

MMC Activities.....	1
Fine MEMS Pj.....	9
Column	10
Overseas Trends	11
Member's Profiles	12

MMC Activities

Activities of the Micromachine Center in Fiscal 2006

The Micromachine Center conducted the following activities relating to micromachine technology (MEMS and other nanoscale machines and systems) in fiscal 2006. The aim of these activities was to establish and promote the industrialization of basic micromachine technologies, thereby contributing to the further development of Japan's industry and economy as well as to the international community.

1. Governmental/NEDO project related activities

To establish basic micromachine technologies relating to micromachines and microelectromechanical systems (MEMS), the Micromachine Center actively promoted national government and NEDO-sponsored research and development projects that mobilized the capabilities of government, industry and academia. During fiscal 2006, the Center continued to promote the MEMS Design and Analysis Support System Development Project and also initiated the Highly Integrated and Complex MEMS Manufacturing Technology Development Project.

(1) MEMS Design and Analysis Support System Development Project (project commissioned by NEDO)

This project, a three-year commissioned project initiated in FY 2004, ended in March of this year, having completed its initial objectives. In addition, approximately 400 licenses have been issued for the alpha version of the MemsONE design and analysis software that was released last November, and the software is currently being evaluated by MEMS researchers and engineers.

(2) Study of methods for promoting MEMS-ONE (project commissioned by NEDO)

A briefing was held last year on November 9 to announce the achievements of the MEMS-ONE project. The briefing was attended by approximately 250 persons and provided information on functions, pricing, support and so on, as well as information on participation in dissemination activities scheduled to start in the coming fiscal year.

(3) Highly Integrated and Complex MEMS Manufacturing Technology Development Project (project commissioned by NEDO)

In this project, a high-capacity database server was installed in the Micromachine Center and trial operation of a web-based entry system was conducted. In addition, knowledge and information was upgraded through sharing by a Knowledge Database Committee. Moreover, the Project Promotion Liaison Committee met three times to provide overall management support for the diverse array of issues, and objectives were achieved by each entity involved in the project.

2. MEMS Industry Forum Project (policy recommendations and industry interchange / stimulation projects)

In order to support the further development of the MEMS

industry, the MEMS Industry Forum was established in April as a new Special Project Committee. With members made up of companies involved in the MEMS industry, the MEMS Industry Forum promotes policy recommendation projects and industry interchange and stimulation projects, with the goal of helping to strengthen the international competitiveness of the MEMS industry in Japan.

(1) Policy recommendation projects

On September 29, 2006, an exchange of views (Micro/Nano Cutting Edge Technology Exchange) was held between the members of the MEMS Industry Forum Promotion Committee and representatives from the government and related agencies. In addition, a MEMS Forum was held at the Micro-Nano 2006 general exhibition in November. These policy recommendation activities were conducted with the aim of promoting the development of MEMS-related industries.

(2) Industry-academia liaison activities

Micro/Nano Cutting Edge Technology Exchange meetings were held four times (in April, July, October and February) in order to promote interchange between industry and academia in the micro/nano field.

(3) Creation of an infrastructure for MEMS development

① With the aim of broadening the base of the MEMS industry, a study was conducted regarding the approach to local publicly-run trials and liaison among foundry companies.

② Dissemination of MemsONE

A study was conducted of liaison with MemsONE in the effort to establish MEMS foundry services.

③ Strengthening of collaboration with public foundries in each area and local clusters

In order to support the participation in MEMS projects by local small and medium-size companies and venture firms, a study was conducted in fiscal 2007 regarding the proposal to set up a forum for the regular exchange of information between publicly-run trials and foundry companies.

④ Promotion of personnel training projects

Study of an Internship Support Project (holding exchanges of views with universities and companies and providing information on a web site) was conducted.

(4) MEMS business interchange activities both at home and abroad

① Opening of a MEMS Mall

② Holding of the Micro/Nano 2006 micromachine exhibition

③ Participation in the 12th Micromachine Summit

④ Construction of an international affiliate network

⑤ Dispatch of overseas missions and researcher interchange

3. Research and investigation of micromachines

The Micromachine Center carried out activities aimed at gaining a clear understanding of the technological and industrial trends in micromachines and MEMS as they become key

manufacturing technologies. The Center also pursued research into new technological issues in domains in which nanotechnologies are becoming integrated.

