Hikari area (first two photos) and Shunan area (last two photos) in Yamaguchi Works.

NSSC: continuous improvement and upgrade to expand synergy effects

Following the successful integration of three business units to create NIPPON STEEL Stainless Steel Corporation last year, the company has grown from strength to strength. Proud to call itself Japan's largest integrated manufacturer of stainless steel, the synergies generated have produced a lean and efficient company focused on upgrading every aspect of its capabilities. Company President Mr. Hitoshi Ito explains NSSC's strategy to upgrade across the board to reinforce the company's position as one of the world's leading producers of high quality, cutting-edge stainless steel products.

By Joanne McIntyre

NIPPON STEEL Stainless Steel Corporation (NSSC) was launched on April 1, 2019. The company is an integration of the former Nippon Steel & Sumikin Stainless Steel Corp., part of the steel sheet business contained within the special stainless steel business of former Nippon Steel & Sumitomo Metal Corp., and the steel sheet business contained within the stainless steel business of the former Nisshin Steel Co., Ltd. NSSC is the largest stainless steel manufacturer in Japan with a crude steel production capacity of approximately 1.8 million tons.

Since the integration, NSSC has continued to improve its efficiencies, optimize its production balance between all the works, and enhance its product portfolio. Mr. Ito explains; "Although there is still room to improve in our company, we are striving to capture a stronger profit base than the former NSSC, and gradually reaping the fruits of our efforts."

NSSC remains focused on consistently producing high-quality and cutting-edge stainless steels. Its stated aim is to become the best steelmaker with world leading capabilities as the stainless steel business sector of Nippon Steel Corporation Group. With a wide range of products from sheets, plates to wire rods and bars, it produces a competitive line-up of products with high added value.

"Our integrated reorganization of the Japanese stainless steel industry triggered a paradigm shift. We are using this as a launch-pad to leverage the country's exceptional technologies to spread appeal of our products to the world," Mr. Ito says.

"Needless to say, our sales volume is reduced at the moment due to

COVID19, which is having a negative impact on demand across the globe. However, we will ascertain the post-pandemic industry environment and continuously reshape and update our approach. Even in difficult times, we will continue to fulfil our corporate mission through our high technological capability and our ability to deliver the best solutions."

Antibacterial stainless-steel products

Stainless steel is widely recognized as the ideal material for hygienic applications as it is easy to clean and sterilize even after decades of service. NSSC has taken these properties a major step further by developing grades that have active antibacterial properties. Not surprisingly, the COVID19 pandemic has led to a surge in consumer demand for these products. In response, the company launched a dedicated website in July 2020 featuring its line-up of antibacterial stainless-steel products.

"Before COVID19, these products were mainly used in the food and medical industries. However, we anticipate that in the future, demand may shift to general-purpose applications. Examples of applications include surfaces that frequently come into human contact such as doors, hand-railings, etc" explains Mr. Ito.

The antibacterial products come in two varieties: either copper added, or coated with acrylic resin.

Expansion of business strategy options

Through the integration last year, NSSC has gained the potential for further improvements to grow its business. "The integration enabled us to concentrate the superior management resources from each company," explains Mr. Ito. "These include production technology, technological development, and marketing power, combining the expertise presented in each separate unit into one coherent whole. By combining these resources, it became possible to meet new challenges and achieve levels of improvement which could not be achieved individually in a short period."

Mr. Ito identified particular areas of future progress including:

- Further improvements to manufacturing efficiency, quality levels, and R&D capability;
- Effective utilisation of each company's intellectual property and acceleration of R&D;
- Reinforcement of NSSC's ability to serve customers with a combination of processing technologies and unique solutions.

"Through these initiatives, we can focus on enhancing our high-end market presence by daring to offer products we never have before. These include future-oriented materials, option combinations, and new manufacturing techniques."

"For the high-end market, we must dare to offer products we never have before."

Initiatives to be implemented

Since the integration, the NSSC team has launched a wide range of bold initiatives, including;

- Organizing & optimizing structure of production: These plans include building an optimized production system, and reorganizing and integrating the company's production bases. In October 2019, NSSC launched the Yamaguchi Works (a integration of the former Shunan & Hikari Works) to improve efficiency. Some idle machines at Kinuura Works (steckel mill and precision product manufacturing equipment) is scheduled to be shut down during the second half of 2020.

NSSC's mission statement

- High quality, high value-added and cutting-edge stainless steel products
- Providing processing technology and other services; offering precise & prompt delivery
- Providing solutions to customers through the above initiatives

The Development & Research Center in Hikari was renewed this year, and further upgrades and expansions are planned.

- Improvement of production capability: A new initiative shares production indexes between the various production sites, and applies the top-performing technology to other sites. Under the company's "Top-Runner- Program", production indexes are shared by all works, and the technology that performs the best is transferred and applied to all the other sites. It is essentially an internal competition comparing performance using the same indexes: KPIs (key performance indicators).
- Upgraded Research & Development Centre: In March 2020 the Research & Development Center located in Hikari was upgraded to improve the company's manufacturing technology, product development, customer support for selecting materials, and process technology. NSSC plan to further enrich its research facility from now on.
- Value-added products: The company will leverage the integration to create new high-quality, value-added products. It will upgrade its market presence by expanding its product portfolio. Technologies which were cultivated by the former individual companies will be continuously upgraded.

High quality, value-added products

NSSC produces a range of truly unique products that will continue to drive its growing presence in the global market. NSSC FW™ (Forward) series and duplex NSSC 2120™ are typical examples. Mr. Ito explains: "The FW series is the world's first stainless steel with added tin, which is nickel-free and contain less chromium than other grades. As such, they are not only cost-saving products but also have considerable price stability against the fluctuation of material price. They allow us to keep our competitiveness in the generic product market where it is quite challenging to make a profit."

