

Introduction to the High Integration Composite MEMS Fabrication Technology (Fine MEMS) Development Project

1. Development aims

In recent years, MEMS (Micro Electro Mechanical Systems) technology has contributed significantly to miniaturizing and increasing the performance of electronic equipment and components, and they are expected to become key devices in a range of fields such as telecoms, medicine, biotechnology, and automobiles among others. In the new industrial strategy produced by the Ministry of Economy, Trade and Industry in FY05, and in the strategy for new economic growth issued in FY06, MEMS are positioned as one of the high-level component industries on which to concentrate. Due to the necessity of reinforcing Japan's competitiveness in MEMS, which are expected to see growth internationally too, the strategy aims to achieve greater miniaturization, power saving, higher performance, and higher reliability through further improvements in MEMS fabrication technology. The High Integration Composite MEMS Fabrication Technology Project was planned to address the important technical issues of combining MEMS with nano-functions, integration with semiconductors, and bonding between MEMS.

2. Project overview

The research and development issues are;

1) MEMS/nano-function composite technology, 2) MEMS/semiconductor integrated fabrication technology, 3) MEMS/MEMS high integration composite technology, 4) Establishment of a database of high integration composite MEMS knowledge

In particular, issues 1) to 3) each consist basically of four technology themes as shown in **Table 1**. Each theme comprises technologically difficult aspects, and factors linking them to industrial production. Technologically sophisticated aspects will be mandated to universities and national research institutions, while development of applications will be conducted by corporations under subsidies. Theme 4) involves gathering technical knowledge and internal and external approaches to high integration composite

MEMS gained through this research and development, and establishing a knowledge database to make it widely available to Japanese industry.

3. Period and scale of the Project

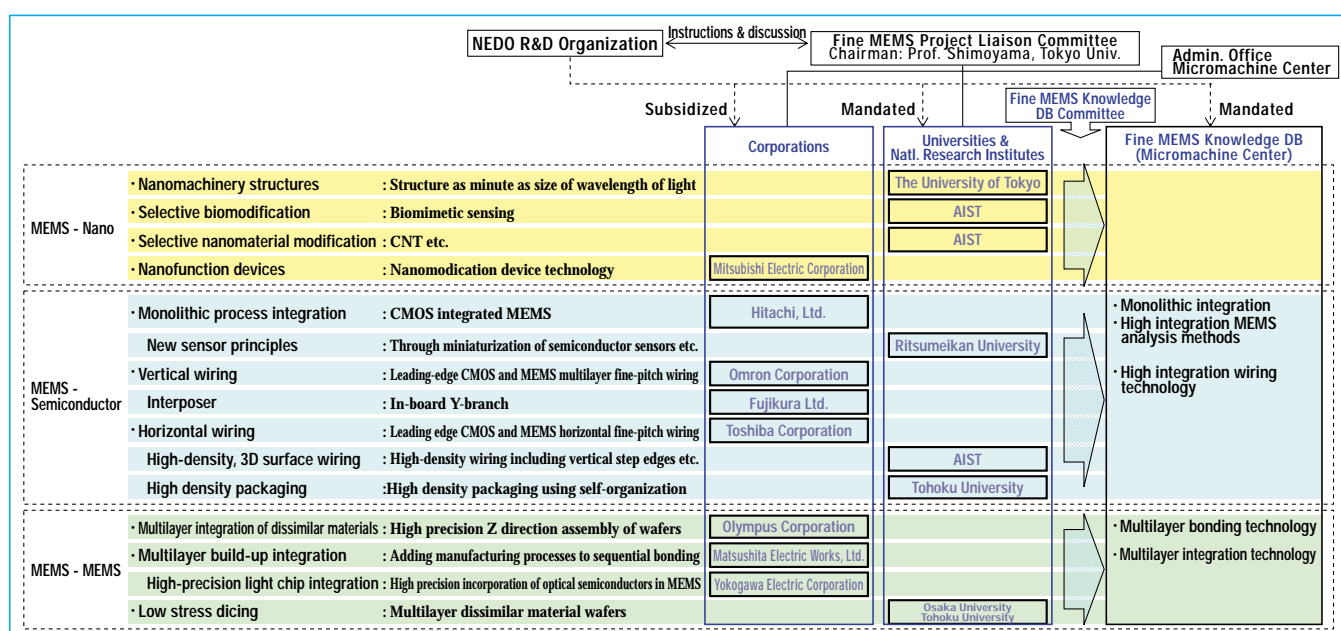
The Project will run for three years from FY2006 to FY2008, and yen 1.1 billion is budgeted for FY2006.

4. Development organizations and the approach of the Micromachine Center

Eight corporations have been selected for subsidized projects and eight organizations (universities and national research institutions) have been selected for mandated projects. The Micromachine Center has been entrusted with 4) Establishment of a database of high integration composite MEMS knowledge.

The knowledge database must cover all the issues involved in high integration composite MEMS fabrication technologies, and therefore a fine MEMS knowledge database committee will be organized to strengthen cooperation within the Project to enable the research data from all the corporations and bodies participating in the Project to be collected. Besides considering effective means of allowing each researcher to enter knowledge easily, the Project will invite university researchers with superior knowledge of the relevant issue to supplement the knowledge data relating to the subsidized project themes in particular.

In addition, the Micromachine Center will provide management support for the Project overall. As described above, the Project is a composite project comprising a number of issues and themes, involving mandated and subsidized programs, therefore it will be necessary to carry out efficient management of progress and of the necessary liaison within and between the disciplines, and to provide a suitable environment for industrialization at the latter stage. With this objective, a project liaison committee will be established for organizing periodic consultations and coordination. The Micromachine Center will be responsible for this role and, under the guidance of the Project Leader, the Center will take an active approach with the aim of maximizing the results of the Project.



High Integration Composite MEMS Fabrication Technology Development Project: Development Issues and Organization