

China Fastener Market Scale and Prospect for 2021

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1. Definition and Categories of Fastener Industry

Fasteners are a fundamental mechanical component dubbed as the pillar of the industrial sector. Fasteners are diversified in their types and specifications and have different performances and uses. They are highly standardized, serialized and generalized and applied in various fields. They are involved in multiple industries from space shuttle, automobile, equipment to toy, tables and chairs.

Fasteners are a generic term for a type of mechanical components to connect two or more parts to make an entity. They include bolts, studs, screws, nuts, self-tapping screws, wood screws, retaining rings, washers, pins, rivets, composite parts, SEMs, weld screws. They are used for fastening and are a widely used component type.

2. Overview of China Fastener Industry

China's fastener industry has grown into a large entity through four decades of Chinese economic reform. The country is now a major fastener manufacturer and exporter that lives up to its title with the world's largest fastener capacity. As the most fundamental and universal mechanical component, fasteners are a critical pillar as an emerging industry under the country's new tactics. Fasteners are a tactical industry that is capital-intensive and highly technical, with vast market demand and a good prospect. Fasteners are the most widely used mechanical components, used in the automotive, energy, electric, electronics and machinery industries. Assorted fasteners can be seen on various types of equipment, vehicles, ships, railroads, bridges, constructions, and dashboards. Among them, automobiles are the largest application field for fasteners, taking up 23.2%, followed by maintenance

and construction industries taking up 20%, and the electronics industry taking up 16.6%. The last is industrial machines industry taking up 13%, metal products at 11% and others at 16.2%.

3. Market Scale

Form 2012 to 2019, the Chinese fastener industry's revenues continued rising until it peaked in 2017. At the end of 2019, the Chinese fastener industry's revenues were RMB 122.059 billion.

In 2019, the fastener industry was met with various challenges and predicaments. The impact of U.S./China trade war emerged that led to an obvious drop in export. International trade conflicts increased which hampered companies' export. Material prices were high and increased production costs. Greater supervision on environmental protection demands makeover, relocation and even closure on many companies. High costs in every aspect refrain companies from increasing production and export. The COVID broke out at the start of 2020. Despite a better current situation in China, the pandemic control to prevent viral spread is still difficult. The pandemic is still not under effective control, which will continue to impact fastener production and export. The revenues for 2020 are expected to continue the decline and reach RMB 112.56 billion. With the proactive measures by the Chinese government against the pandemic, the epidemic in the country is under full control and the people can do business as usual. The government is pushing for an industry cycle which is good news for the fastener industry.

From the perspective of competition, China's sizable fastener manufacturers have increased to 7,000. They have started to form an industrial conglomerate which centers on Yangtze River Delta, Pearl River Delta and Bohai Economic Zone. The fastener industries in these areas take up over 75% of the market share. So far, China's fastener industry mostly consists of medium and small companies.



In 2020, China exported 4,069,125 tons of fasteners, down 2.1%, and the export value was USD 8,792,590,000, up 8.1%. The average export price was USD 2.16 thousand per ton. The revenues are expected to bounce up in 2021 to reach RMB 122.54 billion.

These companies have a smaller scale and weaker R&D, and therefore, most products are manufactured for low-end and mid-end fields. However, they lack the advantage in the highly technical high-end industrial market. Therefore, speeding up towards high-end fields will be the mainstream in the future fastener market.

Three Major Challenges for the Fastener Industry

(1) Steel price hike leads to evident cost pressure

China's steel price dropped and then bounced up. The first quarter of 2020 saw a sluggish steel market nationwide due to the pandemic. The market began to bottom up in April as steel demand increased, and continued to fluctuate upwards. Up to the end of 2020, the national steel price index rose around 26% above the low point.

2020 was indeed a difficult year for the fastener industry. Steel price continued upwards and led to continuous cost surge on fastener companies. There was an economic downturn, the domestic and overseas demand was weak. Trade protectionism was predominant. Trade deals were getting fewer. Factory purchase prices were getting higher and people had to opt for rental. Material costs and price level were going up and shrunk the profit margin. People were stuck in a negative cycle where they feared to purchase equipment when there was no business and they didn't receive orders because they didn't purchase equipment. Recruiting workers was difficult, especially technical workers. This is a common problem currently faced by the Chinese companies. Lack of labor persists despite raising the annual wage. Collecting payment is difficult and repayment is slow. Goods payment is delayed by each supplier in the chain. Therefore, it is believed that the fastener companies that pull themselves through the pandemic are the reliable and powerful ones.

