

Activities of the Micromachine Center in FY 2008

Overview

The Micromachine Center (MMC) is actively engaged in technical development projects commissioned by the government and the New Energy and Industrial Technology Development Organization (NEDO) in an effort to establish core technologies for micromachines, Micro Electro Mechanical Systems (MEMS), and other micro/nano-related fields. At the same time, in order to promote widespread use and industrialization of these core technologies, the MMC aggressively pursues activities to improve the environment for micro/nano technologies. These activities include policy recommendations, industrial exchange and vitalization, investigative research, activities to promote standardization and to encourage dissemination and publicity projects designed to promote industrial development in micro/nano fields and to contribute to the international community.

The following is an outline of the projects that the MMC conducted in 2008.

1. National / NEDO Projects

(1) Highly Integrated and Complex MEMS Manufacturing Technology Development Project (The Fine MEMS Project)

2008 marked the final year of the Highly Integrated, Complex MEMS Production Technology Development Project, more commonly referred to as the Fine MEMS Project, which was a three-year undertaking initiated in 2006. This project concluded after having achieved its original goals satisfactorily.

The Fine MEMS Project ultimately succeeded in compiling a knowledge database with more than 1,500 items of content, which will be made available on the Internet in a Wiki format. Research findings for the fine MEMS integrated design platform were stored in a Web-based system dubbed an equivalent circuit generator, which has built-in functions for linking equivalent circuit models for MEMS and the like and for outputting the electrical and mechanical properties of the models.

(2) The Project to Develop Next-generation Device Manufacturing Technologies that Fuse Different Fields (The BEANS Project) (Commissioned by METI)

The BEANS Laboratory was newly established as a centralized research framework for the Project to Develop Next-Generation Device Manufacturing Technologies that Use Different Fields (commonly referred to as the BEANS Project) initiated on July 1, 2008. The BEANS Laboratory has worked to introduce project management driven by the private sector, to coordinate R&D activities for the inaugural year, and to install research equipment. In 2008, seventeen companies, eleven universities, and two research centers participated in the BEANS project.

(3) Promotion and Dissemination of MemsONE

In an independent project, the MMC has been working with the MEMS Industry Forum to aggressively promote and disseminate the MemsONE software, which was the product of research and development in the MEMS Open Network Engineering System of Design Tools project. We also worked with the software vendor to update the software, which is the basis of our dissemination activities. Hence, Version 1.1 produced at the end of the project was improved and enhanced and released as the more complete Version 2.0, which has more powerful functions and greater stability.

2. MEMS Industry Forum Projects (for Policy Recommendations and Industrial Exchange and Vitalization)

The MEMS Industry Forum (MIF) was established in April 2006 as a special project committee with the goal of supporting the further development of MEMS industries. Membership in the MIF increases each year, spurring more and more activity. In 2008 the MIF continued to promote activities centered on its MEMS-related member companies in collaboration with affiliated academies, regional centers, and overseas institutions, including various activities for proposing policies to the government and related agencies (e.g., encouraging the exchange of ideas between MIF members and the government and related agencies at MIF promotion committees),

encouraging industrial exchange and vitalization (e.g., informal gatherings on advanced micro/nano technologies), implementing MEMS training programs to develop personnel knowledgeable in MEMS development, and encouraging information exchange among businesses in MEMS and other industries (e.g., the MEMS Mall launched October 1, 2008).

3. Investigative Research and Data Collection and Provision

We also investigated new issues on micro/nano technologies that arise when merging nanotechnology with technologies in other fields.

The MMC is also collecting information and documents related to micro/nano technologies from universities, industrial circles, public organizations, and other sources in Japan and overseas, which documentation will be consolidated with documentation from surveys conducted at the MMC. We periodically issue the *Micro/Nano Index*, an informational publication including abstracts of technical documents and materials. The collection of technical documents and materials has been organized and stored in the MMC archives, where they have been made available for browsing and searching.

4. Standardization Activities

In 2008 we demonstrated initiative on the international stage by promoting standardization in the micromachines and MEMS fields. These activities included examining standard certification criteria for proposing international standards, following up on a proposal of standards for fatigue testing of thin film materials, conducting an investigative study on overseas standards, and pursuing the adoption of a tensile test method for thin film material as a JIS.

5. Dissemination and Publicity Activities

In 2008 the MMC continued to provide information internally and externally through its Web site, publish and distribute newsletters, hold exhibitions, and otherwise disseminate information on micromachines and MEMS to educate the public and publicize the MMC's activities. This year also featured the 19th Exhibition Micromachine/MEMS, a three-day event held at Tokyo Big Sight from July 30 to August 1, 2008 as part of Micro/Nano 2008. Over these three days, the exhibition received a total of 14,075 visitors, which was nearly a 12% increase over the previous year (12,424) and a record high for the event.



19th Exhibition Micromachine/MEMS



MEMS Industry Forum (May 2008)