

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 September 2005 (15.09.2005)

PCT

(10) International Publication Number
WO 2005/084241 A2

(51) International Patent Classification: **Not classified**

06810 (US). **BAUM, Thomas, H.** [US/US]; 2 Handol Lane, New Fairfield, CT 06810 (US).

(21) International Application Number:
PCT/US2005/006228

(74) Agent: **CHAPPUIS, Margaret**; Advanced Technology Materials, Inc., 7 Commerce Drive, Danbury, CT 06810 (US).

(22) International Filing Date: 25 February 2005 (25.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/790,535 1 March 2004 (01.03.2004) 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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, 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.

(71) Applicant (for all designated States except US): **ADVANCED TECHNOLOGY MATERIALS, INC.** [US/US]; Chappuis, Margaret, 7 Commerce Drive, Danbury, CT 06810 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KORZENSKI, Michael, B.** [US/US]; 110 Woodcrest Lane, Danbury, CT

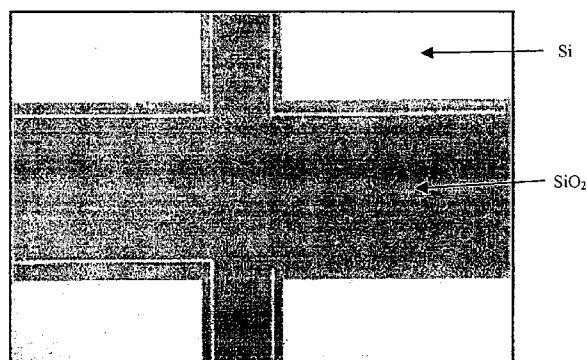
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: ENHANCEMENT OF SILICON-CONTAINING PARTICULATE MATERIAL REMOVAL USING SUPERCRITICAL FLUID-BASED COMPOSITIONS



(57) Abstract: A method and composition for removing silicon-containing particulate material, such as silicon nitrides and silicon oxides, from patterned Si/SiO₂ semiconductor wafer surfaces is described. The composition includes a supercritical fluid (SCF), an etchant species, a co-solvent, a surface passivator, a binder, deionized water, and optionally a surfactant. The SCF-based compositions substantially remove the contaminating particulate material from the wafer surface prior to subsequent processing, thus improving the morphology, performance, reliability and yield of the semiconductor device.





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, 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).

Published:

— *without international search report and to be republished upon receipt of that 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.