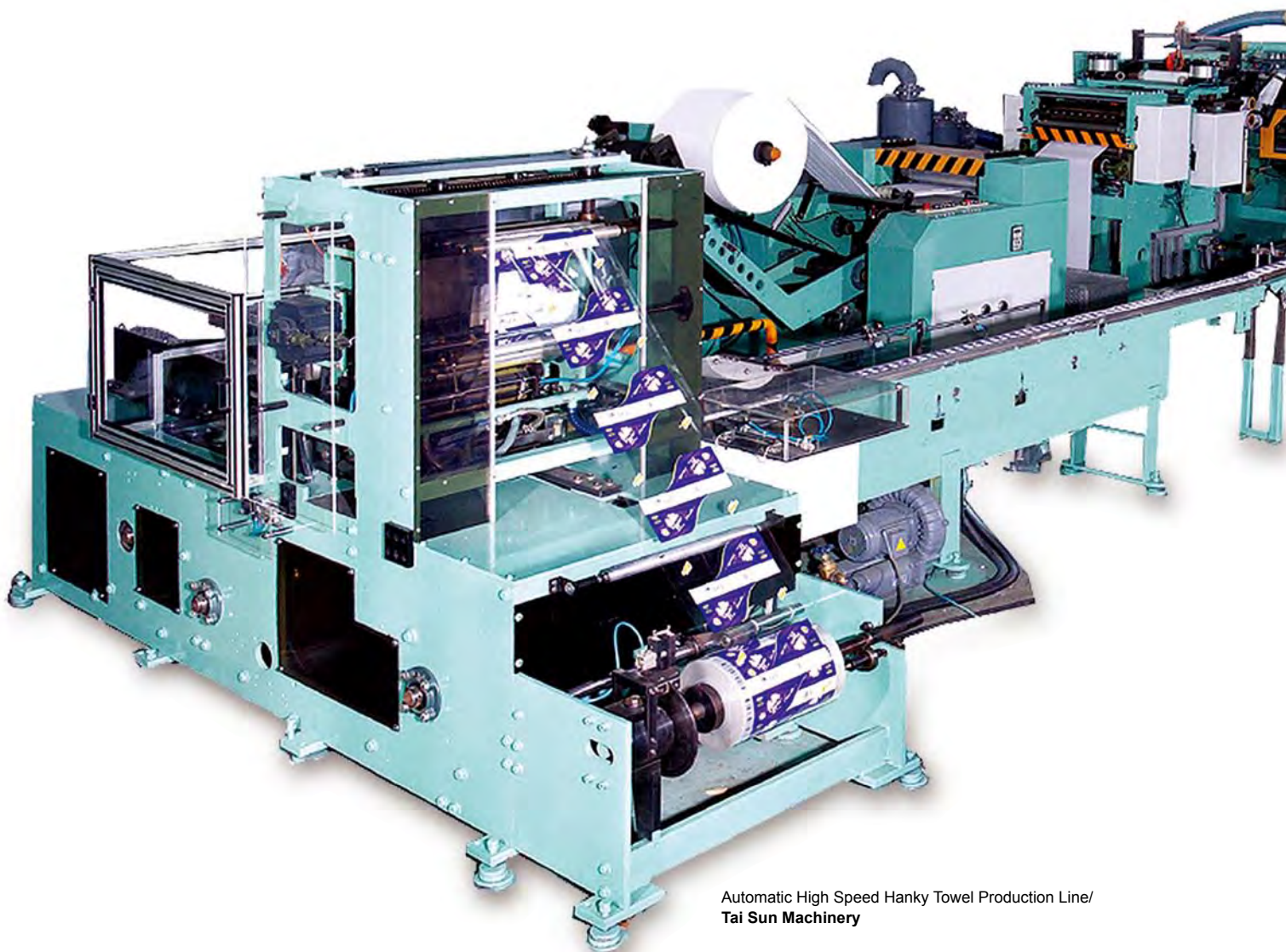


The Machinery Industry:

Marching Forward

The machinery industry in Taiwan is distinguished from similar industries in other countries by these simple facts: It is the world's most complete and integrated, and its system of satellite factories allows for the world's fastest

supply chains. With nearly half of Taiwan's machinery makers clustered in the central part of the country—especially firms producing machine tools, woodworking machinery, precision machinery, and parts and



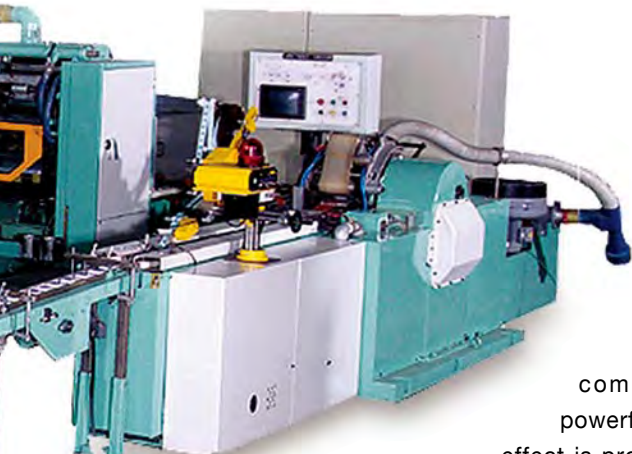
Automatic High Speed Hanky Towel Production Line/
Tai Sun Machinery



