

Nippon Steel & Sumikin Stainless Steel Corporation: Contributing to society with high-value-added stainless steel



Nippon Steel & Sumikin Stainless Steel Corporation (NSSC), the largest stainless steel producer in Japan, has a clear mission: to contribute to society through high-value-added, high-quality and environmentally friendly stainless steel products for customers. “As a manufacturer with comprehensive capabilities for producing sheets and strips, plates, bars and wire rods, we do not aim to produce and sell large quantities of generic products at a low price; we aim to provide high-value-added and high-quality products produced in an environmentally friendly manner as innovative solutions to our customers through close and mutual relationships with them. We believe those products allow our customers to reduce the cost as well as to improve their company image,” explained Mr. Hitoshi Ito, Representative Director and President of NSSC, when Stainless Steel World (SSW) visited the company’s headquarter in Tokyo recently.

By Joanne McIntyre



The main gate at the NSSC Hikari works.

Since SSW last visited NSSC in 2014, the company has continued to enjoy positive growth and turnover while the global stainless steel industry has been suffering in a challenging business environment. This depends to a large extent on its high-value-added and high-quality products such as NSSC®FW (Forward) series, the world's first Sn (tin)-added stainless steels grade and NSSC®2120, lean duplex with improved weldability.

Sheets and strips

1) Innovative NSSC®FW series

In 2010 NSSC surprised the industry with the launch of NSSC®FW series, the world's first tin- added stainless steel



In 2015 NSSC®2120 won the METI Minister's Award in the Sixth Monodzukuri Nippon Grand Awards.

grade. NSSC®FW series has corrosion resistance equal or superior to that of generic grades while achieving significant resource saving. NSSC®FW-1, reducing 23% of Chromium in comparison with type 430 and containing a very small amount of tin, attains similar properties to type 430 containing 18% Chromium. NSSC®FW-2, a nickel-free grade with a reduced amount of chromium compared with conventional grades as well as a very small amount of tin, is substitutable with type 304 (18% Cr-8% Ni). In 2012 the company won the Prime Minister's Prize in the Fourth Monodzukuri Nippon Grand Awards for NSSC®FW (Forward) series.

"Orders for NSSC®FW series have been increasing year-on-year because our customers are gradually realizing the cost advantage of using these products" explains Mr. Ito. "As the NSSC®FW series are nickel-free and contain less chromium, it's not only a cost-saving material but also has considerable price stability. Therefore it has been maintaining certain competitiveness in a market of generic products where making a profit is extremely difficult. As one of our 'strategic products' we have successfully expanded the sales of NSSC®FW series up to around 30,000 tons per year."

2) Increasing demand for duplex

While the demand for duplex was basically limited to the business field

of plates in the past, it is now being expanded to that of sheets and strips. This is largely due to the advantages of duplex including high strength which allows a significant weight reduction. For example, NSSC®2120 is used for solar panel frames because it facilitates conveyance and installation work.

3) Automotive applications

Of the total orders for sheets and strips NSSC receives, automotive applications account for approximately 50%. Upon request from the major Japanese automotive manufacturers the company has put a lot of effort into the development of new products for applications such as exhaust manifolds, mufflers, EGR system and turbo parts.

"In order to deal with more severe exhaust restrictions, the exhaust gas temperature has been rising. As a result, requirements for material properties are becoming significantly stricter. In close cooperation with the Japanese automotive manufacturers, we have been developing new products which satisfy these requirements. Taking advantage of technology developed by this cooperation, we have also been encouraging non-Japanese manufacturers to adopt our new products which allow a reduction in product weight as well as increased efficiency."

Plates

NSSC has many years of experience in producing a variety of duplex from lean, standard to super duplex. Moreover, the company has also developed some original duplex grades.

“In 2012 we launched NSSC®2120, the world’s first lean duplex which enables high-heat-input welding,” explains Mr. Ito. “NSSC®2120 can enhance the efficiency of welding and also has superior strength compared to type 304. As we won Ministry of Economy, Trade and Industry (METI) Minister’s Award in the Sixth Monodzukuri Nippon Grand Awards last year, NSSC®2120 is now widely credited with a product having a bright future.”

