

Review and Outlook of Taiwan Stainless Steel Bar and Wire Market in 2013

by Wen-Hai Liu
Source: TSIA periodical and customs statistics

I. Preface

The global stainless steel industry experienced a difficult year in 2012 amid economic downturn and shrinking domestic demands. The European debt crisis and the slow economic growth of many countries led to the decrease in demand while China continued to expand its production of nickel and raw iron. According to the World Bureau of Metal Statistics, the global nickel market was oversupplied by 117,000 tons, which contributed to the fall of nickel prices. With the prices of major raw materials hitting new lows in recent years, downstream manufacturers have become less willing to purchase. Despite shrinking market demand, China has continued to expand its stainless steel productivity, changing itself from the biggest importer to the biggest exporter.

The enlarged scale and lowered production costs due to mergers and strategic alliances of stainless steel businesses all over the world in recent years have accelerated the unbalance between supply and demand of the stainless steel market. The intense price war even led to the sharp decrease of gross margin of each product as all the major steel makers are facing the most severe challenges now. For the Taiwan stainless steel market, in addition to the above-mentioned global economic impacts, the exodus of downstream industries, rising domestic oil, electricity and labor costs and heightened environmental awareness have made operation even more difficult.

The European debt crisis has gradually eased and the US fiscal cliff has been avoided due to the debt ceiling extension; however, due to

the withdrawal of quantitative easing monetary policy (QE3) as a result of the slow growth of China's economy, and the weakened growth momentum of emerging countries, the global economic growth in 2013 has fallen short of expectation.

II. Review of Taiwan Stainless Steel Bar and Wire Market

The local hot rolled stainless steel bar and wire manufacturers include Walsin Lihwa, Yeih Hsing and GMTC Gloria and the former two makers specialize in stainless steel rods with an annual output of 220,000 tons and 100,000 tons respectively. The stainless steel straight bars are produced by GMTC Gloria (with an annual output of 90,000 tons) and Walsin. The major downstream wire manufacturers include New Best Wire, Rodex, Tong Hwei and Sen Chang, etc. The total production of Taiwan stainless steel

bars and wires in 2012 amounted to 307,000 tons, remaining at the level of the previous year. The aggregated production from Jan. to Jul. in 2013 was 165,000 tons. The production of the whole year is estimated to be 284,000 tons, a slight decrease over the previous year.

1. Stainless Steel Rods

The stainless steel rods production in 2012 was 240,000 tons (excluding wires), remaining at the same level of 2011. The export volume was 100,000 tons and import volume was 30,000 tons. The surface demand was 171,000 tons, showing a decline for 2 consecutive years. The consolidated output from Jan. to Jul. 2013 was 127,000 tons and the output of the entire year was estimated to be 219,000 tons, a reduction of 8% over 2012.

The rods are mainly used in screws, nuts, small hand tools, steel wires and cables, machinery parts, small motor cores and serve as an export-oriented steel product. The steel wires can be divided into 20 categories and cold forged fasteners take up the biggest use for about 25%, followed by welding wires of 15% and spring wires coming in the third with 8%. The change of supply and demand of stainless steel rods in recent years in Taiwan is shown in Fig.1.

