



With two plants producing hot-rolled steel in Pohang and four plants in Gwangyang, POSCO manufactures 9.8 million tons hot-rolled steel products per year. Some of the hot-rolled coils produced at our hot-rolling plants are sold as finished products while others are used as intermediary materials for cold-rolled or electrical steel production, thus being reprocessed into high added value products.

HOT ROLLED STEEL

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Pohang & Gwangyang Steelworks

Pohang Steelworks



Upon completion of its first-phase manufacturing facility in 1973, Pohang Steelworks, Korea's first integrated steel mill, was finally completed after 4 stages of construction at Young-il Bay in February 1981.

POSCO is capable of producing and processing a variety of carbon steels and stainless steels. The company's global competitiveness was further enhanced when we opened the world's first FINEX commercialization facility in May 2007.

Main products _ Hot-rolled steel, Plate, Cold-rolled steel, Wire rod, Electrical steel, Stainless steel, API steel, etc.

Crude steel production _ 16,852 million tons (as of 2021)

Gwangyang Steelworks



Gwangyang Steelworks is the world's largest integrated steel mill which features an optimal layout for processing carbon steel.

Products from Gwangyang works include automotive steel, high-strength hot rolled steel, high-quality API steel, and thick plates among other products.

With the goal of specializing in the manufacturing of the world's best automotive steels, Gwangyang Steelworks focuses on enhancing its competitive edge.

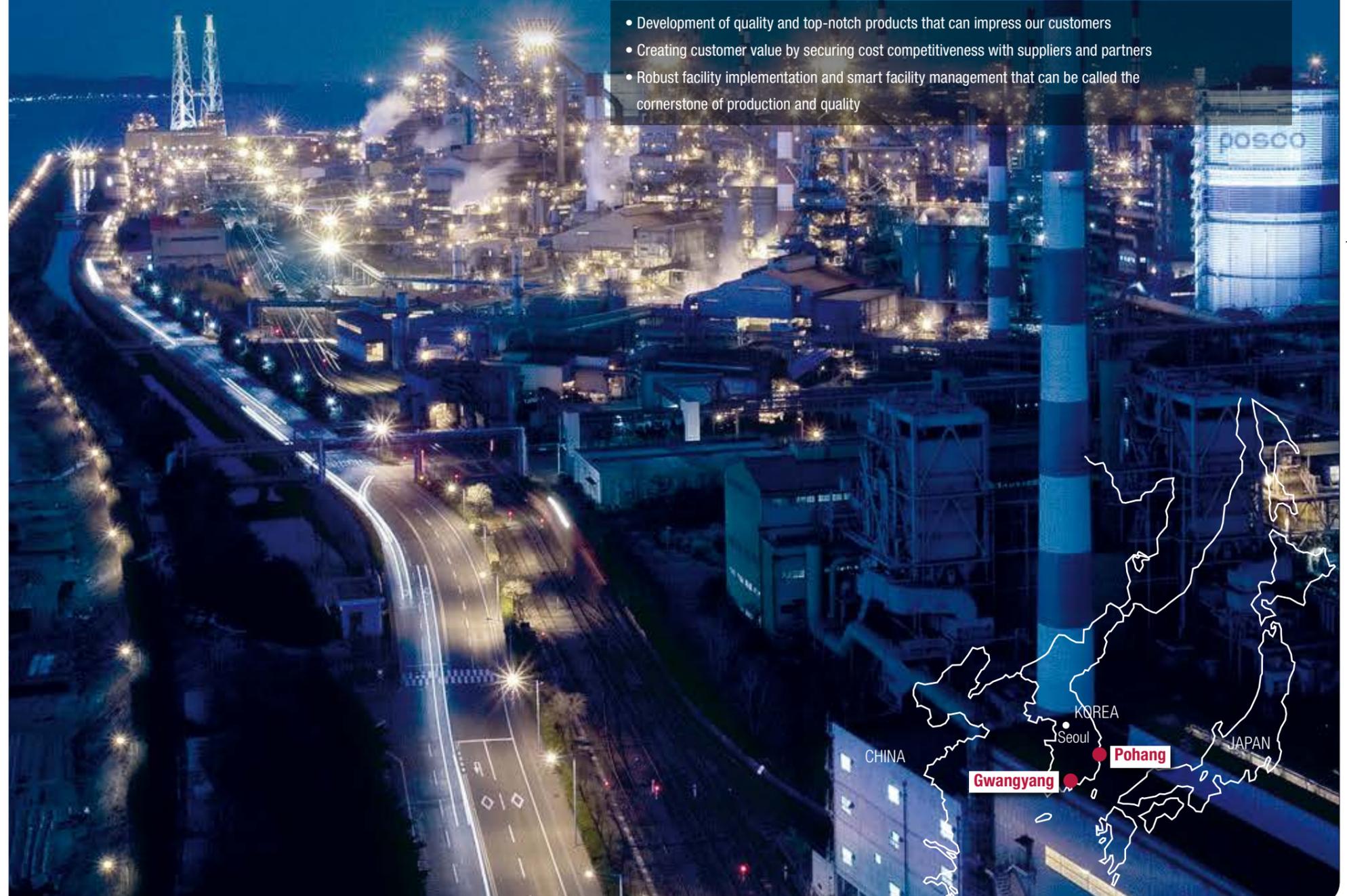
Main products _ Hot-rolled steel, Plate, Cold-rolled steel, Car steel, API steel, etc.

Crude steel production _ 21,412 million tons (as of 2021)

Creation of customer value by securing product quality and cost competitiveness

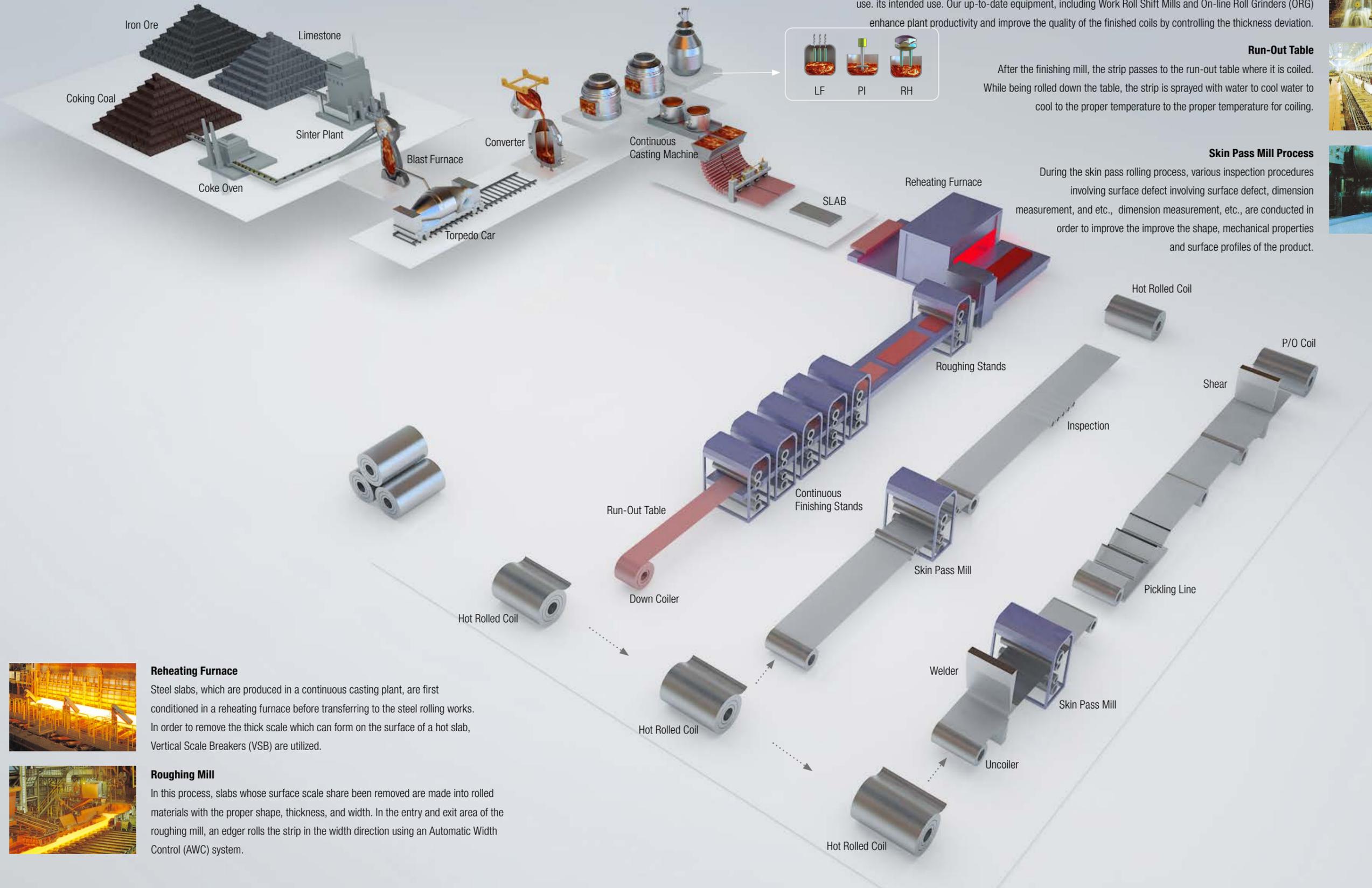
Realization of symbiotic values through the establishment of a robust industrial ecosystem with suppliers, partners, and customers

- Development of quality and top-notch products that can impress our customers
- Creating customer value by securing cost competitiveness with suppliers and partners
- Robust facility implementation and smart facility management that can be called the cornerstone of production and quality



Manufacturing Process & Equipment

In order to deliver quality products, meeting customer's requirements, POSCO is equipped with the latest fully-automated computer controlled cutting edge facilities and technologies. These tools guarantee products of the highest precision and quality for our customers.



