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PATENTS/APPLICATIONS:

1. US#5066615 – **PHOTOLITHOGRAPHIC PROCESSES USING THIN COATINGS OF REFRACTORY METAL SILICON NITRIDES AS ANTIREFLECTION LAYERS.** M.F. Brady, J.K. Dorey, and A.L. Helms, Jr., Issued November 19, 1991.
2. US#5106786 – **THIN COATINGS FOR USE IN SEMICONDUCTOR INTEGRATED CIRCUITS AND PROCESSES AS ANTIREFLECTION COATINGS CONSISTING OF TUNGSTEN SILICIDE.** M.F. Brady, and A.L. Helms, Jr., issued April 21, 1992.
3. US#7205247 – **ATOMIC LAYER DEPOSITION OF HAFNIUM-BASED HIGH-K DIELECTRIC.** Sang-In Lee, Jon S. Owyang, Yoshihide Senzaki, Aubrey L. Helms, Jr., and Karem Kapkin, Issued April 17, 2007.
4. US#20030104707 – **SYSTEM AND METHOD FOR IMPROVED THIN DIELECTRIC FILMS.** Yoshihide Senzaki, Bob Herring, Aubrey L. Helms, Jr., and Nick Osborne, Utility Application filed March 25, 2002.
5. US#20050175789 – **METHOD FOR ENERGY-ASSISTED ATOMIC LAYER DEPOSITION AND REMOVAL.** Aubrey L. Helms, Jr., Kerem Kapkin, Sang-In Lee, and Yoshihide Senzaki, Utility Application filed June 23, 2003.
6. US#20050227017 – **LOW TEMPERATURE DEPOSITION OF SILICON NITRIDE.** Yoshihide Senzaki, and Aubrey L. Helms, Jr., Utility Application filed October 28, 2004.
7. Application filed in general area of ALD Precursors. Aubrey L. Helms, Jr., and Yoshihide Senzaki, Provisional Application filed March 1, 2004. [Dropped by Assignee-?]

PUBLICATIONS:

1. *Correlations of ¹³C Chemical Shifts and Geometry Modifications*, D.B. Chestnut, A.L. Helms, Jr., *Theoretical Chemica Acta* **58** 163-165 (1981).
2. *LEED Analysis of Pulsed Laser Damage to Mo(100) Surfaces*, A.L. Helms, Jr., C.C. Cho, and S. L. Bernasek, *Bolder Damage Symposium*, October, (1984).
3. *Epitaxy and Defects in Laser Irradiated Single Crystals Bismuth*, C.W. Draper, A.L. Helms, Jr., S.L. Bernasek, D.C. Jacobson, and J.M. Poate, *Materials Research Society Proceedings*, **vol. 35**, 439-444 (1985).
4. *The Use of LEED for the Characterization of Surface Damage From Pulsed Laser Irradiation*, A.L. Helms, Jr., C.C. Cho, S.L. Bernasek, and C.W. Draper, *Materials Research Society Proceedings*, **vol. 48**, 3-10 (1985).

5. *Defect Structures on Metal Surfaces Induced by Pulsed Laser Irradiation: Characterization by LEED-Spot Profile Analysis and He⁺ Ion Channeling*, A.L. Helms, Jr., C.C. Cho, S.L. Bernasek, C.W. Draper, D.C. Jacobsen, and J.M. Poate, **LASER SURFACE TREATMENT OF METALS**, eds. Draper and Mazzoldi, NATO ASI Series **vol. 115**, 141-156 (1986).
6. *Characterization of Titanium Nitride Films and Sputter Target Material by 14 MeV Neutron Activation Analysis*, S. Yegnasubramanian, R.F. Roberts, A.L. Helms, Jr., and E.J. Canning, *J. Radioanal. Nucl. Chem. Letters*, **118(5)**, 339-348 (1987).
7. *Polyimide Adhesion as a Function of Substrate Structure*, J.V. Mil, and A.L. Helms, Jr., *Materials Research Society Proceedings*, **vol. 119**, 247-252 (1988).
8. *Epitaxy and Defects in Laser-Irradiated Single Crystal Bismuth*, A.L. Helms, Jr., C.W. Draper, D.C. Jacobsen, J.M. Poate, and S.L. Bernasek, *Journal of Materials Research*, **3(6)**, 1097 (1988).
9. *Dependence of PECVD Silicon Oxynitride Properties on Deposition Parameters*, A.L. Helms, Jr., and R.M. Havrilla, *Materials research Society Proceedings*, **vol. 131**, 295-300 (1988).
10. *Anti-reflection Coatings (ARC) for use with Aluminum Metallizations on GaAs ICs*, M.F. Brady, and A.L. Helms, Jr., *Materials Research Society Proceedings*, Spring, 1990.
11. *The Simultaneous Deposition and Flow of BPSG at High Temperatures*, A.L. Helms, Jr., *American Vacuum Society CVD Users Group Meeting, Invited Talk*, January, 1992.
12. *The Simultaneous Deposition and Flow of BPSG*, A.L. Helms, Jr., and Kevin Uram, 4th Annual DIELECTRICS AND CVD METALLIZATION SYMPOSIUM, *Invited Talk*, February, 1992.
13. *An Integrated BPSG Process Compatible With Salicide Technology*, R. Jairath, A.L. Helms, Jr., and K. McKinley, *Proceedings – 9th International VLSI Multilevel Interconnection Conference*, June, 1992.
14. *Aluminum Planarization for Sub-Micron Devices using a High temperature 2-step Aluminum Process*, E.J.H. Chiang, K.C. Wang, D. Lee, J. Carmody, V. Hoffman, and A.L. Helms, Jr., *Proceedings – 11th International VLSI Multilevel Interconnection Conference*, June, 1994.
15. *A Novel Technology for Half-Micron Aluminum Planarization using in-situ Ti/TiN/Al Metallization*, E.J.H. Chiang, K.C. Wang, and A.L. Helms, Jr., *SEMICON-Taiwan*, September, 1994.
16. *How do you Support a Process?*, Aubrey Helms, *QIP Today*, Varian Associates, May, 1995.
17. *Correlation of PVD-TiN Materials Properties to Barrier and Device Performance in Al-fill Technologies*, K.C. Wang, E.J.H. Chiang, A.L. Helms, Jr., and R. Wu, 12th International VLSI Multilevel Interconnection Conference, June, 1995.
18. *Thermco is "Production Ready" at 300mm*, Aubrey Helms, *SILICONET*, Silicon Valley Group, March, 1998.

