

Multichamber and In-Situ Processing of Electronic Materials

Robert S. Freund
Chair/Editor

10-11 October 1989
Santa Clara, California

Sponsored by
SPE—The International Society for Optical Engineering

Cooperating Organizations
Center for Advanced Electronic Materials Processing/North Carolina State University
Engineering Research Center for Plasma-Aided Manufacturing/University of
Wisconsin-Madison
SEMATECH

Published by
SPE—The International Society for Optical Engineering
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone 206/676-3290 (Pacific Time) • Telex 46-7053



1188

MULTICHAMBER AND IN-SITU PROCESSING
OF ELECTRONIC MATERIALS

Volume 1188

CONTENTS

	Conference Committee	v
	Introduction	vi
SESSION 1	MULTICHAMBER SYSTEMS	
1188-02	Multichamber deposition system and its application to VLSI manufacturing process K. Numajiri, T. Ishida, N. Takahashi, Anelva Corp. (Japan).	2
1188-04	Multichamber and in-situ processing system design and control S. Chen, Univ. of North Carolina/Charlotte.	8
1188-05	Vacuum mechatronics and inspection for self-contained manufacturing S. E. Belinski, M. Shirazi, Univ. of California/Santa Barbara; T. E. Seidel, SEMATECH; S. Hackwood, Univ. of California/Santa Barbara.	21
1188-06	Ni substrate processing using in-vacuo wafer transfer to integrate surface characterization, surface cleaning, and Ni-Cu epitaxial alloy growth R. P. Burns, North Carolina State Univ.; R. A. Rudder, M. J. Mantini, J. B. Posthill, R. J. Markunas, Research Triangle Institute.	33
1188-07	Multichamber integrated-processing UHV system for the formation of silicon heterostructures on three-inch wafers J. T. Fitch, J. J. Sumakeris, G. Lucovsky, North Carolina State Univ.	43
SESSION 2	VLSI PROCESSING	
1188-08	Process integration: the future of chipmaking (Invited Paper) D. N. K. Wang, Applied Materials, Inc.	56
1188-10	Effects of multichamber processing on reliability of submicron vias T. Tokunaga, N. Owada, Hitachi, Ltd. (Japan).	61
1188-11	In-situ planarization of dielectric surfaces using boron oxide J. Marks, K. Law, D. N. K. Wang, Applied Materials, Inc.	69
1188-12	Characterization of a multiple-step in-situ plasma-enhanced chemical vapor deposition tetraethylorthosilicate planarization scheme for submicron manufacturing J. M. Perchard, H. E. Smith, R. O'Connor, Digital Equipment Corp.; J. C. Olsen, K. Law, Applied Materials, Inc.	75
1188-13	Cluster processing for 16-Mb DRAM production A. S. Bergendahl, D. V. Horak, IBM Corp.	86
1188-14	In-situ cluster processing for advanced semiconductor technologies E. A. Matuszak, C. M. Hill, D. V. Horak, IBM Corp.	96
SESSION 3	COMPOUND SEMICONDUCTOR PROCESSING	
1188-15	Recent applications of finely focused EB/IB technologies for multichamber and in-situ processing H. Sawaragi, H. Kasahara, R. Mimura, M. Obata, R. Aihara, JEOL Ltd. (Japan); W. B. Thompson, M. H. Shearer, JEOL USA, Inc.	108
1188-16	Effects of HCl gas and hydrogen-mixture etching on in-situ cleaning of GaAs substrates in molecular beam epitaxy J. Saito, K. Kondo, Fujitsu Labs. Ltd., Atsugi (Japan).	115

(continued)

MULTICHAMBER AND IN-SITU PROCESSING
OF ELECTRONIC MATERIALS

Volume 1188

1188-17	Contamination of remote plasma processes upon addition of hydrogen as a downstream reagent gas R. A. Rudder, S. Hattangady, J. B. Posthill, G. C. Hudson, M. J. Mantini, R. J. Markunas, Research Triangle Institute.	125
1188-18	Electron-beam-excited GaAs maskless etching using Cl₂ nozzle installed FIB/EB combined system N. Takado, Y. Ide, K. Asakawa, NEC Corp. (Japan).	134
1188-09	Formation of silicon-based heterostructures in multichamber integrated-processing thin-film deposition systems G. Lucovsky, S. S. Kim, D. V. Tsu, G. N. Parsons, J. T. Fitch, North Carolina State Univ.	140
SESSION 4	IN-SITU PROCESS MONITORING	
1188-23	AEMPES: an expert system for in-situ diagnostics and process monitoring S. Chen, Univ. of North Carolina/Charlotte.	152
1188-24	In-situ spectroscopic ellipsometry investigation of ion beam damage: a kinetic study J. W. Andrews, Y. Z. Hu, E. A. Irene, Univ. of North Carolina/Chapel Hill.	162
1188-25	Design of a new in-situ spectroscopic phase-modulated ellipsometer B. Drevillon, J. Y. Parey, M. Stchakovsky, Ecole Polytechnique (France); R. Benferhat, Y. Josserand, B. Schlayen, Instruments SA (France).	174
1188-27	Optical emission spectroscopy for in-situ diagnostics in RIBE and RIE: velocity selective detection of particles in broad ion beams and a new method for etch rate and endpoint determination F. Heinrich, H. Stoll, H. Scheer, P. Hoffmann, Fraunhofer-Institut für Mikrostrukturtechnik (FRG).	185
	Addendum.	195
	Author Index.	196