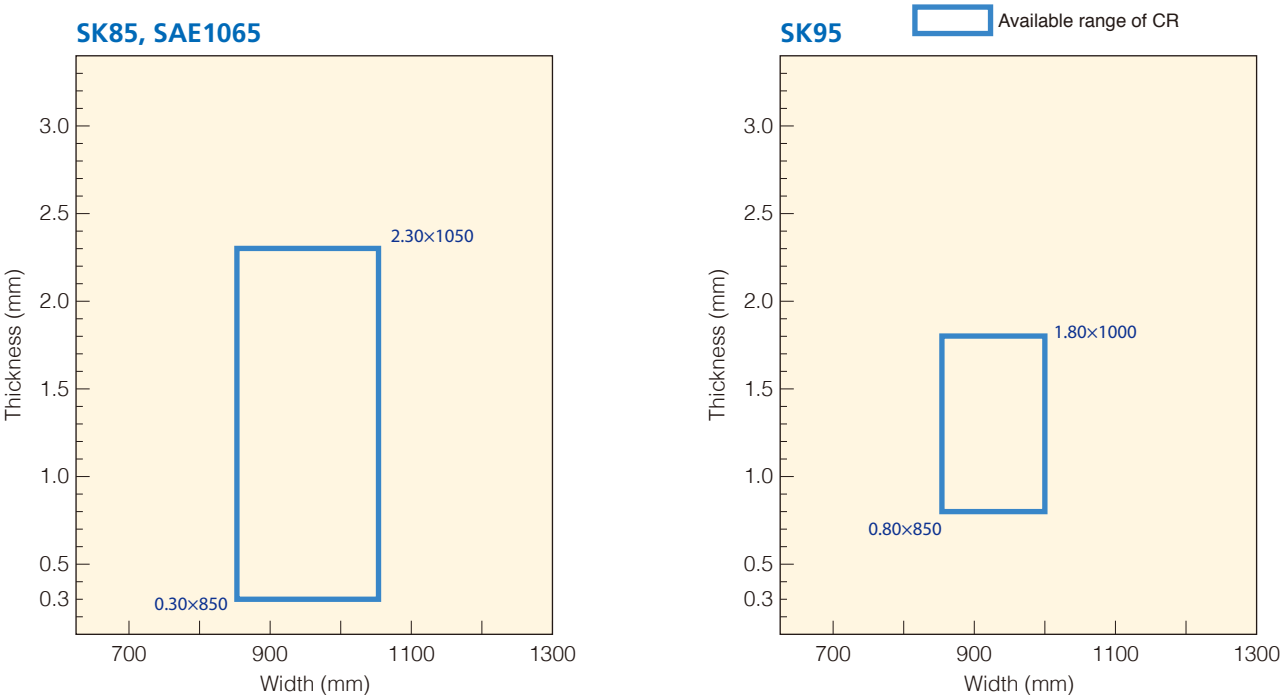
Thickness (mm)	Width (mm)
1.6	780
2.0	1100
3.0	1200
4.5	1150
5.0	1100
6.0	800
6.5	1100
7.0	900

S45C

Graph for S45C hot rolled steel sheet. The y-axis represents Thickness (mm) from 1.0 to 13.0, and the x-axis represents Width (mm) from 700 to 1300. The available range of HR is outlined in blue, showing a stepped profile with points: (750, 2.0), (750, 11.0), (900, 11.0), (900, 12.0), (1100, 10.0), (1100, 5.5), (1200, 5.5), (1200, 2.0), (750, 2.0). The available range of shot blasted is shown with red diagonal lines, and the available range of pickled is shown with blue diagonal lines.

