NIPPON STEEL

http://www.nipponsteel.com/

SteeLinC™is a brand of the Bar & Wire Rod of NIPPON STEEL CORPORATION

[Brand Statement]

SteeLinC™ 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.

NIPPON STEEL CORPORATION
2-6-1 Marunouchi, Chiyoda-ku,Tokyo 100-8071 Japan

SteeLinC Brand pamphlet
B102en_05_202205f

NIPPON STEEL

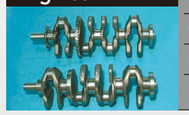
SteeLinC™
NEW STEEL AGE

NET ZERO
NIPPON STEEL
Green Transformation
initiative

NIPPON STEEL CORPORATION

High-end products to customers, which are made by realizing the ultimate potential of steel

We have released innovative new products that contribute to the high strength, high durability, omission of process and environmental response.
We will continue to provide the world's most advanced steel material products in response to the needs of society.

Sector	Application	High strength Low weight	Omission of processing operatins Enhanced workability	Environmentally friendly Others
Autmobiles and constructin machinery				
Engines 	Hot-forged parts	High-strength untempered steel for hot forging		
	Cold-headed parts		Steel bars for cold heading	
	Connecting rods	High-strength steel for FS/cracking connecting rods		
	Valve springs	Wire rods high-strength valve springs		
Transmissions 	Gears	Steel for high-strength gears (XG5), etc.		
	Nitrocarburized parts	Highly durable nitrocarburized steel with low distortion		
	Carburized parts	Steel for mild carburization		
		Steel that prevents large grain (NSACE™)		
		Mild alloy and super mild alloy		
Suspension systems 	High-frequency hardened parts	Steel for high-frequency hardning with high strength		
	Cold-headed parts		Super forging (SF)	
	Shafts		Directly normalized processed steel (FG and DN)	
	Suspension springs	High-strength suspension spring steel		
	Tires	Wire rods for steel tire cords		
Fasteners 	Bolts and nuts	Steel for high-strength bolts (MB series, and ADS series)	Boron steel for cold forging (SBR and NHB™)	
			Untempered steel for cold foging (NHF™ and SUC80D)	
			Law-carbon aluminium killed steel without annealing (SNH**A/B)	
			New soft wire rods (DS)	
			Soft wire rods (SCS™)	
			Wire rods with simplified annealing (ED, EC, and ES)	
Industrial machinery and electric machinery				
	Cuttung parts	High-toughness steel	Untempered steel for direct cutting	
	Solar power generation (saw wires)		Free-cutting steel for machine construction	Lead-free free-cutting steel (EZ, SumiGreen™ S, T, and CS)
		Wire rods for saw waire (SPURKS™)		
Constructin and public works				
	High strength bolts	SHTB™ , Steel for high-tension bolts		Steel for fire-resistant bolts Steel for weather-resistant bolts
	Bridge cables	Wire rods for high-strength bridge cables	DLP™ wire rods	
	Concrets	Wire rods for high-strength PC steel wires Steel for high-strength shearing reinforoement bars (NS High Deck™ and KSS785)	Direct-quenched wire rods (NHQ™)	
	Chains	Steel for high-strength chains		

What's the SteeLinC built-in ?
It's a proof that the world's most advanced SteeLinC products are used.

SteeLinC™ NEW STEEL AGE + built-in =

SteeLinC™ built-in NIPPON STEEL Japan Quality

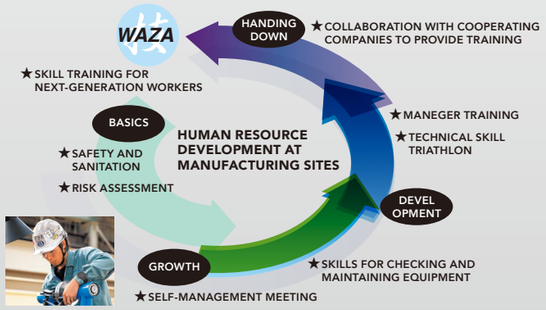
Advanced technology and on-site competence

Our level of craftsmanship allows us to satisfy any request.

