

IAL MARKET REPORT

THE GLOBAL MARKET FOR ELECTRONIC CHEMICALS

**© IAL CONSULTANTS
APRIL 2004**

CP House, 97-107 Uxbridge Road, Ealing, London W5 5TL
Tel: +44 (0) 20 8810 0919 Fax: +44 (0) 20 8566 4931
Email: ial@brg.co.uk
Web site: www.ialconsultants.com

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the copyright owner.

NOTE

The information given in this report has been compiled from published sources and interpreted from fieldwork based on informed opinions. Whilst every care has been taken in the preparation of the report, there may have been some errors in the information obtained. Although it is impossible to verify every single detail by cross checking, we believe the general picture provided is reasonably accurate and comprehensive.

Many IAL reports contain an overview of selected company financial information and capabilities based on published sources where available. Although the companies represented are believed to be the major suppliers the profiles are meant to be indicative rather than definitive.

It is fundamental to the philosophy of IAL Consultants to constantly seek to extend and improve our service to clients. In pursuit of these aims, we shall be pleased to consider all requests for regular or periodic updating of all or any part of the information contained in this report, or for extensions in coverage in terms of product areas, market sectors and/or geographic regions.

We are, of course, always happy to discuss with any subscriber the possibility of undertaking further work, whether arising out of this report or in different business areas.

MORE INFORMATION ON IAL CONSULTANTS

Should you require more information on either our published reports or our private client services, please contact us at the address given.

Full details on all IAL Consultants published studies (including full tables of contents and tables of tables) and ad-hoc research services can be found on our website :

www.ialconsultants.com

CONTENTS

1. INTRODUCTION.....	1
1.1 SCOPE OF THE STUDY	1
1.1.1 <i>Geographic Coverage</i>	1
1.1.2 <i>Product Coverage</i>	2
1.2 METHODOLOGY	2
1.3 FORECASTS	3
1.4 ABBREVIATIONS.....	3
2. GLOBAL SUMMARY	5
3. GLOBAL OVERVIEW OF THE ELECTRONIC COMPONENTS INDUSTRY	9
3.1 GLOBAL OVERVIEW OF SEMICONDUCTOR COMPONENT MARKET.....	10
3.2 GLOBAL OVERVIEW OF THE PRINTED CIRCUIT BOARD (PCB) MARKET	12
3.3 CHINA	14
3.3.1 <i>Semiconductor Wafer Manufacturers</i>	16
3.3.2 <i>Chinese PCB Industry</i>	17
4. GLOBAL SEMICONDUCTOR CHEMICALS MARKET BY REGION	19
4.1 SUBSTRATES.....	19
4.1.1 <i>Market Overview</i>	19
4.2 SEMICONDUCTOR PHOTORESISTS.....	31
4.2.1 <i>Markets</i>	31
4.2.2 <i>Prices</i>	35
4.2.3 <i>Suppliers</i>	36
4.3 PROCESSING CHEMICALS	39
4.3.1 <i>Overview</i>	39
4.3.2 <i>Market by Region</i>	40
4.3.3 <i>Global Suppliers</i>	46
4.4 SEMICONDUCTOR GASES.....	48
4.4.1 <i>Global Market</i>	49
4.4.2 <i>Suppliers</i>	53
4.4.3 <i>Technical trends</i>	55
4.5 SEMICONDUCTOR ENCAPSULANTS	56
4.5.1 <i>Global Market</i>	56
4.5.2 <i>Suppliers</i>	61
4.6 LIQUID CRYSTALS & ORGANIC LIGHT EMITTING MATERIALS.....	63
4.6.1 <i>Introduction</i>	63
4.6.2 <i>Global Market</i>	64
4.6.3 <i>Suppliers</i>	66
5. GLOBAL PCB CHEMICALS MARKET	69
5.1 LAMINATES.....	69
5.1.1 <i>Introduction</i>	69
5.1.2 <i>Global Market</i>	70
5.1.3 <i>Suppliers</i>	78
5.2 PCB RESISTS.....	80
5.2.1 <i>Introduction</i>	80
5.2.2 <i>Global Market</i>	81
5.2.3 <i>Suppliers</i>	87
5.2.4 <i>Technical Trends</i>	88
5.3 PCB PLATING AND PROCESSING CHEMICALS	89
5.3.1 <i>Introduction</i>	89
5.3.2 <i>Global Markets</i>	90

