Chemical Mechanical Polishing (CMP) Characteristics of Silica Slurry Remaked by Mixing of Original and One-Used Slurry

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Chemical mechanical polishing (CMP) technology has been widely used for global planarization of multi-level interconnection for ULSI applications. However, cost of ownership (COO) and cost of consumables (COC) were relatively increased because of expensive slurry.

In this work, we have studied the possibility of recycle of reused silica slurry in order to reduce the costs of CMP slurry. Also, we have investigated the CMP characteristics by mixing of original slurry and used slurry. The removal rate and within-wafer non-uniformity (WIWNU) were measured as a function of different slurry composition. As an experimental result, the performance of reused slurry with annealed silica abrasive of 2 weight(wt) percent contents was showed high removal rate and low non-uniformity. Therefore, we propose the two-step CMP process as follows; In the first-step CMP, we can polish the thick and rough film surface using remaked slurry, and then, in the second-step CMP, we can polish the thin film and fine pattern using original slurry. Consequently, we can expect the saving of high-cost slurry.