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Optical Image Analysis Through Semiconductor Defect Detection Simulation and Suggestion on How to Improve the Fine Particle Detection Capability of Semiconductor Equipment

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Abstract : As design rules become smaller, semiconductor processes are becoming a new problem because defects that were not previously a problem affect yields. Recently, semiconductor fine inspection technology has been required to develop high-precision, high-efficiency technology to manage defects, and the detection capability of semiconductor inspection equipment has been improved by studying defect detection through a comprehensive understanding of semiconductor inspection equipment, semiconductor processing, and defects. The optimal test parameters were applied to actual equipment by conditional comparison results aimed at detecting 30 nm particles in low-density semiconductors, thereby improving the detection capability of particle inspection equipment. The improvement of 30 nm particle detection has been studied based on the results of image analysis and evaluation through defect simulation. Factor analysis such as wavelength polarization incident angle of semiconductor equipment parameters and acquisition of scattering signals of actual equipment has been found to have found the optimal conditions of detection power and contributed to defect detection. As a result, it was confirmed that the detection power differed significantly in the experiment of 266 nm wavelength and P incident polarization conditions using P polarization, and 30 nm particles were detected, contributing to the yield improvement.

Keywords : electronic simulation system, a semiconductor defect, Reynolds' equation, semiconductor optical measuring equipment, facility engineering
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