

**Current Issues in Pattern Transfer into
Dielectric Films by High-Resolution
Plasma Etching Techniques**

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Low pressure discharges are used for transfer lithographically defined patterns into dielectric layers in integrated circuit production. An important application is the etching of vias and trenches in the formation of high-performance multi-level interconnection schemes. This requires pattern transfer into SiO₂ and, increasingly, a variety of low dielectric constant materials that range from different spin-on glass films, over organic insulators to nanoporous materials. In addition, the industry is responding to global warming concerns by investigating alternative fluorocarbon gases. The necessity of different chemical etching environments and the varying spontaneous chemical reactivity of the dielectric materials in the context of demanding technological requirements on the pattern transfer process presents a spectrum of challenges on the control of plasma-surface interactions. We will illustrate these issues by discussing promising approaches to prototypical pattern transfer applications that can satisfy the technological requirements.

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