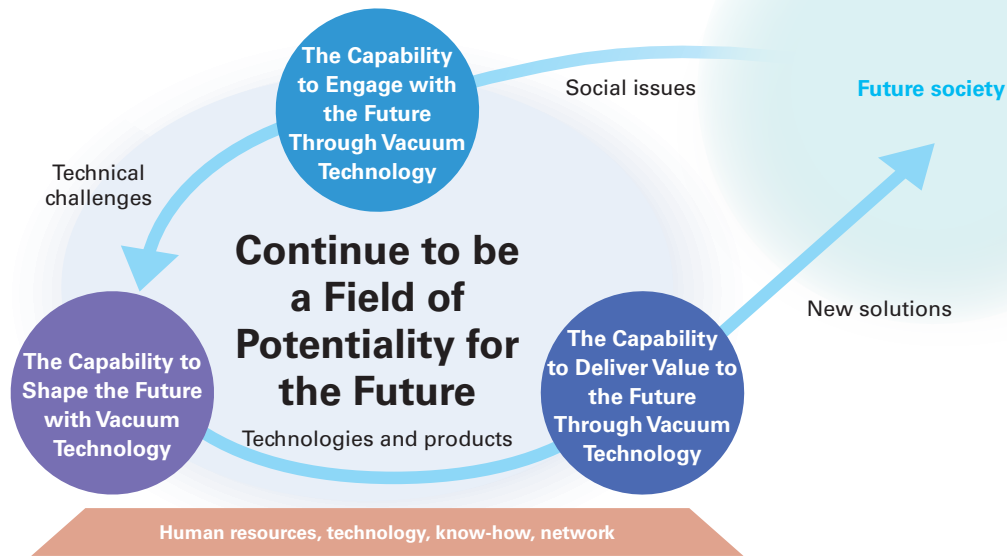


ULVAC's Strengths <Continue to be a Field of Potentiality for the Future>

ULVAC's strengths are not based solely on the possession of technology and know-how, nor on differences in business models.

Drawing on vacuum technology cultivated over many years, we leverage the advantages of three core strengths—engaging with the future, shaping the future, and delivering value to the future—to create social value from vacuum technology.



Strength 1 The Capability to Engage with the Future Through Vacuum Technology

In today's complex and uncertain social environment, delivering value in response to the changing times requires understanding the future envisioned by our customers while identifying the true challenges that need to be addressed. Since its founding, ULVAC has carefully monitored industry trends rooted in vacuum technology and shaped the direction of its technological development through dialogue with customers. In recent years, we have strengthened our framework for grasping global technological trends while expanding external collaborations in rapidly evolving fields such as semiconductors and AI, including participation in the R&D program of imec, a leading semiconductor research institute in Belgium, and involvement in JOINT3, a consortium established by our customers for next-generation semiconductor packaging. Furthermore, we are expanding into new fields, including medical engineering, and, through joint research with universities, are promoting initiatives that explore future possibilities from a long-term perspective. By integrating the insights gained through these initiatives with ongoing communication with our customers, we can more confidently identify future development themes and the challenges we need to address. ULVAC will continue to carefully listen to customers' aspirations while advancing technological development and the creation of value for the future.

Strength 2 The Capability to Shape the Future with Vacuum Technology

ULVAC has ventured into diverse fields with vacuum technology at its core, accumulating technological expertise and know-how along the way. At the same time, we engage sincerely with the challenging issues posed by our customers, persistently seeking solutions even in fields where answers are not readily apparent. This reflects how the "curiosity of engineers tackling difficult problems," a spirit inherited since our founding, has become deeply rooted in our organization over the years. Today, we are strengthening our development structure to address more advanced technical challenges through cross-functional collaboration across process technology, equipment design, software development, and data analysis. These initiatives are driving the development of integrated technologies to address increasingly complex customer requirements and future needs. It is the spirit of curiosity combined with integrated capabilities that is the source of ULVAC's ability to shape the future.

Strength 3 The Capability to Deliver Value to the Future Through Vacuum Technology

With production bases in Japan, China, South Korea, and Taiwan, ULVAC has established regional supply chains that allow for local procurement at each site, ensuring a stable supply of products. Through a global development structure that emphasizes collaboration with customers, we are enhancing our ability to respond flexibly to diverse needs. Moreover, our value offering does not end at the time of delivery. Our worldwide service network collaborates to provide continuous support throughout the entire equipment lifecycle, from maintenance and operational assistance to improvement proposals. The insights gained from these initiatives are reliably applied to subsequent development, thereby contributing to our customers' value creation. This integrated approach—the seamless delivery of technology, supply, and service—underpins ULVAC's unique capabilities of value offering.

Putting Strengths into Practice

ULVAC's Strengths in Dual-Frequency ICP Etching Technology

In the mid-2010s, demand for advanced packaging technologies began to rise. Recognizing this trend, ULVAC began developing a new etching technology around 2015. At that time, competing equipment offered high performance but struggled to form the more complex and precise shapes customers required, making a new approach necessary for the next generation. In these circumstances, during the early development phase, ULVAC published academic papers to assess future market potential and advanced development while indicating the technology's direction. Initially, development proceeded using the conventional single-frequency 13.56 MHz method. However, it became clear this approach could not sufficiently ensure the plasma controllability required for complex shapes. Therefore, ULVAC turned to a dual-frequency method that combines 2 MHz and 13.56 MHz, which have different electromagnetic field characteristics. However, ULVAC encountered a difficult challenge: interference between the two frequencies caused instability in the antenna that generates plasma by carrying high-frequency current, making it impossible to reproduce performance consistently. Nevertheless, by systematically tackling each challenge and making successive improvements, ULVAC succeeded in achieving the target performance by combining its antenna technology—accumulated over approximately 10 years—with an RF splitter (ISM-Duo). The resulting technology has been highly evaluated at academic conferences both in Japan and overseas. Currently, new application fields are expanding, including dicing equipment for advanced packaging processes and TSV processes. Regarding development for overseas customers, we are strengthening collaboration with local Group companies to establish a rapid verification system tailored to their needs. This technology's journey—anticipating future trends, tackling successive challenges, and delivering value worldwide—is a practical expression of ULVAC's strengths.



This study received the "Best Interactive Presentation Award" at the IEEE 74th Electronic Components and Technology Conference (ECTC). This award is one of four for presentations and papers recognized for academic and technical excellence, selected from 391 general presentations (252 oral + 139 poster).