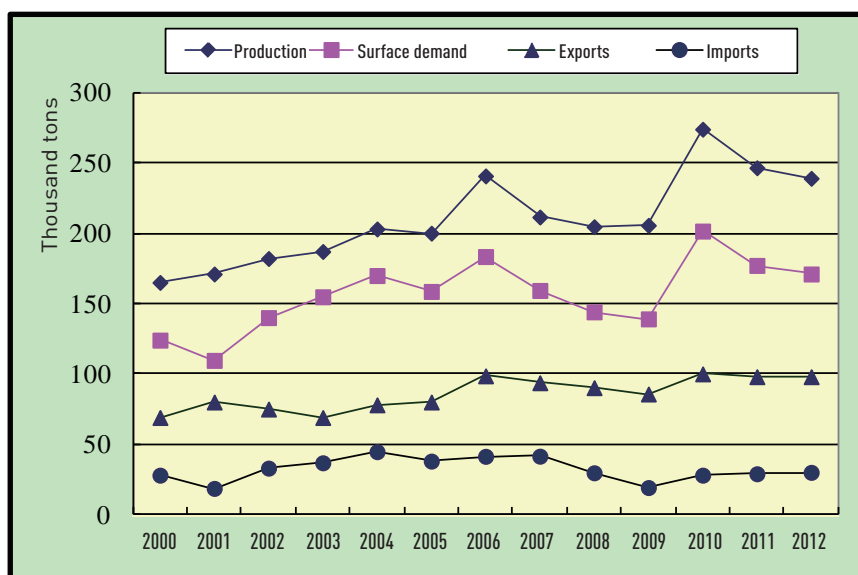


Fig.1 Taiwan Stainless Steel Rods (Excluding Wires) Supply and Demand Analysis

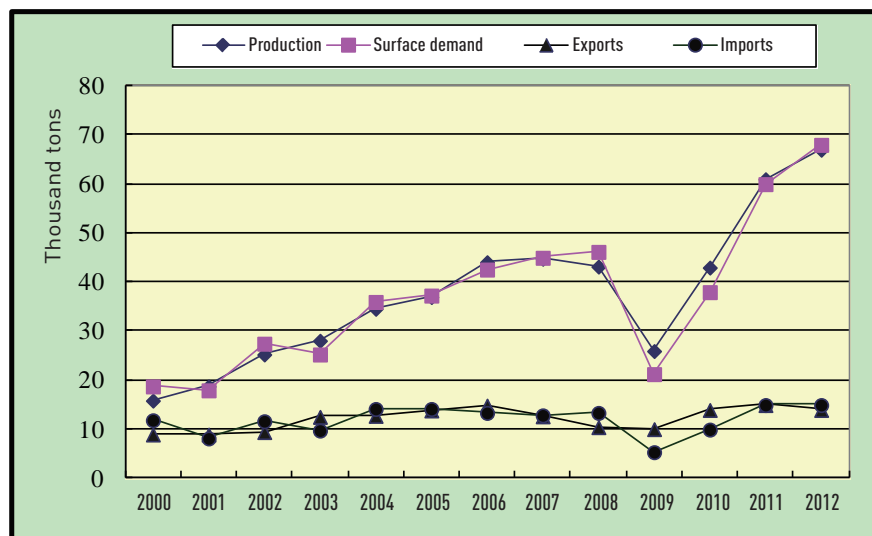


Fig. 2 Taiwan Stainless Steel Straight Bars (Excluding Wires) Supply and Demand Analysis

2. Straight Bars

The production of stainless straight bars (excluding cold drawn rods) was 67,000 tons. The export was 14,000 tons and import was 15,000 tons. The surface demand was 69,000 tons, growing by 15%. The supply and demand has shown a consecutive 3-year growth, surpassing the peak before the financial crisis. The combined production from Jan. to Jul. 2013 was 38,000 tons and the output of the entire year was estimated to be 65,000 tons, remaining at the same level of 2012. Stainless straight bars are mainly used in forging materials, machinery/ship shafts, valve parts, rollers, bolts and other processing materials. The changes of demand in stainless steel bars in recent years are shown in Fig. 2.

The stainless steel bar and wire imports to Taiwan in 2012 amounted to about NTD5.85 billion with a volume of approximately 53,000 tons, averaging at NTD110 per kilogram. Among the imports, the stainless steel rods took up NTD3 billion (51% of stainless steel bars and wires) with a volume of 30,000 tons, averaging at NTD101 per kilogram, about 10% higher than the export unit price. The imports mainly consist of special materials not produced domestically, and Japan and Korea are the main source countries. The stainless steel wire imports amounted to about NTD1

billion with an import volume of about 65,000 tons, averaging at NTD155 per kilogram with Korea, Japan and Thailand as the main sources. The stainless steel rods imports during the Jan.-Aug. period totaled about NTD2.14 billion (a 16% increase from the same period of 2012) with an import volume of about 24,000 tons (a 35% growth from the same period of 2012), averaging at NTD90.3 per kilogram. The whole-year imports are estimated to be around 35,000 tons, a 17% increase from 2012.

