

Applications Assistance Worksheet

Verity Instruments is ready to help customers use Verity sensors to develop Optical Emission Spectroscopy (OES) endpoint solutions for their processes. As an OES supplier, Verity's experience can be more quickly applied to solving customer problems when the background information requested in this Applications Assistance Worksheet is supplied.

1. Traditional OES Endpoint detects a spectral change in the plasma emission in close proximity to the film being etched. The film can be on the wafer being etched or on the walls of the reaction chamber in a cleaning operation. Is light emitted from the region close to the film being etched? Yes No
2. OES Endpoint can be detected from any or all three possible changes in the plasma light emission:
 - A. The decrease of emission from a by-product of the material being etched as the etch progresses through the interface between the two films.
 - B. The appearance of emission from a by-product of the underlying film material as it is exposed to the plasma by the etch breaking through the interface between the two materials.
 - C. The increase of emission from the active chemical etching species as its concentration increases in the plasma due to lack of material to etch.

What are the chemical compositions of the film being etched and the underlying film, or stopping layers?

What are the reactive gases in the plasma (or feed gases that produce the reactive species)?

3. Process conditions should remain static, just before and during the OES Endpoint transition, to avoid confounding the OES endpoint signal with OES changes caused by process changes. How long does the process remain stable just preceding the endpoint? _____
4. OES Endpoint is more difficult to detect as the actual material being etched becomes a small fraction of the total surface area being exposed to the etching plasma. For example, contact etch OES endpoint is more challenging as the percent (%) open area falls below 1% of the total wafer surface. What is the percent open area being etched?

5. Some reactors achieve uniform results using rotating magnetic fields or actually rotating the wafer. These methods modulate the intensity of the light emitted through the observation window. Does your reactor use these methods?
 Yes No
6. Some processes rapidly coat optical windows. Does your company's process have this characteristic?
 Yes No
7. What information and experience do you already have in developing an OES Endpoint solution for your process?

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8. Describe your current OES Endpoint system.

A. How does it operate? _____

B. Describe the difficulties encountered. _____

9. What tool are you using? _____

10. Describe the performance you must have from your endpoint system. _____

Name: _____

Company: _____

Address: _____

City, State, Zip: _____

Telephone: _____ FAX: _____

Email: _____