Thickness (mm)	Width (mm)
2.0	730
5.5	1150
6.0	1100
6.5	850
10.0	1200
12.0	900

Cold rolled steel sheet



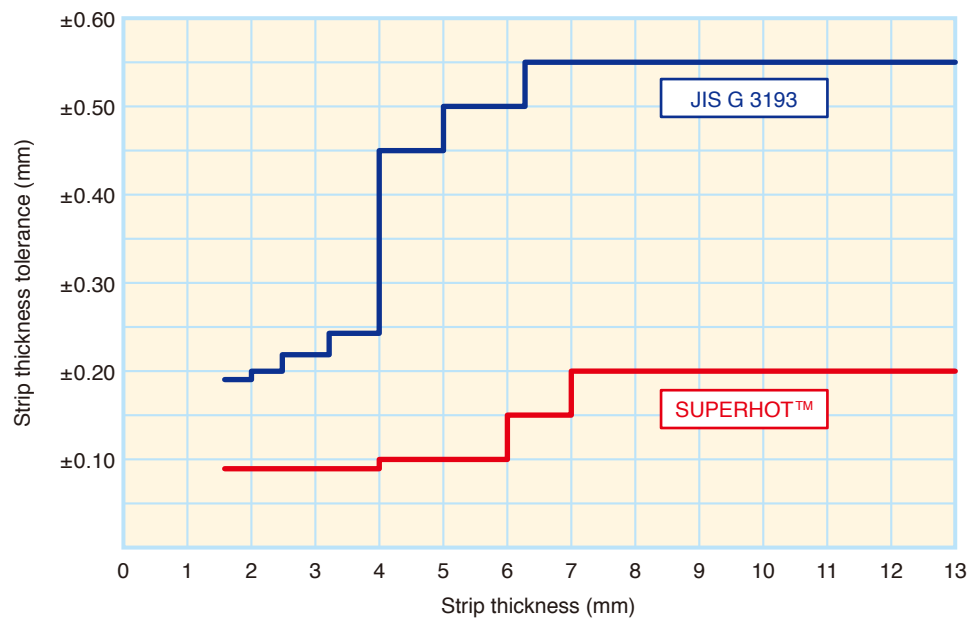
Please consult with us if the standards and dimensions that you require are not shown in the table.

Dimensional tolerance

Hot rolled steel sheet

Basic standard is JIS G 3193 (Dimension, mass and permissible variation of hot rolled steel plates, sheets and strip).

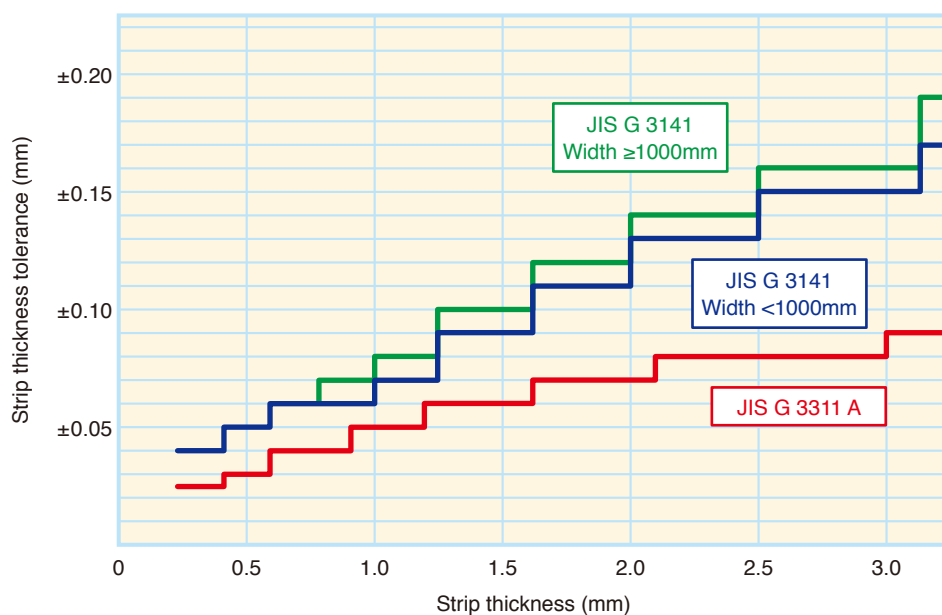
For high thickness accuracy, SUPERHOT™ tolerance can be applied (see figure).



Cold rolled steel sheet

Basic standard is JIS G 3141 (Cold rolled steel coils and strips).

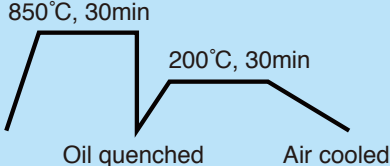
For high thickness accuracy, JIS G 3311 (Cold rolled special steel strip) can be applied.



Product hardness and hardness after heat treatment

Hot rolled steel sheets

Carbon steel and carbon steel for machine structural use

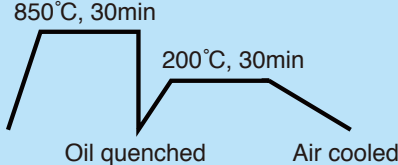
JIS	SAE	JFE standard	Non-pickled, pickled (unannealed) Values in () are reference values.	Normalized material (annealed)	After heat treatment (examples of hardness)
					