The stainless steel bar imports in 2012 were about NTD1.85 billion with

a volume of about 16,000 tons. Among the imports, the straight bars amount was about NTD1.71 billion, averaging at NTD109 per kilogram with India, Japan and Korea as the main source countries; the imports of polished bars took up only 700 tons but averaged at as high as NTD198 per kilogram with Japan and Korea as the main source countries. The 2012 long-bar stainless steel imports analysis is shown in Table 1. The imports of stainless steel bars from Jan. to Aug. combined were about NTD930 million (declining 22% over the same period last year) with an import volume of about 10,000 tons (same with 2012), averaging at NTD86 per kilogram. The entire year imported volume is estimated to be 16,000 tons, remaining at the same level of last year.

The stainless steel bars and wires exports from Taiwan in 2012 amounted to about NTD19.2 billion with an export volume of approximately 170,000 tons, averaging at NTD113 per kilogram. Among the exports, the stainless steel rods took up NTD9 billion (47% of stainless steel bars and wires) averaging at NTD92 per kilogram with Korea, Thailand and Mainland China as the main destinations; the second biggest export item, polished bars, took up

Table 1. 2012 Taiwan Long-bar Stainless Steel Imports Analysis

	Import Value	Import Amount	Import Unit Price	Main Source Countries
Long-bar Stainless Steel	Hundred Million Dollars	Thousand Tons	NTD/Kilogram	
Wire Rods	30	30	101	Japan, Korea, (93% share)
Seamless Tubes	47	17	278	Japan, China, (88% share)
Straight Bars	17.1	15.6	109	India, Korea, Japan, (86% share)
Steel Wires	10	6.5	155	Korea, Japan, Thailand (72% share)
Figured Iron	3.4	14	236	Japan, Germany, (78% share)
Seamed Tubes	2	0.5	370	Japan, China, (64% share)
Polished Bars	1.4	0.7	198	Japan, Korea, (36% share)
Total	110.9	71.7	155	

NTD61 billion of the export amount with an export volume of 42,000 tons, averaging at NTD147 per kilogram with USA, Korea and Japan as the main destinations. The stainless steel wire exports totaled about NTD2.54 billion with an export volume of 16,000 tons, averaging at NTD160 per kilogram with USA, Japan and mainland China as the main destinations; stainless steel straight bars exports amount was about NTD1.55 billion with an export volume of 14,000 tons, averaging at NTD110 per kilogram with Mainland China, ASEAN countries and Australia as the main destinations. The analysis of long-bar stainless steel exports from Taiwan in 2012 is shown in **Table 2**.

The combined stainless steel rods exports from Taiwan during the Jan.-Aug. period totaled about NTD4.93 billion (a 25% decline from the same period of 2012) with an export volume of 59,000 tons (a 15% decline from the same period of 2012), averaging at NTD83 per kilogram. The exports of the whole year are estimated to be about 88,000 tons, a 10% decrease from the previous year; the combined stainless steel polished bar exports during the Jan.-Aug. period totaled about NTD3.55 billion (a 16% decline

from the same period of 2012) with an export volume of about 27,000 tons (a 5% decline from the same period of 2012), averaging at NTD132 per kilogram. The whole-year exports are estimated to be around 39,000 tons, a 7% decline from 2012.