Finishing Mill

The purpose of finishing rolling is to adjust the thickness and width of a coil to the specified dimensions and to produce a smooth surface and shape at a desired finishing temperature appropriate for its intended use. Our up-to-date equipment, including Work Roll Shift Mills and On-line Roll Grinders (ORG) enhance plant productivity and improve the quality of the finished coils by controlling the thickness deviation.



Run-Out Table

After the finishing mill, the strip passes to the run-out table where it is coiled. While being rolled down the table, the strip is sprayed with water to cool water to cool to the proper temperature to the proper temperature for coiling.



Skin Pass Mill Process

During the skin pass rolling process, various inspection procedures involving surface defect involving surface defect, dimension measurement, and etc., dimension measurement, etc., are conducted in order to improve the improve the shape, mechanical properties and surface profiles of the product.



Reheating Furnace

Steel slabs, which are produced in a continuous casting plant, are first conditioned in a reheating furnace before transferring to the steel rolling works. In order to remove the thick scale which can form on the surface of a hot slab, Vertical Scale Breakers (VSB) are utilized.



Roughing Mill

In this process, slabs whose surface scale have been removed are made into rolled materials with the proper shape, thickness, and width. In the entry and exit area of the roughing mill, an edger rolls the strip in the width direction using an Automatic Width Control (AWC) system.



Production Facilities

Facility	Pohang Works		Gwangyang Works			
	No.1 Hot Strip Mill	No.2 Hot Strip Mill	No.1 Hot Strip Mill	No.2 Hot Strip Mill	No.3 Hot Strip Mill	No.4 Hot Strip Mill
Reheating Furnace	200T/H x 2 Walking beam Type	240T/H x 4 Walking beam Type	325T/H x 3 Walking beam Type	270T/H x 3 Walking beam Type	270T/H x 3 x 3 Walking beam Type	250T/H x 3 Walking beam Type
Scale Breaker	Horizontal	Vertical	Vertical	Vertical	Vertical	Vertical
Roughing Mill						
Finishing Mill	x 7	x 7	x 7	x 7	x 7	x 7
Down Coiler	T1.2~12.7mm 18MT x 2	T1.2~22 mm 35MT x 3	T1.2~22 mm 35MT x 3	T1.2~22 mm 35MT x 2	T1.2~22 mm 35MT x 2	T1.2~25.4 mm 35MT x 3
Skin Pass Mill	T1.2~6.4mm 18MT 762mm	T1.2~6.4mm 35MT 610,762mm	T1.2~6.4mm 35MT 610,762mm	T1.2~6.4mm 35MT 610,762mm	T1.2~6.4mm 35MT 610,762mm	T1.2~6.4mm 35MT 610,762mm

AWC
AWC(Automatic Width Control) System

An AWC System, which is attached to the roll of a skin pass rolling mill, automatically adjusts the width of a coil by using the highly-sensitive hydraulic cylinder while monitoring the result width of a coil.

Pair Cross Mill
Pair Cross Mill

The shape and crown of a coil is adjusted by the paired upper and lower rolls crossing each other.

ASC
ASC(Automatic Shape Control) System

An ASC (Automatic Shape Control) System, which is attached at the end of a finishing mill, adjusts the flatness of a coil. After that, the ASC System automatically adjusts the pressure of the roll bender to control a strip shape.

AGC
AGC(Automatic Gauge Control) System

An AGC System, which is attached to the end of a finishing mill, automatically adjusts the thickness of a coil by using the highly sensitive hydraulic cylinder while monitoring the resultant thickness of a coil.

Main Uses

Hot-rolled steel products are divided into two groups: hot-rolled coils produced by hot strip mill and hot-rolled steel plates, which are made by cutting material from hot-rolled coils. Some of the hot-rolled coils produced at our hot-rolling plants are sold as finished products while others are used as intermediary materials for cold-rolled or electrical steel production, thus being reprocessed into high value added products. Hot-rolled steel products are widely used in many different industries due to their high strength as well as good weldability, machinability and corrosion resistance.

Steel for Structural Uses

Steel for general and welding structures are produced and are used for building iron structures and the structures of bridges, ships and cars, etc.

- **KS** SS330, 400, SM400A, B, C, SM490A, B
- **JIS** SS330, SS400, SS490, SS540, SM400A, B, C, SM490A, B, C, SM490YA, YB, SM520B, C, SM570
- **ASTM** A36, A283, A570
- **BS** BS1449 PART 1 50/35HR, HS, BS4360, 40B, 43A, B, C, 50B, C
- **DIN** DIN17100 ST22, ST33, ST37-2, ST44-2, ST52-3

Weather Resistant Steel

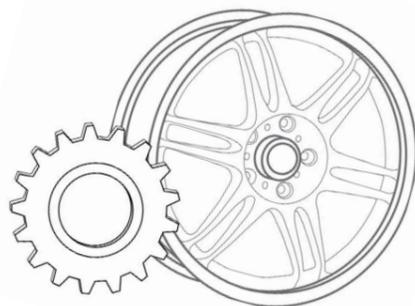
This type of steel with enhanced corrosion and atmospheric corrosion resistant properties through the addition of such special elements as P, Cu, and Cr is used in manufacturing containers, special automobiles and construction structures.

- **POSCO** PAWS50
- **JIS** SPA-H

Steel for automotive Structural Uses

The type of high strength steel which has extremely excellent drawability and weldability is used in automobile frames, members and wheels.

- **POSCO** ATOS540, 590, 780 AUTOBEAM, STAB
- **JIS** SPA-H310, 370, 400, 440, SPFH490, 540, 590
- **ASTM** A715-40, 45, 50, 55, 60, 65, 70, 80



Steel for automotive Structural Uses

Carbon Steel for Pipe and Tube

This type of steel, excellent in weldability and formability, is widely used in structural pipes, general pipes, special pipes, and machine-structural carbon steel pipe.

- **POSCO** POSP290A, 340A, 370A, 410A, 440A, 470A, 500A, 540A
- **JIS** SPHT1, 2, 3, 4, STB340, 410, STK290, 400, 490, 500, 540, STKM11A, 12B, 13A, 13B, 14B, 16A, 18A

High Carbon Steel

Under this category are carbon steel for machine structures, alloy steel, and tool steel. After going through cold-rolling and QT heat treatment processes, they are used in making a variety of machine parts.

- **JIS** S10C-S55C, SK60-120, SCM415-440
- **SAE** SAE1010-1055
- **DIN** 50CRV4, 75CR1

Cold Rolled Steel

This cold rolled steel is used in many cold rolled products, such as CR, GI and color plates.

- **SAE** SAE1006-1055

Steel for Oil Well Pipes

It is mainly used as a mining and energy transportation channel and is excellent in formability, weldability, and Collapse resistance.

- **API** [5CT] J55, K55, N80, L80, R95, P110, Q125
[5ST] CT70, CT80, CT90, CT100, CT110

⚠ The usage presented in this section reflects the general use and shall be used as a reference. Please be sure to consult with our associates when making orders for specific usage.