5.3.3	Suppliers	96
5.3.4	Technical advances	97
5.4	ADHESIVES	98
5.4.1	UV Structural Adhesives	98
5.4.2	Global Market	99
5.4.3	Suppliers	102
5.4.4	Opportunities for UV Adhesives.....	104
6.	MARKET FACTORS.....	105
6.1	ENVIRONMENTAL LEGISLATION	105
6.1.1	European Directive on Waste Electrical & Electronic Equipment (WEEE).....	105
6.1.2	European Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).....	105
6.2	MARKET OPPORTUNITIES	105
6.2.1	RFID (Radio Frequency Identification).....	105
6.2.2	Mobile Phones.....	106
6.2.3	Automotive Electronics	106
6.2.4	Digital Consumer Products.....	106
6.2.5	High Powered Illumination.....	107
7.	CHINESE ELECTRONIC CHEMICAL COMPANIES	109
7.1	PROFILES OF CHINESE COMPANIES	109
7.1.1	San Teh Xing (China) Group Co., Ltd.....	109
7.1.2	Yantai Electronics Industry Research Institute	111
7.1.3	Jiangsu Yangzhou Electronic Vacuum Elements and Material Factory.....	112
7.1.4	Chunguang D&M Factory.....	113
7.1.5	Shenzhen Huamei Electroplate Technology Co.,Ltd.....	114
7.1.6	Suzhou Ruihong Electronic Chemicals Ltd.....	116
7.1.7	Wuxi Sanyou Chemical Co.,Ltd.....	117
7.1.8	Luoyang Weiyuan Silicon Micro Powder Co.,Ltd.....	119
7.1.9	Beijing Liuling Gas Technology Co.,Ltd (Linggas Ltd)	120
7.1.10	Yixing Xining Chemical Group	121
7.1.11	Zhejiang Jingpeng Chemical Co.,	122
7.1.12	Lianyungang Huawei Electronic Group Co.,Ltd	123
7.1.13	Fujian Show Hoow Insulation Material Co.	124
7.1.14	Shaanxi Hongxing Radio Elements and Materials Factory.....	125
7.1.15	Hebei Xinji Barium Carbonate, Strontium Carbonate Group Co., Ltd.....	126
7.1.16	Wuxi Chemical Industry Research & Design Institute.....	127
7.1.17	Jiangsu Silicon Valley Specialty Gas Group.....	128
7.1.18	Hangzhou Greenda Chemical Co	129
7.1.19	Huizhan Electronic Material Co	130
7.1.20	Suzhou Crystal Clear Chemical Co.,Ltd	131
7.1.21	Beijing POME Sci-tech Co.,Ltd	132
7.1.22	Huayu Tongfang Chemical Industry Technology Development Company.....	134
7.1.23	Zhengzhou Yellow River Abrasives Co.,Ltd.....	135
7.1.24	Guangzhou Etsing Plating Research Institute.....	137
7.1.25	Zhenjiang HuangXu Chemical Factory	138
7.1.26	Hangzhou Linan Jingxin Chemical Factory.....	139
7.1.27	Zhejiang Huangyan Fine Chemical Group Co.,Ltd	140
7.1.28	Wuhan Fengfan Surface Engineering Co., Ltd	141
7.1.29	Hualida Copper Clad Laminate Co Ltd.....	143
7.1.30	International Laminate Material Ltd	144
7.1.31	Zhaoyuan Jinbao Electronics Co. Ltd.....	145
7.1.32	Changzhou Wujin No. 2 Radio Factory	146
8.	DIRECTORY OF ELECTRONIC CHEMICAL SUPPLIERS BY COUNTRY	147
8.1	BELGIUM	147
8.2	BRAZIL	147
8.3	CHINA	147
8.4	FINLAND.....	151

