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(54) Title: LOW DISHING OXIDE CMP POLISHING COMPOSITIONS FOR SHALLOW TRENCH ISOLATION APPLICATIONS AND METHODS OF MAKING THEREOF

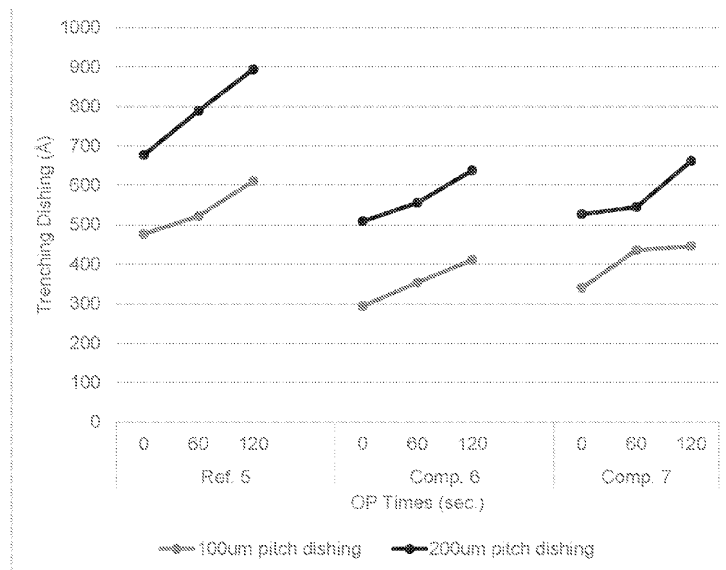


Figure 7

(57) Abstract: Shallow Trench Isolation (STI) chemical mechanical planarization (CMP) polishing compositions, methods and systems of use therefore are provided. The CMP polishing composition comprises abrasives of ceria coated inorganic oxide particles, such as ceria-coated silica; and dual chemical additives for providing the tunable oxide film removal rates and tunable SiN film removal rates; low oxide trench dishing, and high oxide: SiN selectivity. Dual chemical additives comprise at least one silicone-containing compound comprising at least one of (1) ethylene oxide and propylene oxide (EO-PO) group, and at least one of substituted ethylene diamine group on the same molecule; and (2) at least one non-ionic organic molecule having at least two, preferably at least four hydroxyl functional groups.

[Continued on next page]

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