KS Korean Industrial Standards **JIS** Japanese Industrial Standards **DIN** Deutsches Institut für Normung **BS** British Standards
ASTM American Society for Testing and Materials **SAE** Society of Automotive Engineers **API** American Petroleum Institute

Steel for Pipelines

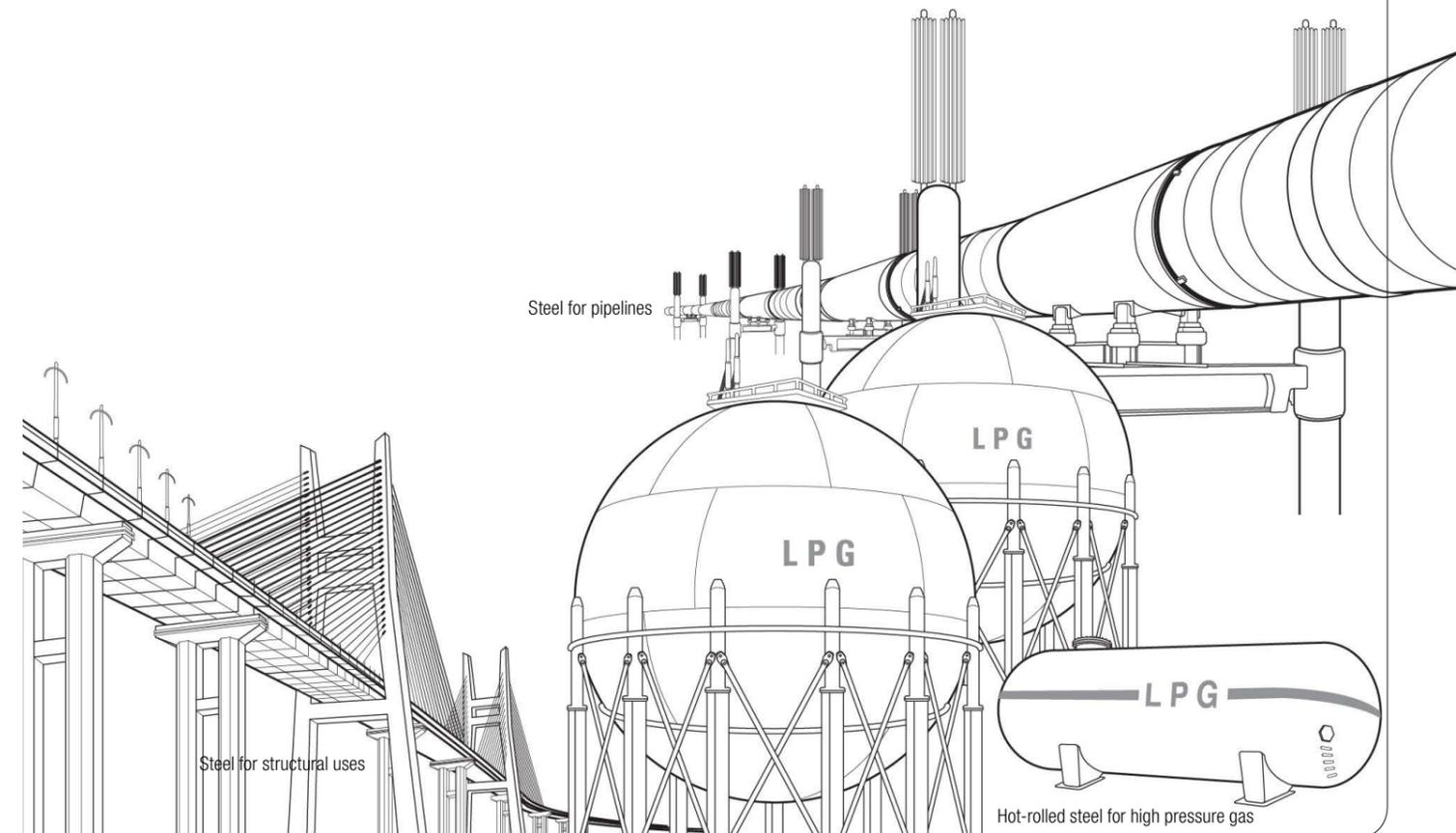
The piping used for transporting energy sources features excellent weldability, low-temperature toughness, and resistance to hydrogen-induced cracking

- **API** [5L] B, X42, X46, X52, X60, X65, X70, X80

Hot-Rolled Steel for Gas Cylinders

This steel, which has high strength qualities and good formability, is used in high pressure gas containers, with less than a 500l inner capacity, used for holding LPG, acetylene and other high pressure gases.

- **JIS** SG255, 295, 325, 365
- **ASTM** A455



Steel for pipelines

Steel for structural uses

Hot-rolled steel for high pressure gas

High Carbon Steels

General Characteristics

High carbon steel is used where greater strength is required and this high strength is obtained through final heat treatment. There are two product groups: high carbon steel products with carbon content of more than 0.30wt.% or those with added alloy elements such as Mn, Cr, Mo, B, and Ni with carbon content of more than 0.15wt.%.

The final specified physical properties of high carbon steel are achieved mostly through the process of hot rolling, pickling, cold rolling and annealing. Final heat treatment is performed after the steel is processed and made into parts.

Product Types and Features

High carbon steel can be broadly categorized into high carbon steel for machine structures and high carbon steel for tools. Then, each category can be divided into general high carbon steel and alloy high carbon steel.

Types		JIS	SAE	DN	POSCO	
High carbon steel for machine structures	General high carbon steel	S30C, S35C, S40C, S45C, S50C, S55C	1030, 1035, 1040, 1045, 1050, 1055	C30, C45, C50, C55	POS20FB, POS45FB	
	Alloy high carbon steel	Ni-Cr-Mo	SNCM220	8620, 8622, 8660	20NiCrMo2, 20NiCrMoS2	-
		Cr	SCr415, 420, 430	5046	34Cr4, 34CrS4	POS1062Cr, 1077Cr
		Cr-Mo	SCM415, 430, 435, 440	4120, 4130, 4135, 4140	34CrMo4, 34CrMoS4	-
		Mn	SMn443	1527, 1536, 1541, 1552	34CrMn4, 34CrMnS4	-
		B	-	10B22, 15B27, 15B35	20MnB5, 30MnB5, 27MnCrB5	Autobeam, STAB, POS10B22, POSPM35P
		Others	SUP9	6150	50CrV4, 51CrV4	POS1031MA, 1047MA
High carbon steel for tools	General high carbon steel	S60C, S65C, S70C, S75C, SK65, SK75, SK85, SK95, SK105, SK120	1060, 1065, 1070, 1075, 1080, 1085, 1090, 1095	C80W1	-	
	Alloy high carbon steel	SKS51, SKS81	-	75Cr1	POS10A0Cr, POS10A2Cr	

Chemical Composition(Wt.%)

Spec.	C	Si	Mn	Ni	Cr	Mo
S45C	0.42~0.48	0.15~0.35	0.60~0.90	-	-	-
S50C	0.47~0.53					
S55C	0.52~0.58					
SK65	0.60~0.70	0.10~0.35	0.10~0.50	-	-	-
SK85	0.80~0.90					
SK120	1.15~1.25					
SKS51	0.75~0.85	0.35Max	0.50Max	1.30~2.00	0.20~0.50	-
SNCM220	0.17~0.23	0.15~0.35	0.60~0.90	0.40~0.70	0.40~0.60	0.15~0.25
SCr430	0.33~0.38			0.25Max	0.90~1.20	-
SCM435	0.28~0.33			0.25Max	0.35Max	0.15~0.30
SMn420	0.17~0.23	-	1.20~1.50	0.25Max	0.35Max	-
SAE1536	0.30~0.38	0.15~0.30	1.20~1.55	-	-	-
SAE1541	0.36~0.45		1.30~1.65			
SAE1080	0.74~0.88		0.60~0.90			
DN-51CrV4	0.47~0.55	0.25~0.50	0.80~1.10	-	0.90~1.20	V:0.1~0.2
DN-75Cr1	0.70~0.80	0.15~0.35	0.60~0.80	-	0.30~0.40	-

Main Uses

High carbon steel is used to make auto parts such as automatic and manual transmission components, seat belt parts as well as in other diverse products like chainsaw teeth, chains, needles, and farming tools.

					
Clutch Diaphragm	Automission plate	Buckle	Tongue	Seat Recliner	Timing Chain
DN-50CrV4	JIS-S45C	JIS-S50C	JIS-S55C	JIS-SNCM220	SAE1070

					
Impact Beam	Knitting Needle	Shank	Band Saw	Agricultural machine	Hose Clamp
AUTOBEAM	JIS-SK85	JIS-SCM435	POS1047MA	JIS-S55C, SAE1095	JIS-SK85

Weather Resistant Steel

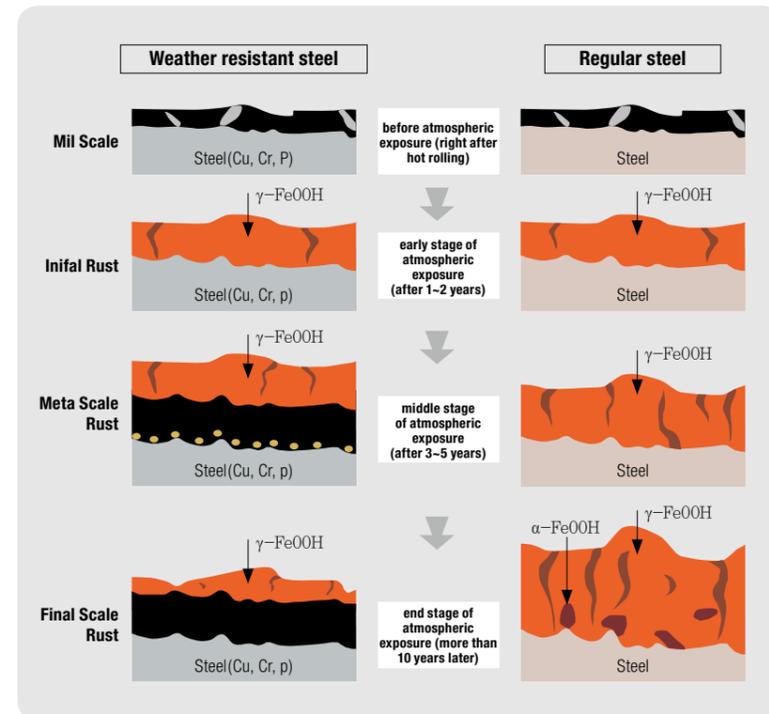
General Characteristics

Weather resistant steel features superior corrosion resistance compared to regular steel and thus suffers less rusting when exposed to the atmosphere. Resistance to moisture and oxygen in the atmosphere is greatly increased. In particular, saltwater resistant steels are excellent for use in marine environments.

