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Contact for inquiries:

Bar & Wire Rod Unit of NIPPON STEEL TEL: +81-03-6867-5512

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NIPPON STEEL CORPORATION

2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071 JAPAN

Tel: +81-3-6867-4111

Steel Bars/Wire Rods
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Steel Bars / Wire Rods



NIPPON STEEL CORPORATION



World-leading steel bar and wire products to meet a wide variety of needs

Our steel bar and wire rod products are trusted by many customers in Japan and overseas, and are used in a wide variety of fields such as for automobiles, construction, heavy industry, electrical appliances and OA devices.

NIPPON STEEL will continue to develop new products and improve manufacturing processes, by advancing technologies and skills, and respond to customer needs, such as the lightening of important parts with high-strength products, the promotion of process saving and energy saving with excellently formable products, and the realization of a recycling society with the supply of eco-friendly products.

SteelInc™ is a brand of the Bar & Wire Rod Unit of NIPPON STEEL Group.



SteelInc™
NEW STEEL AGE

<NIPPON STEEL>

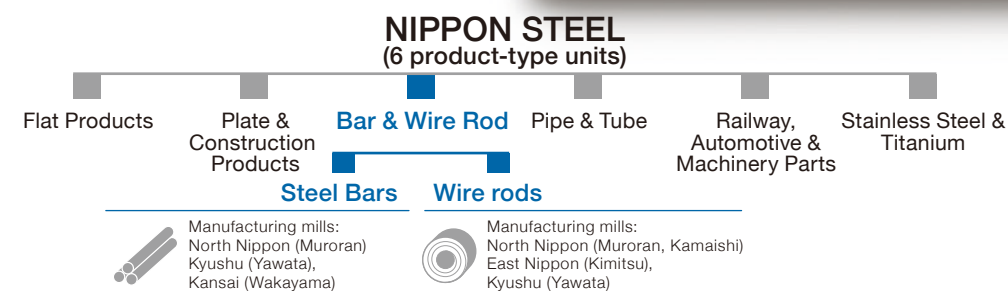
Steel Link Customer

<Customer>

Brand Statement

The Bar & Wire Rod Unit of NIPPON STEEL has accumulated experience in manufacturing including processing and the technologies used in processing.

Based on this, we are committed to increase the value and productivity of customers' products through the provision of the world's most advanced steel bar and wire rod products and the creation of values resulting from the combination of our steel and customers' manufacturing method.



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We are the Best Steelmaker with World-Leading Capabilities

NIPPON STEEL realizes the full potential of steel products as industrial materials, and thus contributes not only to the developing needs of customers but also to the creation of an affluent society.

Innovation of next-generation values through the multiplication of "steel materials x processing method"



We consider the synergy effect with our customers the most valuable goal of our Bar & Wire Rod Unit, and thereby provide a comprehensive solution by combining our steel materials and the customer's processing method based on our strength in technologies, quality, supply system and skilled workers.



Strength in advanced technologies and on-site competence (i.e., strength in basic quality)



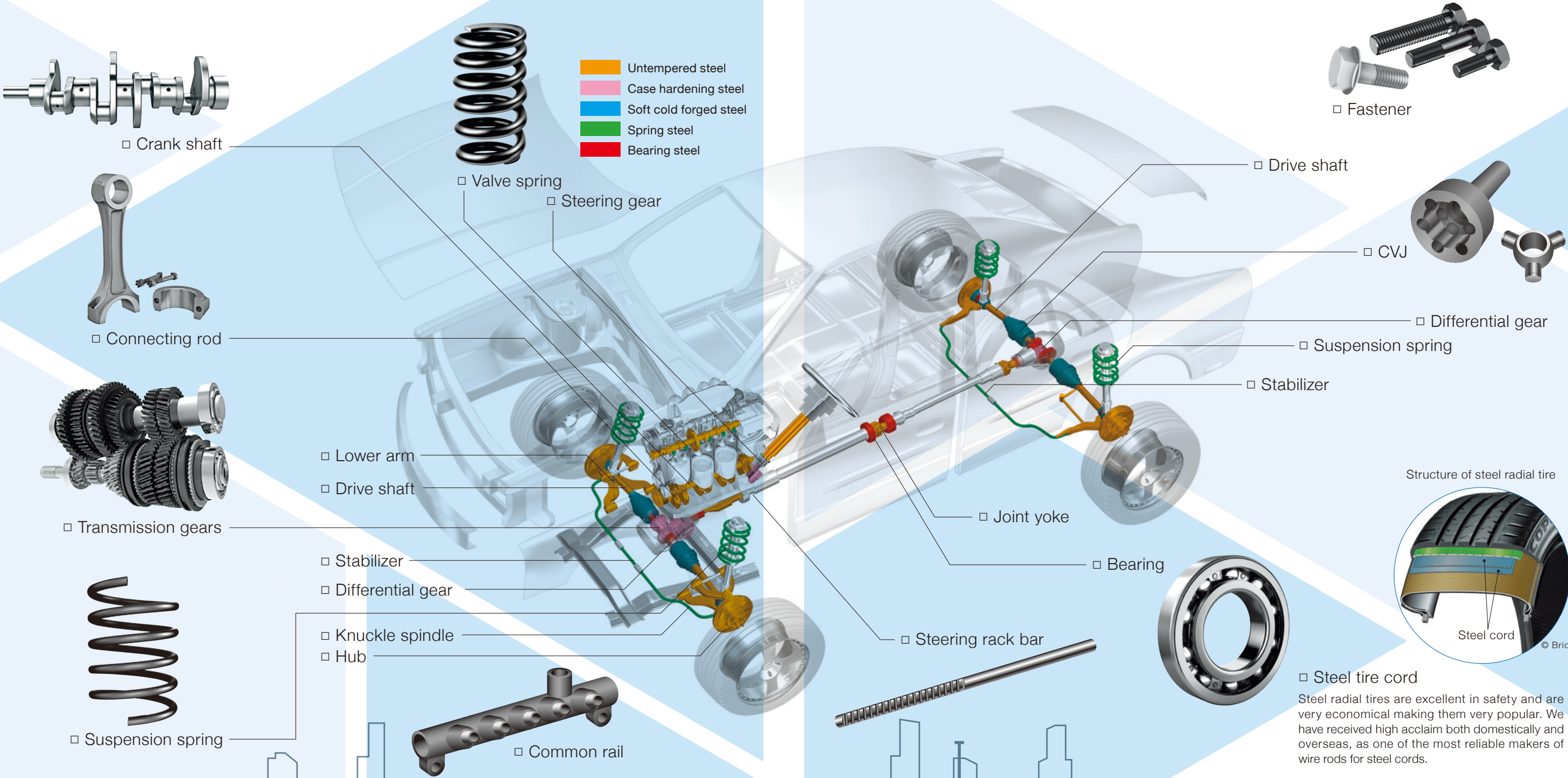
We have been putting our energy into improving the skill levels of the individual workers who actually produce our products, in order to allow the workers to manufacture steel materials that are designed with advanced technologies in an accurate and stable way.

High-end products created through our pursuit of the "full potential of steel"



In pursuit of a high-end product range that realizes the ultimate potential of steel, we have released innovative new products that contribute to high strength, high durability, omission of processes and environmental response of final products. In the future, we will commit to the highest efficiency and performance of the special steel.

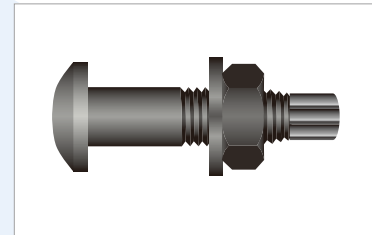
Automobiles made in Japan are well-known as being No.1 in the world in terms of quality and performance. Our products have shared in the support of this successful technology. We have always been the leader in the technical development field with regard to keeping vehicles weight down or the development of steel bars in which the manufacturing process can be omitted, or environmentally friendly steel bars such as lead-free bars, etc. We are capable of providing our customers with appropriate suggestions, selecting from our diversified product menu, suitable for the shape of the parts, function, manufacturing method, etc. of your intended purpose.