The high-heat-input weldability of NSSC®2120 makes it suitable for applications such as chemical tankers, desalination plants, storage tanks, construction and architecture. “Historically, stainless steel or aluminium has been used for flood gates in contact with seawater because this application requires high corrosion resistance. With this background, we actively encouraged the government, consultants and flood gate manufacturers in Japan to apply NSSC®2120 which can make the product weight even lighter than aluminium due to its advantages such as equal corrosion resistance and twice the strength compared with type 304. As a result, NSSC®2120 was successfully adopted and has now become a specified material in the design stage of some public construction projects in Japan. In future, overseas demands for flood gates will increase, particularly as sea levels rise due to global warming. Additionally, we expect that there will be special procurement demands for



NSSC®FW series are widely used for home appliances and kitchen utensils.

infrastructure development in relation to the 2020 Tokyo Olympic and Paralympic Games. In order to meet the growing demands, we have increased the production capacity of duplex stainless steel plate to 4,000 tons per month.”

Bars and wire rods

This year NSSC completed the replacement of its bars and wire rods rough rolling mill. Consequently, the company has now become capable of producing higher grades of bars and wire rods products. By combining state-of-the-art equipment and its manufacturing technologies including in-line heat treatment, it is now possible to produce products with uniform surface properties over the entire length. “The key benefits of this replacement include improvement in

productivity and quality as well as a reduction in the occurrence of flaws” explains Mr. Ito.

“For the future, we expect to see increasing orders for high grade products such as ferritic grades for the automotive applications where excellent surface quality is required, as well as duplex.”

Solution sales

In their ongoing efforts to best meet their customers’ needs, NSSC adopts a ‘Solution Sales’ approach in which sales, technical service, manufacturing and research department work closely together.

“Unlike conventional mass production, we aim at made-to-order manufacturing to produce products in accordance with customers’ needs. This means



The company completed the replacement of its bars and wire rods rough rolling mill this year.



Plate is NSSC’s core product.

we provide not only high quality and customized products for specific usages but also unparalleled technical support. For this purpose, we have especially been working on reducing the distance between sales and research.”

Cooperation between sales and research

Every year the company hold in-house research workshop which is attended by up to 200 people. In the workshop, researchers in a wide age group, from Head of Research & Development Centre to freshman employees give presentations. One of the key benefits of the event is that a lot of salespeople also attend to ask questions and provide feedback from customers. “We have been holding this workshop for 10 years. It has become a valuable opportunity to link research and sales, as there are active discussions and exchange of opinions between researchers and salespeople, even during break time.”

Environmental awareness

‘Environmentally-friendly operation’ is positioned as one of the most important issues in NSSC’s business activity. To take some good examples of their achievements, the company won the Sustainability Award of International Stainless Steel Forum (ISSF) for 15 years of its recycling activity of refractory in 2014. Also its Rotary Hearth Furnace (RHF) and Submerged Arc Furnace (SAF) recover approximately 1,000 tons of rare earth metals per month.

Looking toward the future

When we asked about future at the end of the interview, Mr. Ito explained as follows, “First of all, in order to further deepen our solution sales activity, we will be committed to establishing



Lean duplex NSSC®2120 has now become a specified material in the domestic public construction projects. While having twice the strength and excellent corrosion resistance, NSSC®2120 is even lighter than aluminium.

closer relationships with our customers by introducing new supply chain systems. This will make it possible to improve delivery accuracy as well as to contribute to inventory reduction on the customer’s side. Secondly, we will develop the next strategic products following NSSC®FW series and NSSC®2120. Thirdly, we will also focus on personnel development as well as safety, environment and disaster prevention to strengthen the foundation of business continuity. Finally, the aim of the ‘NSSC Brand’ is not to produce inexpensive generic products in quantity but to contribute to society through providing high-value-added and high-quality products. As a member of Japan’s ‘Monodzukuri (manufacturing)’ industry, we are determined to maintain pride in our quality.”



Solar panel stand is an ideal application for NSSC®2120 which is lighter than aluminium and therefore facilitates conveyance and installation work.



Facts & Figures

| | |
|----------------------|---|
| Name: | Nippon Steel & Sumikin Stainless Steel Corporation |
| Headquarters: | Tokyo |
| Overseas Offices: | Bangkok, Shanghai, Guangzhou, Chicago, Jakarta |
| Number of employees: | 1500 |
| Production sites: | Hikari, Kashima and Yawata (all in Japan) |
| Turnover: | 19.4 billion USD (2015 fy) |
| Products: | Sheets and strips, plates, and bars and wire rods. |
| Key markets: | Power generation, infrastructure, desalination, shipbuilding, chemical industry, oil & gas, pulp & paper, automotive, construction, electric appliances and home appliances, cookware |
| Website: | http://nssc.nssmc.com/en/ |