(2) Appreciated RMB; More Pressure on Export

During the end of 2020 and the start of 2021, it was 6.40~ 6.50 RMB in exchange for USD 1. The rapid RMB appreciation driven by both internal and external factors is a double-edged sword. From a global perspective, this is a need for global fund hedging. The pandemic is still not under effective control and positive tested patients as well as death rate set records every day. Economically, by the World Bank's estimates, the world economy remained in a state of negative

growth in 2020. These all entail urgent global fund hedging. Domestically, this is a manifestation of China's power. The country's performance on epidemic control is for all to see. The economic growth rate is turning positive from negative. The country's burst of consumption demand stimulates the growth of domestic demand and leads to re-evaluating RMB assets. Meanwhile, full work resumption makes for China to quickly dominate the world's demand for products.

Currency appreciation is a double-edged sword that raises RMB asset price on one hand and poses a negative impact on export on the other hand. Therefore, it is necessary to maintain stability, balance and controllability of RMB's currency value and exchange rates. Despite gradual work resumption and economic recovery in overseas countries, external trade faces pressure from fluctuating exchange rates.

(3) Price War; Malevolent Competition

In the backdrop of weakening domestic and overseas demand, the fastener industry competition is turning more intense and white-hot. Besides increased material and labor costs, and decreased domestic and overseas demand, fastener companies have to deal with rival competition. An example is that rivals could sacrifice profits by lowering the price by 15% to gain market share. How should a fastener company react to that? Should the company stick to its price and risk losing clients, or lower to the same price as the rivals' and strike a deal that loses money? The fastener industry in nature is low-profit and price-transparent, and malevolent price competition is a common occurrence. However, fastener people must get this straight: There is no end to price competition and the consequence is that no one gets to earn the money!

We look up to companies that stick to their brand/quality/price positions. They are the pillars, future and hope of the industry that are worth the respect. Those that truly earn the respect are not the fastest growing and fastest expanding companies, nor the ones with the largest scale, but the ones that stick to creating business and society values and guard their bottom lines throughout the way. Their existence is a blessing for the industry, society and ourselves! Therefore, the critical corporate and commercial bottom line is sticking to your own product value, commercial value, and the value of your existence.

4. Industry Forecast

2021 is the year for the 14th Five-Year Plan of China. It is of utmost importance to develop the economy and society well as the first step in China's development during the 14th Five-Year Plan. This first step has to be precise and steady and draw innovation that brings new progress. In the new phase of development, the fastener industry facilitates its role as a critical infrastructure to realize national industry ecology, digitization, intelligent and high-speed manufacturing, transformation to new momentum, and economic structural symmetry. The industry also sticks to innovative, coordinated, eco-friendly, open and mutual development. This new infrastructure receives attention from all walks of life.



(1) Innovation is the Road Map for Building a Fastener Nation

We cannot deny that China is less capable of innovating fastener technology which is apparent in its low density of innovative factors, lack of independent innovation, and low added value of products. China is at the low end of the international fastener supply chain, and it uses technologies that are mostly originated from the innovation of overseas countries which China's fastening technology is often restrained to. Improving the capabilities for innovation requires digesting external technologies and reinventing, and boosting independent innovation for advantageous products to form IPR-driven and critical technologies.

Critical technologies are not just plainly exclusive. They don't qualify as new, but they are hard to master and replicate. They are a series of technologies which explain that a company has improved technical capabilities, performance, quality and lower costs. They are unique to the company, are the tricks and essence of day-to-day technique, and are effective methods combined.

The Chinese fastener companies must elevate innovation capabilities, stick to independent R&D, master core technologies, polish day-to-day technique, and work on technical differentiation. Meanwhile, different corporations should share critical technologies (platforms) and avoid fighting alone.

(2) Chinese Fastener Industry Prospect in the New Phase

In 2021, China's fastener industry enters a new development phase of steady progression where the growth slows down to a pace of 2% to 5%. There is increased improvement on product structures to speed up development of high strength, non-standard mechanical components. There ought to be new breakthrough in critical and fundamental technique. We must grasp the opportunities in electric vehicles, alternative fuel equipment, railroad vehicles, aircraft and aerospace, and develop high strength fasteners made of steel and alloys that are resistant to heat, corrosion and fatigue. The continuous development of wind power industry provides a great market outlook for the fastener industry. With global increasing awareness on environmental protection

and lowering wind power cost, more and more countries are making their ways into wind power. According to China Wind Power Road Map 2050, the electric capacity of wind power equipment installed in China will be 250,000 megawatts in 2021, 400,000 megawatts in 2030 and 1 million megawatts in 2050. Wind power will cater to 17 % of electric demand by 2050 and become one of the 5 major sources of electricity for China. Fasteners are an indispensable part in wind power and there is a margin for the growth of wind power equipment installation in China and the world. This makes for a vast market for the Chinese fastener manufacturing industry.