[Construction, civil engineering, energy] [Electricity, etc.]

Our steel materials are used everywhere from urban development to living-ware.

Our wire rods for bridge cables in long-span bridge projects, our high-function products that provide high-safety construction and civil engineering and our products that contribute to reducing impact on the environment, and electric power lines in the energy field are employed in Japan and overseas. In a place closer to life, the office equipment and supplies and bed springs are highly evaluated.



□ High-strength bolts

High-strength, high-quality bolts developed through proprietary chemical composition designs.



□ Steel for high strength chain

Development of high strength steel with low weight, durability and long service life required for anchoring materials such as marine structures and ships.



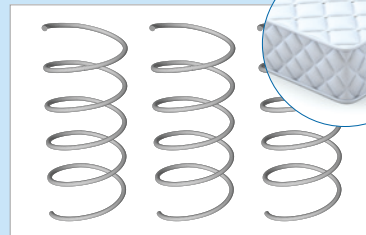
□ Saw wires

The wire rods we manufacture for saw wires reduce the inclusion to the utmost limit at which snapping may be caused when wire drawing or during the cutting process.



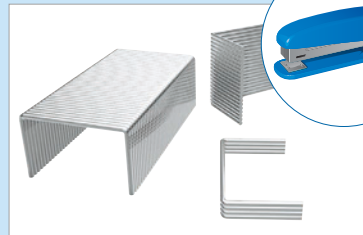
□ Miniature bearing

Bearings with an outer diameter of 30 mm or less, made of steel balls with extremely roundness in nanometers. It has long life and lighter weight, and uses it in a wide range of fields.



□ Bed springs

Developed steel for bed spring with high carbon steel wire material. It is excellent in elasticity, durability, shape conservation, contributing to the comfort of living.



□ Staples

The development of high-quality staples is achieved by a mild steel wire material that achieves optimum strength and dimensional stability by original component design.

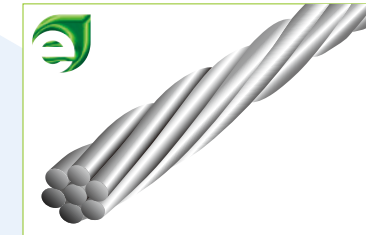
Representative eco-products

NIPPON STEEL offers eco products that reduce the burden on the environment to the maximum extent, within the flow of: "mining raw materials > transportation > manufacturing of steel materials > forming and assembly of parts and members > use of the product by the customer > recycling," by means of its technical development strength – one of the best in the world – and based on the philosophy of LCA (Life Cycle Assessment). We are introducing our representative products.



□ PWS (Parallel wire strand)

In order to respond to customers' needs for long bridge projects, which are expanding all over the world, we have developed products with the world's highest strength up to a 2.0GPa grade using our original process (DLP).



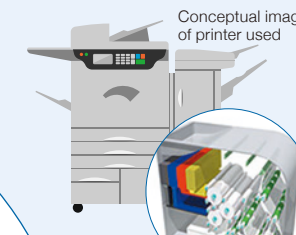
□ Power transmission / distribution lines

The Plated steel wires with high corrosion resistance and steel stranded wires using hard steel wire rod have reduced the life-cycle cost, and also contributed to the LCA of end products.



□ Connecting rod

The steel for cracking connecting rods with both high fatigue strength and cutting formability. Contributing to reducing CO₂ emissions by realizing lighter and better fuel economy for automobiles.



Example of using OA shaft (light-blue part)

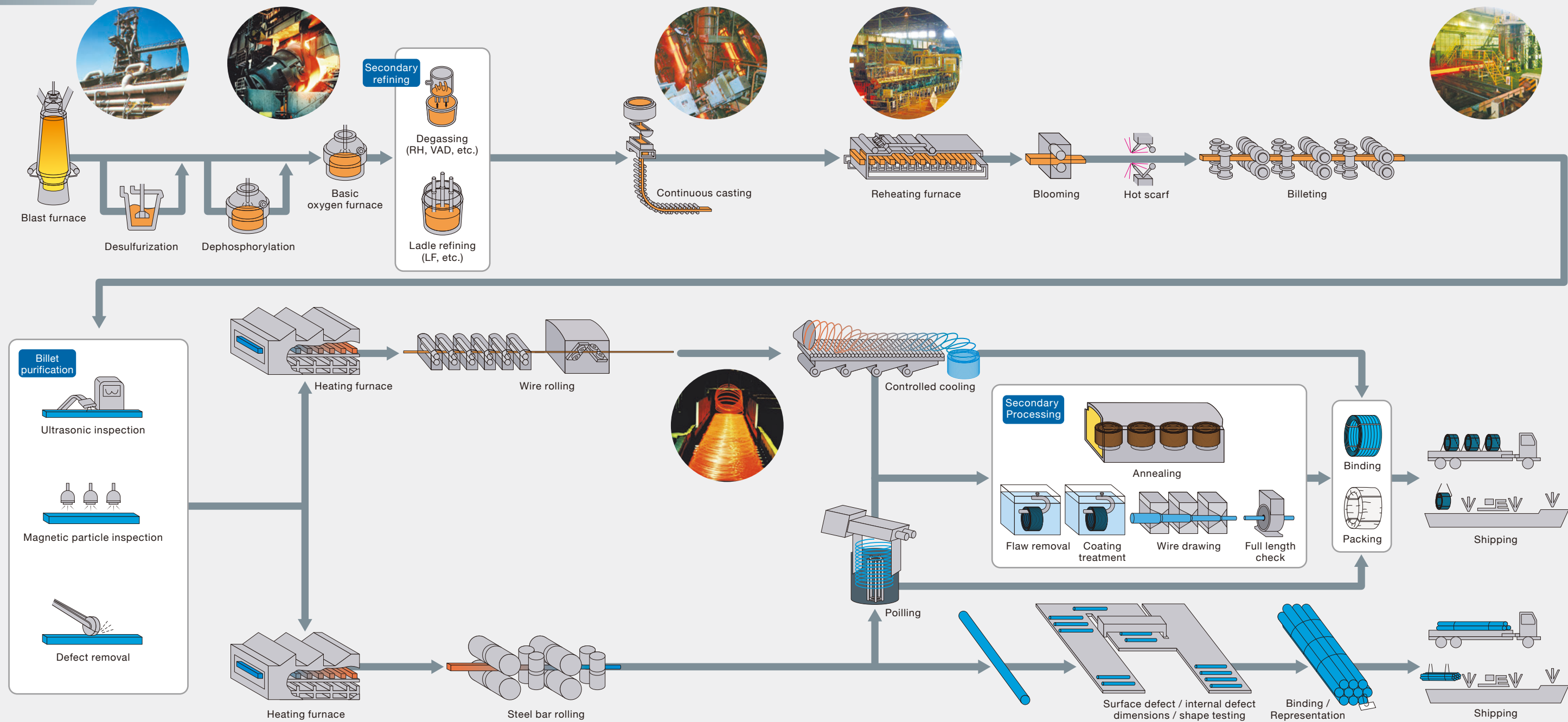


□ OA shafts

Developed low-carbon and lead-free free-cutting steel with low environmental impact. Excellent cutting formability improves productivity and realizes the OA shafts of smooth machined surfaces.

