
Improvement of productivity through time reduction by using cleaning process optimization using OES wavelength of semiconductor plasma equipment

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In order to increase the yield in the semiconductor plasma process, it is important to control particle source in process chamber. As one of the methods for control particle, Etch process is used to clean the chamber using plasma. It is to reduce particle attack to the next wafer. But, such a chamber clean process decreases productivity, interfering with wafer manufacturing time. So, it is important to minimize chamber cleaning time.

This page is a study to analyze chamber condition and to minimize the cleaning time using OES (Optical Emission Spectroscopy) analysis. It is to analyze the clean point selecting OES wavelength and using Actinometry method. When remove some component in chamber, there are many byproduct and etchant gas. Select wavelength of species A, B (A, B is byproduct and etchant gas component) and apply actinometry method. And then the value of ratio (A/B) decrease, finally the gradient changes disappear. The specific time is minimum time to clean in chamber.

We used commonly EPD (End Point Detecting) technic in etch process. But it is used to detect minimum cleaning point in etch chamber. As a result, it was contributed to increase yield and productivity by identifying the minimum time to remove byproduct.