The government's policies provide a good environment for the fastener industry. In recent years, China's multiple policies and regulations on wind power scale, growth rate, management, technical standards make a margin for the future development of Chinese wind power. As a fundamental industry



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China's attention to the wind power industry provides a powerful political support for the fastener industry. High performance, high added value and high strength fasteners must take up 10% of all fastener products. Fastener capacity for 2021 is estimated at 9 to 9.5 million tons, up 2% to 5%.

for high-end equipment manufacturing, the high-strength fastener industry plays a critical role in emerging tactical industries.

(3) Counting on Technical Innovation to Expand Domestic & Overseas Markets

We must stay on the track of suppliers structural reform this year, and put our focus on supply management to invigorate the market, find market potentials and create dynamic balance between supply and demand. We must resort to technological innovation, combine information, technology and standards, monitor the development of ISO-compliant fastener standardization to keep China in sync with global standards. Implementing ISO standards is very important in elevating China's technical level and connect with the world. This is an essential and fundamental national policy. It is necessary to implement new standards (refer to **Table 1** for national standards related to fastener inspection and production), develop IT and advanced technical applications, develop new cold forming machines enabled with human-machine interaction and develop online automatic inspection equipment, promote eco-friendly electroplating, and promote new applications for untempered steel. ■

Table 1 National Standards Related To Fastener Inspection and Production

| No. | Standard Code | Title of Standard | Alternative Standard | Effective Date |
|-----|------------------|--|----------------------|----------------|
| 1 | GB/T34895-2017 | General Rules for Metallographic Examination of Heat Treatment | / | 2018-05-01 |
| 2 | GB/T230.1-2018 | Metallic Materials- Rockwell Hardness Test- Part 1: Test Method | GB/T230.1-2009 | 2018-12-01 |
| 3 | GB/T231.1-2018 | Metallic Materials- Brinell Hardness Test- Part 1: Test Method | GB/T231.1-2009 | 2019-02-01 |
| 4 | GB/T2975-2018 | Steel and Steel Products—Location and Preparation of Samples and Test Pieces for Mechanical Testing | GB/T2975-1998 | 2019-02-01 |
| 5 | GB/T224-2019 | Determination of Depth of Decarburization of Steels. | GB/T224-2008 | 2020-05-01 |
| 6 | GB/T38751-2020 | General Rules for Metallographic Examination of Heat Treatment | / | 2020-11-01 |
| 7 | GB/T38720-2020 | Microstructure Examination of Medium-Carbon Steel and Medium-Carbon Alloy Structural Steel After Quenching | / | 2020-10-01 |
| 8 | GB/T38770-2020 | Spheroidite Examination and Grading for Low and Medium Carbon Steels | / | 2020-11-01 |
| 9 | GB/T38749-2020 | Technical Requirements of Controlled Atmosphere Heat Treatment | / | 2020-11-01 |
| 10 | GB/T3098.23-2020 | Fastener Mechanical Performance: M42-M72 Bolts, Screws, Studs | / | 2020-10-01 |
| 11 | GB/T3098.24-2020 | Mechanical Properties of Fasteners—Stainless Steel and Nickel Alloys Bolts, Screws, Studs and Nuts for High Temperature Applications | / | 2021-06-01 |
| 12 | GB/T3098.25-2020 | Mechanical Properties of Fasteners—Guidance for the Selection of Stainless Steels and Nickel Alloys for Fasteners | / | 2021-06-01 |
| 13 | GB/T229-2020 | Charpy Pendulum Impact Test Method for Metals | GB/T229-2007 | 2021-04-01 |
| 14 | GB/T39191-2020 | Heat Treatment of Stainless Steel And Heat-Resistant Steel | / | 2021-05-01 |
| 15 | GB/T39192-2020 | Heat Treatment of High Temperature Alloys | / | 2021-05-01 |
| 16 | GB/T39194-2020 | Technical Requirement of Heat Treatment for Vacuum Low Pressure Carburizing and high Pressure Gas Quenching Furnace. | / | 2021-02-01 |
| 17 | GB/T39130-2020 | Test Methods of Determination of Adhesive Property for Galvanized Steel Sheet | / | 2021-05-01 |
| 18 | GB/T39039-2020 | Evaluation Method for Hydrogen-induced Delayed Fracture of High Strength Steels | / | 2021-02-01 |
| 19 | GB/T13912-2020 | Metallic Coatings--Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles--Specifications and Test Methods | GB/T13912-2002 | 2021-05-01 |
| 20 | GB/T11376-2020 | Metallic and Other Inorganic Coatings—Phosphate Conversion Coating of Metals | GB/T11376-1997 | 2021-05-01 |
| 21 | GB/T38807-2020 | General Specification for Super Austenitic Stainless Steels | / | 2021-01-01 |
| 22 | GB/T39033-2020 | Austenitic-ferritic Duplex Stainless Steel Wire Rods | / | 2021-02-01 |