S20C			HRB ≤90	HRB ≤80	—
		J22C	HRB ≤100	HRB ≤83	HV 450
S35C			HRB ≤100	HRB ≤86	HV 550
		J35C	HRB ≤100	HRB ≤83	HV 550
S45C			HRB ≤100	HRB ≤90	HV 610
		J48C	(HRB ≤103) HRC ≤27	HRB ≤87	HV 630
S50C			(HRB ≤103) HRC ≤27	HRB ≤90	HV 640
	SAE1050				
S55C			(HRB ≤105) HRC ≤30	HRB ≤92	HV 660
	SAE1055				
		J55C		HRB ≤89	HV 660
S60C			(HRB ≤105) HRC ≤30	HRB ≤93	HV 680
	SAE1060				
S65C			(HRB ≤107) HRC ≤32	HRB ≤95	HV 700
	SAE1065				
S70C			(HRB ≤110) HRC ≤39	HRB ≤95	HV 720
	SAE1070				
	SAE1074		(HRB ≤110) HRC ≤39	HRB ≤97	HV 730
S75C					

Values for heat-treated hardness are not a guaranteed values, as the actual hardness will differ depending on the heat treatment conditions.

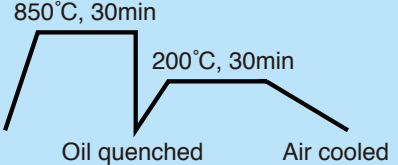
Please consult with us if you require a detailed agreement on hardness.

Hot rolled steel sheets

Carbon tool steel

JIS	SAE	Non-pickled, pickled (unannealed)	Normalized material (annealed) Values in () are reference values.	After heat treatment (examples of hardness)
				
SK85		HRC ≤43	HRB ≤100	HV 760
SK95		HRC ≤44	(HRB ≤103) HRC ≤27	—

Alloy steel for structural use

JIS	SAE	Non-pickled, pickled (unannealed) Values in () are reference values.	Normalized material (annealed)	After heat treatment (examples of hardness)
				
SCr420		Please consult with us	HRB ≤90	HV 430
SCM415		(HRB ≤103) HRC ≤27	HRB ≤90	HV 380
SCM420		(HRB ≤105) HRC ≤29	HRB ≤90	HV 430
SCM435		(HRB ≤107) HRC ≤32	HRB ≤90	HV 550
	SAE1541	(HRB ≤105) HRC ≤29	HRB ≤95	—

Values for heat-treated hardness are not a guaranteed values, as the actual hardness will differ depending on the heat treatment conditions.

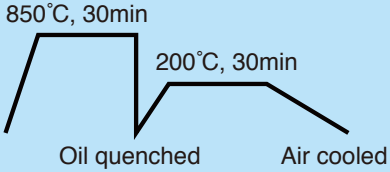
The heat-treated hardness of carbon tool steel is the value specified in JIS G 4401.

Please consult with us if you require a detailed agreement on hardness.

Product hardness and hardness after heat treatment

Hot rolled steel sheets

Alloy tool steel / spring steel / bearing steel

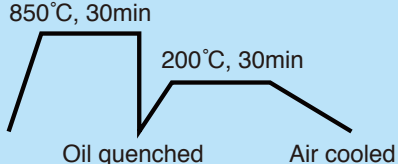
Product types	JIS	SAE	Non-pickled, pickled (unannealed)	Normalized material (annealed)	After heat treatment (examples of hardness)	
						
Alloy tool steel	SKS5			HRB ≤100	HV 760	
	SKS51			HRB ≤100	HV 750	
Spring steel	SUP10		HRC ≤38	HRB ≤100	-	
		SAE6150	HRC ≤38	HRB ≤100	-	
Bearing steel	SUJ2			Please consult with us	HV 780	

Values for heat-treated hardness are not a guaranteed values, as the actual hardness will differ depending on the heat treatment conditions.

Please consult with us if you require a detailed agreement on hardness.

Cold rolled steel sheet

Carbon steel for machine structural use / carbon tool steel / alloy tool steel

Product types	JIS	SAE	As-cold rolled	Annealed	After heat treatment (examples of hardness)
					
Carbon steel for machine structural use	S20C		HV \geq 200	HV \leq 170	—
		SAE1020			
	S35C		HV \geq 200	HV \leq 170	HV 550
	S50C		HV \geq 220	HV \leq 180	HV 640
		SAE1050			
	S55C		HV \geq 250	HV \leq 180	HV 660
		SAE1055			
	S60C		HV \geq 260	HV \leq 190	HV 680
		SAE1060			
	S65C		HV \geq 260	HV \leq 190	HV 700
		SAE1065			
	S70C		HV \geq 260	HV \leq 200	HV 720
		SAE1070			
Carbon tool steel	SK85		HV \geq 260	HV \leq 200	HV 760
	SK95		HV \geq 270	HV \leq 210	HV 770
Alloy tool steel	SKS5		HV \geq 260	HV \leq 210	HV 750

Values for heat-treated hardness are not a guaranteed values, as the actual hardness will differ depending on the heat treatment conditions.

