EMERGING COMMUNICATIONS
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SiN etch on Phantom etcher

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Summary:
This document is a basic recipe for etching thin films of SiN using the Trion Phantom etcher.

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1 Associated Documents & References

MSDS if chemicals or gas involved.
Phantom etcher standard operating procedure
Rules and procedures of cleanroom

2 Equipment Used

Phantom Etcher (www.triontech.com) in Bahen Cleanroom. This equipment has to be reserved through the online resource scheduler. If you need to be assisted by technicians check availability with them before reserving the equipment. Users have to go through regular training before using this equipment alone.

3 Verifications Prior to Processing

Chamber clean. No air leaks into etcher.

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4 Recipe description

Pump chamber for 10 minutes with no gas flowing, no RF power and pressure set to 0 mTorr.

pressure 150 mTorr, ICP 200 watts RIE 25 watts, SF6 45 sccm O2 5 sccm
He backside cooling 2 Torr.
Enter an etch time based on an etch rate of approximately 200 nm per minute.

Add a pumpdown (no gas, no RF) and cooling step at the end of the etch of 10 minutes.

2. Load the empty carrier into the chamber
3. Ensure the chamber walls are clean and vacuum any loose particulates.

4 do a "conditioning" run with the above steps. This aids in cleaning the walls, degassing/conditioning the walls and warming up the chamber in preparation for the sample etch.

5. Check the reflected power are low (ICP reflected less than 20 watts, RIE reflected less than 2 watts) . A high reflected power indicates poor plasma conditions or circuit tuning is not working.

6. Check the color of the plasma during the "conditioning" . If there is any residual air or water vapor the color will off.

7. Quickly load sample to minimize absorption of air and water vapor on the walls and close the lid.

6. Run etch recipe.
7. Check the reflected power and color of the plasma during etching.

Allow a cooldown period of 10 minutes before retrieving the sample.

5 Technical Data

Etch rate, selectivity and profile depends on the size of the feature, the depth of the feature and how much open area and density the pattern occupies. The parameters in the recipe will have to be varied in order to find the optimum etch conditions for the sample.

6 Measurements & Statistical Process Control

7 Record of Revisions

Rev. 0	First Edition

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