III. Challenges Faced by Taiwan Stainless Steel Bar and Wire Industry

In the face of the increasingly harsh competitions and challenges from the stainless steel manufacturers around the world, especially the price advantage of Mainland China, Taiwan's general-purpose stainless steel products will gradually lose their competitive edge. Amid the difficult and ever-changing global industrial and economic conditions, business operation will be confronted with more changes and uncertainties. The challenges faced by the Taiwan stainless steel bars and wires industry are as follows:

- **Reliance on imports of major materials (such as nickel and chrome) of which the prices fluctuate strongly.**
- **Anti-dumping or trade protection measures adopted by various countries to block imports.**
- **Oversupply of Chinese long-bar products, dramatic improvement of production techniques of general-purpose steels by class one and class two steel plants and the transition from being an importer to a sole exporter. The price and supply volume advantages of upstream state-run steel plants can diminish the competitiveness of Taiwan products in China. The price war waged by second-class steel plants will have a negative impact on the industry.**
- **Taiwan's inability to enter the free trade areas such as ASEAN (Japan, Korea and Mainland China are already members) can hurt its export expansion efforts.**
- **India has increased its productivity and become export-oriented products. The country is also strengthening the development of the downstream fastener industry to compete directly against the Taiwan**

downstream manufacturers and increase their competitiveness in the European market. Meanwhile, the quality has seen an increasing improvement and shown tendency of replacing the competitors' products.

- **Overseas competitors such as Korea and Japan are actively seeking export orders due to poor domestic demands. The productivity utilization rate has remained low.**

- **With the second-stage ECFA negotiation approaching, Taiwan will open its market to the Mainland Chinese steel products, which will have a major impact on the domestic market.**

Table 2. 2012 Taiwan Long-bar Stainless Steel Exports Analysis

	Export Value	Export Amount	Export Unit Price	Main Destination Countries
Long-bar Stainless Steel	Hundred million NTD	Thousand tons	NTD/Kilogram	
Seamed Tubes	165	158	104	USA, Australia, Canada, (29% share)
Rods	90	98	92	Korea, Thailand, China, (51% share)
Polished Bars	61	41.6	147	USA, Korea, Japan, (56% share)
Steel Wires	25.4	16	160	USA, Japan, China
Straight Bars	15.5	14	110	China, ASEAN countries, Australia
Figured Iron	4.9	1.6	325	Hong Kong, Japan, France
Seamless Tubes	1.7	1.5	114	ASEAN Countries
Total	363.5	330.7	110	

IV. Future Directions And Opportunities For Taiwan Stainless Steel Bar And Wire Industry

The steel industry will still have its advantages in the future, particularly with the rapid development of Mainland China and Southeast Asian countries. For example, China's 12th 5-year development project covers items such as high-speed railway, automobiles, ship building, petrochemical and energy while the entrance of ECFA will create a very big niche and demand market. In addition, stainless steel products conform with the environmental protection trend as they can be fully recycled and reused. With the economic and living standards rising in various countries, the demand for stainless steel products will increase. In the face of price competition advantage of Chinese products, advanced countries are moving towards the development of niche-type and nickel saving stainless steels. The examples are cited below for reference by the industry:

(1) Martensitic stainless steel

Martensitic stainless steel has a chrome content of 11%-18% and contains a certain level of carbon. The 13Cr stainless steel of SUS 403, SU410 (13Cr-1Mn, C≤0.15%) is most representative of this type of stainless steel. It can be hardened with quenching. A wide range of characteristics can be obtained through the selection of composition and heat treatment conditions. It mostly comes in the forms of steel rods and plates and is applied in high-strength, anti-corrosion and anti-heat machine parts, such as turbo blades, pumps, bearings and nozzles.

In terms of the anti-corrosion characteristic, Martensitic stainless steel with less carbon content is advised. This type with more carbon content has excellent

durability against wear. Therefore, SUS420 grade (13Cr high carbon) is applied in knives, motorcycle/bicycle brake discs, surgery wares and stainless utensils. The SUS440 grade (18Cr high carbon), with the highest hardness, is used in shafts.