Product Types and Features

Corrosion resistant steel contains alloying elements such as Cu, Cr, Ni, and P. at the surface, the steel acquires a stable crystal structure which reduces surface oxidization.

Comparison of rust layer development between weather resistant steel and regular steel



Corrosion Resistant Steel Types

Product name abbreviation	Corrosion resistance	Tensile strength	C	Si	Mn	Cu	Cr	Ni	P	S
JIS-SPA-H	Weather resistance	≥490MPa	≤0.12	0.20~0.75	0.20~0.50	0.25~0.55	0.30~1.25	≤0.65	0.07~0.15	≤0.035
POSEIDON500	Saltwater resistance	≥500MPa	≤0.10	≤0.50	≤1.00	≤0.50	≤1.50	≤0.50	≤0.03	≤0.015
POS1007MA	Saltwater resistance	≥520MPa	≤0.12	≤0.50	≤1.50	0.25~0.55	≤2.00	≤0.50	0.07~0.15	≤0.025

Surface Treatment of Weather Resistant Steel

Weather resistant steel can be used with various surface conditions such as unpainted, general painting, and rust stabilization coating.



Unpainted

Weather resistant steel can be directly exposed to and used in the atmosphere without additional surface treatment. Unpainted weather resistant steel is known for its superb corrosion resistance when exposed to the atmosphere, about fivefold greater than that of regular steel. It should be noted, though, that during the early stages of atmospheric exposure, weather resistant steel forms a coating of rust similar to that of regular steel, with possible contamination occurring when rain washes rust off the steel into the environment. In order to promote even rusting on the surface of unpainted weather resistance steel, a balanced wet and dry cycle must be repeated over a period of time. It is important that unpainted steel not face long term exposure to salt spray in coastal areas or to sulfur oxygen compounds such as sulfur dioxide.



Painted

Paint products meant for regular carbon steel can also be used on weather resistant steel to prevent rust. When regular anticorrosive paint is used on weather resistant steel, its corrosion resistance effect is nearly doubled, thanks to the metal's excellent paint adhesion properties. Weather resistant steel used in ocean shipping containers is mostly finished with regular paint products.



Rust Stabilization Coating

As an alternative to regular paint, this surface treatment coating can be applied in order to form stable oxide film on the surface of weather resistant steel. Various surface treatment methods have been developed and used. As a result, more and more of weather resistant steel used in building exterior and roofing materials are treated with rust stabilization coating. A rust stabilization coating method has been developed in Korea as well. The exterior of the POSCO Museum has been treated with this particular coating.

Long-term Exposure and Corrosion Test for Saltwater Resistant Steel

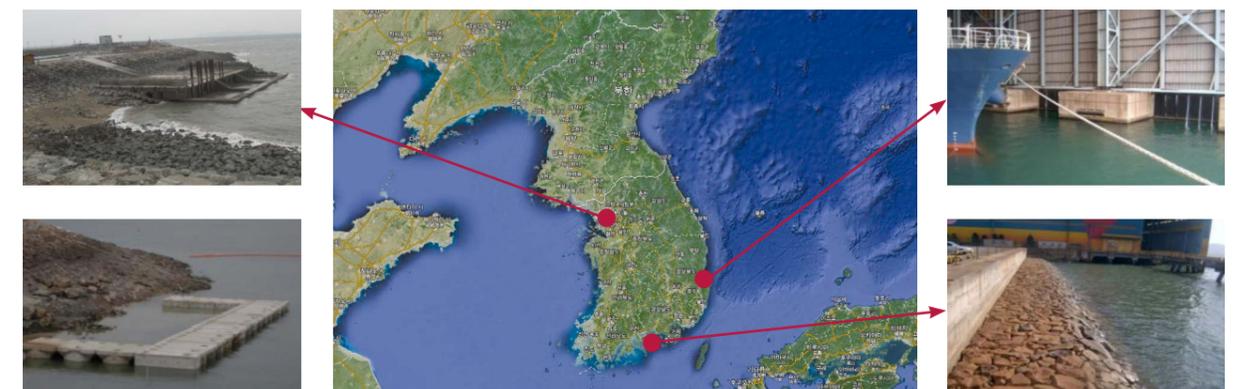
Long-term saltwater exposure testing conducted in Pohang, Gwangyang and Shihwa over a period of two years have confirmed that saltwater resistant steel's anti-corrosion properties are greatly superior to that of regular steel.



Regular carbon steel



POSEIDON 500



Steel for Oil Well Pipes & Pipelines

General Characteristics

API steel pipes refer to pipes used for oil and gas extraction and production, as well as pipelines used for transportation.

Product Types and Features

Steel Pipes for Oil Wells

It is a general term for all casing and tubing used in drilling oil or gas wells, extracting crude oil or natural gas, etc.

- Casing is a steel pipe inserted into an oil or gas well in order to prevent its wall from collapsing and to stop water or soil from infiltrating the well.
- Tubing is a steel pipe inserted through the casing and extending down to the oil deposit after the oil well is established. It is used to pump crude oil up to ground level.

Pipelines

Pipelines are a series of installed pipes to transport crude oil, oil products, or natural gas from source to destination. Either toughness-oriented steel or corrosion-resistant steel is used to make such pipes depending on the environmental characteristics of their installation.

- Steel for toughness is used to make pipe which resists fracture due to external impact or internal pressure, particularly at low temperature.
- Steel for corrosion resistance is used to produce pipe which withstands the harsh conditions and chemicals found in oil and gas wells.



How to Mark API Strength

- The number written on API steel is the minimum of yield strength required by specification. The unit used is ksi. (1ksi=6.8923, MPa=0.70307kg/mm²)
- API strength is the value required when a pipe is formed. For special purpose API steel pipes, the required strength value is measured after the formed pipe undergoes heat treatment processing.

API Standard system

API - 50 - 0 00 - 0000

① ② ③ ④

① : Usage

L	Steel pipe for pipelines	a pipe used to transport crude oil and natural gas to its destination
CT	Steel pipes for oil wells	a pipe used to pump out crude oil and natural gas from the oil deposit to ground level

② : Grade

A, B	pipe for refining
X	pipe for crude oil/gas
H, J, K, N....	serial number

③ : Minimum yield strength (unit: ksi)

④ : PSL1 or PSL2

Division	PSL1	PSL2
strength / Toughness	YP, TS only minimum regulated/no guarantee	YP, TS up to maximum regulated/0°C
Components	only five primary element (C, Mn, Si, P, S) guaranteed	Cu, Ni, Cr, Mo, Nb, V, and Ti marked in M/S

API Standard types

Division	Grade	YS min(MPa)	YS max(MPa)	TS min(MPa)	TS max(MPa)	C max(w%)	Si max(w%)	Mn max(w%)	P max(w%)	S max(w%)
5L 46 th edition (Linepipe) PSL2 Welded pipe	B	245	450	415	655	0.22	0.45	1.2	0.025	0.015
	X42	290	495					1.3		
	X46	320	525					435		
	X52	360	530	460	760			1.6		
	X56	390	545	490				1.7		
	X60	415	565	520				1.85		
	X65	450	600	535				0.12		
	X70	485	635	570	0.02					
	X80	555	705	625	825					
	X90	625	775	695	915			0.1		
X100	690	840	760	990						

Division	Grade	Nb max(w%)	V max(w%)	Ti max(w%)	Cu max(w%)	Ni max(w%)	Cr max(w%)	Mo max(w%)	B max(w%)	Carbon Equivalent % max
5L 46 th edition (Linepipe) PSL2 Welded pipe	B	0.05	0.05	0.04	0.5	0.3	0.3	0.15	0.001	0.43
	X42									
	X46									
	X52	Nb+V+Ti≤0.15%	0.5	0.5		0.5	0.004	-		
	X56									
	X60									
	X65									
	X70	1	0.5	0.5		0.004	-			
	X80									
	X90									
X100										

Division	Grade	YS min(MPa)	YS max(MPa)	TS min(MPa)	TS max(MPa)	C max(w%)	Si max(w%)	Mn max(w%)	P max(w%)	S max(w%)
5CT 10 th edition (Casing & Tubing) Welded pipe	J55	379	552	517	-	-	-	-	-	0.03
	K55	379	552	655	-	-	-	-	-	
	N80	552	758	689	-	-	-	-	-	
	L80	552	655	655	-	0.43	0.45	1.9	0.03	0.01
	R95	655	758	724	-	0.45	0.45	1.9		
	P110	758	965	862	-	-	-	-	0.02	
	Q125	862	1034	931	-	0.35	-	1.35		

Automobile Structural Steel

General Characteristics

The name refers to all steel products used for automotive structures. These are steels which have high tensile strength, greater than 500MPa, and yield strength, greater than 300MPa. High strength is obtained by adding alloy elements or cooling to low temperature. Steel products with tensile strength greater than 1,000MPa can be manufactured.

