

Members' Profiles

Alps Electric Co., Ltd.

1. Company Profile

Under the corporate philosophy "Alps creates new values that satisfy stakeholders and are friendly to the earth," Alps Electric has been developing and manufacturing products focused on five business divisions, while being true to its business domain of "perfecting the art of electronics."

The Mechatronics Devices Division supports the electronic industry with diverse product lines including switches, potentiometers, sensors, and connectors. These products are the result of condensing many years of experience in molding, machining, plating, and mechatronics technologies and have received high praise for their performance and reliability.

By introducing advanced technologies into its proprietary onboard electronic systems, the Automotive Products Division has developed various devices and systems that enhance automobile safety and comfort while reducing environmental impact. These systems include the Haptic Commander[®], which uses a tactile feedback technology, as well as steering modules, and instrument panel operation units.

Amid the dramatic changes in the communications industry, the Communication Devices Division has used its high-frequency circuit technology and other proprietary technologies to develop tuners compatible with broadcasting systems in various countries, communication modules for next-generation information terminals, and transceiver units for mobile phones. This division is also engaged in the development of lenses and modules for optical communications, and camera modules for mobile phones.

The Peripheral Products Division develops devices serving as interfaces between people and equipment. This division develops input devices such as GlidePoint[™] touchpads for laptop computers, display-related devices such as highly transparent and responsive touch panels making use of our micromachining technology, and output devices such as compact photo printers and thermal printers.

The Magnetic Devices Division provides a wide array of products incorporating magnetic materials, drawing on our expertise in magnetic materials and thin-film manufacturing and processing technologies cultivated through many years of developing magnetic heads. These products include magnetic sensors incorporating magnetic sheets developed with our proprietary Licalloy[™] material, and high-precision magnetic elements. This division strives to develop products contributing to advanced functions and performance in a variety of equipment ranging from compact digital devices to automotive products.

2. SENSORING[™]

One of the product lines Alps Electric is currently focusing its attention on is sensors. We currently develop resistive sensors, capacitive sensors, magnetic sensors, and piezoresistive sensors. Setting our sights on the continually evolving sensor industry, we have begun developing a business referred to as "SENSORING[™]", combining the base "sensor" with the progressive form "ing," expressing innovation and a desire to take on the industry.

Resistive sensors take advantage of our company's expertise on resistors excelling in long lifetime and robustness that we accumulated through the development of potentiometers. Our resistive sensors are widely used in not only consumer electronics, but also automobiles, in which high-reliability in extreme environments is essential.

We have also developed capacitive pressure sensors, which are characterized by low power consumption and high sensitivity. Hence, these sensors are suitable for such applications as automotive Tire Pressure Monitoring Systems (TPMS) and instruments used to measure blood pressure.

The magnetic sensors use highly reliable magnetic elements. Because our sensors offer a wide detection range and low performance deviation even at high-sensitivity levels, they allow greater freedom in circuit board design and sensor layout. Moreover, with their low power consumption and stable operating temperature, these sensors expand the application possibilities in such broad fields as cell phones, personal computers, household appliances, and automobiles.

Piezoresistive sensors are suitable for compact pressure detectors and have been used to perform high-resolution detection by optimizing the digital circuit and temperature compensation circuit. These sensors have potential application ranging from portable navigation devices to white goods.

Hence, Alps Electric has developed diverse sensors with wide-ranging uses and applications. To create these products, MEMS technologies will be indispensable.

3. MEMS Technologies at Alps Electric

Anticipating a future trend toward smaller and thinner products having higher performance and functionality, our initial approach toward MEMS technology has been based on the belief that the size and precision required in molding technologies will evolve from millimeters to micrometers and from micrometers to nanometers, and that it will be necessary to dramatically increase the degree of freedom in machining shapes. In MEMS processing, we have pursued a fusion of MEMS processing with precision machining cultivated through our switch development and manufacturing. The technologies born from this fusion have enabled us to form dies with a high aspect ratio and a high degree of freedom in sidewall inclination, while allowing an extensive range of machining dimensions (see Fig. 1). This MEMS technology is based on the micromachining technologies we cultivated when developing magnetic heads.

While to date we have developed MEMS technology as one means of die machining, we also hope to develop applications for MEMS in manufacturing the various sensors described above. Using our own technologies, we have implemented feed-through electrode formation on glass capable of producing hermetically sealable electrodes and hope to continue making contributions toward meeting the compact high-performance requirements of sensors.

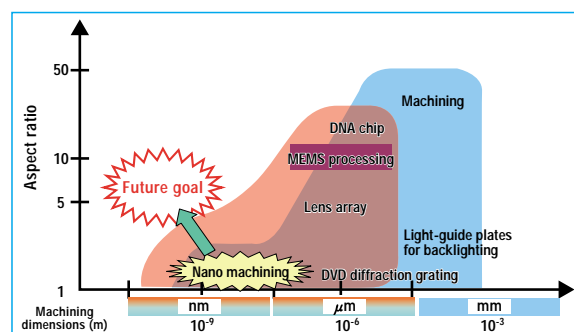


Fig. 1 Machining levels targeted through the fusion of precision machining and MEMS technologies

MICRONANO No. 62

MICRONANO is published quarterly by Micromachine Center (MMC) to promote the international exchange of information related to micromachines, R&D and other technical topics, and is circulated free of charge. Please send your comments about MICRONANO to the publisher :

Keiichi Aoyagi, Executive Director, Micromachine Center (MMC)
MBR99 Bldg., 6F., 67 Kanda Sakumagashi, Chiyoda-ku, Tokyo 101-0026, Japan
Tel : +81-3-5835-1870, Fax : +81-3-5835-1873
Internet Home Page : <http://www.mmc.or.jp/>
Date of Issue : February 15, 2008