



Semiconductor Materials Information

Wet Chemicals

For Semiconductor Device Processing

A Techcet Group Critical Materials Report

Prepared by
Lita Shon-Roy

2009

* www.techcet.com

Lshonroy@techcet.com

Ph: 858-259-9077

Acknowledgments

Much thanks to all those that provided inputs for this report. Most of those that participated wished to remain anonymous. They included all major chemical suppliers in addition to large US end users. Other information obtained for this report was gleaned from industry conferences, technical experts, and literature in the public domain.

TABLE OF CONTENTS

	Page #
1 EXECUTIVE SUMMARY	7
1.1 Market.....	7
1.2 Suppliers	7
1.3 Supply Issues.....	7
1.4 Environmental, Health, and Safety.....	8
2 INTRODUCTION	9
2.1 Definition of Basic Wet Chemicals Bulk	9
3 MARKET RESULTS 2008	10
3.1 Market Share by Region	11
3.2 US Wet Chemical Market Shares	12
3.3 Worldwide Wet Chemical Market Shares.....	13
4 SUPPLY CHAIN ISSUES	15
4.1 IPA and Related Solvents	15
4.2 Phosphoric Acid	17
4.3 Hydrofluoric Acid.....	21
4.4 Sulfuric Acid (H ₂ SO ₄)	25
4.5 HCL.....	25
5 PRICE DECLINES ANYONE?.....	26
6 MAKERS AND SUPPLIERS.....	27
7 COMPANY PROFILES AND NEWS	35
7.1 Air Liquide (supplier)	36
7.2 BASF / Merck (maker & supplier).....	37
7.3 BlueStar New Chemical Materials (maker)	38
7.4 Dong Woo (supplier)	39
7.5 Dow Chemical (raw material maker)	40
7.6 Eastman (maker)	42
7.7 FujiFilm Microelectronic Chemicals (maker and supplier).....	44

7.8	General Chemical (maker and supplier).....	45
7.9	Honeywell (maker and supplier).....	46
7.10	ICL Performance Products LP / Astaris, LLC. (maker).....	47
7.11	KMG (supplier).....	48
7.12	Kanto (maker and supplier).....	49
7.13	Mallinckrodt-Baker (maker and supplier).....	49
7.14	Mitsubishi (raw material supplier, maker and supplier)	51
7.15	OM Group / Rockwood holdings Inc. (maker and supplier).....	53
7.16	Rudong Zhenfeng Yiyang Chemical Co., Ltd. (maker).....	54
8	“SHIP TO CONTROL” - UPDATE.....	55
9	ENVIRONMENTAL, HEALTH AND SAFETY	56
9.1	PFOS	56
9.2	REACH	57
9.3	RoHS	58
9.4	Greenhouse Gas Emissions	58
	APPENDIX A: SHIP TO CONTROL BACKGROUND	60
	APPENDIX B: THE WET CHEMICALS MARKET AND BIOFUELS	62
	APPENDIX C: ABBREVIATED LIST OF CHEMICALS AND ASSOCIATED SUPPLIERS	64
	APPENDIX D: SUPPLIER SPECIALIZATION (FROM 2008 REPORT).....	67

List of Figures

	Page #
Figure 1: World Wide Acids, Bases and Solvents Revenues for ICs	10
Figure 2: Wet Chemical Regional Share as a Percent of WW Volume Consumption-2008	11
Figure 3: US Chemical Supplier Market Share as a Percent of Revenues	12
Figure 4: Worldwide Wet Chemicals Market Share 2008.....	13
Figure5: Spot Price for Crude Oil (\$/barrel)	15
Figure 6: US Department of Energy Oil Pricing and Forecast.....	17
Figure 7: Phosphate Rock Price History	19
Figure 8: World Phosphate Rock Reserves	20
Figure 9: Mitsubishi Chemical Holdings Group Structure.....	51
Figure A1: Ethanol Fuel Market Influence on Semiconductor Wet Chemicals	63

List of Tables

	Page #
Table 1: Worldwide Acids, Bases and Solvents Revenues for ICs (\$M's)	10
Table 2: Semiconductor Wet Chemical Regional Market Leaders	14
Table 3: World Fluorspar Mine Production.....	22
Table 4: Wet Chemical Suppliers, Purifiers, and Makers for Selected Chemicals	27
Table 5: Air Liquide Sales and Earnings	36
Table 6: BASF Sales and Earnings.....	38
Table 7: Sumitomo Sales and Earnings.....	40
Table 8: Dow Chemical Sales and Earnings	41
Table 9: Eastman Sales and Earnings.....	43
Table 10: FujiFilm Sales and Earnings	44
Table 11: Honeywell Sales and Earnings	46
Table 12: ICL Sales and Earnings	47
Table 13: KMG Sales and Earnings.....	48
Table 14: Covidien Sales and Earnings	50
Table 15: Mitsubishi Sales and Earnings	52
Table 16: OM Group Sales and Earnings	54

Readers Note: This report represents the interpretation and analysis of information generally available to the public or released by responsible agencies or individuals. Data was obtained from sources considered reliable. However, accuracy or completeness is not guaranteed.