POSCO produces ATOS540 to ATOS780 grade in compliance with the ATOS (AuTOmobile Structural Steel) specification.

Product Types, Components, Materials, and Material Property

Specifications	Thickness(mm)	Chemical Composition(wt.%)					
		C	Si	Mn	P	S	Nb
ATOS540	2.3~12.7	≤ 0.20	≤ 0.40	≤ 1.50	≤ 0.03	≤ 0.03	Added
ATOS590	2.3~12.7	≤ 0.20	≤ 0.40	≤ 1.50	≤ 0.03	≤ 0.03	
ATOS780	2.3~14.0	≤ 0.20	≤ 0.40	≤ 2.00	≤ 0.03	≤ 0.03	

Specifications	Yield Point (MPa)	Tensile Strength (MPa)	Tensile Test			Bending Test		
			Elongation(%), Thickness(mm) *Rolling Direction			Bending Angle	Inner Radius	Test Piece (JIS No.3)
			No.5 Test Piece, 2.5~5.0	No.5 Test Piece, 5.0~6.3	No.1 Test Piece, 6.3~12.7			
ATOS540	≥ 540	≥ 340	≥ 20	≥ 21	≥ 14	180°	1.5t	Perpendicular to Rolling Direction
ATOS590	≥ 590	≥ 420	≥ 19	≥ 20	≥ 13	180°	1.5t	Perpendicular to Rolling Direction
ATOS780	≥ 780	≥ 700	≥ 14	≥ 14	≥ 9	180°	1.5t	Perpendicular to Rolling Direction

- Remarks) 1. The number inside parentheses is for reference only.
 2. Appearance, form, dimension, weight and permissible tolerances comply with JIS G 3134.
 3. Number of tensile test pieces and bending test pieces for ATOS590 & ATOS780: throughout the same type and thickness of steel, one piece per class. If the weight exceeds 50 tons, two pieces per class.
 4. A bending test piece is perpendicular to JIS unit 3 rolling direction.

■ ATOS780

· It has high strength and excellent cold forming ability, used in making boom and arms, truck and trailer frames.

Weight Savings due to High Strength Steel

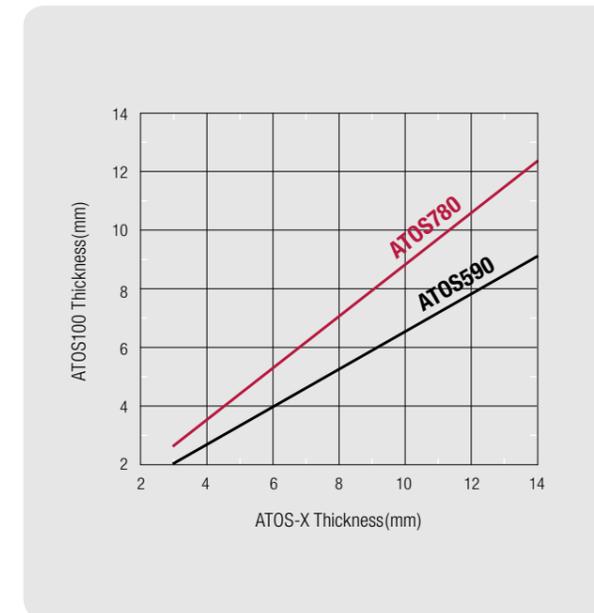
· It is calculated as resistance against bending displacement: high strength steel thickness =

$$\text{regular steel thickness} \times (\text{YS}_{\text{regular steel}} / \text{YS}_{\text{high strength steel}})^{0.5}$$

· Regarding elastic deflection, reinforcement design is necessary with thickness reduction (proportional to 'elasticity displacement E X thickness³').

· Reinforcement design is also needed for buckling (related to dimension, occurring in elastic region)

(Unit : mm, MPa)



ATOS590		ATOS780	
Thickness of original material	Thickness when ATOS 100 used	Thickness of original material	Thickness when ATOS 100 used
14	9.2	14	12.3
12	7.9	12	10.6
10	6.6	10	8.8
9	5.9	9	7.9
8	5.3	8	7.1
7	4.6	7	6.2
6	3.9	6	5.3
5	3.3	5	4.4
4	2.6	4	3.5
3	2.0	3	2.6
(YS 390)	(YS 880)	(YS 700)	(YS 880)
lightening potential 34%		lightening potential 34%	

Adequate Welding Material Suggestion

Specifications	Yield strength tensile strength (MPa)	Bending ratio (R/t)	Ceq	Heat treatment	Heat input (butt joint)	Welding material	
ATOS590	YS ≥ 390 TS ≥ 590	-	0.35	Pre-heating, Post-heating usually not required	-	Solid-wire	AWS A5.28-05-ER80SG (Ex. KISWEL Z0-60)
						Flux-cored	AWS A5.29-07-E81T1-Ni1 (Ex. KISWEL K81-T)
ATOS780	YS ≥ 700 TS ≥ 780	-	0.40		0.3~1.0 kJ/mm heat input amount test (in progress)	Solid-wire	AWS A5.28-05-ER120SG (Ex. KISWEL ZH-120)
						Flux-cored	AWS A5.29-07-E121T1-G (Ex. KISWEL K120TG)

POSCO Specifications

Hot Rolled Steel Sheets & Strips for Deep Drawing

: These specifications are applied to the hot-rolled steel strips for cold-rolled deep drawing that are manufactured by POSCO.

Specifications	Thickness (mm)	Chemical Composition (wt.%)						
		C	Si	Mn	P	S	Sol-Al	Others
POSHRD2	1.8~7.0	≤ 0.03	≤ 0.03	≤ 0.25	≤ 0.02	≤ 0.02	≤ 0.06	-
POSHRD25	2.0~7.0	≤ 0.005	≤ 0.03	≤ 0.20	≤ 0.02	≤ 0.02	≤ 0.06	Ti 0.005~0.05 Nb 0.005~0.04
POSHRD3	2.0~7.0	≤ 0.005	≤ 0.03	≤ 0.20	≤ 0.02	≤ 0.02	≤ 0.06	Ti 0.01~0.06

Notes) 1. External appearance, shape, dimension, weight and thickness tolerance with SAE. 2. This specification guarantees chemical composition without mechanical properties.

Acid Sulfuric Corrosion Resistance and Weather Resistance High Strength Steel Sheets & Strips

: These specifications are applied to the acid sulfuric corrosion resistance and weather resistance hot-rolled high-strength steel sheets and strips that are manufactured by POSCO.

Specifications	Thickness (mm)	Chemical Composition (wt.%)					
		C	Si	Mn	P	S	Others
ANCOR-H (Acid Sulfuric Corrosion Resistant Steel)	1.8~7.0	≤ 0.10	≤ 0.50	≤ 0.80	≤ 0.035	≤ 0.035	Cu ≤ 0.50 Cr ≤ 0.50
HICON700W (Weather Resistant High Strength Steel)	2.3~6.5	≤ 0.12	≤ 0.45	≤ 2.50	≤ 0.035	≤ 0.01	Cu ≤ 0.55 Cr ≤ 1.20

Notes) 1. External appearance, shape, dimension, weight and thickness tolerance with SAE. 2. This specification guarantees chemical composition without mechanical properties.

Hot Rolled Steel Sheets & Strips for Automotive structural

: These specifications are applied to the hot rolled steel sheets and strips for automotive structures that are manufactured by POSCO.