8.5	FRANCE.....	151
8.6	GERMANY.....	152
8.7	HONG KONG.....	153
8.8	INDIA.....	154
8.9	ISRAEL.....	154
8.10	ITALY.....	154
8.11	JAPAN.....	154
8.12	MALAYSIA.....	167
8.13	NETHERLANDS.....	167
8.14	SINGAPORE.....	167
8.15	SOUTH KOREA.....	168
8.16	SWITZERLAND.....	170
8.17	TAIWAN.....	170
8.18	UNITED KINGDOM.....	172
8.19	USA.....	174
9.	SOURCES OF INFORMATION.....	187
9.1	TRADE ASSOCIATIONS.....	187
9.1.1	<i>Europe.....</i>	<i>187</i>
9.1.2	<i>Japan.....</i>	<i>188</i>
9.1.3	<i>Asia-Pacific.....</i>	<i>189</i>
9.1.4	<i>North America.....</i>	<i>189</i>

TABLE OF TABLES

1.	INTRODUCTION.....	1
1.1	SCOPE OF THE STUDY	1
1.2	METHODOLOGY	2
1.3	FORECASTS	3
1.4	ABBREVIATIONS.....	3
	Electronic Chemicals – General Terms and Abbreviations	3
2.	GLOBAL SUMMARY	5
	Global Market for Electronic Chemicals by Type, 2003 & 2008 (US\$ Million).....	5
	Americas Market for Electronic Chemicals by Type, 2003 & 2008 (US\$ Million)	6
	Asia-Pacific Market for Electronic Chemicals by Type, 2003 & 2008 (US\$ Million)	7
	EMEA Market for Electronic Chemicals by Type, 2003 & 2008 (US\$ Million)	8
3.	GLOBAL OVERVIEW OF THE ELECTRONIC COMPONENTS INDUSTRY	9
	Global Market for Electronic Products, 2003 (US\$ Billion).....	9
3.1	GLOBAL OVERVIEW OF SEMICONDUCTOR COMPONENT MARKET.....	10
	Global Market for Semiconductor Components (ICs), 2003 and 2006 (US\$ Billion).....	10
	Global Market for Semiconductor Components (ICs & Discretets), 2003 and 2006 (US\$ Billion)	10
	Top 10 Semiconductor Microchip Suppliers, 2003 (US\$ Billion).....	11
3.2	GLOBAL OVERVIEW OF THE PRINTED CIRCUIT BOARD (PCB) MARKET	12
	Global Production of PCBs by Region, 2003 and 2008 (US\$ Million)	12
	Leading Global PCB Manufacturers, 2002, and Sales (US\$ Million)	13
3.3	CHINA.....	14
	Direct Labour Hourly Cost by Country, 2001	16
4.	GLOBAL SEMICONDUCTOR CHEMICALS MARKET BY REGION	19
4.1	SUBSTRATES.....	19
	Global Overview of the Semiconductor Silicon Wafer Market, 2003 and 2008 msi	20
	American Market for Semiconductor Silicon Wafers, 2003 and 2008 (msi)	20
	Asia-Pacific Market for Semiconductor Silicon Wafers, 2003 and 2008 (msi)	21
	EMEA Market for Silicon Semiconductor Wafers, 2003 and 2008 (msi)	22
	Global Market for Silicon Wafers by Wafer Diameter, 2003–2008 (msi).....	23
	Averaged Prime Wafer Prices by Type and Size	23
	Global Market Value for Silicon Wafers by Wafer Diameter, 2003–2008 (US\$ Million)	24
	Leading Silicon Wafer Manufacturers and their Global Market Shares (%), 2003.....	25
	Global Market for Mobile Phones by Region, 2003 & 2008 (Million units)	27
	Merchant Market for GaAs Substrates by Wafer Diameter, 2003 and 2008.....	28
4.2	SEMICONDUCTOR PHOTORESISTS.....	31
	Global Overview of the Semiconductor Photoresist Market, 2003 and 2008, ('000 litres)	31
	Global Market for Semiconductor Photoresists, 2003 and 2008, US\$ Million (including developer & stripper).....	32
	The American Market for Semiconductor Photoresist, 2003 and 2008, ('000 Litres)	32
	Asia-Pacific Market for Semiconductor Photoresists, 2003 and 2008, ('000 litres)	33
	EMEA Market for Semiconductor Photoresists, 2003 and 2008 ('000 litres)	34
	Averaged Global Prices for Semiconductor Photoresists 2003 (US\$/litre).....	35
	Leading Earners in Semiconductor Photomask Industry	35
	Typical Prices for Photomasks (US\$) by Technology	36
	Leading Global Suppliers of Semiconductor Photoresists, by Value (2003) and Market Shares (%).....	37
4.3	PROCESSING CHEMICALS	39
	Global Market for Semiconductor Wet Chemicals, by Region, 2003 (100% concentration) ('000 Litres)	40
	Global Market for Semiconductor Wet Chemicals, by Region, 2003 (100% concentrations) (Tonnes).....	40
	Global Market Value for Semiconductor Wet Chemicals, by Region, 2003 (US\$ Million).....	40
	Global Market for Semiconductor Wet Chemicals, by Region, 2008 (100% concentration) ('000 Litres)	41
	Global Market for Semiconductor Wet Chemicals, by Region, 2008 (100% concentrations) (Tonnes).....	41
	Global Market for Semiconductor Wet Chemicals, by Region, 2008 (US\$ Million)	41
	Global Market for Semiconductor Wet chemicals, by Type and Region, 2003 ('000 litres) (100% Concentration)...	42
	Global Market for Semiconductor Wet chemicals, by Type and Region, 2003 (Tonnes) (100% Solutions).....	43
	Global Market for Semiconductor Wet chemicals, by Type and Region, 2008 ('000 litres) (100% Solutions)	44
	Global Market for Semiconductor Wet chemicals, by Type and Region, 2008 (Tonnes) (100% Solutions).....	45
	Main Regional Markets for Global Suppliers of Semiconductor Grade Hydrogen Peroxide	47
4.4	SEMICONDUCTOR GASES.....	48

