Introducing process inverse problem analysis software

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Purpose

In designing MEMS devices, the design of the masks used in the processes is a major task, while at the same time, it involves very difficult problems. A skilled practitioner who has a thorough knowledge of MEMS can use their experience and knowledge to establish the necessary processes. However, for a beginner, it is very difficult to draw a MEMS pattern while thinking through the processes, and it is not unusual to draw patterns that are impossible.

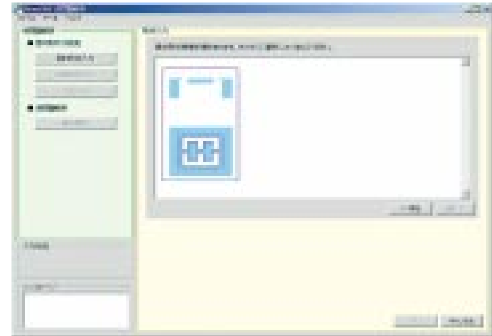
This software facilitates design by resolving the difficult problems of MEMS device design while providing the user with guidance, and it is expected to be an effective learning tool especially for MEMS beginners.

Functions

The software has the following functions for performing inverse problem analysis.

- Load MEMS device pattern (top, cross section) files
- Specify MEMS device pattern dimensions
- Set process conditions (equipment used, processes etc.)
- Inverse process guidance for MEMS device patterns
- Framework linkage
- Mask data file output (the format conforms to the framework)
- Process recipe file output (the format conforms to the framework)

To enable the user to perform analysis easily, the settings can be performed using a wizard (the screenshot shows a prototype).



State of development

Following specification development last year, the software is now in the development phase. The first stage of development will be completed this year, and the α version is scheduled for release in 2006.

Introducing about package bonding analysis software

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Bonding technology is a technology that is used for MEMS processes and packaging. When dissimilar materials are bonded, damage to the bonded interface and edges may occur due to the influence of differences in the physical properties of the dissimilar materials such as their Young's modulus, Poisson's ratio, coefficient of thermal expansion and so on, and the geometric configuration of the bonded edges, the materials and dimensions of the intermediate layers and other factors.

The package bonding analysis software supports the design and development of MEMS that may experience this kind of problem. It includes a material compatibility analysis function for evaluating the stress singularity at bonded edges, a function for analyzing the deformation and temperature history and inheritance arising from changes in the material and form, a reliability analysis function for evaluating bond strength.