Specifications	Thickness (mm)	Chemical Composition (wt.%)					
		C	Si	Mn	P	S	Nb
ATOS540	2.3~12.7	≤ 0.20	≤ 0.40	≤ 1.50	≤ 0.03	≤ 0.03	
ATOS590	2.3~12.7	≤ 0.20	≤ 0.40	≤ 1.50	≤ 0.03	≤ 0.03	Added
ATOS780	2.3~14	≤ 0.20	≤ 0.40	≤ 2.00	≤ 0.03	≤ 0.03	

Notes) 1. External appearance, shape, dimension, weight and thickness tolerance with JIS G 3193(ANCOR-H), JIS G 3134(HICON700W).
2. Number of tension test pieces and bend test pieces: one pieces each of the same charge and same thickness. However, in excess of 50 ton, two pieces of each.
3. Bending test piece JIS No.3, perpendicular to rolling direction.

Hot Rolled Steel Sheets & Strips for the Impact Beams and Stabilizers of Automobiles

: These specifications are applied to the hot rolled steels strips for the impact beams and stabilizers of automobiles that are manufactured by POSCO.

Specifications	Thickness (mm)	Chemical Composition (wt.%)							
		C	Si	Mn	P	S	Sol-Al	Cr	B
AUTOBEAM	1.6~7.0	≤ 0.30	-	≤ 1.50	-	≤ 0.005	≤ 0.12	0.10~0.30	-
STAB	1.6~7.0	≤ 0.30	≤ 0.25	≤ 1.00	≤ 0.025	≤ 0.015	≤ 0.10	0.20~0.40	0.001~0.005

Notes) 1. External appearance, shape, dimension, weight and thickness tolerance with KS D 3555(AUTOBEAM), JIS G3193 (STAB).
2. Number of tension test pieces and bend test pieces: one pieces each of the same charge and same thickness. However, in excess of 50 ton, two pieces of each.
3. Bending test piece: JIS No.3 rolling direction.

△ The product standards are subject to change. Please be sure to confirm the recent standards when making orders or to consult our associates.

Specifications	Yield Point (MPa)	Tensile Strength (MPa)	Elongation		Bending Test		
			Test Piece	%	Bending Angle	Inner Dia.	Test Piece/Direction
ANCOR-H	≥ 245	≥ 400	No.5 Rolling Direction	≥ 25	180°	1.5t	JIS No1. Transverse to Rolling Direction
HICON700W	≥ 700	750~950	No.5 Rolling Direction	≥ 12	90°	1.0t	JIS No5. Transverse to Rolling Direction

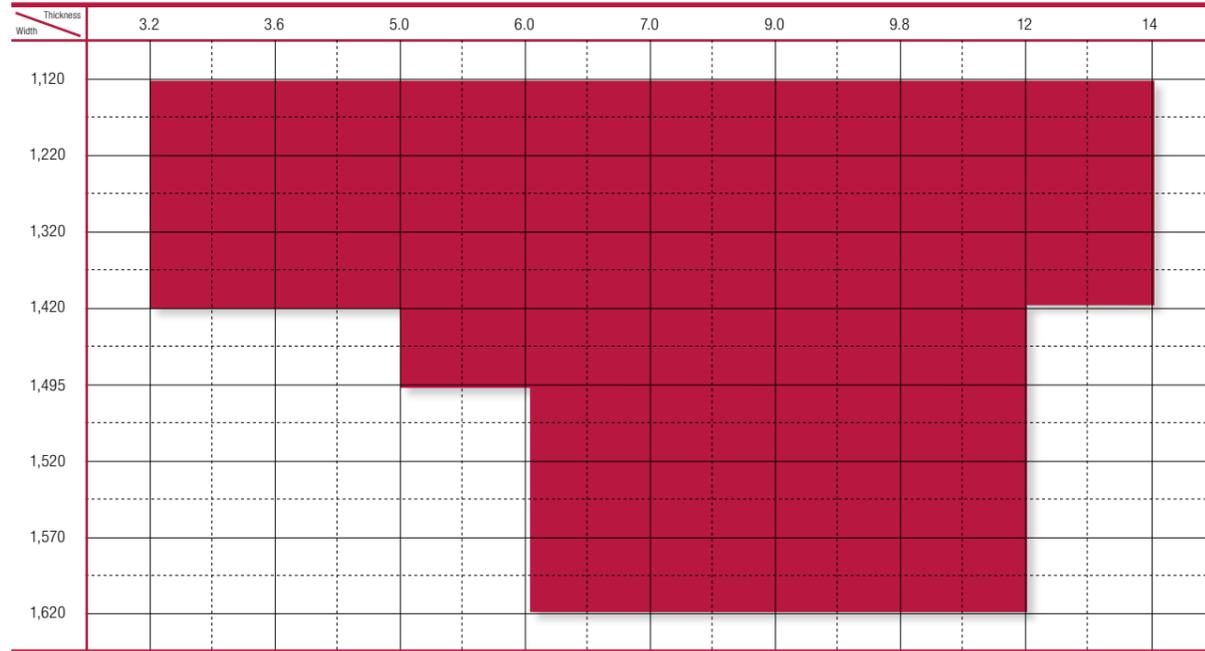
Specifications	Yield Point (MPa)	Tensile Strength (MPa)	Tensile Test			Bending Test		
			Elongation(%), Thickness(mm) *Rolling Direction			Bending Angle	Inner Dia.	Test Piece (JIS No.3)
			No.5 Test Piece, 2.5~5.0	No.5 Test Piece, 5.0~6.3	No.1 Test Piece, 6.3~12.7			
ATOS540	≥ 540	≥ 340	≥ 20	≥ 21	≥ 14	180°	1.5t	Transverse to Rolling Direction
ATOS590	≥ 590	≥ 420	≥ 19	≥ 20	≥ 13	180°	1.5t	Transverse to Rolling Direction
ATOS780	≥ 780	≥ 700	≥ 14	≥ 14	≥ 9	180°	1.5t	Transverse to Rolling Direction

Specifications	Yield Point(MPa)	Bending Test		Remark
		Bending Angle	Inner Dia.	
AUTOBEAM	490~784	180°	1.5t	Steel pass through proper heat treatment to come out as finished products
STAB	-	180°	1.5t	

Available Dimensions

Hot Rolled Steel Coil TS 800MPa Class

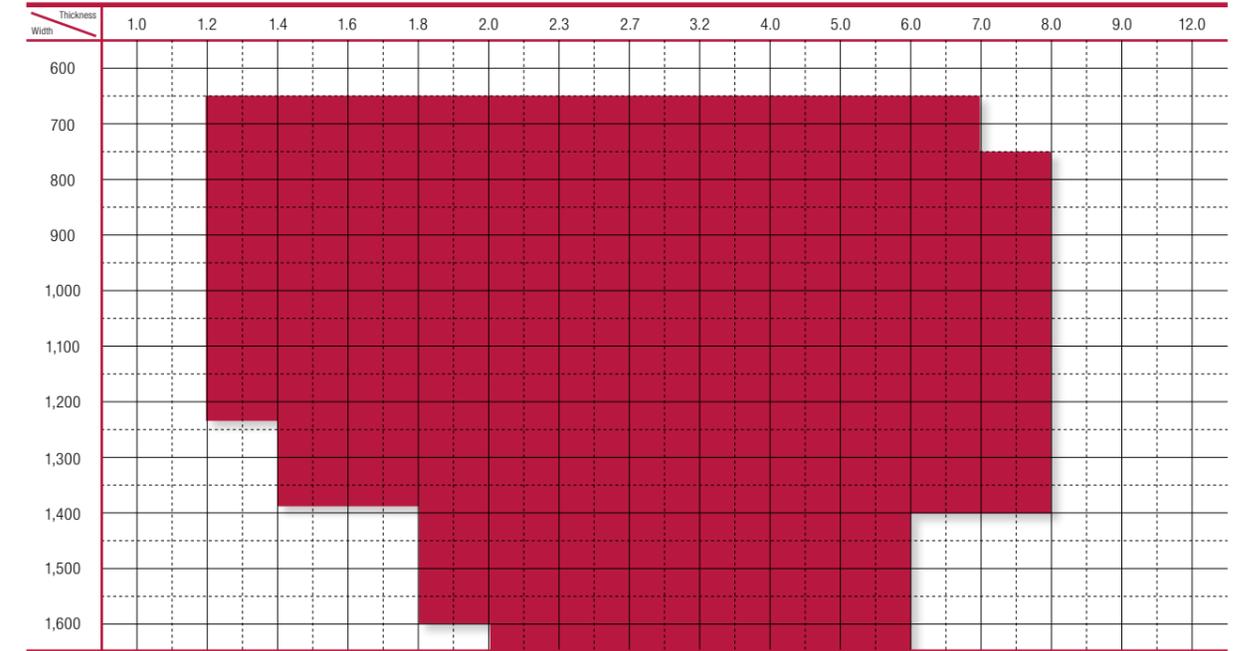
(Unit : mm)



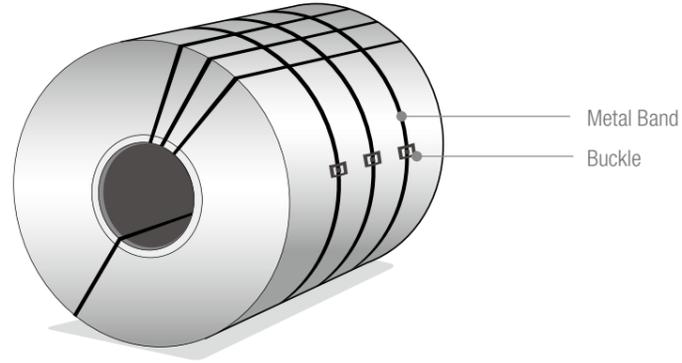
⚠ The available sizes are subject to change. Please consult with the POSCO contact person before ordering.