Advanced technology supported by our prowess in the field

Developing 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 excellent engineers

We encourage workers to acquire skills that are unparalleled the world over. Many of our workers have received national awards, such as the Award of Contemporary Master Craftsmen*1 and Medal with Yellow Ribbon.*2

*1 Award of Contemporary Master Craftsmen: To be awarded to people who have excellent skills and who have contributed to the development of industry
*2 Medal with Yellow Ribbon: To be awarded to engineers who have worked hard on the frontlines and who are good examples for others

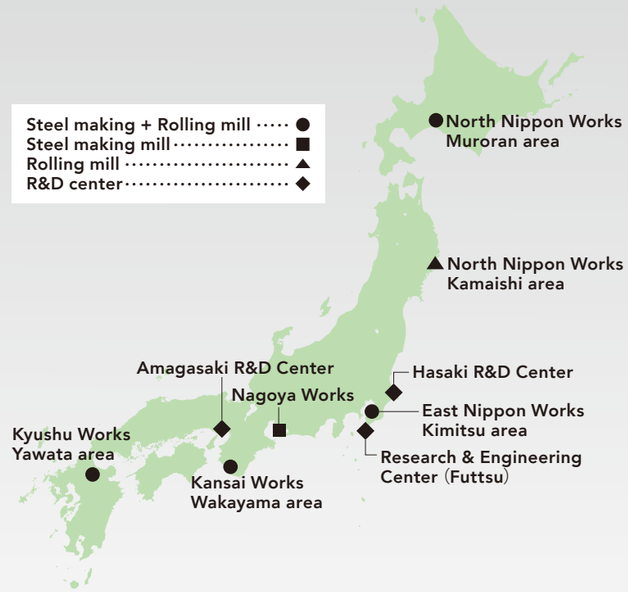
Has excellent skills for managing the quality of wire rods and analyzing them (can feel fine inclusions [approximately 50 μm] using his fingers)

Has established a technique to use noncombustible ores (which led to improved productivity) and has made efforts to provide training to help develop younger workers

Our production sites distributed over a large area secure a stable and efficient system that reacts to disasters with full preparation.

Stable supply system with multiple steelworks

The manufacture of a product at multiple steelworks is possible, and this allows us to cope with environmental changes and emergencies in a speedy and flexible way.



Creation of new values through the multiplication of "steel materials (Nippon Steel) × processing operations (customers)".

Processing and heat treatment technologies

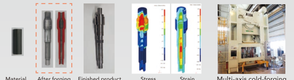
We are engaged in the development of various techniques, such as those for steel utilization, along with solutions that can support customer processing operations. Also, we make proposals for reducing customer processing operations and costs, as well as for improving part functions.

Cutting technologies

We are working on an assessment simulation for the machinability of various cutting techniques (e.g., lathe turning and drilling). We propose materials for which machinability has been improved and conditions for cutting as well.

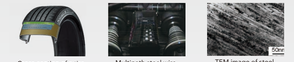
Forging technologies

We are studying and developing methods for the best possible forging processes and for the prediction of cracking limits during forging, etc., with the full use of cutting-edge forging test machines and simulation techniques.



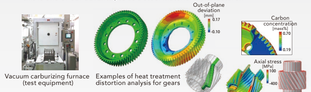
Secondary and tertiary processing technologies

We are developing technologies used in the secondary and tertiary processing sectors, including wire drawing. In addition, we offer wire rods for high-strength steel cords and other steel materials, which prove their true value when undergoing customer processes, such as heat treatment.



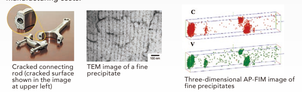
Heat treatment technologies

We propose heat treatment conditions to customers as based on the prediction of heat treatment distortion, with the full use of cutting-edge heat treatment test machines and simulation techniques.The prediction of the distortion of all steel types is possible by using enormous amounts of data on material characteristics —this is one of our advantages as a steel material manufacturer.



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.



High strength Low weight Omission of manufacturing processes Environmentally friendly

Nippon Steel provides customers with proposals and supports them through the due consideration of customer processing operations.

The flexible control of components and inclusions realizes a wide range of steel materials.

Material design and manufacturing technologies

We ensure that customer requests will always be satisfied, such as for need regarding higher strength, higher quality, or lower cost, along with need for environmentally friendly products.

Wide varieties of steel types

In order to obtain the necessary and sufficient strength ranges that meet customer usage, the volume of carbon and alloy composition is formulated in an optimal way.

