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CONFORMAL FILM DEPOSITION FOR GAPFILL

ABSTRACT

A method and apparatus for conformally depositing a dielectric oxide in high aspect ratio gaps in a substrate is disclosed. A substrate is provided with one or more gaps into a reaction chamber where each gap has a depth to width aspect ratio of greater than about 5:1. A first dielectric oxide layer is deposited in the one or more gaps by CFD. A portion of the first dielectric oxide layer is etched using a plasma etch, where etching the portion of the first dielectric oxide layer occurs at a faster rate near a top surface than near a bottom surface of each gap so that the first dielectric oxide layer has a tapered profile from the top surface to the bottom surface of each gap. A second dielectric oxide layer is deposited in the one or more gaps over the first dielectric oxide layer via CFD.

FIG. 5

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