

Gas Injector Effect on Gas Flow Uniformity in Inductively Coupled Plasma Etcher

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Gas injector effect on gas flow uniformity in inductively coupled plasma (ICP) has been studied. CFD-ACE+ commercial code was used for the flow simulation inside ICP chamber.

For the simple problem definition, we make an assumption for the etchant mixture to an Ar flow; ~600sccm based on the oxide etching process recipe. The flow effect is focused and the plasma model is not included in this work. Real dimension of plasma chamber 3D model has been used. Simulated chamber has two different injecting points; center and side injectors. Center injector is located at the top center of a chamber and side injector is located at the side wall of a chamber for improving wafer edge uniformity.

The gas injector effect on gas density uniformity at the 200mm wafers area is analyzed and gas density was compared to the oxide etch and photoresist blanket ash rate uniformity results.