Area	Application	Product name and characteristics		
Automobiles	Engine	Hot forged parts	High-strength non-refining steel for hot forging	•Component design according to the purpose, form and size of forged products on the customer side
		Cold forged parts	Steel bar for cold forging	•A wide range of strength and excellent workability •Component design according to the purpose and processing type of customers
		Connecting rod	Steel for high-strength connecting rod	•High fatigue and high buckling non-refining steel •Steel for cracking that provides compatibility of high fatigue strength and machinability
		Valve spring	Wire rods for high-strength valve springs	•High cleanliness and long life •Satisfies both high strength and good workability
	Transmission	Gear	Steel for high-strength gears (XG5, CM201, etc.)	•Optimal component design according to customers' needs •XG5:excellent tooth strength and tooth bending strength •CM201:excellent cycle bending strength, reduces carburized abnormal layers and provides thick carburized hardening-layers
		Parts for soft nitriding	Low-distortion and high-durability steel for soft nitriding	•Pitching resistance resulting from hardening of deep layers, high fatigue strength
		Carburized parts	Coarse grain prevention steel (NSACE™)	•Coarse grain prevention during high-temperature carburizing
			Mild alloy	•Same components as standardized steel •Reduces hardness with the same rolling method
		Super mild alloy	•Addition of trace elements •Hardness equivalent to spheroidizing annealing (SA) with the same rolling method	
	Suspension	High-frequency quenched parts	Steel for high-strength, high-frequency quenching	•Excellent bearing fatigue strength and bending fatigue strength •Optimal component design according to customers' needs
		Cold headed parts	Super Forge (SF)	•Controlled rolling – the combination of controlled cooling and spheroidizing annealing improves the level of spheroidizing of carbides
		Shafts	Steel for direct normalizing treatment (FG, DN) High-strength, high-toughness steel without the quench-and-temper process	•Refining of structures using the controlled rolling method •Our unique rolling method achieves high strength and high toughness equivalent to quenched and tempered steel
		Suspension springs	Steel for high-strength suspension springs	•Excellent hydrogen embrittlement resistance and toughness
		Tires	Wire rod for steel tire codes	•Reduces hard inclusions and segregation •Stable code property (strength, etc.) with small component fluctuations •Our original high strength component design •Thin wire rod (can supply wire rod with diameters of 3.8Φ, 4.0Φ and 4.5Φ)
	Fastener	Bolts and nuts	Steel for high-strength bolts (MB series, ADS series)	•Controls hydrogen embrittlement (delayed fracture) and contributes to high strength
			Boron steel for cold forging (SBR, NHB™)	•Maintains adequate bolt strength without a spheroidizing annealing process by reducing the carbon amount and adding boron
			Non-refining steel for cold forging (NHF™, SUC80D)	•Our original high-strength and non-refining component design
			Non-annealing type low-carbon aluminum killed steel (SNH*: A/B)	•Prevents strain aging
			New soft wire rod (DS, DL)	•In-line softening treatment realizes a hardness level equivalent to that of the normal annealing with the same rolling process
			Simplified annealing wire rod (ED, EC, ES)	•In-line softening treatment realizes uniform refining of annealing structures •Reduces hardness level after annealing
Industrial and electrical machinery	Industrial and electrical machinery	Cutting parts	Non-refining steel for direct cutting	•A wide range of strength •Component design according to customers' purposes
			Free-cutting steel for machine structure	•Mechanical characteristics equivalent to carbon steel for mechanical structure and alloy steel for mechanical structure •Excellent machinability
			SUMI-CUT™ (low-carbon free-cutting steel)	•Excellent machinability (containing sulfur, sulfur + lead)
			Lead-free free-cutting steel (EZ, SMIGREEN™S, T, CS)	•Excellent machinability (no lead added)
	Solar power (saw wires)	Wire rod for saw wire (SPURKS™)	•High cleanliness and surface uniformity •Thin wire rod (can supply wire rod with diameters of 3.8Φ, 4.0Φ, 4.5)	
Construction and public works	Construction and public infrastructure	High power bolts	SHTB™, steel for high-tension bolt	•Controls hydrogen embrittlement and contributes to high strength
			Steel for fire resistant bolts	•Excellent fire resistance
			Steel for weather resistant bolts	•Excellent weather resistance
	Bridge cables	Wire rod for high-strength bridge cables	•Thick and high strength materials •Received the "Main Award" of the 47th (FY 2014) Ichimura Prize in Industry	
		Chains	Steel for high-strength chains	•Our original component design contributes to high strength
		Wire mesh for bank protection, fences, power transmission / distribution lines, etc.	TOUGH GUARD™ series	•Holds about 5 times more corrosion resistance than the conventional zinc aluminum alloy *Based on the corrosive loss evaluation by plate type in 5,000 hours of salt water spraying
Common area	Common area	Steel codes, piano wires, hard steel wires, wire rods for welding, etc.	Thin wire rod (5.0Φ, 4.5Φ, 4.0Φ, 3.8Φ, 3.6Φ)	•Wire diameter (thin) •Excellent wire drawing capability
		Bridge cable, cold forged parts, etc.	DLP™ wire rod (DLP™: Direct in-Line Patenting)	•Our original in-line heat treatment wire rod •Excellent balance of strength and extension •Can be used for a wide range of purposes

Advantages for customers	High strength weight reduction	Omission of process Easy workability	Environmental response Others
•Enables omission of quenching and tempering processes	●	●	●
•Enables cold forging for a wide range of purposes and processing types		●	●
•Contributes to weight reduction and fuel improvement	●	●	
•Enables omission of manufacturing processes	●		
•Reduces string weight and engine size	●		
•Contributes to weight reduction and fuel improvement	●	●	●
•Enables cold forging in combination with spheroidizing heat treatment		●	
•XG5:enables cold forging		●	
•CM201:realizes longer fatigue life		●	
•Enables omission of the tooth repair cutting process by quenching to reduce distortion	●	●	●
•Enables omission of high-temperature carburizing and intermediate heat treatment processes		●	●
•Enables omission of the annealing treatment process before cold processing		●	●
•Same hardness distribution as conventional materials after carburizing and quenching		●	●
•Enables omission of the annealing treatment process before cold processing		●	●
•Enables further softening and extension of life of metal molds when SA is adapted		●	●
•Enables omission of the carburizing heat treatment process	●		
•Contributes to high-torque types and reducing part size	●		
•Contributes to increasing the limit of processing when forging		●	
•Enables omission of the normalizing treatment process		●	●
•The steel is available to reduce the quench-and-temper process		●	●
•Contributes to the improvement of suspension design flexibility and weight reduction	●		
•Enables a stable wire drawing processing that prevents disconnection	●	●	●
•High-strength special component menu enables weight reduction of tires	●	●	●
•Thin wire rod menu enables omission of processes	●	●	●
•Contributes to the weight reduction by decreasing bolt size and the number of construction bolts	●	●	●
•Enables simplification of heat treatment process		●	
•Reduces costs for alloy steel		●	
•Enables omission of quenching and tempering processes after cold forging (requires bluing treatment)		●	●
•Enables cold forging while maintaining high strength		●	●
•Enables repeated processes without annealing		●	●
•Small processing hardening during cold forging		●	●
•Extends the life span of metal molds		●	●
•Enables omission of the annealing process after wire drawing		●	●
•Extends the life span of metal molds		●	●
•Enables simplification (omission of grinding) in the wire drawing process		●	●
•Enables omission of quenching and tempering processes		●	●
•Extends the life span of tools		●	
•Increases productivity		●	
•Extends the life span of tools	●	●	●
•Increases productivity	●	●	●
•Reduces environmental load substances	●	●	●
•Reduces wire disconnection during wire drawing and cutting processes	●	●	●
•Reduces the cutting loss of silicon wafer, etc. due to thin wires	●	●	●
•Enables reduction of the size of joint works and construction costs	●		
•Applied to connecting bolts of fire resistant (FR) steel for construction structures			●
•Applied to connecting bolts of steel structures such as bridges			●
•Enables the reduction of design flexibility of bridges and decrease of construction costs	●		
•Enables weight reduction of chains for mooring of marine structures, etc	●		
•Extends the life span and reduces costs			●
•Excellent environmental performance			●
•Enables omission of the patenting process	●	●	●
•Enables omission of the wire drawing process	●	●	●
•Enables omission of the heat treatment process (LP = lead patenting) by the customer		●	●
•Contributes to environmental load reduction by saving energy		●	●
•Contributes to the reduction of environmental load substances		●	●



On-site capability that supports advanced technologies

Cultivation of human resources at manufacturing sites

We are committed to improving the skills of each worker who manufactures products in order to build steel materials, which are designed using advanced technologies, with elaborate work in a precise and stable manner. We train workers to become an "artisan" with a high level of skill through the integrated program, who fulfill the demands of customers.