E-Clean(EO1) / AGAiT



E-Clean(EO2) / AGAiT



components — a powerful clustering effect is produced. This

allows the industry to produce a great variety of goods that, while their quality is high, can also compete powerfully on price, especially in comparison to countries like Japan.

Moreover, the majority of Taiwan's machinery and parts makers are small or medium-sized businesses that both produce their own brands and provide manufacturing flexibility to foreign firms. They tend to excel in research and development, customer service, and the provision of complete product categories. The Taiwanese machinery industry, with its combination of specialization and integration, enjoys advantages that few countries can match.

In 2010, the global economy began to recover from the financial crisis and the resulting global downturn. Taiwan's exports of machinery grew too, with shipments over the first eleven months of the year increasing 54.1 percent over the

same period a year earlier to reach a total of US\$15.1 billion. Exports to China alone grew by 92 percent. Meanwhile, imports grew at a rate of 84.3 percent over the first eleven months. All this shows both increased demand from high-tech businesses abroad and an environment of increasing investment. China and Hong Kong represented the industry's largest export destinations over the first ten months of 2010, accounting for 34.6 percent of global exports, while the United States accounted for 14.6 percent. Japan was the largest source of imports, representing 41 percent of the total, while the United States came in second, at 21.8 percent.

Big Plans

Taiwan's government has set a goal for the machinery industry of becoming the country's third trillion-dollar line of business in terms of annual production value (after semiconductors and flat-panel displays, and denominated in NT dollars). The government envisions ongoing double-digit annual output growth for the industry, and hopes to see machinery firms make products with greater value added, allowing them to become more profitable. The Central Taiwan Science Park has been designated as a hub for the development of the precision machinery industry. The

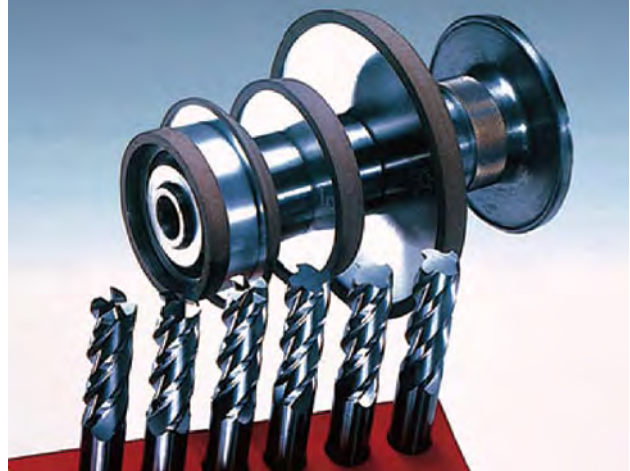
government calls for robust investment in the development of cutting-edge technologies. Such efforts should add to the industry's already impressive strengths in manufacturing and research and development.

A sector of the machinery industry especially highlighted in the government's efforts is robotics. Two thousand and ten was the "year of the robot" in Taiwan, and the country's vice president was quoted as saying he looked forward to Taiwan achieving progress in robotics comparable to Japan's, South Korea's, and Germany's.

Already, the local robotics industry produces goods worth US\$1.4 billion annually—a number that can be expected to grow through further investment and innovation. The industry is a leader in industrial robots, house-cleaning robots (it is the world's second-leading producer in this sector), and robots with entertainment functions. Matsutec Enterprises, AGAIT Technology, and MSI are representative companies in the field of house-cleaning robots.

The robotics sector suffered somewhat during the global downturn but is now rebounding nicely. In the future its prospects for growth appear bright, as aging populations in

Diamond Tools / Taiwan Asahi Diamond



many countries, rising labor costs, and vigorous investment in the industry are all likely to promote expansion.

An example of the Taiwanese industry's abilities is provided by Hiwin Technologies Corp., which in late 2010 debuted the world's first robot capable of playing the piano with 10 fingers. Hiwin makes ball screws and components such as linear motors, which were used in the keyboard player. This robot pianist is an entertaining application of technology—but its manufacturer, along with other firms, intends in the future to both generate profits and contribute positively to society by applying robotics technology to the challenges that accompany rapid change in countries worldwide. (By Jane Feng)



Industrial Sewing Machinery / Kaulin Mfg.

