Shimoda Iron Works: Pioneering Sustainable Manufacturing

Shimoda Iron Works leverages cutting-edge forging technologies and sustainable practices, driving innovation in various industries, from oil and gas to aviation. *By Sean McBride*

Shimoda Iron Works, established in 1946, has grown into a pivotal player in the global manufacturing landscape, specializing in forged flanges and fittings. With annual sales reaching $34 million, the company operates from its head office and main plant in Aioi City, Hyogo Prefecture, Japan, employing around 100 people. Its group company, Shimoda Manufacturing Technology Centre Co., Ltd., and business partner, Yamashita Forging Co., Ltd., together run three plants, all located within Hyogo Prefecture.

"Our standard manufacturing processes involve different types of forging such as ring rolling, stamp forging and open-die forging. Heat treatment, machining and final machining are also standard processes of ours," explains Shinji Shimoda, president of Shimoda Iron Works.

6-axis robots for WAAM

The company's products, primarily flanges and forged fittings, are integral to various industries, including oil and gas, chemical plants, power generation facilities, semiconductor manufacturing, aviation, construction and civil engineering.

Seamless flange elbow

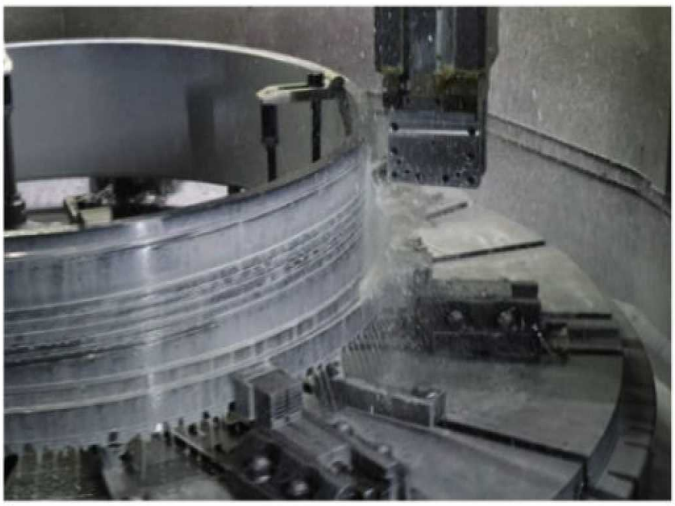
This diverse application spectrum underscores Shimoda Iron Works' capacity to adapt and innovate continually. Advanced technologies like closed-die forging, ring rolling mill forging and 3D machining have propelled the company's growth, significantly contributing to Japan's industrial development.

In alignment with global sustainability goals, Shimoda Iron Works has integrated several innovative processes aimed at reducing environmental impact. "Our flanges and our technology contribute to the Sustainable Development Goals and carbon neutrality. Our three new processes are HIP processing, cold drawing and WAAM 3D printing," says Mr. Shimoda. The company's HIP (Hot Isostatic Pressing) technology, developed with subsidies from Japan's Ministry of Economy, Trade and Industry (METI), is already making significant strides, particularly in the oil and gas sector. Cold drawing technology targets small quantities with high variety, crucial for industries like nuclear power and semiconductors. The latest addition, WAAM (Wire Arc Additive Manufacturing) systems, includes two new machines from the Netherlands and Germany, aimed at sectors such as buildings, architecture and defence.

Shimoda Iron Works' innovative spirit is further exemplified by its ongoing projects and partnerships. The company collaborates extensively with academic institutions and other businesses to leverage cutting-edge technologies. "We received many subsidies and have been working with Osaka University. Our next plan is to introduce a large-sized 3D printer at our plant next year," notes Mr. Shimoda. This advanced printer, equipped with a 6-axis robot and a 2-axis positioner, will enable the production of large parts for industries such as architecture and aviation.

The company's HIP processing, a collaboration with Metal Technology Co. Ltd. (MTC), exemplifies its commitment to overcoming industry challenges. "The barriers to entry into oil and gas upstream are very high. We have just passed the process with MTC of acquiring European HIP manufacturing certification. We are currently waiting for the results and plan to take the next step in January of next year," reveals Mr. Shimoda.

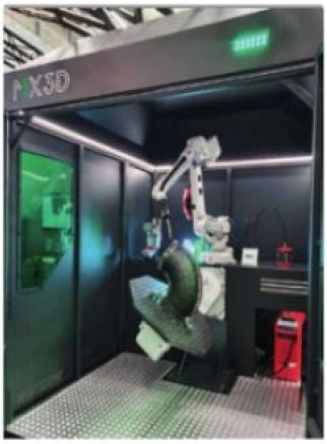
Strategic partnerships extend beyond Japan's borders, highlighting Shimoda Iron Works' global outlook. Collaborations with companies like Euskal Forging from Spain enhance the company's capabilities in sectors such as offshore wind turbines, which are crucial for Japan's energy future.



Thread machining connector

> "My dream is to make our business more sustainable and use sustainable materials."
>
> **Shinji Shimoda**, President, Shimoda Iron Works

Despite challenges posed by Japan's aging population and shrinking workforce, Shimoda Iron Works remains resilient by focusing on innovation and strategic collaborations. The introduction of new technologies like HIP and 3D printers aims to attract young talent and ensure a healthy work-life balance. "We believe that embedding digital transformation technologies and ideas will create a healthy work-life balance, helping us employ more people and increase interest in our company," states the president.



WAAM metal 3D printer