Producing prominent craftsmen

Our site workers strive to acquire the world's top level skills in order to manufacture high-quality products. Many of our skilled workers have received honorable recognition from the government such as the Contemporary Master Craftsman^{*1} or Medal with Yellow Ribbon^{*2}.

^{*1} : Contemporary Master Craftsman: recognition given to those who contributed to the development of industry with excellent skills.

^{*2} : Medal with a Yellow Ribbon: recognition given to those who have persevered in a task on the front lines and have acquired skills or made achievements that can be a role model for others.



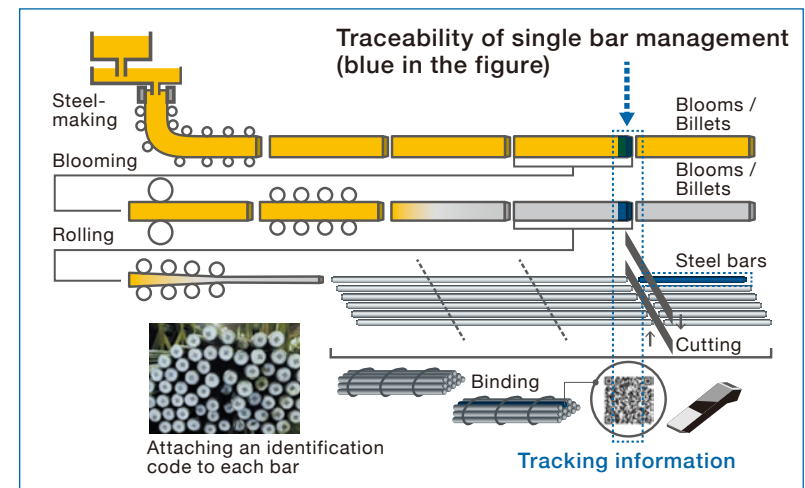
Integrated traceability system

Steel materials are manufactured under strict quality control. The manufacturing history can be traced back to the rolling and steelmaking process by one product unit*, which ensures the reliability and safety of products.

* Wire rod : 1 coil unit, steel bar : shifted from 1 lot unit to an integrated management system.

First in the industry!

Up to approximately 200 bars are manufactured from a single billet. In the past, accurate tracking after the cutting process was difficult. Our system can conduct a trace back to the casting section for even a single bar, based on our own in-house technologies.

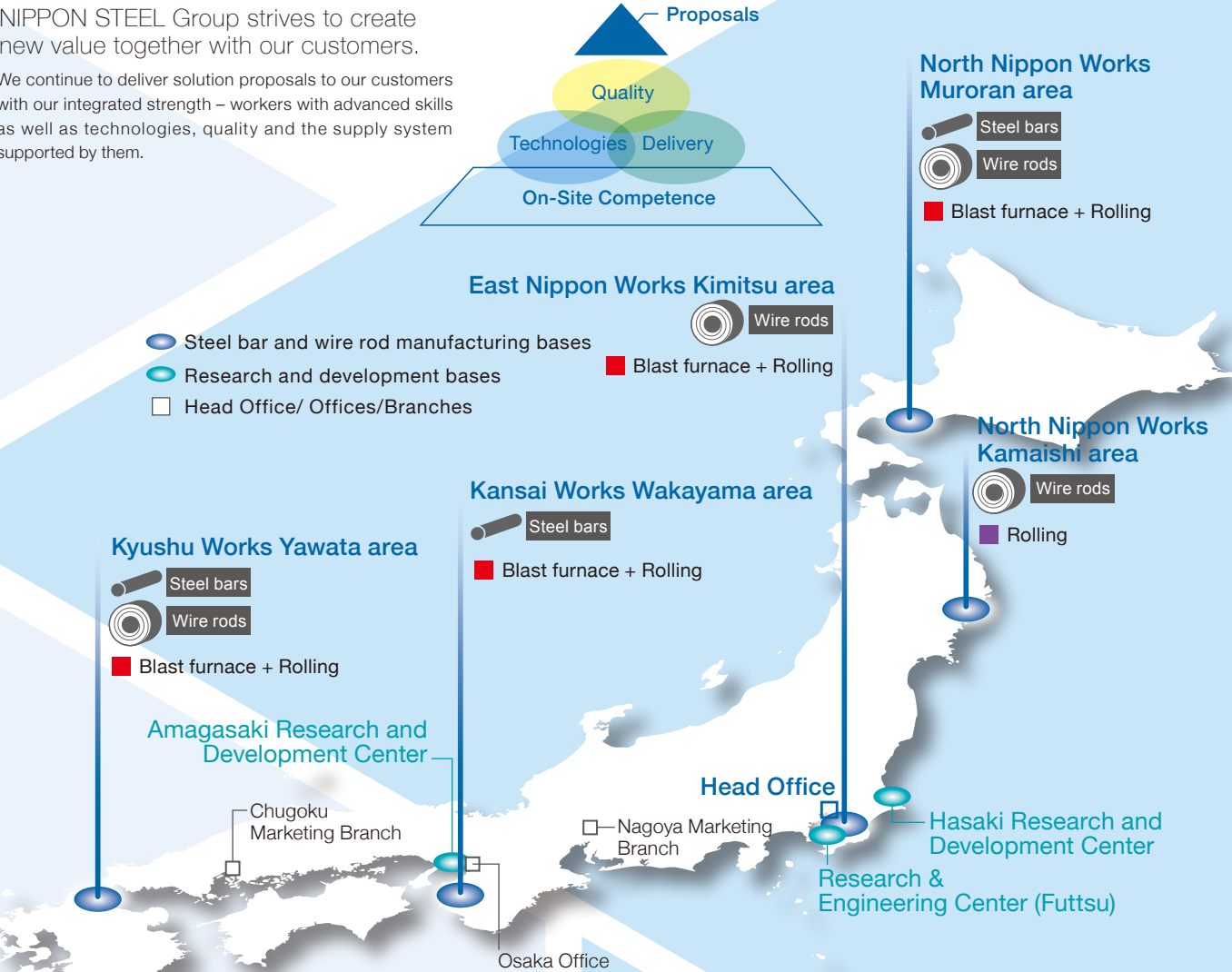


* System handled only by Muroran area.

Multiple steelworks provide strong supply capabilities.

NIPPON STEEL boosts the steelmaking technologies of 100-year results, working alongside the Japanese manufacturing industry. Centering on the 13 nationwide manufacturing sites having know-how accumulated over many years and state-of-the-art technologies, we stably supply high-quality Japan-made products in cooperation with each research laboratory.

NIPPON STEEL Group strives to create new value together with our customers. We continue to deliver solution proposals to our customers with our integrated strength – workers with advanced skills as well as technologies, quality and the supply system supported by them.



Stable supply system with multiple steelworks

With 5 blast furnace bases and 5 rolling mill bases (3 steel bar steelworks and 4 wire rod steelworks), our Bar & Wire Rod Unit can respond to environmental changes and contingencies in a prompt and flexible manner. Also, a system to source steel from other varieties has been developed so that we can address a long-term disaster during a customer's BCP (business continuity plan). We received good reviews from customers for our stable quality and delivery during the Great East Japan Earthquake.

Stable and reliable product transport system

We utilize automated high-rise warehouses to store rolled coils, in order to avoid accidental flaws or rust. For transportation, we have introduced small roll-on/roll-off ships for steel bars and wire rods. Products are directly loaded onto and unloaded from such ships using pallets, which reduces the handling time. We have also introduced all-weather berths for stable delivery, which allow us to stably transport products without being influenced by weather.