The heat-treated hardness of carbon tool steel is the value specified in JIS G 4401.

Please consult with us if you require a detailed agreement on hardness.

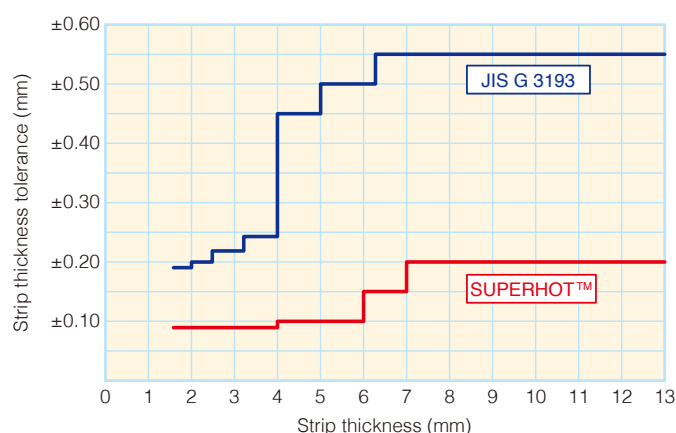
Introduction of high functional products

1. High carbon steel sheets with high formability (SUPERHOT™-F:SH-F)

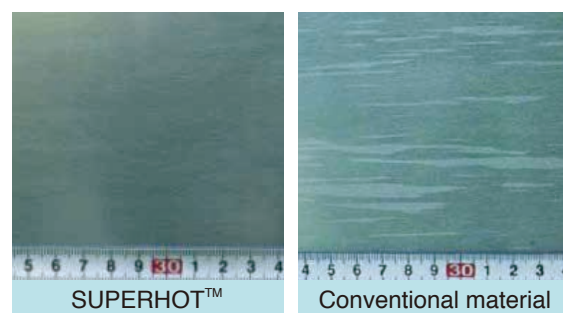
JFE Steel has developed these new steel sheets for machine structural use which are suitable for complex forming and can realize cost reductions by allowing the customer to simplify manufacturing processes.

- SUPERHOT™-F is a hot rolled steel sheet that realizes high sheet thickness accuracy on the same level as cold rolled steel sheets.

This means it can be substituted for heavy gauge cold rolled sheets that require high sheet thickness accuracy.



- SUPERHOT™-F can also be applied to parts that require an attractive external appearance.
- There is no difference between the chemical composition of SUPERHOT™-F and that of general carbon steel for machine structural use. (S35C, S45C)

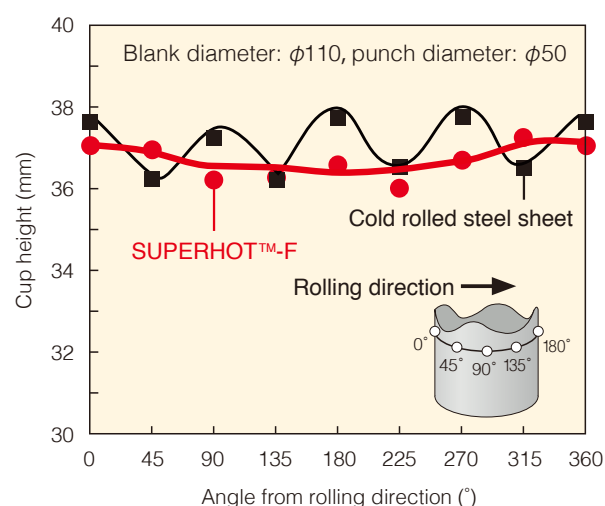


Representative properties

Type	Standard	C content	YS (MPa)	TS (MPa)	El (%)
High formability SUPERHOT™-F	S35C	0.35%	310	470	38
	S45C	0.45%	340	500	34
Conventional steel	S35C	0.35%	320	510	35
	S45C	0.45%	350	530	30