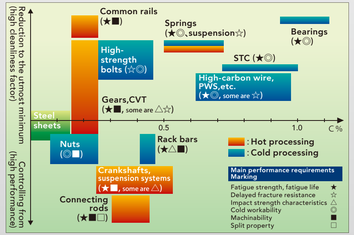
Inclusion control

Nonmetallic inclusions can be reduced to the utmost minimum. In addition, we propose their active use by controlling their form.

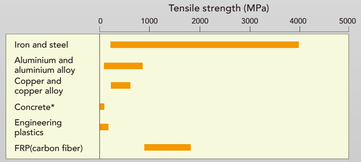
Manufacturing technologies and skills

Our cutting-edge manufacturing equipment, our advanced production technologies, and the skills of our expert workers actualize the accurate and stable production of finely designed steel materials.

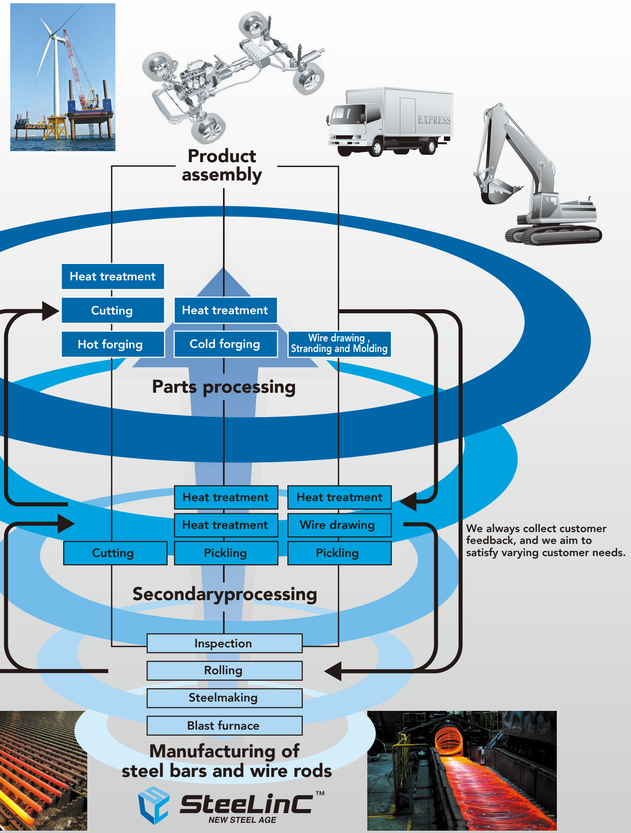
Formulation of the volume of carbon and inclusions in accordance with the parts to be applied



Comparison of various material strengths



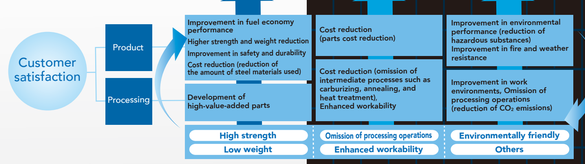
*Compressive strength



Nippon Steel provides customers with proposals and supports them through the due consideration of customer processing operations.

We always collect customer feedback, and we aim to satisfy varying customer needs.

Nippon Steel strives to create new value together with our customers.



An example of new value creation with customers

Gear Steel for the Hybrid Process of Vacuum Carburizing with Induction hardening that contributes to high strength and reduction of CO_2 emissions

*Results of collaborative development with AISIN AW CO., LTD. and Aichi Steel Corporation

Technical points

The combination of "optimum component design" and "Innovation method (heat treatment)", the gear part with high strength, realize the reduction of CO_2 during production

Features / Effects

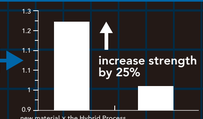
Gas carburizing

The Hybrid Process of Vacuum Carburizing with Induction hardening

CO_2 emissions ↓50% | **Low distortion & Low cost** | **Processing time ↓55%**

Alloy element	Current	New material
Mo	0.2%	Non-added
Cr	1.0%	Non-added
B	–	Adjusted
less rare metals		low cost

High strength



cf.

- used in differential gears for automatic transmission
- win The Japan Institute of Metals and Materials Technical Development Award
- win the METI Minister's Prize(Product and technology development) for the 8th Monodzukuri Nippon Grand Awards