Manufacturing technologies, material design

Our technologies and design meet customers' demands for high strength, high quality, cost reduction, environmental response, etc.

A wide range of steel types

We design the most suitable carbon amount and alloy ingredients in order to realize an adequate range of strength for customers' use.

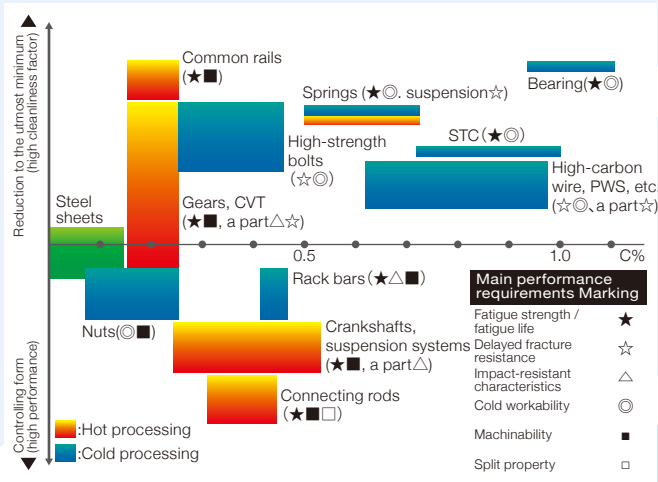
Inclusion control

We are able to reduce the level of non-metal inclusions to the limit. We also suggest the active use of non-metal materials by controlling the form.

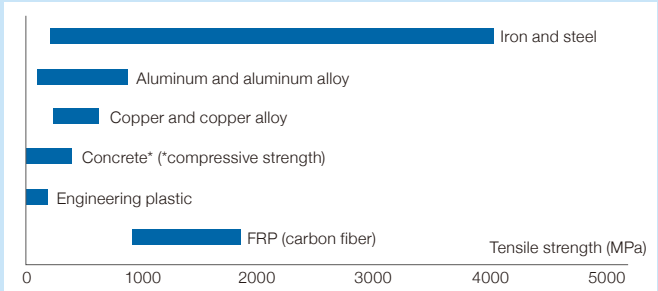
Technologies and skills for manufacturing

We are committed to the accurate and stable manufacturing of steel that is elaborately designed, using state-of-the-art manufacturing facilities, advanced production technologies, and skills of experienced engineers.

Designing the carbon amount and inclusions based on purposes and parts



Comparison of strengths of various materials

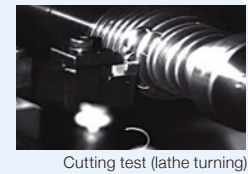


Processing and heat treatment technologies

We are committed to various research areas including technologies for usage and solution, which provide support to the manufacturing process of customers. This can offer customers with proposals for the omission of processes, cost reduction and functional improvement of parts.

Cutting technology

We are working on simulations to evaluate the machinability of steel materials using various cutting techniques (such as turning and drilling). We are proposing to customers not only new materials with improved machinability but also cutting conditions for those materials.



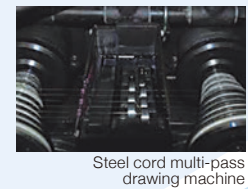
Forging technology

By making full use of our state-of-the-art forging testing machines and simulation technology, we are engaged in research and development on the optimum design of forging processes and the prediction of critical cracking stress during forging.



Secondary and tertiary processing techniques

We are also working on technical developments in the fields of secondary and tertiary processing, including wire drawing. In addition, we are proposing steel products that will demonstrate their true value when processed and heat treated by customers, such as steel wire rods for high-strength steel cord.



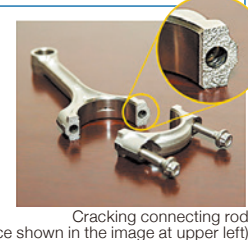
Heat treatment technology

By making full use of our state-of-the-art heat treatment testing facility and simulation-based predictions of heat treatment distortion, we provide customers with recommended heat treatment conditions. By utilizing a huge amount of material property data, which is one of the strengths of a steelmaker, heat treatment distortion can be predicted for any type of steel material.



Fracture-splitting technologies

We assist customers in developing processing methods, all through our abundant technologies for steel materials. For example, we have developed fracture-splitting/cracking steel for high strength connecting rods that are formed in one piece, then cracked, and then assembled again, which reduces both engine weight and manufacturing costs.



Process			North Nippon (Muroran)			North Nippon (Kamaishi)			
Iron-making	Blast furnace capacity x Number of furnaces		2902m³ × 1 furnace						
Steel-making	Preliminary processing	Molten iron pretreatment (TPC type)							
	Basic oxygen furnace capacity x number of converter furnaces	270T / CH × 2 furnaces							
	Continuous casting	350 × 560mm (4 strands), 220 × 220mm (6 strands)							
	Refining equipment	Vacuum degasser (RH), outside-furnace refining equipment (LF)							
Blooming	Blooming roller		Hot scarf + VH continuous system (hot scarf + dual reversing system + VH continuous system)						
Billet purification			Shot blasting, supersonic detector, magnetic particle detector, defect removal device						Shot blast, ultrasonic test equipment, magnaflux tester, defect removing machine
Rolling			Steel bar factory		Wire rod factory		Wire rod factory		
	Forms of rollers		Continuous type VH mill + high-rigidity 3-roll finishing mill		Continuous type VH mill + NT block mill + high precision finishing mill		Continuous type HH mill + NT block mill + mini block mill (MBM)		
	Number of strands		1		1		2		
	Controlled cooling		BIC: Air blast cooling, slow cooling		Warm water/cold water EDC, dry, retarded		Air blast cooling, SCS		
	Cooling bed		Fullrehen method (with slow cooling cover)		—		—		
	Cutter		Cold cutter		—		—		
	Online inspection machine		Hot eddy current tester, Profile meter		Hot eddy current tester, Profile meter		Hot eddy current tester, Profile meter		
Product finishing	Offline inspection machine		Supersonic detector, Magnetic particle detector, Magnetic leakage flux tester (MLFT)		—		—		
Secondary processing			Continuous annealing furnace, batch annealing furnace, continuous acid cleaning bonderizing equipment, full-length defect detection equipment			—			
Product specifications			BAR	BIC	WR		WR		
	Dimensional range		φ19~120	φ19~60	φ5.5~22.0		φ3.6~16.0*		
	Product weight		Approx. 2t /binding	2.5t maximum, 2.0t standard	2.5t maximum, 2.0t standard		Standard 2.0t		
	Coil outer diameter*		—	1300mm	1300mm		1320mm		
	Coil inner diameter*		—	1000mm	980mm		880mm		
	Coil height*		—	1600mm full, 1000mm half	1700mm full, 1000mm half		1500mm full, 750mm half		
	Coil winding direction		—	Counterclockwise	Counterclockwise φ9 or less : Clockwise [counterclockwise]		Clockwise winding [counterclockwise winding]		
					φ9 or more : Counterclockwise [clockwise]				
	Uni-fying		Score	3 bindings or 4 bindings	4 bindings	4 bindings		4 bindings	
			Material	Annealed wire or hoop	Hoop	Hoop		Hoop	
			Large unification	—	Half 2-coil	Half 2-coil		Half 2-coil	
Remarks						Inside [] indicates a possibility with equipment.		Inside [] indicates a possibility with equipment. * The coil small-diameter size (φ3.6-4.0) may have a restriction in product type or application. Please consult us.	