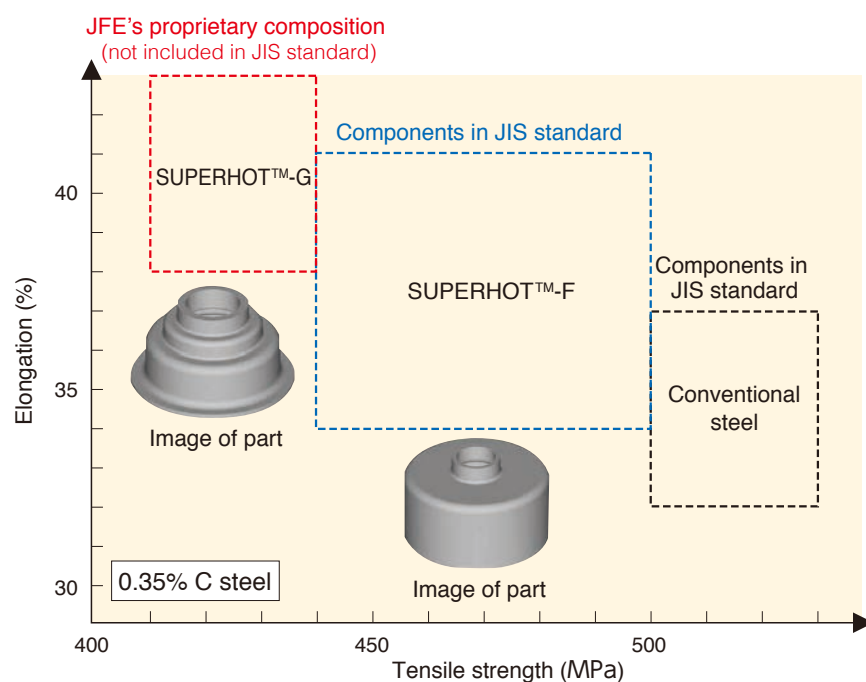
[Tensile test piece: JIS No. 5, 4 mm², tension in rolling direction, El: butt elongation]

- In comparison with cold rolled steel sheets, SUPERHOT™-F suppresses "earing" after the cylindrical cup drawing process, making it possible to eliminate the cutting trimming process.



2. High carbon steel sheets with high formability (**SUPERHOT™-G: SH-G**)

- In SUPERHOT™-G, even higher formability (softness, high ductility) than SUPERHOT™-F was achieved by use of a proprietary composition design and optimization of the cementite distribution.
- SUPERHOT™-G is suitable for complex forming, and can realize unitary cold pressing of parts that had been manufactured conventionally by multiple processes such as casting and forging, welding, etc. Thus, simplified manufacturing processes can be expected.



Part simulating a J48C
rotor holder

■ Representative properties

Type	Standard	C content	YS (MPa)	TS (MPa)	El (%)
High formability SUPERHOT™-G	J35C	0.35%	260	420	40
	J48C	0.48%	320	460	36
	J55C	0.55%	350	520	34
Conventional steel	S35C	0.35%	320	510	35
	S45C	0.45%	350	530	30

[Tensile test piece: JIS No. 5, 4 mm¹, tension in rolling direction, El: butt elongation]

