

Can



# Robotics Be a Niche for Chinese Fastener Industry?

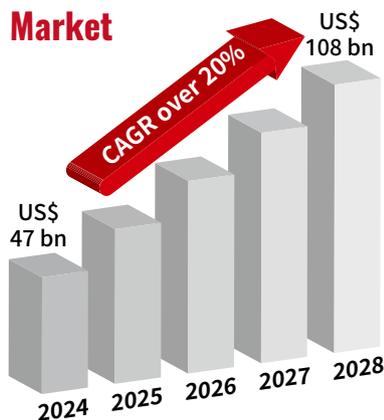
## AI机器人能成为中国紧固件业利基吗?

### Introduction

China's robotics and automation ecosystem is expanding rapidly, reshaping manufacturing and industrial supply chains. At the same time, the Chinese fastener industry—a foundational but often overlooked segment of manufacturing supply chains—faces growth pressures and opportunities from multiple directions. This article assesses whether and how the AI robotics sector can act as a niche or growth frontier for China's fastener players, using current statistics, industry forecasts, and strategic market analysis.

The short answer: there is opportunity, but it isn't straightforward. For fastener companies to meaningfully leverage the AI robotics boom, they must rethink value creation—not simply sell more bolts and screws—but integrate into robotic assembly, tailor solutions for smart manufacturing cells, and differentiate into higher-precision, high-margin components.

### China's Robotics Market



## 1. The Scale and Growth of China's Robotics Industry

China today is indisputably the largest global market for industrial robots. According to the International Federation of Robotics, *China installed over 295,000 industrial robots in 2024, representing about 54% of global demand* and pushing its total installed base beyond 2 million units. <sup>1</sup>

The robotics industry in China has also seen dramatic revenue growth—from 106.1 billion yuans (~US\$15 billion) in 2020 to 237.89 billion yuans in 2024, nearly doubling in five years. Exports of Chinese industrial robots have similarly expanded, rising from US\$390 million in 2020 to over US\$1.15 billion in 2024. <sup>2</sup>

These figures underscore three vital trends:

1. Rapid adoption of automation across manufacturing sectors, not just traditional heavy industries.
2. Domestic Chinese robotics firms are gaining market share, surpassing foreign suppliers within China.
3. Robot applications are diversifying as industries adopt not just programmable arms but AI-driven, adaptive robotic systems.

Market analysts also expect robust expansion in both traditional industrial robotics and AI-powered robotic applications. *Morgan Stanley estimates China's robotics market could more than double from around US\$47 billion in 2024 to US\$108 billion by 2028, with compound annual growth exceeding 20%.* <sup>3</sup>

Key takeaway: China's robotics transformation is real and accelerating, creating large volumes of demand for components, assembly, and integration services.

## 2. Snapshot of the Chinese Fastener Industry

### Current Market Size

*The Chinese industrial fastener market alone was valued at about USD 12.24 billion in 2024 and is forecasted to grow to USD 22.79 billion by 2032—a CAGR of roughly 8%.* <sup>4</sup>

1. [https://ifr.org/downloads/press\\_docs/2025-09-25-IFR\\_press\\_release\\_China\\_in\\_English.pdf](https://ifr.org/downloads/press_docs/2025-09-25-IFR_press_release_China_in_English.pdf)
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4. <https://www.credenceresearch.com/report/china-industrial-fasteners-market>
5. <https://www.intelmarketresearch.com/screw-tightening-robot-market-9723>



Within the fastener segment, some sub-markets—such as automotive fasteners—are expected to see growth in parts demand thanks to electric vehicle manufacturing and global automotive production trends.

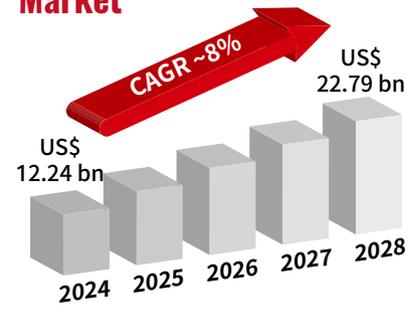
## Structural Characteristics of Fastener Demand

The Chinese fastener industry is:

- Highly fragmented, with many small and midsize producers.
- Export-oriented, serving global assembly capacity.
- Naturally integrated into broad manufacturing supply chains, as fasteners make up essential sub-components in sectors like automotive, electronics, construction, appliances, and machinery.

Nevertheless, the industry faces challenges such as raw material price fluctuations, environmental regulations, intense competition on price rather than value, and pressure to innovate and customize. China's fastener industry is large and growing, but mostly centered on traditional manufacturing value chains where scale and cost advantages drive competition.

## Chinese Industrial Fastener Market



## 3. Where Robotics and Fasteners Overlap

At first glance, robotics and fasteners seem disconnected. One is cutting-edge automation; the other is basic hardware. But on closer inspection, *fasteners are intrinsic to robotics and automation supply chains in three ways:*

### 3.1. Component Supply for Robot Assembly

Industrial robots and automated systems are complex machines requiring hundreds of custom-grade fasteners—from precision nuts used in motion joints to specialized bolts securing actuators. Although these are low-value per unit, they are often high in volume and must meet strict tolerances and quality specifications.

Growth in robot production increases the demand for these precision fasteners. Given China's rapid domestic robot manufacturing growth, this could translate into meaningful demand uplift for high-precision fasteners if suppliers can meet required quality and certification standards.

