

Nippon Yakin Kogyo Co. Ltd: Providing worldwide

From its humble beginnings making fire extinguishers in 1925, Nippon Yakin Kogyo Co., Ltd. has come a long way, evolving into an industry leader in the manufacturing of coils and plates by using a wide range of materials. Anything from general-purpose stainless steel to high-performance materials such as super stainless, nickel alloy, and the like. Nippon Yakin brings innovation and technology to its products, stays dedicated to research, and continues its long tradition of creating excellence with a state-of-the-art production system, backed by a precision quality system.

By Catarina Muia

The current situation

Fiscal year 2017 was the first year of the medium-term management plan 2017 (FY 2017 to 2019). Nippon Yakin posted a profit for the fifth consecutive year.

During this period, the stainless and specialty steel industry's high levels of domestic production continued owing to the demand for stainless steel, following moderate economic growth in Japan.

The supply-demand balance has been stable on overseas markets. In the field of high-performance alloys, the demand for mainly overseas has remained strong due to the increasing demand in oil and gas industries, environment industries, energy industries and so on, in addition to strong demand for consumer durables.

Amid these business conditions, Nippon Yakin expanded sales in the high-performance alloys market and started strengthening the maintenance work on its production capability for general-purpose stainless steel, in order to capture as much demand as possible.

Although Nippon Yakin's Kawasaki plant suffered a fire accident in May 2017, the company has continued its efforts to achieve the appropriate selling prices, and to further reduce production cost, then reach its usual recorded sales.

Capital investments

Nippon Yakin is investing 28 billion yen throughout the next three years. Much of this is a strategic capital investment in the innovation of the manufacturing process, as well as refreshing the Kawasaki plant. This will include an improvement of the staff's welfare facilities and a reconstruction of the factory layout.

The first measure in refreshment of the Kawasaki plant is to construct a new 'multi-purpose building', which includes part of the testing and research facilities, as well as welfare facilities for employees. Construction will be completed in January 2019, and the welfare and work efficiency will be improved. The land no longer being used due to the facilities being moved into the new building, will be effectively utilized as a new factory site.

Strengthening the competitiveness in Asia

An important topic highlighted in Nippon Yakin's 2017 medium-term management plan was to establish the company as a top supplier in the Asian high-performance materials market. To do this, the company is displaying 'Quality, Cost, and Delivery' (QCD) competitiveness, and various measures are being looked at to further this sector of business.

There is a demand in the company's key market, China, for shorter delivery periods, heavier products, and wider products for high-performance materials. In order to meet these demands as a joint venture company, NISCO Nippon Yakin Kogyo Nanjing Co., Ltd. began working with Nanjing Iron and Steel Co., Ltd. (NISCO) and others on January 16 of this year.

Nippon Yakin has built a product supply system, which meets the advanced market needs by entrusting the wide plate production to NISCO, which has state-of-the-art, high-performance wide-plate manufacturing facilities.

Since NISCO has also established strong customer relationships in China, Nippon Yakin will strengthen sales capabilities of high-performance materials in the Chinese market through the collaboration of NISCO and Nippon Yakin Shanghai Co., Ltd. (local Chinese subsidiary of Nippon Yakin). A commemorative ceremony was held in Nanjing on April 20 of this year, where many stakeholders attended and celebrated the new beginning.

Wide coils of high-performance alloys

High nickel alloys have superior corrosion resistance compared to super stainless steel. They are used in chemical plants and flue gas desulphurisation (FGD) equipment in coal-fired power plants, which have extremely severe corrosive environments. This is a material that Nippon Yakin is focusing on by strengthening the competitiveness in coils and cold-rolled sheet-widening.

Nickel alloys typically resulted in limited coil width due to high temperature strength, however, owing to improvements



Hot rolled 4-foot wide coils of UNS N10276.

in hot rolling process conditions in 2015 for UNS N10276, Nippon Yakin succeeded in manufacturing four-foot wide coils for the first time. In 2016 the company was also able to manufacture four-foot wide coils with UNS N06022 and UNS N06625. Meanwhile it has also increased productivity on five-foot wide cold-rolled sheets by improving the manufacturing process.

A reduction in the number of welding lines by wider materials has brought a shorter welding period, and the sales volume of wide-width materials is steadily increasing. In the 2019 fiscal year, the final year of Nippon Yakin's medium-term management plan, sales should exceed 100 tonnes per month.

Product applications

Nippon Yakin's main high-performance products fall into four fields; environment and energy, food, sheathed heaters, and electronic and electrical machinery.

Environmental and energy fields

Around the globe people are becoming more environmentally-conscious, and a movement to regulate sulphur oxide (SOx) in exhaust gas has begun. As a countermeasure, ships are being installed with SOx scrubbers as exhaust gas purification equipment.

A SOx scrubber washes the exhaust gas with a shower of seawater to reduce SOx. This creates a sulphuric acid environment within the scrubber causing corrosion to general-purpose stainless steel. To combat this, high corrosion-resistant duplex stainless steel UNS S32506, as well as super austenitic stainless steel UNS S32053 and UNS S31254 have been adopted in Japan. On March 27 of this year, the SOx scrubber system for marine ships in which UNS S32506 and UNS S32053 are used as components, received the award at the Japan Stainless Steel Association's (JSSA) 17th Contest for Excellent Products.

