4th Japan-Korea-China MEMS Standardization Workshop

Efforts to promote international standardization of Micro-Electro-Mechanical Systems (MEMS) have up to now resulted in the publication of three international standards originating in Japan: "Terms and definitions," "Tensile testing method of thin film materials" and "Thin film standard test piece for tensile testing." Another proposed standard, "Thin film fatigue test methods," is currently under review as a Committee Draft Version (CDV). Recently efforts to achieve international standardization have become active in South Korea as well. Five draft standards have been proposed and are currently under review.

Workshop venue

Against this backdrop, the Japan-Korea-China MEMS Standardization Workshop has been held as a forum to promote cooperation and the exchange of information relating to MEMS standardization among Japan, Korea and China. The 1st workshop was held in 2005 in Tokyo. The 2nd workshop was held in 2006 in Gyeongju, South Korea. The 3rd workshop was held in Beijing, China. After having been held in all three countries, for the 4th workshop the venue returned to Japan once again, and the workshop was held on Friday, June 20, 2008 in Tokyo to coincide with the IEC TC47 WG4 Tokyo Meeting. Although at this year's workshop there were only four presentations (two each from Japan and South Korea), as China had been forced to cancel its participation as a result of the Sichuan Earthquake, the presentations sparked a lively discussion.

The following is an overview of the presentations.

Following the opening address by Chairman Naotake Oyama of the Micromachine Center's Standardization Project Committee, the following four presentations were given on the topic of MEMS standardization.

(1) Professor Park of Kyunpook National University in South Korea gave a presentation on the current status of MEMS / NEMS standardization and the approach to standardization research in South Korea. He spoke about standardization in the MEMS field (IEC TC47 / WG4) and the state of international standardization in the area of nanotechnology (IEC TC229), as well as future approaches in the MEMS field (in terms of the evaluation of packages, sensor devices and flexible devices and standardization topics for which reliability is a chief concern).

(2) Associate Professor Tsuchiya of Kyoto University gave a presentation on "The Accelerated Life Test for MEMS Device Structures," one of the standardization projects currently being promoted in Japan. Dr. Tsuchiya began by giving an overview of the material evaluation type standardization projects that have been implemented in Japan up to now and the current state of international standardization. Subsequently, he reported on progress in the accelerated life test standardization project currently being implemented. He also discussed a draft standard that is currently under study.

(3) Dr. Nak Kyu Lee of the Korea Institute of Industrial Technology gave a presentation on the Forming Limit Diagram (FLD) Test for evaluating the ductility of nanoimprint materials. In this test, a thin film is fastened in place and a semispherical jig is used to compress the film, after which the deformation of the film is evaluated. In the presentation, he discussed the measurement principle and introduced a deformation measurement technique that utilizes a CCD camera to measure the grids formed on the test specimen. Plans call for this test method to be proposed to the IEC as an international standard.

(4) Professor Higo of Tokyo Institute of Technology gave a presentation on the development of standard materials used for calibrating thin film material test equipment, entitled "Bending specimen for calibrating materials testing machine." He proposed metallic glass materials as materials that are stable, uniform, strong and have a low modulus of elasticity, and noted that these materials have been confirmed to possess stable elastic properties. He also reported on studies of the significant impact of machining on these standard materials, as well as on the shape of the test specimens used for calibration.

The conference ended with Keiichi Aoyagi, Executive Director of the Micromachine Center, expressing his hopes for standardization in the MEMS field.

Although it was unfortunate that China was unable to participate, it was a valuable workshop, with an active exchange of information between Japan and South Korea and participants from many companies in attendance. Prior to this 4th workshop, the workshop had been held in each of the participating countries – Japan, South Korea and China – and so this workshop also marked the beginning of the second round of workshops held in each country. The major achievement of the Workshop has been its role in providing a forum for the exchange of information regarding the current state of MEMS standardization and future prospects in each country, as well as in enhancing the common recognition in these three countries. It is crucial that these achievements be utilized in MEMS standardization strategies in Japan.

The 5th Japan-Korea-China MEMS Standardization Workshop will be held in South Korea in 2009.