"Original duplex stainless steel NSSC 2120 is a high-strength and good corrosion resistance material as well as superior weldability. In the past, the disadvantage of duplex was its poor weldability, so we improved quality of welded area on developing NSSC 2120. It has proven its value in various and actual applications such as floodgates and land-locks required for seismic protection, and to improve the resilience of national lands against natural disasters such as flooding and tsunamis. The material is increasingly specified for applications in public infrastructure. For example, the Tokyo metropolitan government undertook a project to install bridges constructed of this duplex to connect esplanades along the Sumida River. Sales of these strategic products continues to expand by meeting a wide variety of customers' needs and requests," explains Mr. Ito.

A land lock for flood/tsunami protection constructed from NSSC 2120 duplex.

NSSC 2120 duplex is increasingly specified for public infrastructure, such as the bridge connecting esplanades along the Sumida River in Tokyo.

New duplex celebrates integration: NSSC 2351™

In September 2019, the company rolled out its first post-integration product: Integration Commemorative Product NSSC 2351. Based on an upgrade of the NSSC 2120 grade, as the result of integration, in-house knowledge was shared and multiplied, resulting in the successful development of a superior product with even greater corrosion resistance.

Mr. Ito commented: "With this development, the next generation series of duplex stainless steel offers even more choices - covering our generic austenite stainless steels from type 304 to 316! For the 2351 grade, we are targeting at infrastructure facilities in brackish water environments that utilise corrosion protection; as well as tanks and containers in the food and pharmaceutical industries."

"It's a perfect example that the integration was not just a simple addition of the technical capabilities, but an opportunity for us to get appended synergy through our own and joint efforts made by all the team especially on the field of new products development."

The demands for duplex for civil engineering projects are increasing, and there has been correspondingly high demand for NSSC's original new duplex steel grade.

"In an environment where lifecycle cost translates to a demand for prolonged maintenance life, stainless materials are one of the best optimal choices. Our original duplex steel not only offers stainless steel's superior performance such as corrosion resistance in this regard, but the weight of the product can be reduced by 25% due to its high strength. We see high ratings and increased demand for these products."

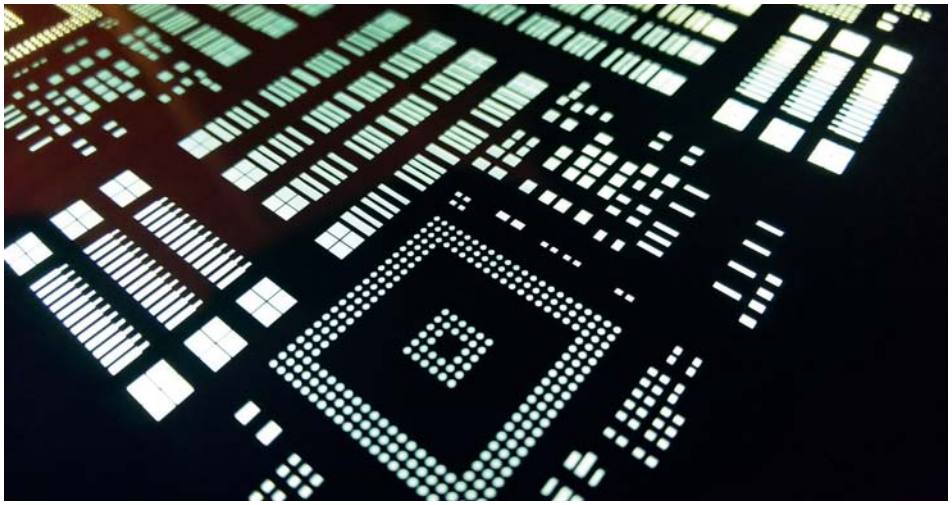
Stainless Steel Sheet for Precision Processing FYGRAS™

Stainless steel sheet FYGRAS™ with fine crystal grains and with advanced dimensional accuracy of forming is suitable for precision processing.

In recent years the integration of electronic gadgets such as smartphones have been extremely advanced. The performance and quality of stainless steel stencils by solder printing for the circuit board are important factors.

By fine crystal grains of stainless steel stencils the dimensional accuracy of those holes isn't only improved but the surface of holes formed in the stencils is also smoothed. These improve the solder flow. As a result, connection reliability and packaging density connections have been very much advanced.

In the near future, perhaps the package density connection will advance. The development of materials based on FYGRAS is very much expected.



Extremely fine crystal grains make FYGRAS stainless steel ideal for precision machining.

Improved customer solutions through integration

Through the integration, NSSC is improved its solution-oriented business model.

"Our team offers proposal-based sales that provide not only high-quality, value-added materials but also applications and manufacturing technology/know-how which fulfil our clients' needs," explains Mr. Ito.

"Offering a solution-focused business is not just about solving customers' problems by presenting them with existing materials and products. We have our engineers actually meet with customers and then make appropriate proposals to them. We may recommend a particular material to solve a problem which the customer is experiencing. Some materials may also be developed together with customers; the engineers take the problem back to the office if necessary, research and solve it. All the former companies had been involved in this type of solutions-focused business, and now, their DNA has been combined. Great synergy was created by multiplying the technology and knowledge of each company; it wasn't simply an addition. So our capability to offer solutions has been upgraded."

Facts & Figures

Name:	NIPPON STEEL Stainless Steel Corporation (NSSC)
Headquarters:	Tokyo
Overseas Offices:	Bangkok, Shanghai, Guangzhou, Chicago, Jakarta
Number of employees:	3,200
Production sites:	Kashima, Kinuura, Yamaguchi (Hikari Area and Shunan Area), Yawata (all in Japan)
Turnover:	3.4 billion USD (2019 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:	https://stainless.nipponsteel.com/en/