Harmonizing industry and environment by state-of-th

Japan's leading solution provider:

NSSC, which last year celebrated their 10th anniversary, was established with the merger of the stainless steel divisions of Nippon Steel Corporation and of Sumitomo Metal Industries. The company aims to be a stainless steel producer which attains high profitability through high-added-value with a wide array of products which meet the needs of the present time. Stainless Steel World visited the company's headquarters in downtown Tokyo, a city which is already being invigorated by the upcoming 2020 Olympic Games. We met with Mr. Hitoshi Itoh, Representative Director and President, to learn firsthand the direction in which the company will proceed.

By Joanne McIntyre

While Nippon Steel & Sumikin Stainless Steel Corp (NSSC) is Japan's largest stainless steel manufacturer, the company is keen to focus on high added-value rather than a high volume of production. "Our mission is to be a stainless steel producer which provides VALUE to customers with a wide array of products, developed with our leading-edge technology," explains Mr. Itoh. "During this decade, the stainless steel industry has seen, mainly in China, the emergence of new producers with 2 or 3 million tons of production capacity. The total capacity of stainless steel in the world has finally reached 45 million tons, with 20 – 30% of this total seeming to be idle over-capacity. However, many producers have boosted their capacities to produce mainly generic grades of stainless steel. This has caused the structural issue of low-profitability in our industry." Looking back at the turbulent decade, Mr. Itoh emphatically states: "This will not be the direction we strive to. I want to ensure our global presence in the global market based on our VALUE, not the scale of our production."

A problem-solving company

Mr. Itoh has been in his current position for just over a year. "Because of my long career in sales, I have learnt that solutions are appreciated by customers when they are provided along with products. This marketing style is also encouraged for our team."

"I believe NSSC is a problem-solving company which is able to offer solutions to the customers," Mr. Itoh emphasizes, "and we will improve our sales by making the best use of our capabilities to propose solutions. Our product line-up extends over plates, sheets, wires, rods and other original products, so we proud our product capabilities. Through the traditional sales of generic stainless steel, we have fostered our customers trust with our long-established standard in sales work; for example meeting the requested delivery dates and other requirements. Our customers trust, accumulated in the past, now forms the basis of our matured production and sales activity."

NSSC places a strong emphasis on research to support its solution-focused

NSSC's Hikari works, which is surrounded by lush greenery, seems to embody its company motto, "eco-friendliness".

e-art technology

NSSC

activities. "As a problem solving partner for our customers, we have sufficient qualified personnel and provide the best possible materials to fulfill their needs."

'Green' stainless steel: FW series

NSSC's company policy is 'to contribute to society through stainless steel'. "We wish to keep contributing globally through our advanced technology," Mr. Itoh elaborates. "In addition, our company motto is *eco-friendliness* – we are oriented towards products which can reduce the burden on the environment. Originally, stainless steel contains a certain amount of alloys, such as chromium, nickel and molybdenum. We have intensified the development and production of ferritic stainless steels in which we can reduce the quantity of alloy added. One of the solutions we have successfully developed is our "Forward (FW)" series."

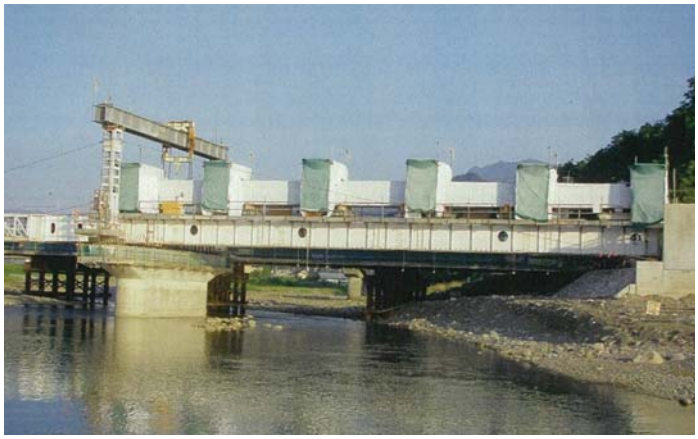
"In the FW series we have reduced the consumption of alloy which in turn means less exploitation of natural resources. It also has the effect of mitigating the impact of the product price in response to fluctuations in the market price of the alloying ingredients. The number of customers who are in sync with us in understanding our pro-environmental policy and are adopting our solutions is growing."

