

ULVAC, Inc.

1. The Challenge of MEMS

ULVAC has been supplying advanced vacuum technology products, such as semiconductor production equipment, flat panel displays and other production equipment based on myriad technical development in the core of vacuum technologies. Some ULVAC Group companies have been involved in such advanced materials as ultrafine particles, and surface analysis equipment. In addition, ULVAC plans to enter new fields, including biotechnology, fine mechatronics, and fine chemicals. We have added to our equipment lineup with the SME-200 sputtering device for forming high-dielectric films and SAW device electrodes, the CME-200 CVD device for forming silicon oxide films and nitride films, and the NLD-6000, which demonstrates its efficiency in the deep etching of quartz.

2. Launching a MEMS Foundry Service

ULVAC develops distinctive semiconductor wafer processing technologies, including deposition of high-dielectric films, magnetic films, and other functional materials that are difficult to form with conventional equipment, as well as deep etching of quartz, and dry etching of materials that could not be etched until now due to low vapor pressure. The vapor deposition polymerization method developed by ULVAC can add a



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water-shedding quality, hydrophilicity, biocompatibility, antifungal properties and other properties to various types of samples. It also provides excellent step coverage enabling the formation of a uniform polymerization film over the details of a fine processing shape. Using these technologies, ULVAC has undertaken some processings of brought-in materials for deposition and etching onto customer's wafers.

We have received an increasing number of requests from customers to manufacture MEMS devices in addition to these processing services. To meet such demands, we have prepared lithography and other MEMS processing lines and have established an integrated production line from design to dicing and bonding, to say nothing of the deposition and etching processes, in order to launch our MEMS foundry service.

3. Features of the ULVAC Foundry Service

Our foundry service has the following two features:

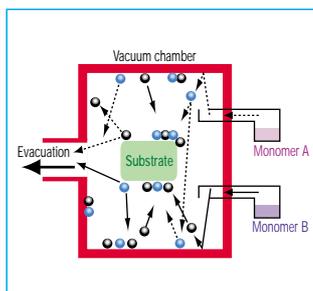
1. Utilizing ULVAC's distinctive technologies for vapor deposition polymerization, dielectric deposition, and NLD dry etching, we fabricate MEMS devices and manufacture and provide materials. The ULVAC foundry also provides a wide range of materials for purposes other than silicon processing.
2. Utilizing our technologies and know-how to develop equipment and processes as an equipment manufacturer, we provide rapid services for processing that requires new processes and equipment to meet customer demands.

4. Future Challenges

In addition to these technologies, ULVAC has carbon nanotube and ultrafine particle manufacturing technologies and powerful surface analysis tools. Through the integrated application of our technologies, we hope to provide our foundry service, while simultaneously developing MEMS devices and processes.



NLD-6000 MEMS dry etcher and processed sample



Our own vapor deposition polymerization technology for forming uniform polymer film over complex substrates



SME-200 PVD device for forming high-dielectric films and MEMS electrodes



CME-200 PE-CVD device for forming SiO₂ and SiN_x films