* Approximate value

East Nippon (Kimitsu)	Kyushu (Yawata)		
4500 m³, 5555 m³, 2 furnaces	5000m³ x 1 furnace		
Molten iron pretreatment, KR	Molten iron pretreatment (TPC type), KR		
255T / CH x 2 furnaces	350T/CH x 2 furnaces		
305 x 502mm (4 strands)	339 x 456mm (6-strand)		
Vacuum degasser (REDA), outside-furnace refining equipment (KIP)	Vacuum degasser (REDA), outside-furnace refining equipment (LF)		
Dual reversing system + hot scarf + VH continuous system	Dual reversing system + hot scarf + VH continuous system		
Shot blast, ultrasonic test equipment, magnaflux tester, defect removing machine	Shot blast, ultrasonic test equipment, magnaflux tester, defect removing machine		
Wire rod factory	Steel bar factory	Wire rod factory	
Continuous type HH mill + high-rigidity 3-roll intermediate mill + NT block mill	Continuous type VH mill + high-rigidity 3-roll finishing mill(RSB) + NT block mill	Full continuous VH mill + high-rigidity 3-roll intermediate mill + NT block mill	
4	1	1	
Air blast cooling, DLP	BIC : Air blast cooling, wind cooling	Air blast cooling	
—	Fullrehen method	—	
—	Cold shearing machine	—	
Hot eddy current flaw detector, profile meter	Hot eddy current flaw detector, profile meter	Hot eddy current flaw detector, profile meter	
—	Supersonic detector, Magnetic leakage flux tester(MLFT), Eddy current tester (ET)		
—	Continuous heat-treatment furnace (coil), STC furnace (bar), intermediate processing line, micro mill (cold rolling)		
WR	BAR	BIC	WR
φ5.0～16.0	φ19～120 □50～350	φ18.0～52.0	φ5.5～21.0
2.0t standard	Approx. 2t / unification	Maximum 3.0t, standard 2.0t	2.0t standard
1220mm	—	1400mm	1350mm
830mm	—	950mm	900mm
1550mm full, 850mm half	—	1100mm full, 550mm half	1650mm full, 900mm half
Clockwise winding	—	Counterclockwise winding	Counterclockwise winding
4 bindings	3 to 6 bindings	4 bindings	4 bindings
Hoop	Annealing wire	Hoop	Hoop
Half 2-coil	—	Half 2-coil	Half 2-coil

* Those only related to rolled steel bars/wire rods in the factory are described.

1. Manufacturing sizes (mm)

Coil (φ)		
3.6 *	13.0	29.5
3.8 *	13.3	30.0
4.0 *	13.5	31.0
4.5	14.0	31.2
5.0	14.3	31.75
5.5	14.5	32.0
5.7	14.7	32.5
5.9	15.0	33.0
6.0	15.3	34.0
6.15	15.5	34.5
6.35	15.7	35.0
6.4	16.0	36.0
6.5	16.3	36.45
6.75	16.5	37.0
7.0	16.7	37.45
7.1	17.0	38.0
7.3	17.5	39.0
7.4	18.0	39.69
7.5	18.3	40.0
7.65	18.5	41.0
8.0	18.7	42.0
8.3	19.0	42.86
8.33	19.4	43.0
8.5	19.5	43.5
8.7	19.6	44.0
8.73	20.0	44.5
9.0	20.6	45.0
9.2	21.0	46.0
9.5	21.5	47.0
9.7	22.0	48.0 *
9.75	22.3	48.5 *
10.0	22.6	49.0 *
10.3	23.0	50.0 *
10.5	23.5	50.8 *
10.7	24.0	51.0 *
11.0	24.5	52.0 *
11.1	25.0	53.0 *
11.3	25.4	54.0 *
11.5	26.0	55.0 *
11.8	26.4	56.0 *
11.9	27.0	57.0 *
12.0	27.5	58.0 *
12.3	28.0	59.0 *
12.5	28.6	60.0 *
12.7	29.0	

Round bar (φ)		
19.0	54.0	100.0
20.0	55.0	102.0
21.0	57.0	103.0
22.0	57.15	105.0
22.22	58.0	106.0
23.0	60.0	107.0
24.0	62.0	108.0
25.0	63.0	110.0
25.4	63.50	115.0
26.0	65.0	117.0
27.0	66.68	119.0
28.0	67.0	120.0
28.58	68.0	123.0
29.0	69.85	125.0
30.0	70.0	130.0
31.0	71.0	135.0 *
31.75	72.0	140.0 *
32.0	73.0	145.0 *
33.0	73.02	150.0 *
34.0	74.0	155.0 *
34.92	75.0	160.0 *
35.0	76.0	170.0 *
36.0	76.20	180.0 *
37.0	77.0	190.0 *
38.0	78.0	200.0 *
38.10	79.0	210.0 *
39.0	80.0	220.0 *
40.0	81.0	230.0 *
41.0	82.0	240.0 *
41.28	82.55	250.0 *
42.0	83.0	260.0 *
43.0	84.0	270.0 *
44.0	85.0	280.0 *
44.45	86.0	290.0
45.0	87.0	300.0
46.0	88.0	310.0
47.0	90.0	320.0
47.62	91.0	330.0
48.0	92.0	340.0
48.5	92.08	350.0
49.0	93.0	360.0
50.0	94.0	370.0
50.80	95.0	380.0
51.0	95.25	390.0
52.0	96.0	400.0
53.0	97.0	
53.98	98.0	

Square steel (□)	
50	*
55	*
57.15	*
58.7	*
60	*
63.5	*
65	*
70	*
75	*
80	*
83	*
85	*
90.0	*
93.0	*
95.0	*
100.0	
110.0	
115.0	
120.0	
125.0	*
130.0	*
140.0	*
150.0	*
160.0	*
162.0	*
180.0	*
190.0	*
235.0	*
250.0	*
280.0	*
300.0	*
340.0	*
350.0	*
400.0	*
450.0	*
500.0	*
550.0	*