With its FW series, the company has added to its line-up a product with corrosion resistance equal or superior to that of generic grade stainless steels. FW-1, which contains 14% Chromium, and a small amount of tin, attains similar properties to type 430 (18% Cr). In the case of FW-2, which contains no nickel, less chromium (17%) than the conventional grade, and a small amount of tin, is substitutable with type 304 stainless steel (18% Cr-8% Ni). "Several major Japanese manufacturers of electrical appliances and kitchenware have started adopting the FW series, and valued customers outside of Japan are showing strong interest."

A step further: 2120 'Green' duplex

NSSC has many years of experience in producing standard, lean and super duplex. "We are the only company in the

The good weldability and workability of 2120 results in the increasing adoption to the use of cargo tanks for the shipbuilding sector.



Ferritic stainless steel reinforcing bar is suitable for structural applications.

Asian region who can deliver every duplex grade," explains Mr. Itoh. "In 2008, just before the financial crash of Lehman Brothers, we enhanced the plate production capacity at our Yahata works. In terms of facilities and equipment, we have a very highly advanced facility which also includes leveling processes and pickling equipment."

"The higher strength of duplex allows customers to reduce the thickness and it is really an ideal solution for customers from the view point of the cost and function. For example, lean duplex needs less alloy contents (nickel, molybdenum, etc.) compared with the generic stainless steels such as 304 (L) and 316(L). However, there is a disadvantage of lean duplex: its inferiority of weldability compared with generic stainless steels. If the welding speed is increased, the heat input become excessive which may cause weld cracking. Some specialized welding techniques to avoid the cracking are needed, but this problem has prevented the spread of lean duplex utilization in Japan."

Setting its sights on becoming a pioneer for duplex in Asian market, NSSC has provided a solution through its problem-solving abilities.

"Two years ago we developed 2120, a new lean duplex with fabulous weldability. It accepts the same level of high heat input as that for generic grade stainless steel."

This new product, originally developed as plate, began to spread to other products. "For example, some of our domestic customers want to use 2120 even for sheets and wire rod due to its enhanced weldability. Along with the growing popularity of duplex, the weight saving effects of this high strength material has further drawn the attention of customers. Duplex 2120 can fulfill these various customers' needs."

Instauration of developments

In the wake of the devastating earthquake and tsunami three years ago Japan is reassessing how it should undertake construction. Mr. Itoh explains: "On the civil engineering front, we have brought an alternative solution to the use of traditional reinforced concrete rods. In Europe, austenitic stainless steel is developed in this area, but the cost is so high. Usually, polyvinyl chloride resin-coated steel is used for such applications: although it is inexpensive, the corrosion resistance and the handling defects mean it is weaker than stainless steel. Therefore, we are proposing a deformed reinforcing bar of ferritic stainless steel in which the life cycle cost and the durability are well-balanced. Compared with austenitic stainless steel, it has price competitiveness and the durability is improved."

A further example of a ferritic stainless steel reinforcing bar application.

In Tokyo a construction and development boom is expected in the lead-up to the 2020 Olympic Games. "Many development and reconstruction projects are already underway," Mr. Itoh says. "I hope the refurbishment work for the roof of the National Stadium will present a great opportunity to use 220M. Apart from its high corrosion resistance, its properties as a ferritic material realize the same level of low coefficient of thermal expansion as that of concrete, making it suitable for use in large-scale construction. We are also anticipating demand from the expansion of the

270 is adopted as the lining jacket for the pier construction of the new runway at Haneda Airport, based on its high corrosion resistance which is comparable with titanium.