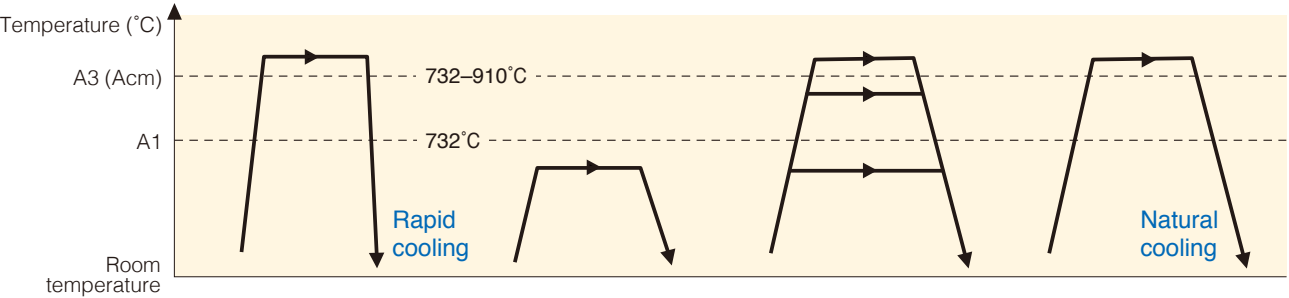
Technical information

Effect of chemical elements

- C** Forms the semi-stable Fe₃C (cementite) carbide with Fe. The stable phase is graphite. Also enhances quenchability and increases strength and abrasion resistance. Steel with a C content of 0.77% is eutectoid, and 0.02%-0.77% is hypo-eutectoid, and over 0.77% is hyper-eutectoid. The strength of carbon steel is increased by transformation of pearlite and bainite to martensite in cooling from high temperature.
- Si** Increases strength as a solid solution strengthening element. Promotes spheroidization of cementite and graphitization. Improves toughness in the low temperature temper brittleness range below 300°C in the same manner as Cr, Mo and V.
- Mn** Stabilizes austenite and lowers the transformation temperature, improving quenchability. Increases strength without reducing toughness. Stabilizes cementite and suppresses graphitization. Fixes S, which is a harmful element in steel, as MnS and thereby prevents red brittleness.
- P** Generally contained as an impurity. Segregates at grain boundaries, reducing toughness. Increases temper brittleness, but also increases strength, grindability and corrosion resistance.
- S** Generally contained as an impurity. Forms FeS with Fe, which causes red brittleness and lowers ductility during hot rolling. Red brittleness is prevented by adding Mn to form MnS, and also results in improved grindability.
- Cu** Improves quenchability. Dissolves cementite and promotes graphitization. Increases strength by generating precipitates at high temperature. Improves corrosion resistance.
- Ni** Forms stable austenite and lowers the transformation temperature. Multiple addition with Cr and Mo strengthens ferrite and extremely improves low temperature embrittlement. Promotes graphitization by dissolving cementite.
- Cr** Improves quenchability and prevents softening during temper by forming secondary carbides. Extremely suppresses graphitization by refining carbide particles. Improves corrosion resistance and anti-abrasion resistance.
- Mo** Forms carbides, increasing resistance to temper softening. Promotes secondary hardening. Improves brittleness by preventing temper embrittlement.
- Al** Used as a deoxidizer in steelmaking. Combines with N to form AlN and improves toughness by preventing abnormal coarsening of the austenite grain size.
- N** Combines with nitride creators. Improve toughness by refining grains and preventing abnormal coarsening of austenite.

Technical information

Nomenclature and types of heat treatment

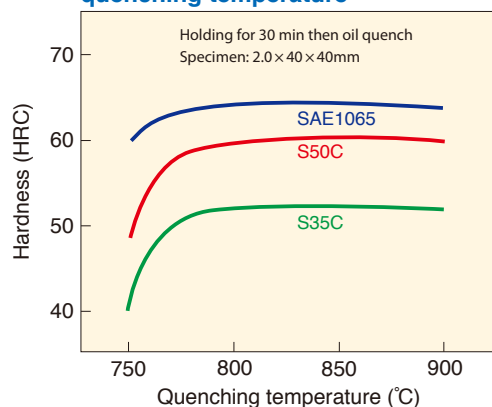


Name	Quenching	Tempering	Annealing	Normalizing
Place performed	Customer	Customer	Steel works, customer	Customer
Object materials	High carbon steel, alloy steel	High carbon steel, alloy steel	General steel sheets, high carbon steel	Pressure vessels, bearing steel
Purpose	Increase strength, hardening	Internal stress relief (strain removal) Adjustment of quenched hardness Adjustment of toughness	Adjustment of TS and EI Improvement of workability Spheroidizing of carbides	Homogenization of structure and mechanical properties Improvement of toughness
Other	Since materials cannot be processed due to hardness after quenching, materials are frequently quenched after processing.	Applied as a set with quenching. If martensitic steel (hardened steel) is not tempered, it will be brittle and cannot be used.	Performed in the production process. Normalizes (softens) materials that have been hardened by rolling.	Performed to eliminate variations in the properties of steel sheets for pressure vessels, bearing steels, etc. Used to prevent fracture of brittle parts.

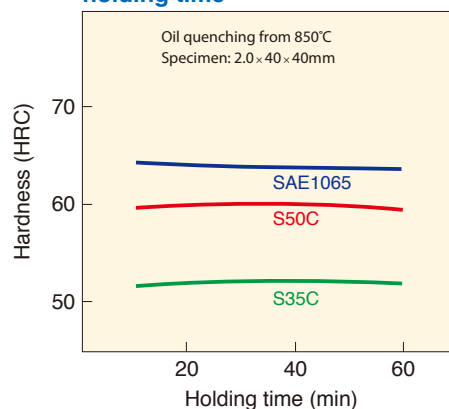
Technical information

Mechanical properties by heat treatment

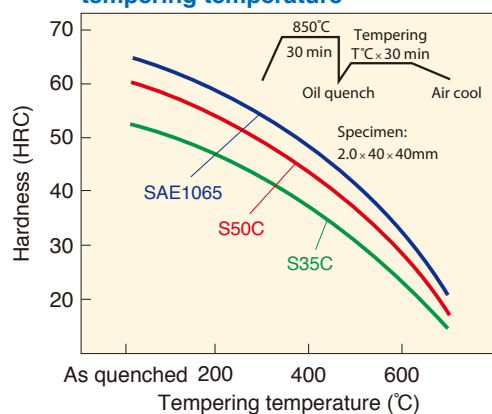
Relation between hardness and quenching temperature



