

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 August 2006 (24.08.2006)

PCT

(10) International Publication Number
WO 2006/089293 A1

(51) International Patent Classification:
B24D 18/00 (2006.01) **B24B 37/04** (2006.01)
B24D 13/14 (2006.01)

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(21) International Application Number:
PCT/US2006/006176

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(22) International Filing Date:
21 February 2006 (21.02.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/060,898 18 February 2005 (18.02.2005) US
60/654,104 18 February 2005 (18.02.2005) US
60/654,173 18 February 2005 (18.02.2005) US
60/677,062 2 May 2005 (02.05.2005) US
PCT/US2005/025330 15 July 2005 (15.07.2005) US
11/251,547 14 October 2005 (14.10.2005) US

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(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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