(1) MEMS frontiers: study of future device technologies made possible by fusion with nanodevices (project commissioned by the Mechanical Social Systems Foundation)

A study was implemented regarding future device technologies that will have a revolutionary impact on the society 20 years from now, which can be achieved through the fusion of nanotechnology and biotechnology by expanding on the achievements of the long-term vision roundtable conference held in FY 2005.

(2) Study of technical trends in Japan and other countries

During the last fiscal year, a study was conducted regarding MEMS research trends in 2001 through 2006 in order to consider current trends. Technological categories were revised based on the results of this study, and the latest research trends for MEMS 2007 were studied in accordance with the new categories.

(3) MEMS market research (partially commissioned by NEDO in order to evaluate the roadmap for MEMS technical strategies)

The Micromachine Center conducted MEMS market research jointly with the Japan Technical Information Services (JATIS), using the MEMS market research technique established in the "Study of the current status of the MEMS market and analysis of Japanese competitiveness" implemented in FY 2003.

(4) Outcomes research relating to micromachine technology (project commissioned by NEDO)

The Micromachine Technology Outcomes Research Committee, made up of members from companies participating in related NEDO projects, was set up within the Micromachine Center, and outcomes research was conducted jointly with the Japan Technical Information Services (JATIS).

(5) Upgrading of micro/nano database

Efforts were made to upgrade document retrieval functions and the database of research reports, etc. made available to supporting members on the MMC website.

4. Projects to promote standardization of micromachines

In micromachine/MEMS technological fields, standardization is being promoted as international initiatives get underway.

(1) Study of roadmap for MEMS standardization (project re-commissioned by the Japanese government and Mitsubishi Research Institute, Inc.)

To maintain and increase the international competitiveness of the MEMS industry, guidelines for strategic efforts to standardize those fields in which Japan can excel were compiled as a roadmap for standardization for the next 10 years.

(2) Response to overseas efforts at international standardization

The Center conducted a study of Japanese responses to Korea's proposed international MEMS standards and mounted a successful effort to ensure that Japan's views would be reflected in the draft Korean standards (RF-MEMS switches, general principles for MEMS etc.).

(3) Promotion of international standardization of MEMS thin film material testing (project commissioned by NEDO)

The Center conducted follow-up activities relating to tensile

testing methods and draft standards for standard test specimens for tensile testing, which were at the stage of the Final Draft for International Standard (FDIS), and was able to publish these as international standards in August.

(4) Micromachine terminology standardization activities

The Committee met three times and completed draft JIS standards and submitted them to the Japanese Standards Association (JSA).

(5) Research and development relating to standardization of life acceleration tests for MEMS materials and standard test specimens for calibration (project commissioned by METI)

The Committee met three times during this fiscal year and conducted a basic study relating to the standardization of life acceleration test methods and standard test specimens for calibration, and also implemented life testing.

5. Publicity activities

The Micromachine Center worked to publicize and increase public awareness of micromachines/MEMS by publishing and distributing magazines and newsletters and holding exhibitions and the like. The Center also posted summaries of various research reports on its website and made information widely available to people both at home and abroad.

(1) Improved dissemination and exchange of information through the MCC website

The Center has actively worked to provide up-to-the-minute information on the Micromachine Center website in a timely manner.

(2) Publication of "MICRONANO" quarterly

The Center published a quarterly magazine entitled "MICRONANO" in April, July, October and January and distributed it to supporting members, MEMS Industry Forum members and MMC personnel.

(3) Publication of monthly newsletter

The Center published a monthly newsletter in Japanese entitled MMC/MIF News and distributed it to supporting members, MEMS Industry Forum members etc.

(4) Publication of MicroNanoExpress newsletter

The Center published an electronic newsletter in Japanese using the MicroNano mailing list to provide information on special events and the like.

(5) Maintaining and upgrading of the MMC library (by upgrading the academic paper abstract database, etc.)

The Center summarized abstracts of technical papers and references in the *Micro/Nano Index* newsletter (Japanese only) and distributed the newsletter in electronic form to supporting members, related institutions etc.

The Center also upgraded the library by gathering further technical documentation and materials, and added this and other information to its database.

(6) Micromachine Exhibition

The Micromachine Center sponsored the 17th Micromachine Exhibition at Tokyo International Forum (Yurakucho, Tokyo) November 7 - 9, 2006. Total attendance was 11,736 persons, the largest yet (last year's attendance was 9,098 persons).