# Challenges of Particle Control Technology in theSemiconductor and Display Process Equipments

Seungki Chae [1]

[1]Sungkyunkwan University, Korea, Republic of

Particle control has been crucial and has influencedthe process equipment productivity and device production yield in thesemiconductor and display manufacturing process. Particles, whose sizes are downto 10 nm range, are challengeable in the points of wafer surface particleinspection and removal in the semiconductor manufacturing process. In the OLEDdisplay manufacturing, the particle size under control is down to 100 nmranges. The performance of wafer surface scanner and in-line defect analyticalmethod will be introduced including atmospheric scanning electron microscopefor OLED display.

For the several different plasma processequipments, such as PE-CVD (plasma enhanced chemical vapor deposition), DryEtch and PVD (physical vapor deposition), some important particle generation mechanismand particle control technology will be introduced for the vacuum and plasmaenvironments. To understand the mechanism of particle generation andmeasurements, several instruments are needed and have been developed. Recentdevelopment and application of in-situ nano-particle monitoring technology,such as PBMS (particle beam mass spectrometer) and RGA (residual gas analyzer) willbe introduced. In-situ dry chamber cleaning has been improved for the particlecontrol and process development using RGA technology. The mechanism of plasmanative-oxide cleaning process has been investigated using Tof-MS residual gasanalyzer.