

Abstract Submitted
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2D etch rate uniformity improvement in a parallel turn ICP system: numerical modeling and experiment JUNGHOOON JOO, Kunsan National University — 2D uniformity at moderately high etch rate is a very important issue as well as under layer selectivity and upright profile. A multi parallel turn ICP has been developed and used as an efficient tool which can control plasma density profile by controlling the antenna coil currents independently in coupled with gas flow design. Fluid based numerical modeling is used to find out the effect of current ratio and gas flow profile. The calculated results are compared with Langmuir probe data. The measured ion saturation current profile is in good agreement with the modeling results. After optimization of the coil current ratio, 3.9 % of wafer scale etch rate non-uniformity was obtained for SiO₂ etch by using Ar+CF₄ in experiment. While the effect of gas injection scheme, horizontal and vertical gas flow rate control, has little effect on the etch rate uniformity at 150 mm gap distance between the wafer and the antenna dielectric window. At lowest operational pressure of 3 mTorr, the best etch rate uniformity was obtained in experiment.

Junghoon Joo
Kunsan National University

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