(2) Duplex Stainless Steel

The duplex stainless steel refers to the stainless steel formed by the ferrite steel and austenite steel. In a solid solution structure, ferrite and austenite each takes up half of the composition. These types of stainless steels are referred to as the ferrite-austenite duplex stainless steel which integrates the excellent strength, workability and weldability of the latter and the good durability and anti-corrosion characteristic of the latter and is represented by SAF2205.

(3) Anti-bacteria Stainless Steel

Japan steel manufacturers began the R&D of anti-bacteria stainless steel in as early as 1995. The first patent emerged in 1996 with the approach of adding copper or silver to form the alloy. Restricted by the Japanese patent, the Taiwanese manufacturers cannot mass produce the anti-bacteria stainless steel. A solution for breaking through this patent barrier could be licensed production or other types of cooperation with the Japanese manufacturers to achieve a win-win position for both sides.

(4) High-strength Austenite Stainless Steel

The High-strength austenite stainless steel is strengthened by adding nitrogen. The functions of the element in stainless steel include: ① nitrogen solid solution

strengthening; ② nitride distribution strengthening; ③ crystal grain refining for improvement of stainless steel performance. The steel types include 304N, 305N (Cr18Ni12), XM7 (Cr18Ni9Cu0.7) and 384, etc. They are characterized by high strength and high purity and can replace the current welded compound screws (low-carbon/stainless steel). When applied in self-tapping screws, the screw tail hardness can reach over HV520 and the core hardness can be over HV520. This type of stainless steel has very good shapability and the screw head can pass the 500~1,000 hour salt spray test.

(5) Super-clean Stainless Steel

The super-clean stainless steels are the stainless steels with the control or inhibition of internal defects reaching the minimum threshold for the specific element design and during the production to give the alloy superb mechanical, physical and chemical performance. These defects include:

- Inclusions (such as oxides, nitrides, silicides, phosphides or other impurities)
- Macro defects (such as blowholes contractive cavities or slag pinholes)
- Oxygen, nitrogen and hydrogen gas content
- Trace elements (such as lead, bismuth and antimony) and composition segregation
- Abnormal distribution of micro structures (such as disproportionate distribution of crystal grains or double phase)

The main applications of super-clean stainless steels include:

- Biomedical: artificial joints, fracture fixing apparatus, medical equipment.
 - Shaping: extra-thin wires. Deep-drawing sheets.
 - Production process: high-purity tubes, valves, connectors, moldings and tooling.
-

(6) Super-thin stainless steel wires

The wire diameter is 0.05~0.03 or 0.02~0.012mm with 304 being the main type. The wire surface must be defect-free and inclusions must be tiny and have higher strength and reflection. The main application is metal fiber cloth with the anti-electromagnetic wave, anti-heat, anti-static, anti-bacteria, cutting-proof, corrosion-proof and noise-proof characteristics.

V. Conclusions

For the prospect of 2014, the Mainland Chinese market has gradually become a vital market which determines the boom and decline of the global stainless steel bar and wire industry for its current production and market demands. Therefore, changes in the supply and demand of the Chinese steel plants, the appreciation speed of RMBs and raw material price fluctuations will be the important factors affecting the stability of the global demand. Given that the rapid fluctuation of raw material prices has become a commonplace of the industry, the material storage of all the manufacturers will be based on the actual needs as they become more conservative in purchase, and a decrease of speculative material preparation is therefore expected.

Powered by China's continued implementation of expanding domestic demands, the demands for welding materials by auto making, petrochemical and nuclear power industries will continue to grow. It is expected that the demand for springs and screw wires by the home appliance and handset industries will continue to grow. However, the fierce competition among the steel manufacturers will cause their exported products to affect the stability of the global stainless market.

For other Asian markets, Japan is gradually seeking alternative material sources as their competitiveness is limited by the overly high domestic production costs. The chance of trying steel materials provided by Taiwan manufacturers has therefore largely increased. For the Middle East markets, the demands are mainly for low-price materials from India.

