

## **NSSC Launches World's First Sn-added Ferritic Stainless Steel Grades, the "FW series", Having High Corrosion Resistance, High Workability**

– Markets NSSC<sup>®</sup> FW1, which achieves corrosion resistance higher than 18% Cr steel using only 14% Cr –

NSSC (Nippon Steel & Sumikin Stainless Steel Corporation; Address: Chiyoda-ku, Tokyo; President: Hiroshi Kinoshita) announced today that it has developed the world's first Sn-added low-interstitial ferritic steel grades, named the "FW (forward) series". This was achieved by making use of NSSC's own seed technology that can drastically improve the corrosion resistance of ferritic stainless steel by adding a micro amount of tin (Sn). The FW series steel exhibits not only improved corrosion resistance but also increased workability.

NSSC also announced that from July it has begun marketing/distributing the first FW series steel, "NSSC<sup>®</sup> FW1", a highly corrosion resistant, low-chrome, and low-interstitial ferritic stainless steel, which consists of 14% Cr but which has a corrosion resistance level equivalent to 18% Cr stainless steel grades (Tp.430, SUS430LX, Tp.439, etc.).

NSSC<sup>®</sup> FW1 has the highest-level workability among ferritic steel sheets, thus it can be adopted to a wide range of applications, including those in which existing 18% Cr grades are often used. Since NSSC<sup>®</sup> FW1 is an ultra fine-grained steel with low-alloy elements (no addition of Ni or Mo, and with reduction of Cr), it conserves alloy resources and is stable in cost by minimizing the effect of fluctuations of raw material prices.

Because NSSC<sup>®</sup> FW1 exhibits these excellent functions and characteristics, NSSC markets it with the hope that it will become a candidate for a new general-purpose grade that can substitute existing grades including two leading types of steel (Tp.304 [18%Cr-8%Ni] and Tp.430 [18%Cr]), which account for more than 50% of all distributed stainless steel.

### 1. Basic technology of NSSC<sup>®</sup> FW1

- 1) NSSC<sup>®</sup> FW1 uses a unique seed technology, in which the corrosion resistance is drastically improved using NSSC's low-interstitial technology with micro amounts of Sn (tin). This is the world's first Sn-added, low-interstitial ferritic steel. Both corrosion resistance and workability superior to 18% Cr were achieved by adding micro amounts (approx. 0.1%) of Sn to a base of 14% Cr.
- 2) Sn exists as an oxide in a passivation film, which consists of a Cr oxide, and also exists substantially in the most superficial layer of the base immediately below the passivation film in the metal status. Sn is thought to enhance the stability and protection performance of the passivation film and contributes to the regeneration capacity of the passivation film itself (see Figure 1).

### 2. Solutions offered by NSSC<sup>®</sup> FW1

NSSC<sup>®</sup> FW1 contains only 14% Cr; however, it exhibits a corrosion resistance exceeding 18% Cr stainless steel, while, among low-interstitial ferritic steel, it also shows top-level workability and surface quality including anti-ridging characteristics after being processed. NSSC<sup>®</sup> FW1 can establish its value in various applications for kitchen tools, electrical appliances, building components, and cooking utensils, etc., which are standard applications for 18% Cr stainless steel grades.

### 3. Future expansion

NSSC has already received high marks from customers who tried this steel before the commencement of marketing.

NSSC is currently positioning this grade as one of its main sheet products; as NSSC<sup>®</sup> FW1 could become a new standard steel candidate that can be used in a wide variety of applications in the same way as the two leading steels (Tp.430 and Tp.304) are currently used. NSSC plans to actively expand the product's applications.

In the coming December, NSSC plans to make the further announcement of a new product with even higher corrosion resistance, the "NSSC<sup>®</sup> FW2", a new type of steel grade from the same series as NSSC<sup>®</sup> FW1, which also utilizes a micro amount of Sn.

### 4. Exclusive website

In addition to answering direct inquiries and those sent via distribution channels as before, we have now an exclusive NSSC<sup>®</sup> FW1 website that can explain in detail product characteristics and receive inquiries, thus widely meeting the needs of our customers.

URL : <http://www.ns-sc.co.jp/fw>

E-mail : [fw@ns-sc.co.jp](mailto:fw@ns-sc.co.jp)

### Reference:

Regarding the meaning of the name "NSSC<sup>®</sup> FW1":

- In full: NSSC Forward One
- FW: **F**orward; **F**erritic for The **W**orld

This refers to "advancement" and a "ferritic strategic product that takes aim at the global market".

Photo. 1 : Appearances after 168hrs of immersion test (the effect of Sn on Corrosion resistance)

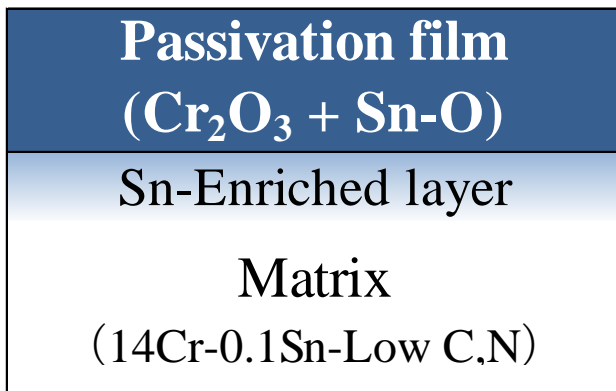


Figure 1: Schema of the Sn corrosion resistance enhancement effect (an example of NSSC<sup>®</sup> FW1)

- 1) Passivation film
- 2) Sn-enriched layer
- 3) Matrix

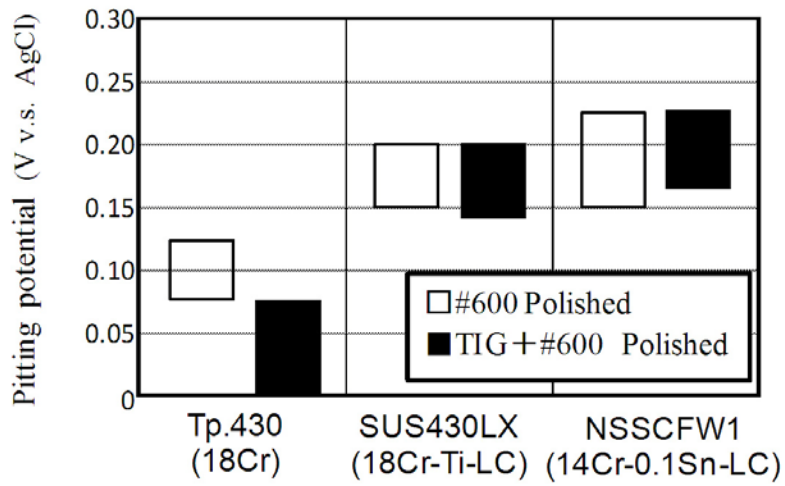


Figure 2: Comparison of corrosion resistance (pitting corrosion potential)

- 1) Pitting corrosion potential
- 2) #600 polished
- 3) TIG + #600 polished



Photo. 2: Example of NSSC<sup>®</sup> FW1 use – IH rice cooker exterior



Photo. 3: Example of NSSC<sup>®</sup> FW1 use – Large size rectangular vat