Taiwan's Machine Tool Industry: Recovering and Strengthening



Taiwan is famous for its proficiency in high-tech industries, from semiconductors to flat-panel displays. But also among the country's most important industries, as measured by production value, is the machine tool industry. In 2008, before the global financial crisis wreaked havoc on the world's economy, the industry achieved total production value of US\$4.76 billion, and Taiwan became the world's fourth-largest exporter of machine tools, ranking behind only Japan, Germany, and Italy.

In 2010 the global economy suffered from the after-effects of the financial crisis—and Taiwan's machine tool industry suffered accordingly, with exports falling to just US\$1.7 billion. But in 2011, with growth expected to top 20 percent, Taiwan is likely to attain more familiar output numbers and also to become the world's fourth-largest producer of machine tools, up from its current position of fifth. The industry's export value is projected to rise by 2015 to US\$7 billion.

Taiwan's machine tool industry is unique in the degree to which it caters to the international market. Almost 80 percent of the industry's production value is exported—in contrast to countries like Japan, China, and South Korea, which depend to a larger extent on domestic markets. The result is that Taiwanese firms maintain a strong global focus and concentrate above all on the needs of their international customers.

Flexibility and Integration

The local machine tool industry has built its strength over more than four decades. It competes at higher price levels with exporters from Japan and Germany, and with China at lower price levels. It is uniquely well situated to thrive amid such competition because of its flexible manufacturing approach, integrated system of satellite factories, and rapid supply chain.

In order to thrive, local makers routinely develop niche products and nimbly adjust their approaches in accordance with market demands. Such traits, which have played a powerful role in the industry's quick recovery from the global recession, also help make Taiwan a destination for one-



stop shopping in the machine tools market. The country's machine tool manufacturers supply customers in industries as varied as defense, aerospace, electronics, green energy, and the automotive sector. Local firms also meet customers' specialized needs through joint ventures, a business

approach at which Taiwanese companies have become adept. JAF Company Ltd., for example, has embarked on joint ventures with two Italian companies—Rambaudi and Rosa—and plans similar ventures with several other firms. Hiwin, meanwhile, has agreed to joint ventures with Mega-F (an Israeli company) and Matrix (a British firm).

Taiwan excels across the spectrum of machine tool products, but in several areas is particularly strong. One is metal-cutting machine tools, a sector that accounts for over 70 percent of all Taiwanese machine tool exports. Indeed, the country's share of global production in metal-cutting machine tools amounts to 73 percent. Another strength for local industry is computerized numerically controlled (CNC) machines. More than 200 machine tool makers and 1,000 components manufacturers are involved in this sector, allowing Taiwan to export about 40,000 CNC machine tools each year. This makes Taiwan the world's second-largest producer of such products.

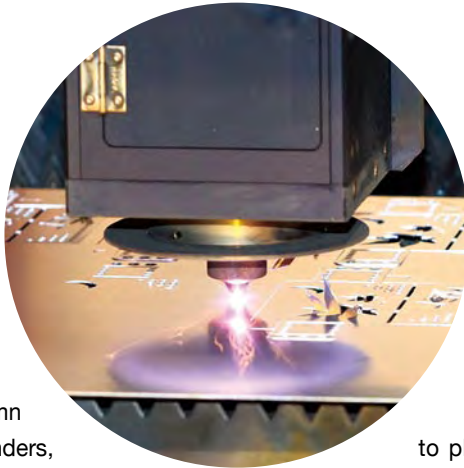
Taiwan also plays a growing role in the global market for machine tool parts. Until recently, local makers were not as prominent in this area as some international competitors, but their role is growing. Many machinery makers around the world today, facing price pressure from various Asian countries, have begun to outsource production of parts. Taiwan is well positioned to excel in this market because of its strong supply system and its abilities in design and research and development. Items for which outsourced parts are becoming more important include linear guides, spindles, turrets for lathes, and chucks.



Growth Markets

Going forward, the international market is expected to exhibit growth in the energy and aerospace industries, and more particularly in product segments such as vertical lathes, horizontal lathes, double column machining centers, double column grinders, and boring and milling machines. Meanwhile, in the market for machining centers, half of all traditional cutting machine tools are set to be replaced by high-speed cutting machine tools. In addition, demand for motion centers will grow in the 4C industries.

Taiwan's ability to compete effectively in the midst of these changes will be enhanced by the government's new plan for the machinery industry, in which the machine tool



industry is marked for double-digit growth. The government plan calls for parts and components suppliers to achieve a greater degree of self-sufficiency and to develop products with greater value added.

As the future unfolds, Taiwan is likely to play an increasingly important role as a machine tool supplier. On the strength of growing demand from emerging Asian economies, Taiwan is in position to become the world's third-largest exporter of machine tools by 2015. International buyers and suppliers are encouraged to visit Taiwan in order to gain a more detailed view of the country's dynamic tools industry. (By Jane Feng)



TC-16B/YCM