P/O Coil

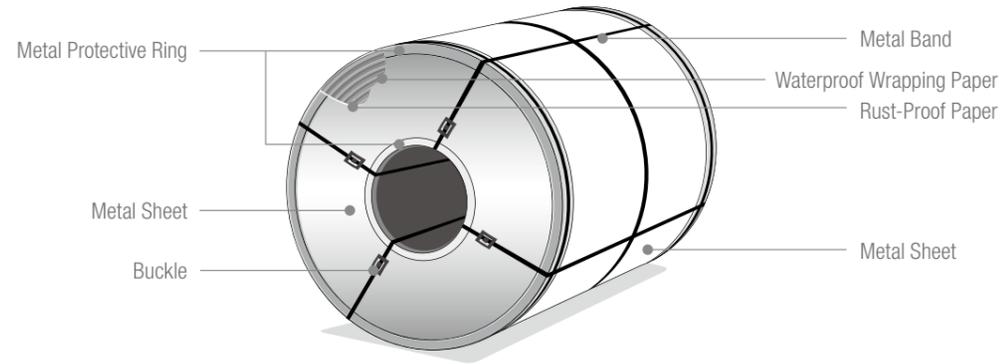
(Unit : mm)



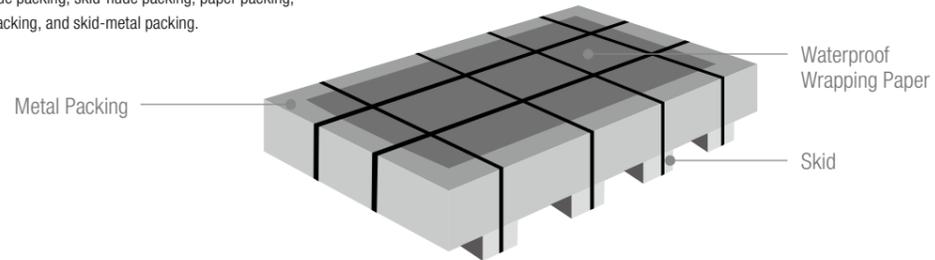
HR COIL | **Nude Packing**
Choose either nude or paper packing.



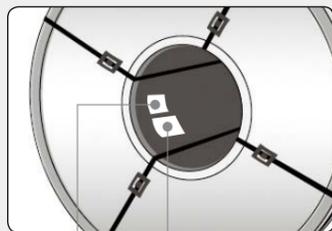
P/O COIL | **Metal Packing**
Choose either paper packing or metal packing.



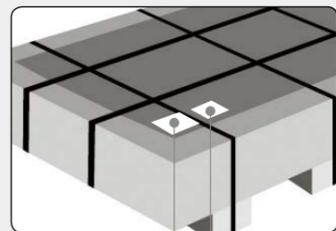
HR SHEET | Choose from nude packing, skid-nude packing, paper packing, skid-papering packing, and skid-metal packing.



■ **Coil**



■ **Sheet**



■ **Product label**



※ Marking labels are attached when requested by customers.

Conversion Factors

■ **Weight**

Classification	kilogram	Ounce	Pound	Short Ton (2,000lbs)	Long Ton (2,240lbs)	Metric Ton (1,000kg)
	kg	oz	lb	st	lt	t
kilogram(kg)	2	35.2740	2.20462	1.001102	0.09842	0.001
Ounce(oz)	0.02835	1	0.06250	0.03125	0.02790	0.00002835
Pound(lb)	0.45359	16	1	0.00050	0.04464	0.00045
Short Ton(st)	907.185	32,000	2,000	1	0.89286	0.90719
Long Ton(lt)	1,106.05	35,840	2,240	1.12	1	1.01605
Metric Ton(t)	1,000	35,274	2,204.62	1.10231	0.98421	1

■ **Leaner Measure**

Classification	Millimeter mm	Centimeter cm	Meter m	Inch in.	Foot ft	Yard yd	Mile ml
Millimeter(mm)	1	0.1	0.001	0.03937	0.0032808	0.0010936	0.0006214
Centimeter(cm)	10	1	0.01	0.3937	0.032808	0.010936	0.006214
Meter(m)	1,000	100	1	39.37	3.28083	1.0936	0.006214
Inch(in.)	25.40	2.540	0.0254	1	0.0833	0.02778	0.0006214
Foot(ft)	304.8	30.48	0.3048	12	1	0.3333	0.0006214
Yard(yd)	914.4	91.44	0.9144	36	3	1	0.0006214
Mile(mi)	1,609,347.0	160,934.70	1,609.35	63,360	5,280	1,760	1

■ **Force**

Classification	kgf	lbf	N
kgf	1	2.205	9.807
lbf	4.536×10 ⁻⁴	1	4.448
N	1.020×10 ⁻¹	2.248×10 ⁻¹	1

■ **Force Per Unit Area**

Classification	kgf	lbf	N
kgf/mm²	1	1.422×10 ³	9.807
lbf/in²(psi)	7.031×10 ⁻⁴	1	6.895×10 ⁻³
N/mm², Mpa	1.020×10 ⁻¹	1.450×10 ²	1

■ **Energy**

Classification	kgf-m	lbf-lb	J, N-m	cal
kgf-m	1	7.233	9.807	2.343
lbf-lb	1.383×10 ⁻¹	1	1.356	3.239×10 ⁻¹
J, N-m	1.020×10 ⁻¹	7.376×10 ⁻¹	1	2.389×10 ⁻¹
cal	6.268×10 ⁻¹	3.087	4.186	1

Appendix

Vickers Hardness No.	Brinell Diameter of Ball 10mm Load 3,000kg HB	Rockwell		Shore HS	Tensile Strength Approximate value kgf/mm ²
		B Scale Load 100kg HRB	C Scale Load 100kg HRC		
940	-	-	68.0	97	-
920	-	-	67.5	96	-
900	-	-	67.0	95	-
880	-	-	66.4	93	-
860	-	-	65.9	92	-
840	-	-	65.3	91	-
820	-	-	64.7	90	-
800	-	-	64.0	88	-
780	-	-	63.3	87	-
760	-	-	62.5	86	-
740	-	-	61.8	84	-
720	-	-	61.0	83	-
700	-	-	60.1	81	-
690	-	-	59.7	-	-
680	-	-	59.2	80	-
670	-	-	58.8	-	-
660	-	-	58.3	79	-
650	-	-	57.8	-	-
640	-	-	57.3	77	-
630	-	-	56.8	-	-
620	-	-	56.3	75	-
610	-	-	55.7	-	-
600	-	-	55.2	74	-
590	-	-	54.7	-	210
580	-	-	54.1	72	206
570	-	-	53.6	-	202
560	-	-	53.0	71	199
550	505	-	52.3	-	195
540	496	-	51.7	69	190
530	488	-	51.1	-	186
520	480	-	50.5	67	183
510	473	-	49.8	-	179
500	465	-	49.1	66	174
490	456	-	48.4	-	169
480	448	-	47.7	64	165
470	441	-	46.9	-	160
460	433	-	46.1	62	156
450	425	-	45.3	-	153
440	415	-	44.5	59	149
430	405	-	43.6	-	144

Vickers Hardness No.	Brinell Diameter of Ball 10mm Load 3,000kg HB	Rockwell		Shore HS	Tensile Strength Approximate value kgf/mm ²
		B Scale Load 100kg HRB	C Scale Load 100kg HRC		
420	397	-	42.7	57	140
410	388	-	41.8	-	136
400	379	-	40.8	55	131
390	369	-	39.8	-	127
380	360	(110.0)	38.8	52	123
370	350	-	37.7	-	120
360	341	(109.0)	36.6	50	115
350	331	-	35.5	-	112
340	322	(108.0)	34.4	47	109
330	313	-	33.3	-	105
320	303	(107.0)	32.2	45	103
310	294	-	31.0	-	100
300	284	(105.5)	29.8	42	97
295	280	-	29.2	-	96
290	275	(104.5)	28.5	41	94
285	270	-	27.8	-	92
280	265	(103.5)	27.1	40	91
275	261	-	26.4	-	89
270	256	(102.0)	25.6	38	87
265	252	-	24.8	-	86
260	247	(101.0)	24.0	37	84
255	243	-	23.1	-	82
250	238	99.5	22.2	36	81
245	233	-	21.3	-	79
240	228	98.1	20.3	34	78
230	219	96.7	(18.0)	33	75
220	209	95.0	(15.7)	32	71
210	200	93.1	(13.4)	30	68
200	190	91.5	(11.0)	29	65
190	181	89.5	(8.5)	28	62
180	171	87.1	(6.0)	26	59
170	162	85.0	(3.0)	25	56
160	152	81.7	(0.0)	24	53
150	143	78.7	-	22	50
140	133	75.0	-	21	46
130	124	71.2	-	20	44
120	114	66.7	-	-	40
110	105	62.3	-	-	-
100	95	56.2	-	-	-
95	90	52.0	-	-	-
90	86	48.0	-	-	-
85	81	41.0	-	-	-

Conversion Factors

Weight

The weight tables on the following pages show calculated weights of steel products, which thickness, width and length are specified by inch and feet. Calculation is done on the basis of the basic weights show below. Calculation methods for area, weight per unit area are in accordance with KS D3500.