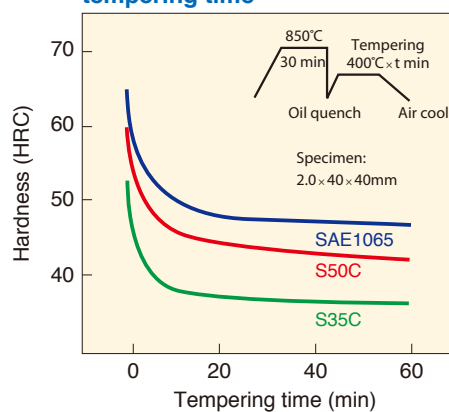
Relation between hardness and holding time



Relation between hardness and tempering temperature



Relation between hardness and tempering time



Technical information

Hardness conversion table

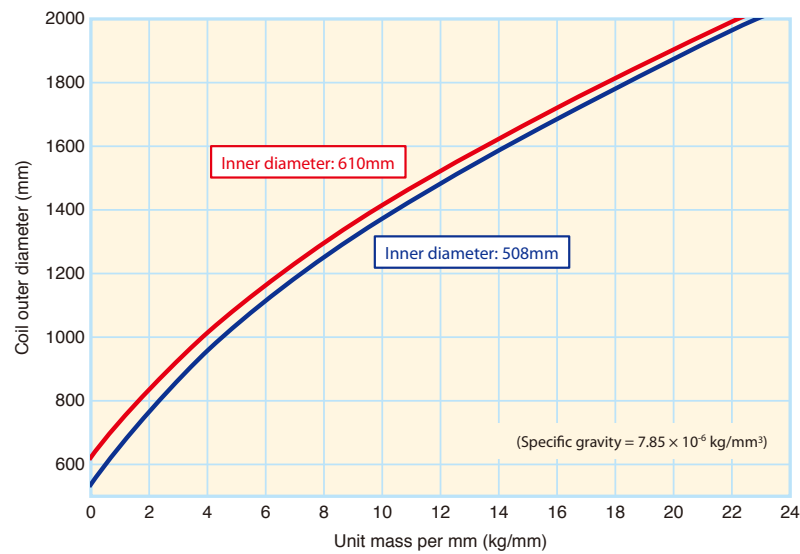
(SAE J 417)

Vickers Hardness (HV)	Rockwell Hardness		Tensile Strength (N/mm ²)	Vickers Hardness (HV)	Rockwell Hardness		Tensile Strength (N/mm ²)	Vickers Hardness (HV)	Rockwell Hardness		Tensile Strength (N/mm ²)
	B Scale (HRB)	C Scale (HRC)			B Scale (HRB)	C Scale (HRC)			B Scale (HRB)	C Scale (HRC)	
900	—	67.0	—	600	—	55.2	—	400	—	40.8	1290
880	—	66.4	—	590	—	54.7	2055	390	—	39.8	1240
860	—	65.9	—	580	—	54.1	2020	380	(110.0)	38.8	1205
840	—	65.3	—	570	—	53.6	1985	370	—	37.7	1170
820	—	64.7	—	560	—	53.0	1950	360	(109.0)	36.6	1130
800	—	64.0	—	550	—	52.3	1905	350	—	35.5	1095
780	—	63.3	—	540	—	51.7	1860	340	(108.0)	34.4	1070
760	—	62.5	—	530	—	51.1	1825	330	—	33.3	1035
740	—	61.8	—	520	—	50.5	1795	320	(107.0)	32.2	1005
720	—	61.0	—	510	—	49.8	1750	310	—	31.0	980
700	—	60.1	—	500	—	49.1	1705	300	(105.5)	29.8	950
690	—	59.7	—	490	—	48.4	1660	295	—	29.2	935
680	—	59.2	—	480	—	47.7	1620	290	(104.5)	28.5	915
670	—	58.8	—	470	—	46.9	1570	285	—	27.8	905
660	—	58.3	—	460	—	46.1	1530	280	(103.5)	27.1	890
650	—	57.8	—	450	—	45.3	1495	275	—	26.4	875
640	—	57.3	—	440	—	44.5	1460	270	(102.0)	25.6	855
630	—	56.8	—	430	—	43.6	1410	265	—	24.8	840
620	—	56.3	—	420	—	42.7	1370	260	(101.0)	24.0	825
610	—	55.7	—	410	—	41.8	1330	255	—	23.1	805
								250	—	22.2	795
								245	—	21.3	780
								240	98.1	20.3	765
								230	96.7	(18.0)	730
								220	95.0	(15.7)	695
								210	93.4	(13.4)	670
								200	91.5	(11.0)	635
								190	89.5	(8.5)	605
								180	87.1	(6.0)	580
								170	85.0	(3.0)	545
								160	81.7	—	510
								150	78.7	—	490
								140	75.0	—	455
								130	71.2	—	425
								120	66.7	—	390
								110	62.3	—	—
								100	56.2	—	—
								95	52.0	—	—
								90	48.0	—	—
								85	41.0	—	—

Values shown in () are reference values.

