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Design, Characteristics and Performance of Diamond Pad Conditioners

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Abstract

A wide range of diamond pad conditioner (disk) designs have been characterized and key performance metrics have been collected. Relationships between design characteristics including diamond size and shape, spatial density, and tip height distribution and polishing pad wear rates and pad surface textures have been established for a variety of pads.

Estimation of the depth-of-penetration of working diamonds, from used disk analyses, allows meaningful topographic assessments of alternative conditioner designs and predictions of relative performance. An example of an improved conditioner that illustrates this design methodology is given.

Conditioner aggressiveness and its decay in various slurries have been measured to assess disk lifetime in Chemical Mechanical Planarization (CMP) processes environments. Key factors affecting disk lifetime are discussed and an improved-lifetime conditioner for use in aggressive slurries will be reviewed.

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