

Simatic and Sinumerik technology in etching tool at Siltronic

Production cell integration

A new wet process etching tool is another project where Totally Integrated Automation has been put to practical use in the new 300-millimeter fab at the Siltronic site in Freiberg. Simatic and Sinumerik technology control the individual process steps, and the interfacing between separate process cells facilitates process optimization.

During wet process etching, the wafers are being cleaned, etched and undergo hydrophilization before they are polished in the next processing step. The new tool at the 300-millimeter fab in Freiberg is the prototype of a new series of etching tools and has reduced the number of separate process steps. Moreover, it offers new interfaces for networking with other so-called production cells such as polishing. These process cells consist of the machine or unit and all related process control and logistics functionalities. Networking between process cells allows feedback on process performance and process-

ing results. For example, when a wafer is found to be defective in the polishing cell, the control system will trigger a message back to etching in order to adjust processing parameters.

Fine structures require exact processes

Processing of 300-millimeter wafers places higher than usual requirements on the surface treatment process and equipment because the structures on these large wafers are finer than those on 200-millimeter wafers. Siltronic had specified that Simatic technology and solutions from the Totally Integrated Automation range should be

used in all package units as far as possible, so the new etching machine is equipped with a Simatic S7-400 controller for process control and a Sinumerik 840D numerical control for handling tasks. The process visualization is implemented with Simatic WinCC. Hermos developed the database and MES applications.

Fine-tuning standard products

“We have been using Siemens products for some time, and the controllers especially are high-performance systems that cover most standard applications,” says Thomas Wagner, who executed the software engineering for the etching tool at Hermos. “Of course, using these systems in a semiconductor environment requires a certain amount of fine-tuning specifications and functionalities, but we were able to rely on the expertise of our partners at Siemens to support us in this.”

Integration supports process improvements

The new etching tool has by now been successfully commissioned at the Freiberg site. Both Hermos and Siltronic are satisfied with the etching tool’s performance, and the process benefits from the tight integration of all process steps – allowing for a higher overall performance and a better and more consistent quality. ■



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