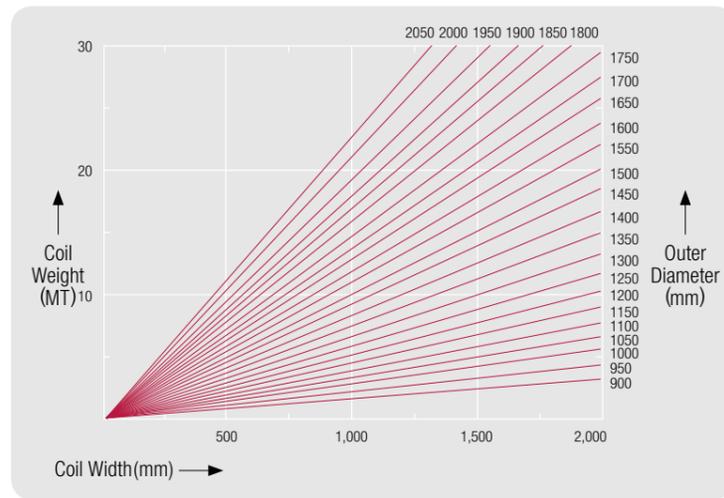
Classification	kgf/mm ²	lbf/in ² (psi)	N/mm ² , MPa
Basic weight as specified by standards specification kg/in, ft ²	7.85kg/mm, m ² 18.524	0.2833 lbs/in, m ² 18.505	40.8 lbs/in, ft ² 18.507

Weight Table

Thickness	Width	Length	1,000	762					914					1,219				
			1,000	1,524	1,829	2,134	2,438	2,743	3,048	1,829	2,134	2,438	2,743	3,048	3,658	1,829	2,134	2,438
1.2	9.24	10.9	13.1	15.3	17.5	19.7	21.9	15.7	18.4	21.0	23.6	26.2	31.5	21.0	24.5	28.0	31.5	35.0
1.4	10.99	12.8	15.3	17.9	20.4	23.0	25.5	18.4	21.4	24.5	27.6	30.6	36.7	24.5	28.6	32.7	36.7	40.6
1.6	12.56	14.6	17.5	20.4	23.3	26.3	29.6	21.0	24.5	28.0	31.5	35.0	42.0	28.0	32.7	37.3	42.0	46.7
1.8	14.13	16.4	19.7	23.0	26.3	29.6	32.8	23.6	27.6	31.5	35.4	39.4	47.2	31.5	36.8	42.0	27.2	52.5
2.0	15.70	18.2	21.9	25.5	29.2	32.9	36.5	26.2	30.6	35.0	39.4	43.7	52.5	35.0	40.8	46.7	52.5	58.3
2.3	18.06	21.0	25.2	29.4	33.6	37.8	41.9	30.2	35.2	40.2	45.3	50.3	60.4	40.3	47.0	53.7	60.4	67.1
2.6	20.41	23.7	28.4	33.2	37.9	42.7	47.4	34.1	39.8	45.5	51.2	56.9	68.2	45.5	53.1	60.7	68.2	75.8
2.9	22.76	26.4	31.7	37.0	42.3	47.7	52.9	38.0	44.4	50.7	57.1	63.4	76.1	50.7	59.2	67.6	76.1	84.6
3.0	23.55	27.3	32.8	38.3	43.8	49.3	54.7	39.4	45.9	52.5	59.0	65.6	78.7	52.5	61.3	70.0	78.7	87.5
3.2	25.12	29.2	35.0	40.8	46.7	52.7	58.3	41.8	49.0	56.0	63.0	70.0	84.0	56.0	65.3	74.7	84.0	93.3
4.5	35.32	41.0	49.2	57.4	65.6	74.0	82.0	59.0	68.9	78.7	88.3	98.1	118	78.7	91.9	105	118	131
5.0	39.25	45.6	54.7	63.8	72.9	82.2	91.2	65.6	76.7	87.5	98.4	109	131	87.5	102	117	131	146
6.0	47.10	54.7	65.6	76.6	87.5	98.6	109	78.7	91.9	105	118	131	157	105	123	140	157	175
7.0	54.95	63.8	76.6	89.4	102	115	128	91.9	107	122	138	153	184	123	143	163	184	204
8.0	62.80	73.0	87.5	102	117	132	146	105	122	140	157	174	210	140	163	187	210	233
9.0	70.65	82.0	98.5	115	131	148	165	118	138	157	177	197	236	158	184	210	236	263
10.0	78.50	91.2	109	128	146	164	182	131	153	175	197	219	262	175	204	233	262	292
11.0	86.35	100	120	140	160	181	201	144	168	192	216	241	289	193	225	257	289	321
12.0	94.20	109	131	153	175	197	219	157	184	210	236	262	315	210	245	280	315	350

Appendix

Width-Weight Curves for Coils (Coil ID=30Inch)



(Unit: mm)

1,219		1,524										1,829							
3,658	4,877	1,829	2,134	2,438	2,743	3,048	3,658	6,096	9,144	12,192	1,829	2,134	2,438	2,743	3,048	3,658	6,096	9,114	12,192
42.0	56.0	26.3	30.6	35.0	39.4	43.8	52.5	87.5	131	175	31.5	36.8	42.0	47.3	52.5	63.0	105	158	210
49.0	65.3	30.6	35.7	40.8	45.9	51.1	61.3	102	153	204	36.8	42.9	49.0	55.1	61.3	73.5	123	184	245
56.0	74.7	35.0	40.8	46.7	52.5	59.3	70.0	117	175	233	42.0	49.0	56.0	63.0	70.0	84.0	140	210	280
63.0	84.0	39.4	46.0	52.5	59.1	65.6	78.8	131	197	263	47.3	55.2	63.0	70.9	78.8	94.5	158	236	315
70.0	93.3	43.8	51.1	58.3	65.6	72.9	87.5	146	219	292	52.5	61.3	70.0	78.8	87.5	105	175	263	350
80.5	107	50.3	58.7	67.1	75.5	80.0	101	168	252	336	60.4	70.5	80.5	90.6	101	121	201	302	403
91.0	121	56.9	66.4	75.8	85.3	94.8	114	190	284	379	68.3	79.7	91.0	102	114	137	228	341	455
101	135	63.4	74.0	84.7	95.1	106	127	211	317	423	76.1	88.8	101	114	127	152	254	381	508
105	140	65.6	76.6	87.5	98.4	109	131	219	328	438	78.8	91.9	105	118	131	158	263	394	525
112	149	70.0	81.7	93.3	105	117	140	233	350	467	84.0	98.0	112	126	140	168	280	420	560
157	210	98.5	115	131	148	164	197	328	492	656	118	138	157	177	197	236	394	591	788
175	233	109	128	146	164	182	219	365	547	729	131	153	175	197	219	263	438	656	875
210	280	131	153	175	197	219	263	438	656	875	141	184	210	236	263	315	525	788	1,050
245	327	153	179	204	230	255	306	511	766	1,021	184	214	245	276	306	368	613	919	1,225
280	373	175	204	233	263	292	350	583	875	1,167	210	245	280	315	350	420	700	1,050	1,400
315	420	197	230	263	295	328	394	656	985	1,313	236	276	315	354	394	473	788	1,182	1,575
350	467	219	255	292	328	365	438	729	1,094	1,459	263	306	350	394	438	525	875	1,313	1,750
385	513	241	281	321	361	401	481	802	1,203	1,604	289	337	385	433	481	578	963	1,444	1,926
420	560	263	306	350	394	438	525	875	1,313	1,750	315	368	420	473	525	630	1,050	1,575	2,101

HOT ROLLED STEEL

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