Corrosion resistant material is also required for parts around the SOx scrubber, including peripheral components.

FDG equipment in a coal-fired power plant is another area requiring high corrosion-resistant solutions. The interior of the FGD is a harsh environment where metals such as super austenitic stainless steel, super duplex stainless steel, high nickel alloys and the like, come into their own.

Since the adoption of super austenitic stainless steel UNS S32053 in FGD systems in Japan during the 1990s, various Nippon Yakin's high-performance materials have been used in Japan and abroad. In recent years, following China, environmental regulations have been strengthened in India and the demand there is increasing.

In photovoltaic power generation, which is a type of renewable energy, polycrystalline silicon-type solar cells are used. In a plant where polycrystalline silicon, a battery material, is produced, an intermediate process takes place which uses high temperatures and high pressure. Thick plates of superior heat-resistant nickel alloys such as UNS N08120 and UNS N08810 are used in the reaction vessel during this process. Demand in China for these alloys is currently high due to the active solar power generation backdrop.

The oil and gas sector has been sluggish for a while, however it is on a recovering trend. From many regions, including Europe and the U.S., Nippon Yakin is receiving increasing inquiries about high-strength and high corrosion-resistant materials and expects that future demand in this field will rise.

When the oil and gas project restarts, it is expected that there will be an increase in sales of duplex stainless steels UNS S31803 and UNS S32205, super duplex stainless steels UNS S32750 and UNS S32760, as well as super austenitic stainless steel UNS S31254, all of which have already acquired the NORSOK standard.

Food applications

A leading Korean food company placed an order with Nippon Yakin for 180 tonnes of super austenitic stainless steel UNS S32053 for their soy sauce brewing tank. This is the second order of this grade in this application. Since soy sauce has 17%

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– Masashi Kobayashi, President of Nippon Yakin Americas Inc.



Completion image of the multi-purpose building.

clients dependable high-performance materials



Sheathed heater made of alloy H880.

salt content, it is highly corrosive. General-purpose stainless steel does not have sufficient corrosion resistance and cannot be used in tanks. This austenitic material has high corrosion resistance, even for soy sauce, making it maintenance-free and contributing to lifecycle and cost reduction. In Japan, it is also employed in salt tanks and salt mirin tanks.

Sheathed heaters

Nippon Yakin manufactures coil material for sheathed heaters, alloy 800, alloy 840, and alloy 825 being the main products. Recently, demand has been good especially for coffee makers. Inquiries are coming in too from newly-established hotels and convenience stores, which means sales figures are going up. In addition, demand for a new alloy H880 (25Ni-24Cr-Mo, Al, Ti), which was developed several years ago and has excellent corrosion resistance, is expected to increase.

Electronic and electrical machinery

Liquid crystal panels are often used

in televisions and mobile phone displays, however the next generation of the organic EL (electro-luminescence) panel has attracted attention. By using Fe-36% Ni alloy, which has low thermal expansion characteristics, in organic EL panel manufacturing equipment, sales of the alloy to Korea are currently strong. The organic EL field is growing, and the sales volume of Fe-36% Ni alloy is expected to increase.

Promotion through exhibitions

Nippon Yakin promotes itself and its high-performance materials at overseas exhibitions to acquire new customers and strengthen its network with existing customers.

Regarding the exhibition activities in 2018, firstly, Nippon Yakin had a booth at NACE CORROSION in Phoenix, AZ in April, where corrosion resistance was the main theme. In November, the company will also exhibit at 2018 Stainless Steel World Americas Conference & Expo in Houston, TX, and looks forward to meeting existing and new customers.



Members of Nippon Yakin America: (Right) Mr. Masashi Kobayashi, President.

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Network of companies

Nippon Yakin has the overseas subsidiaries in China, Singapore, the U.S. and the U.K., and is expanding sales via Japanese and overseas networks.

Nippon Yakin Americas Inc. plays an important role in the American high-performance materials market. “We have been based in Chicago, USA, since 2011, and provide sales and technical support for customers in North, Central and South America. By Japanese technologies and services, Nippon Yakin’s high-performance materials are used in a wide range of fields, although primarily in the energy, the aircraft and the appliance industry,” said Masashi Kobayashi,

president of Nippon Yakin Americas Inc. “Even through the rise of protectionism sentiment, our company receives a high evaluation from our customers continuously, as a Japanese high-performance materials manufacturer.”

The future outlook

Nippon Yakin, through further measures such as deepening its high-performance materials business, intends to increase its corporate value as a competitive specialty stainless steel manufacturer in Japan and overseas, through the dual arms of its high-performance materials business, and general-purpose stainless steel business.



Melting process at Kawasaki plant.

► Nippon Yakin Kogyo at a Glance

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| Company name | Nippon Yakin Kogyo Co., Ltd. |
| Established | 1925 |
| Employees | 1,084 |
| Headquarters | Tokyo, Japan |
| Products | Stainless steels, super stainless steels, nickel alloys, and iron-nickel alloys |
| Website | www.nyk.co.jp/en |