NSSC's high purity (low C-low N) ferritic stainless steels provide a solution to the customers who fabricate exhaust heat recirculation systems, not only with its heat and corrosion resistance, but also with its excellent formability.

airport, the new transportation systems and athletes' accommodation, which will be developed. The Olympic Games are also generating beneficial side effects: they are encouraging redevelopment projects in Tokyo, and reconstruction of 30-50 year old buildings."

Demand in future: from maglev linear to EV

Looking to the future, by 2027 the maglev linear railway which employs cutting-edge magnetic levitation technology, will run between Tokyo and Nagoya, Japan's fourth largest city. Travelling at 500km/h, twice a speed of the existing bullet train (Shinkansen), the linear railway will run the 286 km to Nagoya in just 40 minutes. This ambitious projects provides another good opportunity for non-magnetic stainless steel.

"Out of our production capacity, 1 million tons per year, 30% goes onto the automotive market, particularly for the area of the exhaust system. High potential is expected for hybrid, electric and fuel saving vehicles. We develop materials that suit features of these vehicles, such as the exhaust heat recirculation system. In response to the future hydrogen society, we are working on development of the materials for hydrogen distribution systems and for household fuel cells."

NSSC and Higgs boson

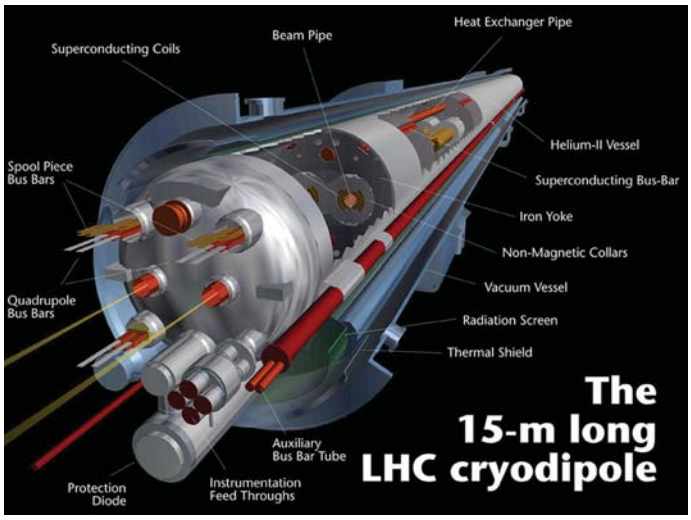
"I have recently received exciting news," Mr. Itoh says. "In 2013, the Nobel Prize for Physics was awarded for the Higgs boson using the Large Hadron Collider (LHC) built by the European Organization for Nuclear Research (CERN). NSSC is proud to have supplied over 13,000 tons of non-magnetic steel to the project, the only producer in the world to do so."

So, tomorrow the world?

"Our customers in Japan such as automotive and home appliance producers are accelerating to expand their production bases out of the home country" Mr. Itoh says. "However, taking the current over capacity situation into consideration, we should seek more rational and effective means to meet our customers' needs, other than investments in a new production base. I believe business alliances may be an answer; it makes more sense to supply our outstanding products, in corporation with our alliance partners. Our state-of-the-art capability for "problem-solving", which has been developed in the past, should greatly work in such future activity."

Let's keep watching the future of NSSC, with its products line-up and its solution-providing activities.

"NSSC is a problem-solving company which is able to offer solutions rather than just products"



130 is adopted to an important component of the LHC dipole magnets.

Facts & Figures

Name:	Nippon Steel & Sumikin Stainless Steel Corp
Headquarters:	Tokyo
Number of employees:	1500
Production sites:	Kashima, Hikari and Yawata (all in Japan)
Turnover:	2.0 billion USD (2012fy)
Products:	Austenitic, ferritic, martensitic and duplex stainless steel coils, sheets, plates, bars and wire rods.
Key markets:	Power Generation, Desalination, Shipbuilding, Chemical Industry, Oil & Gas, Pulp & Paper, Automotive, Construction , Electric appliance, Home appliance, Food machinery