

Nippon Micrometal: Bonding Wire Innovator

Driven by innovation and precision, Nippon Micrometal leads the global semiconductor industry with advanced bonding wire solutions that boost performance and reliability. *By Daniel de Bomford, Cian O'Neill and Bernard Thompson*



"Our goal is to firmly establish ourselves as the world's number one bonding wire company."

Dr. Takashi Yamada, CEO,
Nippon Micrometal Corp.

If semiconductors are the brain tissue of modern technology, bonding wires are the neurons that carry the signals that direct every function of our digital world. Hidden deep within phones, data centers and AI processors, these microscopic threads form the vital circulatory systems of modern electronics.

Since its inception in 1987, Nippon Micrometal has been at the forefront of the semiconductor industry, advancing the science of connection and developing solutions for the critical sector. CEO Dr. Takashi Yamada speaks to this: "Our ambition is to become a full-solution provider across all key application areas: from auto-

motive and AI to memory, mobile, and power semiconductors."

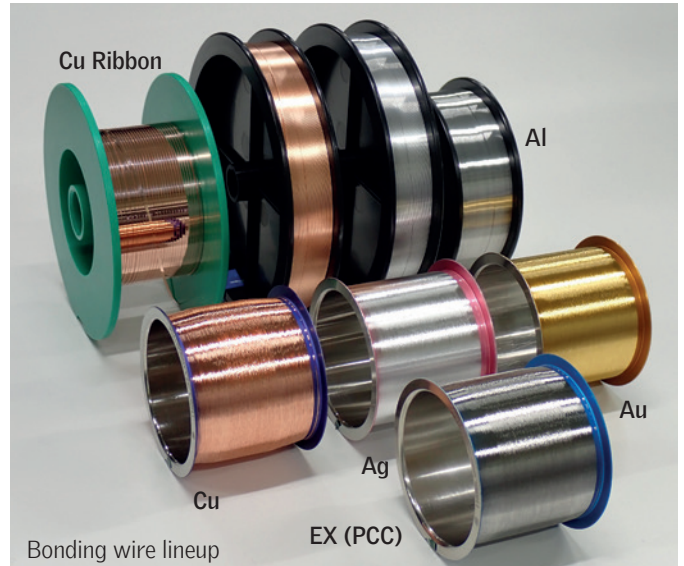
The EX Series: Innovation in Every Strand

Nippon Micrometal's EX series has been a revelation for bonding wire, a critical technological component. Originally developed as a cost-effective, high-performance alternative to gold bonding wire, the series became the de facto worldwide standard.

Bonding wire is responsible for carrying electrical signals to and from semiconductors, making it a crucial component in advanced electronics. Everything from consumer electronics to advanced AI relies on bonding wire to function.

While others had created copper alloys, Nippon Micrometal took a different approach by coating copper wire with palladium at the nanoscale to enhance corrosion resistance without sacrificing conductivity.

Yamada says achieving an ultra-thin uniform quality while maintaining mechanical integrity was "extremely challenging" and required a complete reengineering of plating systems to operate at a nano level. "The result is a product that achieves the desired trifecta of electrical, mechanical, and environmental resilience, and it has been very well received in the market," he says. EX1S, the latest in its series, offers superior corrosion protection while maintaining an electrical resistivity of 24 microhm-centimeters, equal to that of pure gold wire but at a significantly lower cost.



Nippon Micrometal holds over 300 patents across more than 10 countries. These include innovations with silver alloy wire for devices where copper is not always suitable, as well as heavy copper and aluminum wires, which are well-suited for modern power devices with higher current capabilities.

Smart Manufacturing for a Smarter Future

While product innovation is essential, companies must adapt their business practices to remain competitive and meet modern challenges. With acute labor shortages forecast for Japan as its population shrinks, Nippon Micrometal is investing heavily in digital transformation, automation and smart factory initiatives. "Our goal is to scale production output while minimizing dependence on manual labor," Yamada says.

The company develops its core technologies in Japan while simultaneously expanding its global manufacturing footprint. With remote monitoring, Nippon Micrometal can monitor and control its production lines anywhere in the world. "This system captures live production data and enables us to send technical feedback or corrective instructions instantly," Yamada says.

Demand is increasing for bonding wire worldwide as countries scramble to diversify their sup-

ply chains. With facilities in Japan, China and the Philippines and representatives worldwide, Nippon Micrometal is supporting customers' evolving demands through high production capability, uncompromising quality, and advanced technical support.

Scaling Innovation Across Borders

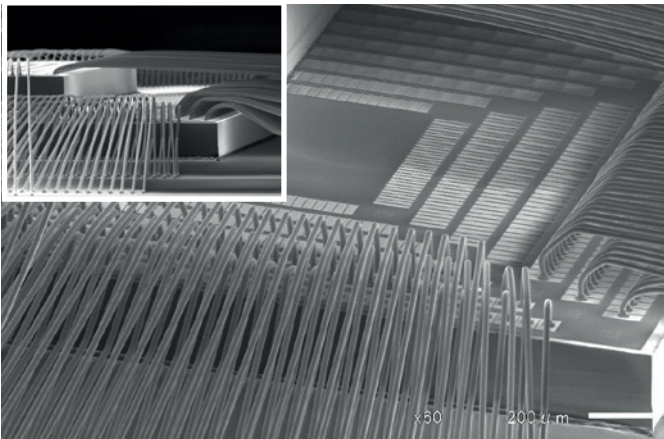
Beyond technology, processes have been standardized globally. Every site receives identical equipment, instructions and work manuals, ensuring uniformity and consistent quality. Yamada says that through these systems, the company achieves identical results from all its factories globally.

This year, Nippon Micrometal focused on scaling its facilities in China and relocating into a new, more advanced factory. Now, the company is looking to expand its facilities in Japan and the Philippines.

Leveraging advanced materials science, Nippon Micrometal supports steady, efficient and sustainable data flow that defines the digital era. It ensures signals continue to flow efficiently through every device, from the smallest sensor to the most powerful AI processor.

 **Nippon Micrometal Corporation**
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18μm EX wire bonding