### 3.2. Fasteners for Smart Manufacturing Cells

Beyond robot hardware, many modern automated production environments use robot-driven assembly cells where automated screw tightening, precision fixture assembly, and repeatable joining operations matter.

For example, the global screw tightening robot market—robots specifically designed for assembly tasks previously done manually—was valued at about USD 807 million in 2024, and is projected to grow to USD 1.34 billion by 2031. China is seen as a growth hotspot for these systems due to rapid automation adoption.

Such systems require not only the robotic unit itself, but also:

- Fasteners optimized for robotic handling.
- Sensors to confirm torque and placement.
- Integration hardware to facilitate automated quality control.

This creates niche opportunities for fastener manufacturers willing to develop robots-friendly product lines.

### 3.3. Value-added Fasteners for Industry 4.0

Moving beyond commodity screws and bolts, fasteners tailored for intelligent manufacturing—such as feedback-enabled smart fasteners that report torque and stability data—could open up premium product niches.

Industry 4.0 encourages interconnected, sensor-rich manufacturing components. Fasteners with embedded sensors or traceability features could become integrated elements in smart factory environments. Robotics adoption increases demand for both traditional fastener volumes and new types of fastening solutions designed for automated assembly and digital integration. But scaling into this niche requires more than basic products—it demands precision and often technological augmentation.

## 4. Strategic Challenges and Considerations

Simply betting on growth in robotic installations does not guarantee gains for fastener companies. Several structural issues must be addressed:

### 4.1. Quality and Precision Standards

Fastener requirements in industrial robotics are high—tolerances in robot joints can be microscopic, and failure can lead to expensive downtime. Many Chinese fastener companies historically focused on low-cost volume, not precision aerospace- or robotics-grade components.

To become part of robotic manufacturing value chains, companies must upgrade capabilities—often a steep investment—but one that enables access to higher-margin segments.

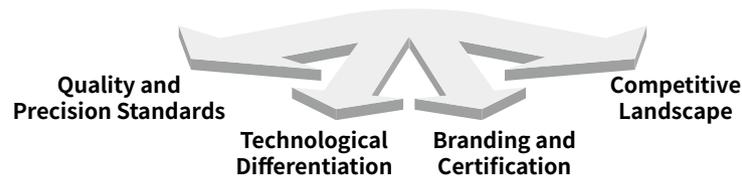
### 4.2. Technological Differentiation

To capture niche robotics opportunities, fastener firms must innovate—moving beyond commodity bolts and screws into smart and customizable components. That means investment in R&D, advanced machining, and sensor-integration capabilities, an explicit departure from traditional models.

### 4.3. Branding and Certification

Industrial robotics makers often require suppliers to meet rigorous certification and quality control standards. Fastener firms without international credentials or recognized quality assurance may struggle to become preferred suppliers to robotics OEMs.

## Structural Issues to be Addressed for Chinese Fastener Companies



### 4.4. Competitive Landscape

The robotics supply ecosystem is global and competitive. In high-end precision fasteners, European and Japanese firms currently dominate. Chinese fastener firms may need to carve niches (for example, price/quality balance for domestic robotics makers) rather than directly compete at the top tier.

## 5. Strategic Pathways for Fastener Firms

If a fastener company wants to capitalize on the AI robotics boom, the following strategic paths merit consideration:

### 5.1. Partner with Robotics OEMs

Rather than approach the robotics opportunity alone, fastener manufacturers can form strategic partnerships with robotics original equipment manufacturers (OEMs). This can enable co-development of fastening standards and ensure tighter integration into assembly bills of materials.

### 5.2. Invest in Precision and Innovation

Upgrading machining capabilities toward micro-precision fasteners, and exploring smart integration (e.g., torque sensing or RFID tagging) could unlock higher margins. Precision micro-fasteners are valuable in robotic end-effectors and compact robotic units where tolerance is critical.

### 5.3. Focus on Automation-Friendly Products

Fasteners optimized for automated assembly—e.g., features that facilitate robotic gripping, self-aligning heads, or embedded indexing features—can win preference where manufacturing cells use automated screwdriving robots.

### 5.4. Certifications and Supply Chain Positioning

Fastener firms should seek ISO and industry-specific certifications, and align their quality systems with robotics OEM purchasing requirements. This might entail retooling QC processes and elevating traceability and documentation.

### 5.5. Leverage China's Strategy and Scale

China's robotics ecosystem is not just large—it's policy-driven. The "Made in China 2025" initiative explicitly prioritizes robotics and smart manufacturing as strategic sectors. Fastener companies that position themselves as contributors to localized supply chains could benefit from policy incentives and local OEM relationships.

## Conclusion

The Chinese AI robotics industry is booming, asserting global leadership in automation installations and technological development. That growth does open opportunities for the fastener industry—but only for players that move beyond traditional product offerings. Volume demand from robotics assembly exists and will continue to grow. However, the real niche lies at the intersection of precision, automation compatibility, and value-added fastening solutions—not simply increased bolt and screw output.

To seize this niche, fastener manufacturers must consciously elevate their technological capabilities, align with OEM requirements, and strategically innovate around products designed for the needs of AI-driven automation and smart factory ecosystems.

In other words: Yes—the AI robotics industry can be a meaningful niche for Chinese fastener firms—but only if they evolve beyond commodity supply and become partners in automation's future. ■

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