19. *Single Wafer Furnace Technology (SWFT)*, C. Ratliff, T. Koble, R. Sloan, S. Sedehi, A. Helms, Jr., and J. Kowalski, 7th International Conference on Advanced Thermal Processing of Semiconductors, RTP '99, Proceedings pg. 16-19. September, 1999.
20. *Status and Future of Batch Hot Wall Furnaces*, Aubrey Helms, Jr., Robert B. Herring, Cole Porter, and Alan Starner, Solid State Technology, pg 83-92, November, 1999.
21. *Hf-Si-O Formation for High-K Gate Applications*, Sang-In Lee, Yoshi Senzaki, Aubrey Helms, Jr., Kerem Kapkin, SK Lee, and HK Shin, ALD 2002 Conference, American Vacuum Society, August 2002.
22. *High-K Gate Dielectric Applications using ALD Hf-based Oxides*, SI Lee, J. Owyang, Y. Senzaki, A. Helms, Jr., and K. Kapkin, Solid State Technology, January, 2003.
23. *Atomic Layer Deposition of High-k Metal Oxides for Gate and Capacitor Dielectrics*, Yoshihide Senzaki, S.G. Park, Randall Higuchi, Hood Chatham, Lawrence Bartholomew, Sattar Al-Lami, Carl Barelli, Sang-In Lee, and Aubrey Helms, Jr., Electrochemical Society Meeting, April 2003, Paris, France.
24. *Characteristics of TiN Film Grown by ALD using TiCl₄ and Metalorganic (MO) Precursors*, SK Lee, BC Cho, YH Park, HJ Lim, TW Seo, SI Lee, Y. Senzaki, K. Kapkin, and A. Helms, ALD 2003 Conference, American Vacuum Society, August 2003.
25. *300mm Batch ALD of Al₂O₃ for use in Capacitor Dielectric Applications*, C. Barelli, D. Teasdale, L. Bartholomew, S. Al-Lami, Y. Senzaki, SI Lee, K. Kapkin, A. Helms, Jr., SG Park, and C. Tousseau, ALD 2003 Conference, American Vacuum Society, August 2003.
26. *Atomic Layer Deposition of Hafnium Oxide and Hafnium Silicate Films for Gate and Capacitor Dielectrics*, Y. Senzaki, SG Park, R. Higuchi, L. Bartholomew, H. Chatham, SI Lee, and A. Helms, Jr., ALD 2003 Conference, American Vacuum Society, August 2003.
27. *Ozone-based Deposition of Metal Oxides utilizing a Showerhead ALD Reactor*, SI Lee, Y. Senzaki, J. Bailey, S. Mokhtari, K. Kapkin, A. Helms, Jr., and SK Lee, ALD 2003 Conference, American Vacuum Society, August 2003.
28. *ALD System Architecture Driven by Film Applications*, Aubrey L. Helms, Jr., Yoshi Senzaki, and Jon Owyang, Invited Talk, NEMAT Conference, Grenoble, France, March 2004.
29. *Batch Process for Atomic Layer Deposition of Al₂O₃ Thin Films on 300mm Diameter Substrates*, C. Barelli, C. Tousseau, S. Park, L. Bartholomew, Y. Senzaki, and A. Helms, Jr., AVS meeting, March 3, 2004.
30. *Batch Process for Atomic Layer Deposition of Al₂O₃ Thin Films on 300mm Diameter Substrates*, C. Barelli, C. Tousseau, S. Park, L. Bartholomew, Y. Senzaki, and A. Helms, Jr., submitted to Journal of Vacuum Science and Technology B, March, 2004.