Company Profile

WIRE is Dramatic

www.sgw.nipponsteel.com
Our WIRE makes the future possible

History of NSSG

SUZUKI METAL INDUSTRY CO., LTD., the antecedents of NIPPON STEEL SG WIRE CO., LTD., was founded in May 1938 with the pioneering spirit of “making piano wire by Japanese,” in response to an anticipated increase in demand for the basic industrial material, for which Japan had been entirely dependent on imports.

Up to the present, we have manufactured and sold around 10,000 different kinds of wires according to the needs of the various fields that require sophisticated manufacturing technologies and advanced quality control, such as automobiles, household appliances, precision equipment, civil engineering and construction, and medical care.

In recent years, we have worked on reforming our business structure and expanding globally by establishing a joint venture company for stainless steel wire manufacturing (SUZUKI-SUMIDEN STAINLESS STEEL WIRE CO., LTD.) and expanding our overseas bases through the acquisition of the Swedish company (SUZUKI GARPHYTTAN AB) as a wholly owned subsidiary and the addition of THAI SPECIAL WIRE CO., LTD as a consolidated subsidiary. Now, our main product, high grade spring material for automotive parts, have world top class share.

In September 2015, SUZUKI METAL INDUSTRY CO., LTD., became a wholly owned subsidiary of NIPPON STEEL CORPORATION and changed its name then and in April 2019.

Currently, as NIPPON STEEL SG WIRE CO., LTD., we have become a core company responsible for the special wire business of NIPPON STEEL CORPORATION Group.

As a leader in special steel wire, we will continue to improve our group’s presence in the market through the development of new products that utilize our technological innovation, production process saving, and further enhancement of the global business foundation. At the same time, we will strongly support the realization of your dreams in different fields of society.

Inheriting the founder's DNA

Founder Yutaro Murayama preached the importance of challenge without fearing failure, by stating that “To maintain the status quo means retrogression.” He also set the business motto “Seiwa,” which means that people are based on sincerity and harmony. These thoughts of the founder, or his DNA, remain strongly within us and continue to be inherited.

Spirit of “Seiwa”

“Seiwa” is our business motto. It means people are based on sincerity and harmony. A business never goes well without these.

We value the thought that if things are tackled with the spirit of Seiwa, any difficulties will be overcome and a new route will open.
**Thin wire / Ultra-thin wire**

We have wire drawing technology to create wire that is thinner than hair. It is possible to manufacture wire with a diameter of 16 microns (a thickness of one-quarter that of a normal hair). It is used for medical purposes such as catheter guide wire, as well as for various other applications including piano wire for saw wire to cut silicon wafer, and for springs used for contact probes.

**Shaped wire**

In order to meet the needs to reduce the size and improve the performance of industrial products, we develop and manufacture multi-shaped wire. This is available in more complex shapes such as flat wire for wipers and springs, and pentagonal and grooved (H-shaped) wire.

**Oil tempered wire**

Oil tempered wire is widely used for springs that require extremely high resistance to fatigue, heat, and permanent set in fatigue, including the valve springs of the engine, clutch springs, and suspension springs that are considered important security parts of automobiles. Our group’s high-quality oil tempered wire has a large share in both domestic and overseas markets.

**Piano wire / Hard drawn steel wire**

We succeeded in the first domestic production of piano wire in Japan for high-end springs. It meets various needs, such as music spring wire (piano string), from which the name piano wire originates, as well as straightened or high strength piano wire for special purposes. The advanced wire making technology developed through our experience in piano wire is applied to the hard drawn steel wire used for various applications such as bed and shutter springs, household appliances, and automobile seat springs. In order to meet the needs of a wide variety of customers, we also offer plated wire with excellent workability, corrosion resistance, solderability, and conductivity.

**Special product (electrode wire for precision electrical discharge machining:SP wire)**

The precision molds required to manufacture lead frames are produced by wire electrical discharge machining. An electrode wire is required with a diameter of 100 microns or less in addition to excellent electrical characteristics and high strength. The electrode wire “SP wire” is widely used for precision mold production. It has a high strength, high carbon steel wire (piano wire) as its core wire, with a brass layer formed on the surface layer. The product’s wire diameter is 0.03 to 0.10 mm, and the excellent straightness is provided to enable it to be easily connected automatically.