	Global Market for Semiconductor Bulk and Speciality Gases, (US\$ Million) 2003	50
	Global Market for Semiconductor Bulk Gases, 2003 and 2008, by Region ('000 Tonnes & US\$ M)	50
	Global Market for Semiconductor Speciality Gases, 2003 and 2008, by Region ('000 Tonnes & US\$ Million)	51
	Application of Specialty Gases by Semiconductor Process, 2003 (%)	51
	Global Market for Specialty Gases in Semiconductor Wafer and Opto-electronic Applications, 2003	52
	Global Market for All Speciality Gas Electronic Applications, by Region, 2003 (US\$ Million)	52
	Leading Global Suppliers of Gases to the Semiconductor Industry, 2001	53
4.5	SEMICONDUCTOR ENCAPSULANTS	56
	Global Market for Semiconductor Encapsulants by Application, 2003 and 2008 (Tonnes)	56
	Global Market for Semiconductor Encapsulants by Application, 2003 and 2008 (US\$ Millions)	57
	Global market for Semiconductor Encapsulants by Region, 2003 and 2008 (Tonnes & US\$ Million)	57
	Americas Market for Semiconductor Encapsulants, 2003 & 2008	58
	Asia-Pacific Market for Semiconductor Encapsulants, 2003 and 2008 (Tonnes & US\$ Million)	59
	EMEA Market for Semiconductor Encapsulants, 2003 and 2008 (Tonnes & US \$ Million)	60
4.6	LIQUID CRYSTALS & ORGANIC LIGHT EMITTING MATERIALS	63
	The Global Market for Liquid Crystals and Organic Light-Emitting Materials, 2003 & 2008 (Tonnes)	64
	The Global Market for Liquid Crystals and Organic Light-Emitting Materials, 2003 & 2008 (US\$ Million)	64
	Global Market for Liquid Crystal Photoresists, 2003 & 2008 (Tonnes)	65
	Global Market for Liquid Crystal Photoresists, 2003 & 2008 (US\$ Millions)	65
	Leading Suppliers of Liquid Crystals and Market Shares, 2002	66
5.	GLOBAL PCB CHEMICALS MARKET	69
5.1	LAMINATES	69
	Global Market for PCB Laminates by Region, 2003 & 2008 (M m ²)	70
	Global Market for PCB Laminates by Region, 2003 & 2008 (US\$ Million)	70
	Americas Market for PCB Laminates, 2003 & 2008 (M m ²)	71
	Americas Market for PCB Laminates, 2003 & 2008 (US\$ Million)	71
	Asia-Pacific Market for PCB Laminates, 2003 & 2008 (M m ²)	72
	Asia-Pacific Market for PCB Laminates, 2003 & 2008 (US\$ Million)	73
	EMEA Market for PCB Laminates, 2003 & 2008 (Million m ²)	74
	EMEA Market for PCB Laminates, 2003 & 2008 (US\$ Million)	75
	Main Applications for PCBs in USA, 2003, by % of Market Value	76
	Chinese PCB Manufacturing Capacity by Board Type, 2003 (Million m ²)	77
5.2	PCB RESISTS	80
	Global Market for Liquid PCB Resists, 2003 and 2008, by Volume and Value	81