2. Dimensional tolerance

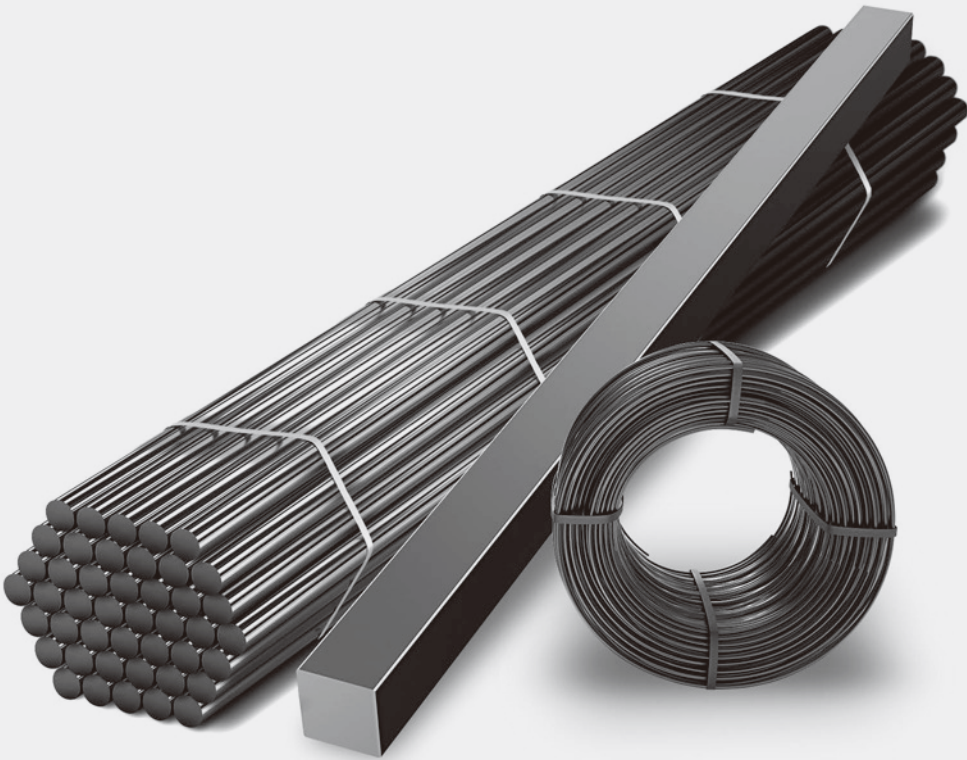
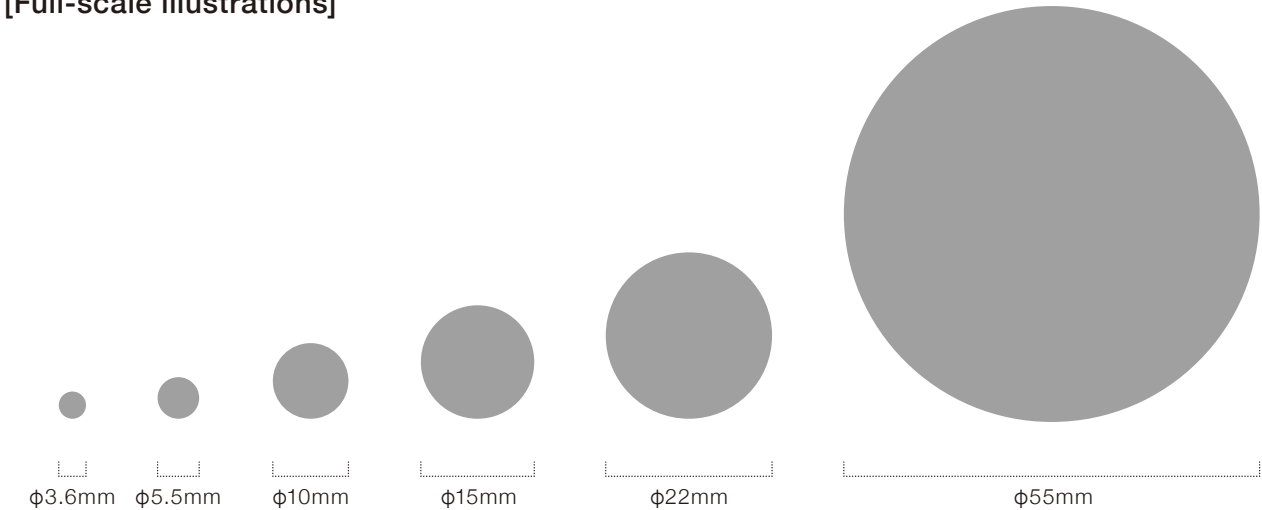
We use the JIS tolerance as the standard: When manufacturing with precise dimensions, consult us.

3. Manufacturable length

The length of 4.5-6.0m is regarded as standard, please consults us for lengths outside this standard.

* The coil small-diameter size (φ3.6-4.0) may have a restriction in product type or application. Please consult us.

[Full-scale illustrations]



When considering ordering the sizes marked * , consult us.
In some cases, we may receive orders of the sizes with a display of two decimal places by rounding them to one decimal place.

JIS (Japanese Industrial Standards)

(1) Carbon steel material for mechanical structures JIS G 4051				
S10C	S20C	S30C	S40C	S50C
S12C	S22C	S33C	S43C	S53C
S15C	S25C	S35C	S45C	S55C
S17C	S28C	S38C	S48C	S58C
S09CK	S15CK	S20CK		

(2) Steel material for steel alloys for mechanical structures JIS G 4053			
SMn420	SMn438	SMnC420	
SMn433	SMn443	SMnC443	
SCr415	SCr430	SCr440	
SCr420	SCr435	SCr445	
SCM415	SCM421	SCM432	SCM445
SCM418	SCM425	SCM435	SCM822
SCM420	SCM430	SCM440	
SNCM220	SNCM420	SNCM447	SNCM630
SNCM240	SNCM431	SNCM616	SNCM815
SNCM415	SNCM439	SNCM625	

(3) Steel material (H steel) for structures that assure hardenability JIS G 4052			
SMn420H	SMn438H	SMnC420H	
SMn433H	SMn443H	SMnC443H	
SCr415H	SCr430H	SCr440H	
SCr420H	SCr435H		
SCM415H	SCM420H	SCM435H	SCM445H
SCM418H	SCM425H	SCM440H	SCM822H
SNC415H	SNC631H	SNC815H	
SNCM220H	SNCM420H		

(4) Steel material for spring steel JIS G 4801			
SUP6	SUP9	SUP10	SUP12
SUP7	SUP9A	SUP11A	SUP13

(5) Bearing steel JIS G 4805			
SUJ2			

(6) Free-cutting steel material of sulfur and sulfur compositions JIS G 4804		
SUM21	SUM25	SUM41
SUM22	SUM31	SUM42
SUM23	SUM32	SUM43

(7) General steel material for cold finished steel bars JIS G 3108					
SGDA	SGDB	SGD1	SGD2	SGD3	SGD4

(8) Steel bars for concrete reinforcement JIS G 3112				
SR235	SR295			
SD295A	SD295B	SD345	SD390	SD490

(9) Rolled steel for general structures JIS G 3101			
SS330	SS400	SS490	SS540

(10) Low-carbon steel wire rods JIS G 3505			
SWRM2	SWRM8	SWRM15	SWRM22
SWRM4	SWRM10	SWRM17	
SWRM6	SWRM12	SWRM20	

(11) Wire rods for core wire of covered electrode JIS G 3503	
SWRY11	SWRY21

(12) Hard steel wire JIS G 3506			
SWRH27	SWRH32	SWRH37	
SWRH42A	SWRH52B	SWRH67A	SWRH77B
SWRH42B	SWRH57A	SWRH67B	SWRH82A
SWRH47A	SWRH57B	SWRH72A	SWRH82B
SWRH47B	SWRH62A	SWRH72B	
SWRH52A	SWRH62B	SWRH77A	

(13) Piano wire rods JIS G 3502			
SWRS62A	SWRS72B	SWRS80A	SWRS87B
SWRS62B	SWRS75A	SWRS80B	SWRS92A
SWRS67A	SWRS75B	SWRS82A	SWRS92B
SWRS67B	SWRS77A	SWRS82B	
SWRS72A	SWRS77B	SWRS87A	

(14) Carbon steel wire rods for cold heading and cold forging JIS G 3507-1		
SWRCH6R	SWRCH10R	SWRCH15R
SWRCH8R	SWRCH12R	SWRCH17R
SWRCH6A	SWRCH15A	SWRCH20A
SWRCH8A	SWRCH16A	SWRCH22A
SWRCH10A	SWRCH18A	SWRCH25A
SWRCH12A	SWRCH19A	
SWRCH10K	SWRCH22K	SWRCH38K
SWRCH12K	SWRCH24K	SWRCH40K
SWRCH15K	SWRCH25K	SWRCH41K
SWRCH16K	SWRCH27K	SWRCH43K
SWRCH17K	SWRCH30K	SWRCH45K
SWRCH18K	SWRCH33K	SWRCH48K
SWRCH20K	SWRCH35K	SWRCH50K

Japanese automobile standard organization JASO M 106

(1) Carbon steel and boron steel			
S10C	S22C	S35C	S48C
S12C	S25C	S38C	S50C
S15C	S28C	S40C	S53C
S17C	S30C	S43C	S55C
S20C	S33C	S45C	S58C
ASBo20	ASBo33	ASBo43	ASBo53
ASBo25	ASBo35	ASBo45	
ASBo28	ASBo38	ASBo48	
ASBo30	ASBo40	ASBo50	

(2) H-steel		
ASMn420H	ASMn435H	ASMn448H
ASMn425H	SMn438H	ASMn453H
ASMn430H	ASMn440H	
SMn433H	ASMn443H	
ASMnB220H	ASMnB422H	ASMnB433H
ASMnB233H	ASMnB425H	ASMnB443H
ASMnC420H	ASMnC520H	
SMnC443H	ASMnC543H	
ASMnCB440H		
SCr415H	ASCr423H	SCr435H
ASCr418H	ASCr425H	SCr440H
SCr420H	SCr430H	ASCr445H
ASCB435H	ASCB440H	
ASCM115H	ASCM320H	SCM435H
ASCM118H	ASCM325H	SCM440H
ASCM120H	SCM415H	SCM445H
ASCM125H	SCM418H	SCM822H
ASCM315H	SCM420H	
ASCM318H	ASCM430H	
SNCM220H	SNCM420H	

(3) Free-cutting steel (Addition or change concerning the components of free-cutting steel)		
.....L1*	S0	S2
.....L2*	S1	

Remarks : * With regard to lead-added steel, please contact us in advance.

