

Semiconductor Manufacturing and Inspection Systems

PREFACE



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IT is not an exaggeration to say that the recent advances in the IT industry have been brought about by the developments of semiconductor technology. From now on, the semiconductor and software industries are expected to further develop as the foundation of the so-called “information society.” Over the last ten years, semiconductor manufacturers have mainly used fine-processing technology to develop small-scale, high-speed, low-cost, and multi-functional devices based on LSI technology. However, with the arrival of the 0.1- μm -process generation, the physical limitations of device structures and materials have been reached. New issues—such as those concerning fine processing, thin-film materials, fabrication techniques, and multi-layer wiring techniques—have therefore been accumulating because conventional process technology cannot deal with these issues. It is greatly expected that semiconductor manufacturing equipment and inspection systems will provide the new processes to tackle these issues and achieve high yield and high productivity.

Hitachi Group (Hitachi, Ltd. and affiliated companies) has divisions for making semiconductor manufacturing equipment and inspection measuring systems. These divisions have been contributing to improvements in yield and in productivity on ramping up production lines by implementing products that fully use leading-edge technology and satisfy user needs. Hitachi also has a semiconductor device division, which is actually an in-house user of Hitachi devices, as well as research and development divisions for device and manufacturing equipment technology. This close technical relationship between devices and equipment, which other semiconductor equipment

manufacturers do not have, enables Hitachi to anticipate user needs. However, to further expand semiconductor business in this very competitive semiconductor manufacturing equipment market, a new approach is essential.

Up until now, each group company has researched and developed its own next-generation technology and products, and set up demonstration and service centers. From now on, however, all resources within the Hitachi group must be shared by the group companies in order to gain mutual benefits and further develop the semiconductor industry. To do so, a new business group named the “Semiconductor Manufacturing Equipment” was established on October 1st this year. This group was established to expand and strengthen the semiconductor manufacturing equipment business. It is to perform strategic central functions in the semiconductor equipment business across the entire Hitachi group. These functions include linking up and working with each group company, unifying R&D among the companies, and setting the direction of Hitachi’s future semiconductor equipment business.

Moreover, it is essential that research and development in each technical field (such as device design, processing, manufacturing, and inspection) cooperates closely and globally in order to expand the semiconductor industry for the 0.1- μm -process era. Hitachi will make technological breakthroughs by gathering all development resources and will aim to be a total semiconductor equipment manufacturer. As a result of making the new Semiconductor Manufacturing Equipment the center of Hitachi’s business, customers all over the world will be provided with the best technical solutions.