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(54) Title: CUSTOMIZED POLISHING PADS FOR CMP AND METHODS OF FABRICATION AND USE THEREOF

(57) Abstract: The present application relates to polishing pads for chemical mechanical planarization (CMP) of substrates, and methods of fabrication and use thereof. The pads described in this invention are customized to polishing specifications where specifications include (but not limited to) to the material being polished, chip design and architecture, chip density and pattern density, equipment platform and type of slurry used. These pads can be designed with a specialized polymeric nano-structure with a long or short range order which allows for molecular level tuning achieving superior thermo-mechanical characteristics. More particularly, the pads can be designed and fabricated so that there is both uniform and nonuniform spatial distribution of chemical and physical properties within the pads. In addition, these pads can be designed to tune the coefficient of friction by surface engineering, through the addition of solid lubricants, and creating low shear integral pads having multiple layers of polymeric material which form an interface parallel to the polishing surface. The pads can also have controlled porosity, embedded abrasive, novel grooves on the polishing surface, for slurry transport, which are produced in situ, and a transparent region for endpoint detection.

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