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MMC Activities

Overview of MMC's Activities in Fiscal 2005

I. Basic Objectives of Activities

The basic objectives of MMC activities are, firstly, to establish basic micromachine technologies and increase utilization of micromachines through promoting research and investigation of micromachines (MEMS and other minute machines and systems), collection and provision of micromachine information, and exchange and cooperation with worldwide organizations; and secondly, to contribute to the further development of Japan's industrial economy and to international society.

MMC's basic objectives in Fiscal 2005 are, as in the previous fiscal year, to promote the industrialization of micromachines/MEMS and to strive for the establishment of next generation basic micromachine and MEMS technologies in accordance with trends in cutting-edge technological fields such as biotechnology, nanotechnology, and IT.

II. Description of Primary Activities

1. Research and Investigation of Micromachines

Planned activities in the field of micromachine/MEMS technology, which is becoming a key technology for the manufacturing industry, are aimed towards gaining a clear understanding of the trends in micromachine technologies and industries and conducting investigations of and research on new technological issues regarding the fusion of micro- and nano-technologies. The MMC also proposes national and NEDO projects in fields in which new research and development is deemed necessary.

(National/NEDO Project-related Activities)

(1) MEMS-ONE: MEMS Open Network Engineering System of Design Tools Project (NEDO-commissioned project)

Now entering its second year, the objective of the MEMS-ONE Project is to develop an open network engineering system of design tools for MEMS. This is starting to be made possible for the first time by bringing together the intellectual data of universities, corporate researchers and technicians that have a track record in cutting-edge MEMS research and development, the leading numerical analysis researchers and software development companies, and foundry-operating businesses and public institutions, the latter two of which both have substantial knowledge about the problems that occur in the MEMS manufacturing process. In particular, the MMC plays a management role in cooperation with universities and the AIST in overseeing the creation of a knowledge/materials database, as well as the promotion and progress of the project overall.

(2) Studies on MEMS-ONE Propagation Activities (NEDO-commissioned project)

In parallel with the MEMS-ONE project, studies will be conducted on activities that promote MEMS-ONE as part of research on the propagation effect of and propagation activities related to the project. In Fiscal 2004, studies were conducted on the attitudes and needs of Japan-based businesses, universities, and public institutions that were potential users. In Fiscal 2005, however, studies will be conducted mainly on effective propagation methods, including the role of support centers.

(3) Next Generation Project Investigation Committee

With a view nationalizing the Next Generation Project from Fiscal 2006 in accordance with Fiscal 2004 proposals, policies

concerning the project's research system and development base, refinement of the research topics undertaken and the consequent results, and elaboration of common elements for integration will be considered.

(4) Micro-chemical Chip DB System (Contract agreement with The Research Association of Micro Chemical Process Technology)

As part of the Microanalysis/Production System Project, in which The Research Association of Micro Chemical Process Technology plays a central role, the MMC is creating a database of documentary information useful in the research and development of microchip devices and systems as well as carrying out activities, such as information gathering and data provision, that aid the creation of this database.

(Research and Investigation-related Activities)

(5) Studies on R & D trends for micromachine technology in Japan and abroad

These studies aim to identify and analyze the latest trends in the field of micromachine technology, which is progressing at a remarkable pace, and micromachine R&D in Japan and abroad; and to develop basic technological data to aid in developing micromachine technologies.

(6) Joint Survey Research Activities Concerning the Industrialization of MEMS

Opportunities for the industrial application of MEMS have been opening up rapidly in recent years; in order to further accelerate the industrialization of MEMS, this research will comprehensively tackle such challenges as advancing foundry services and coordinating MEMS devices and materials fields. Joint research with businesses that provide foundry services will also be conducted, as in the previous fiscal year, on specific issues such as overseas foundry fact-finding missions, process standardization, creation of a materials database, and coordination between foundries.

(7) Studies on MEMS Reliability Assessment Technology (application submitted to the Japan Machinery Federation as a commissioned project)

This research project involves the investigation and consideration of current status, issues, and policies relevant to the improvement of MEMS reliability.

2. Collection and Provision of Micromachine Information

Information and documents on micromachine use in universities, industries, and public organizations in Japan and overseas will be collected, combined with survey results and MMC-produced documents, and made freely available in the MMC library. At the same time, information will be disseminated widely, both domestically and internationally, through the MMC website.

(1) Improved Dissemination and Exchange of Information through the MMC Website

Utilizing the MMC website, efforts to exchange and disseminate information will be made proactively. Website content aimed at supporting members will be enhanced.

(2) Publication of a Micromachine Periodical

"Micromachine Index," containing abstracts of technical documents and information on materials, is issued on a regular basis and provided to supporting members and organizations concerned with micromachines.

(3) Publication of a Newsletter

Information concerning research and governmental trends related to micromachines is distributed monthly to supporting members and other interested individual and organizations.

