

## Study of Silicon Oxidation in a 12-Inch Remote Plasma-Enhanced Rapid Thermal Processor

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As the design rule of semiconductor devices shrinks to the ultra shallow junction grade, manufacturing equipments are confronted with new challenges. The RPERTP is a semiconductor manufacturing equipment that has newly emerged to meet such challenges. This paper describes the experimental and numerical studies on silicon oxidation in a commercial 12-inch RPERTP equipment, KORONATM PERTP1200 system developed in Kormic Systems Co. Ltd., Korea. The equipment was originally developed for high-k material deposition and annealing. However, in the course of the equipment development, remote plasma oxidation (RPO) has been investigated as the monitoring experiment for the deposition uniformity. Along with the equipment development, a numerical simulator was constructed using a commercial computational fluid dynamics software called CFD-ACE+. The simulator calculates the gas flow pattern and SiO<sub>2</sub> growth on the silicon wafer inside the RTP chamber. With the aid of the simulator, the effects of various operating and designed variables on the RPERTP performance could be investigated.