**PC steel wire / PC steel strand**

PC steel wire and PC steel strand are essential basic materials for the development of large infrastructure such as bridges, and in the field of civil construction and architecture. They are used as reinforcing wire for concrete structures and contribute to the prolongation of their life.
Manufacturing Process

Nippon Steel SG Wire Group's special steel product lines

Piano wire / Hard drawn steel wire
- High-strength piano wire
- SUS wire for screws
- Bearing steel wire
- Phosphor bronze wire
- Oil tempered wire for valve springs
- Oil tempered wire for suspension springs
- PC steel wire

Manufacturing process of piano wire

1. Piano wire (high carbon steel)
   - Patenting
   - Descaling
   - Continuous wire drawing

2. Piano wire (low carbon steel)
   - Patenting
   - Descaling
   - Continuous wire drawing

3. Piano wire (high nickel steel)
   - Plating
   - Final drawing
   - Straightening
   - Piano wire (extra fine)
   - Ultra-fine piano wire
   - SP wire

Note: The size range added to the wire diameter is a reference value and varies depending on the product type.

Manufacturing process of oil tempered wire

1. Spring steel wires (oil quenched and tempering)
   - Shaving
   - Heat treatment
   - Descaling
   - Continuous wire drawing
   - Full-length fatigue cyclic testing
   - Quenching and Tempering

2. Cold-drawn oil quenched and tempered wires
   - Oil quenched wire for cold drawing
   - Ultra-fine OT wire
   - Fine OT wire

Note: The size range added to the wire diameter is a reference value and varies depending on the product type.

Patenting
- Drawability is imparted to wire rods and steel wire.
- (adding control to a structure suitable for wire drawing processing and securing strength)

Continuous wire drawing

Quenching and tempering

We impart strength and toughness to the steel wire at the same time in consideration of the performance (e.g., spring set, workability) of the spring as the final product. Although strength and toughness (ductility / tenacity) generally conflict, this is an important process that requires techniques and know-how in order to balance the two. It is called oil tempered wire after the process by which the steel wire is hardened by quenching with oil etc., prior to being tempered with heat.
Quality Assurance / Research & development

In order to deliver high-quality products that customers feel safe to use, we acquire public certification such as JIS and ISO. We also promote quality assurance activities throughout the entire supply chain, from the procurement of raw materials, manufacturing, and shipping to distribution (sales).

<table>
<thead>
<tr>
<th>Acquired JIS standards</th>
<th>ISO acquisition</th>
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<tbody>
<tr>
<td>JIS G 3522 Piano wire</td>
<td>ISO 9001</td>
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<tr>
<td>JIS G 3521 Hard drawn steel wire</td>
<td>ISO 14001</td>
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<tr>
<td>JIS G 3536 PC/steel wire / PC/steel strand</td>
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Research and development system

Our research and development is challenging the creation of distinctive products and technologies that bring out the maximum performance of steel materials, based on a wide range of technological capabilities that we have accumulated over the years as a comprehensive wire manufacturer. We aim to discover and pursue all possibilities in a wide range of fields at all stages from fundamental research to new product development as we continue to strive for unlimited progress by gathering new technologies and information at home and abroad and utilizing our full-fledged development system and the latest equipment.

Cycle of quality assurance

1. Planning
   - Quality assurance at the planning stage
     - Set quality targets and plan products to meet customer’s expectations
2. Design
   - Quality assurance at the design stage
     - Verify the achievement level of product safety and quality targets
3. Production
   - Quality assurance at the production stage
     - Verify that product safety and quality are realized
4. Sales
   - Quality assurance in the market
     - Dispatch product information and reflect the customer’s voice obtained during after-sales service in manufacturing

*Under the “SteeLinC®” business brand of Nippon Steel Corporation that supplies wire rods, we strive to consistently enhance product value from the material design stage and develop products that will contribute to customer’s joy with, for example, high strength and low weight.*
Our group companies provide products required by customers around the world through our global network of Japan, the U.S., Europe, Asia, etc. From our Narashino mother plant, we will expand the operation technologies, know-how, quality management skills, and product development capabilities cultivated and honed by customers in Japan to each of the world’s bases.