(4) Maintaining and Upgrading the MMC Library

Technical documents and materials are collected and stored in the MMC library and listed in a database together with other relevant information.

3. Exchange and Cooperation with Organizations Worldwide

To promote affiliation, exchange and cooperation with related organizations in and outside Japan, MMC will involve itself in such activities as participating in the micromachine summits, holding international symposiums, inviting to Japan and sending overseas researchers and experts in the field, and building foundry services.

(1) Participation in the 11th Micromachine Summit

MMC will participate in the 11th Micromachine Summit in Dallas, USA, taking part in discussions of a wide range of topics, including worldwide trends in micromachine technology and its fields of application.

(2) Holding the 11th International Micromachine/Nanotech Symposium (partially subsidized by activities promoting the Japan Motorcycle Racing Organization)

This year MMC will hold the 11th International Micromachine/Nanotech Symposium focusing on technological issues pertaining to and the future prospects for the fusion of micromachine/MEMS and nanotechnology.

(3) International Exchange and Dispatch of Researchers

A group will be dispatched overseas to promote the exchange of information and opinions with micromachine-related research institutes in universities and similar institutions. This group will also participate in international symposiums and academic meetings held overseas. MMC will further promote exchange by inviting experts in the field from America and Europe and by sending our experts and researchers overseas.

(4) Building a foundry network system

Foundries are vital to the industrialization of MEMS. In order to improve these facilities, we will undertake the establishment of a system to improve services through a network comprising members of the Foundry Service Industry Committee, who represent businesses either involved in or related to the provision of foundry services.

(5) Establishing a forum for the exchange of cutting-edge micro/nano technology

In order to accelerate the development of cutting-edge micro/nano technology – a basic technology expected to have a diversity of applications in various fields – MMC will hold a meeting for the exchange of cutting-edge micro/nano technologies as an exploratory opportunity for the exchange of information and joint research as in the previous fiscal year.

4. Standardization of Micromachines

In cutting-edge technological fields such as micromachine/MEMS, standardization is being promoted as international initiatives are being taken.

(1) Standardization of Fatigue Testing Methods for Micro-nano Materials (NEDO-commissioned project)

Continuing from last year, research on standard fatigue testing methods that enable evaluation of the properties of various thin film materials measuring less than 10 μ m wide and 100 μ m long, with the aim of international standardization. Fatigue tests using conventional 1/1000 sized specimens will be conducted in order to clarify the limits of application for fatigue testing methods that use the current standard mm order specimens, and proposals for international standards will be made in Fiscal 2005, the 3-year project's final year.

(2) Standardization of Tensile Testing Methods for Thin Film Materials

The results of MMC research conducted between Fiscal 1999 and Fiscal 2001 as part of the NEDO project "standardization of evaluation method of properties for micromachine material" have been included in international standardization proposals submitted to IEC in Fiscal 2003; the CD (Committee Draft) was approved in Fiscal 2004 and the CDV (Committee Draft for Vote) will be submitted in Fiscal 2005. This year MMC will continue its activities towards international standardization.

(3) Standardization of Micromachine Terminology

Having passed the NP (New Project) stage, the international specifications proposal "Technical Terms in Micromachine Technology" submitted to IEC in Fiscal 2002 was approved at the CDV (Committee Draft for Vote) stage in Fiscal 2004, and the FDIS (Final Draft International Standard) will be drawn up in Fiscal 2005. This year MMC will again continue its activities towards international standardization.

(4) Research and Investigation of Micromachine Standardization

Further to the international standardization proposals mentioned above, to enable formulation of new strategic proposals for international standardization, issues for inclusion in standardization proposals will be narrowed down through cooperation between the MEMS-ONE project and the MEMS Reliability Assessment Committee and a roadmap for future international standardization formulated.

5. Dissemination of Information and Education about Micromachines

By issuing and distributing quarterly magazines and by holding exhibitions, we hope to disseminate information on micromachines extensively in order to educate as many people as possible.

(1) The quarterly magazine "MICROMACHINE" will be published periodically and distributed to those in or connected with the field. The quarterly magazine will also be made available on the Internet through the Center's home page.

(2) The 16th Micromachine Exhibition and other events will be held to present the latest research achievements, as well as the latest cutting-edge micromachine/MEMS industry-related products and product materials.

(3) We will serve as the Federation of Micromachine Technology Secretariat to work with and strengthen micromachine-related organizations.

Upcoming Event Announcement

The 2005 International Micromachine / Nanotech Symposium and Micromachine Exhibition



The 11th International Micromachine / Nanotech Symposium

November 10 (Thurs.), 2005
Science Hall
Science Museum, Tokyo (Kitanomaru Park)

The 16th Micromachine Exhibition

November 9 (Wed.) – 11 (Fri.), 2005
Science Museum, Tokyo (Kitanomaru Park)

