

How Japan's electronics dominance shifted to niche B2B fields

While Japan has been surpassed by regional competitors in recent decades when it comes to mass-produced, end-consumer (B2C) electronics, Nippon manufacturers today lead the way in the B2B sphere, producing parts, materials and equipment essential to the manufacture of semiconductors and other electronic components. Often working in high-tech, niche areas, these companies are harnessing Japan's manufacturing, engineering and innovative prowess to deliver high-quality solutions for the latest technologies, such as smart devices, AI, VR/AR, IoT, electric vehicles (EVs) and high-speed telecommunications.

"While Japan continues to be extraordinarily capable and dominates a broad set of materials, equipment, and components that allow the global technology industry to run, its participation in the industry has migrated from a B2C model to a B2B model," explains Scott Callon, Chairman and CEO of Japan Display Inc. (JDI), a company that is developing groundbreaking and unique display technologies such as eLEAP, the next generation of OLED screens. "We've chosen to do things that are hard rather than easy," adds the JDI CEO. "Our engineers are generating first-in-the-world, first-in-history breakthroughs. This is excruciatingly hard. But that is part of our strategy, to do things that are really hard, because then you leave your competitors behind and create unique value for customers by building things that no one else can build."

Creating unique and niche technologies is also the competitive strength of Nissei Electric, a manufacturer of insulation, transmission, and wave motion technology. "We develop, manufacture and sell wires, cables and tubes made mainly from fluoroplastics and silicone rubber, as well as optical components, mainly fiber optics. In addition to the characteristics of our materials, our unique processing methods enable us to meet the demands of a wide range of industries," says Nissei's president Hidehiko Kirino. "Over time, we have expanded into diverse industries such as OA (office automation), telecommunications and factory automation, -making full use of the various properties of our materials and our unique processing technology - and are aiming to further expand into robotics, medical equipment, semiconductor manufacturing equipment, mobility and other fields."

Japan once held the top position in the manufacture of finished semiconductors, but now its competitive edge can be found in the field of semiconductor manufacturing equipment, including equipment used in essential cleaning processes. "Japanese companies have large shares, globally, in terms of semiconductor cleaning equipment," stresses Masayuki Bouno, President of J.E.T., which aims to expand its operations in the fast-growing U.S. semiconductor market. "We have signed an agreement with Samsung Electronics to deliver our cleaning

equipment to their new plant in Taylor, Texas. With that as the starting point, we would like to start expanding into North America so that we can find new customers there."

Meanwhile, Shibuya Corporation - a manufacturer of bottling and packaging systems for a range of industries - supplies products used in the backend of semiconductor manufacturing. "The industry is dramatically changing right now," states company president Hidetoshi Shibuya. "New needs are emerging, with the prevalence of large-scale data centers, AI and new mobility solutions including EVs. We are developing nano-level mounting technologies that are required especially for large-scale chips used for AI and large-scale data centers."

Japanese companies engaged in the manufacture of high-performance materials are also playing their part in the development of the latest electronics technologies, with Toshiko Sakane, President and CEO of I.S.T Corporation, giving an example of what her company is doing in this regard. "One of our collaboration projects involves our low color polyimide film, TORMED," she reveals. "We've been working with print circuit manufacturers in Japan. Through this collaboration, we have successfully created a clear flexible print circuit, which has been used in augmented reality (AR) headsets widely used for virtual training, including by the U.S. Army."

Nissei Electric looking to be the number one company in niche markets

As a comprehensive manufacturer engaged in insulation, transmission and wave motion, Nissei Electric aims to address niche market requirements from clients operating in a wide range of industries.



"We want to be a good partner for our customers, working together with them to develop the requirements they want to realize."

Hidehiko Kirino, President, Nissei Electric Co., Ltd.

The Hamamatsu region in which Nissei Electric operates has a mild climate where cotton cultivation flourished in the past, allowing many textile industries to grow there. Nissei Electric's roots can be traced back to the manufacture of braided cotton laces and this braiding technology remains a fundamental technology still evolving today.

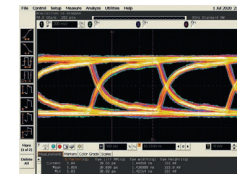


Shoelaces are the roots of Nissei Electric

Car manufacturers Toyota and Suzuki were the predecessors of the loom manufacturers. And manufacturers in the region have since expanded into the fields of 'insulation' using silicone rubber for automobiles, industrial machinery and household appliances, 'transmission' using

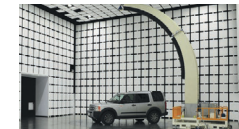
fluoropolymers for communications, mobile equipment and medical applications, and 'wave motion' using optical fibers for semiconductor equipment and sensing. Japanese manufacturers have also been responsible for the innovative development of printers, MFPs and other office automation equipment, especially in roll products used in the fusing process, offering uniquely developed solutions.

For its part, Nissei Electric offers unique products to a diverse range of industries, combining three high-performance materials with fine processing technology.



GigaEx for movable durability and high-speed signal transmission

GigaEx is a generic term for high-speed signal transmission products, comprising conventional metal cables, optical fibers and antenna products for wireless communications. Another strength of the Japanese firm is its ability to handle hybrid products combining metal and optical transmission. Particularly in the fields of FA, robotics and semiconductors, Nissei Electric focuses on the development of next-generation high-speed interface products with functions such as bending, twisting, and noise resistance, as well as flexibility and thin diameter - with solutions such as the AOC optical interface, which is optimized for high-speed transmission at speeds in excess of 10 Gbps.



Gain measurement of large workpieces through a 10m method anechoic chamber

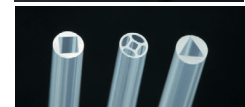
Antenna products are assemblies of coaxial cables optimized for customers' antennas. Nissei Electric provides integrated support from development to mass production of high-frequency antennas for WAN, Bluetooth, LPWA, LTE, 5G (Sub6), UWB, GNSS, etc. High-performance antennas are designed using advanced simulation technology, and gain measurement of large workpieces such as automobiles can also be handled. The company can provide cable-connected antennas with optimum performance, taking into account space saving, multi-band compatibility, and isolation, etc.



Cables with added flexibility, bending resistance and sterilization properties

In the area of ultra-fine diameters, custom cables using wires and coaxial cables with AWG36-48 conductors contribute to the ultra-compactness and lightness of equipment, and provide assemblies with excellent flexibility and bending resistance. The company's unique microfabrication process can also be used for direct connection to FPC boards, as well as in sterilization-compatible speci-

cations using specially formulated silicone rubber for the jacket. A wide variety of assembly proposals are available, including parallel shapes, round shapes and hybrids of the two, as well as devices that maintain flexibility and binding methods that emphasize appearance, in order to deliver products that meet the required mechanisms and functions. Nissei Electric continues to develop applications for medical diagnostic equipment devices, medical treatment devices and remote cameras.



Unique precision extrusion technologies for special applications

Tube fabricated products are customized products that combine Nissei Electric's fundamental technologies. Liner tubes are formed using its own precision extrusion technology. This liner tube can be covered with a metal braid exterior and can also be made in a variety of structures to suit different needs, such as tapered or flared tube ends, multi-layered hybrid products and stretched products. Using microfabrication technology, the company offers a variety of tubing products for use in semiconductor manufacturing equipment, scientific instruments and medical devices.

As president Hidehiko Kirino says: "We at Nissei Electric will continue to provide new functions by refining our unique processing technology based on three high-performance materials to meet the needs of the market and customers."



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