	Americas Market for Liquid PCB Resists, by Volume and Value, 2003 and 2008	81
	Asia Pacific Market for Liquid PCB Resists, by Volume and Value, 2003 and 2008	82
	EMEA Market for Liquid PCB Resists, by Volume and Value, 2003 and 2008	83
	Global Market for Dry Film Resist, 2003 & 2008, by Volume and Value	84
	Americas Market for Dry Film Resist, 2003 & 2008, by Volume and Value	84
	Asia Pacific Market for Dry Film Resist, 2003 & 2008, by Volume and Value	85
	EMEA Market for Dry Film Resist, 2003 & 2008, by Volume and Value	86
5.3	PCB PLATING AND PROCESSING CHEMICALS	89
	Global Market for PCB Plating & Processing Chemicals, 2003, by Value (US\$ Million)	90
	Global Market for PCB Plating & Processing Chemicals, 2008, by Value (US\$ Million)	91
	Americas Market for PCB Plating & Processing Chemicals, 2003, by Value (US\$ Million)	91
	Americas Market for PCB Plating & Processing Chemicals, 2008, by Value (US\$ Million)	92
	Asia Pacific Market for PCB Plating & Processing Chemicals, 2003, by Value (US\$ Million)	92
	Asia Pacific Market for PCB Plating & Processing Chemicals, 2008, by Value (US\$ Million)	93
	EMEA Market for PCB Plating & Processing Chemicals, 2003, by Value (US\$ Million)	94
	EMEA Market for PCB Plating & Processing Chemicals, 2008, by Value (US\$ Million)	95
5.4	ADHESIVES	98
	Global Market for UV Adhesives in Electronic, Electrical & Opto-electronic Applications, 2003 and 2008	100
	Americas Market for UV Adhesives in Electronic, Electrical & Opto-electronic Applications, 2003 and 2008	100
	Asia Pacific Market for UV Adhesives in Electronic, Electrical & Opto-electronic Applications, 2003 and 2008	101
	EMEA Market for UV Adhesives in Electronic, Electrical & Opto-electronic Applications, 2003 and 2008	102
	Global Suppliers of UV/EB Curable Adhesives, 2003	103
6.	MARKET FACTORS	105
6.1	ENVIRONMENTAL LEGISLATION	105
6.2	MARKET OPPORTUNITIES	105
7.	CHINESE ELECTRONIC CHEMICAL COMPANIES	109
7.1	PROFILES OF CHINESE COMPANIES	109

8.	DIRECTORY OF ELECTRONIC CHEMICAL SUPPLIERS BY COUNTRY	147
8.1	BELGIUM	147
8.2	BRAZIL	147
8.3	CHINA	147
8.4	FINLAND	151
8.5	FRANCE	151
8.6	GERMANY	152
8.7	HONG KONG	153
8.8	INDIA	154
8.9	ISRAEL	154
8.10	ITALY	154
8.11	JAPAN	154
8.12	MALAYSIA	167
8.13	NETHERLANDS	167
8.14	SINGAPORE	167
8.15	SOUTH KOREA	168
8.16	SWITZERLAND	170
8.17	TAIWAN	170
8.18	UNITED KINGDOM	172
8.19	USA	174
9.	SOURCES OF INFORMATION.....	187
9.1	TRADE ASSOCIATIONS.....	187