Technical information

Unit mass per mm



Technical information

Surface finish and hardness of steel sheets

Hot rolled steel sheets

Except for non-pickled products, shipped with coating of rust preventive oil.

Surface	Hardness	Remarks	Examples of applications
Non-pickled	Soft	Hot rolled steel sheets are annealed with mill scale remaining. Since a decarburized layer is unavoidable in the surface layer, suitable for use in applications that require grinding.	Material for cold rolling, edged tools
	Hard	Products are as-hot rolled with scale. Little bur during punching due to the hardness of the material, suitable for use as flat sheets. Please consult with us for the degree of working.	Chains, edged tools, building materials, etc.
Pickled	Soft	Mill scale is removed by pickling hot rolled steel sheets. Virtually no decarburization of the surface. Suitable for press forming.	Automotive parts
	Hard	Mill scale is removed by pickling hot rolled steel sheets. Little bur during punching due to hardness, suitable for use as flat sheets. Please consult with us for the degree of working.	Chains, edged tools, building materials, etc.
Shot blasted	Soft	Decaling is performed by shot blasting instead of pickling, and is followed by annealing. Suitable for thicker gauge hot rolled sheets that cannot be pickled.	Automotive parts (heavy gauge)
	Hard	Decaling is performed by shot blasting instead of pickling, and is followed by annealing. Since shot blasting hardens the surface, materials are suitable for punching. Please consult with us for the degree of working.	Chains, cutting tools

Cold rolled steel sheet

Shipped with coating of rust-preventive oil.

Surface	Hardness	Remarks	Examples of applications
Dull finish	Soft	Steel sheets softened by annealing cold rolled steel strip.	Automotive parts
	Hard	As-cold rolled steel products. Little bur during punching due to hardness, suitable for use as flat sheets. Please consult with us for the degree of working.	Chains, edged tools
Bright finish (polished)	Soft	Sheets are softened by annealing cold rolled strip, followed by bright finishing. Little surface roughness, but easily scratched.	Automotive parts
	Hard	Bright finishing is applied to as-cold rolled steel material. Little bur during punching due to hardness, suitable for use as flat sheets.	Cutlery and edged tools, household appliances, etc.

Instructions for ordering and points to note in use

Instructions for ordering When ordering, please confirm the following items.

1 Standard

JFE Steel offers steel sheets conforming to the JIS, SAE and JFE standards.
Please contact us for any unclear points.

2 Order dimensions

The dimensions of JFE Steel products are given by thickness (0.1mm unit) and width (1mm unit).

3 Surface finish and annealing requirements

Referring to the previous pages, please confirm your instructions for the following items. If any points are unclear, we can also propose conditions which are generally used for various applications, etc.

By type of hot rolled steel sheet or cold rolled steel sheet

Surface finish (hot rolled: non-pickled, pickled, shot blasted; cold rolled: dull, bright finish)

Annealed or unannealed (soft or hard)

4 Application/processing method

Please inform us of your intended application/processing method so that JFE Steel can manufacture an appropriate steel product corresponding to the application and processing method.

5 Amount of product used, coil weight, delivery location, etc.

Please inform us of the approximate monthly amount of use of the product.

If you have decided the product delivery location, processing location, and the coil weight that can be received at those locations, please include that information. (If this is undecided, we can also introduce possible options.)

6 Coil inner diameter, packaging, etc.

If you have specifications regarding the coil inner diameter (ID), packing style and edge properties, please inform us.

If you do not have specific requirements, the product will be manufactured in accordance with JFE Steel's standard conditions (ID of non-pickled coils: 762mm, ID of pickled coils: 610mm, ID of cold rolled coils: 508mm).

7 Other items

If any items require strict specifications (e.g., hardness, sheet thickness, sheet width tolerance (allowable width difference), etc.), please inform us.

Points to note when using JFE Special Steel Sheets

1 Safety

Since Special Steel Sheet band products are extremely hard materials, special care is required in handling, as the material may rebound due to springback when the package is opened, product edges can cause cuts, etc.

2 Rust

Since these are steel products, rust may occur. In particular, no rust-preventive measures are applied to non-pickled products.

Since pickled and cold rolled products may also rust if stored for a long period of time, please give appropriate consideration to the storage location and use as quickly as possible.

3 Sale of wide steel strip

JFE Steel ships wide steel strips. Since it is not possible to remove local defects, products may include such defects. If strict control is required in handling these defects, please contact us.

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