SAE (Society of Automotive Engineers)

(1) Carbon steel SAE J403	
Steel type mark	UNS No.
(i) Standard carbon steel	
1005	G10050
1006	G10060
1008	G10080
1010	G10100
1012	G10120
1013	G10130
1015	G10150
1016	G10160
1017	G10170
1018	G10180
1019	G10190
1020	G10200
1021	G10210
1022	G10220
1023	G10230
1025	G10250
1026	G10260
1029	G10290
1030	G10300
1035	G10350
1037	G10370
1038	G10380
1039	G10390
1040	G10400
1042	G10420
1043	G10430
1044	G10440
1045	G10450
1046	G10460
1049	G10490
1050	G10500
1053	G10530
1055	G10550
1060	G10600
1065	G10650
1070	G10700
1074	G10740
1075	G10750
1078	G10780
1080	G10800
1084	G10840

(1) Carbon steel (continued) SAE J403	
Steel type mark	UNS No.
(ii) Manganese carbon steel	
1522	G15220
1524	G15240
1526	G15260
1527	G15270
1536	G15360
1541	G15410
1548	G15480
1552	G15520
1566	G15660

(2) Sulfur free cutting steel SAE J403	
Steel type mark	UNS No.
(i) Sulfur free cutting steel	
1117	G11170
1118	G11180
1137	G11370
1140	G11400
1141	G11410
1144	G11440
1146	G11460
1151	G11510
(ii) Phosphorus, sulfur	
1212	G12120
1213	G12130
1215	G12150

(3) Alloy steel SAE J404	
Steel type mark	UNS No.
(i) Mn steel	
1330	G13300
1335	G13350
1340	G13400
1345	G13450
(ii) Mo steel	
4023	G40230
4027	G40270
4037	G40370
4047	G40470

(3) Alloy steel (continued) SAE J404	
Steel type mark	UNS No.
(iii) Cr-Mo steel	
4118	G41180
4130	G41300
4135	G41350
4137	G41370
4140	G41400
4142	G41420
4145	G41450
4150	G41500

(iv) Ni-Cr-Mo steel	
4320	G43200
4340	G43400

(v) Mo-Ni steel	
4615	G46150
4617	G46170
4620	G46200
4817	G48170
4820	G48200

(vi) Cr steel	
50B46	G50461
5115	G51150
5120	G51200
5130	G51300
5132	G51320
5140	G51400
5150	G51500
5160	G51600
51B60	G51601
52100	G52986

(vii) Cr-V steel	
6150	G61500

(viii) Ni-Cr-Mo steel	
8615	G86150
8617	G86170
8620	G86200
8622	G86220
8625	G86250
8627	G86270
8630	G86300
8637	G86370
8640	G86400
8645	G86450
8655	G86550
8720	G87200
8740	G87420
8822	G88220

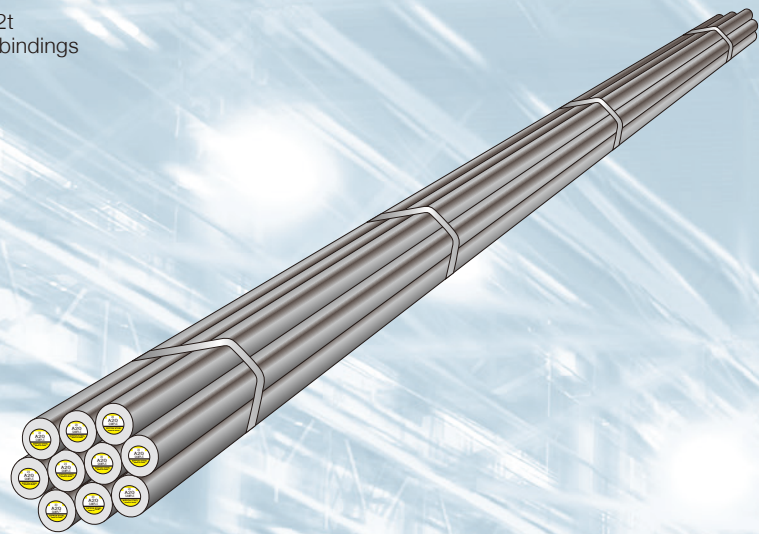
(ix) Si-Mn steel	
9254	G92540
9260	G92600

*In case representation of the JIS mark is required, please confirm separately.

Steel bars

Example of bindings

Binding mass : approx. 2t
Binding method : 3 to 6 bindings



Example of representation

1.End face label of steel bars

A label is attached to the end face of one side of a steel bar.



2.Bill

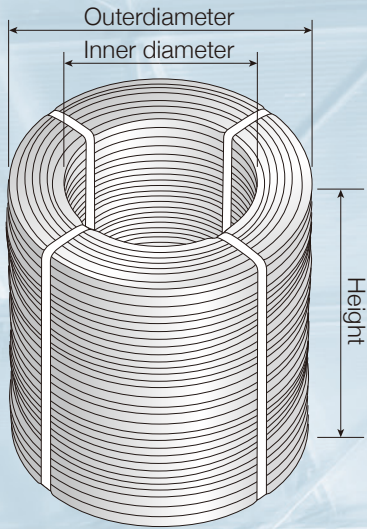
Specification	
Size x length	
No. of pcs	Chemical Composition
Mass	Component value
Cast No.	Lot number
Ins No.	Contract No.
Customer	
Unloading place	
NIPPON STEEL Muroran Works Made in Japan	

3.Cargo tag

NIPPON STEEL Yawata Made in Japan	
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Wire rods

Example of bindings

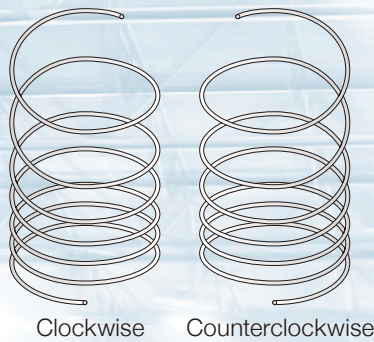


Example of representation

Bill

Specification	
Size	Cast No.
Coil No.	
Mass	
Cast No.	Coil No.
Chemical Composition	Symbol
Contract No.	YYMM
Customer	
NIPPON STEEL Steelworks name Made in Japan SteelInc™	

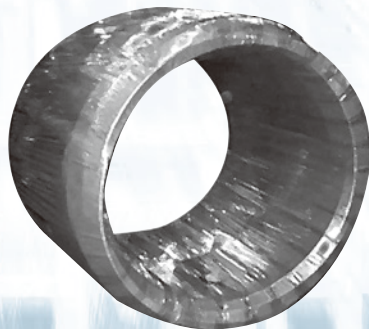
Coil winding



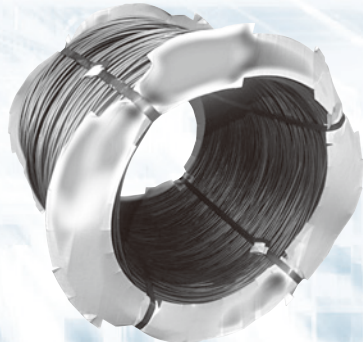
Clockwise : Clockwise from start to end of coil
Counterclockwise : Counterclockwise from start to end of coil

Example of packing

□ Gaiter winding



□ End surface packing



□ PP cloth



memo 1cm grid

