

WINTERGREEN RESEARCH, INC.

**Worldwide Nanotechnology Thin Film Lithium-Ion Battery
Market Shares, Strategies, and Forecasts, 2009-2015**

Lithium-Ion Batteries Provide Increased Energy Density



Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

**WinterGreen Research, Inc.
Lexington, Massachusetts**

www.wintergreenresearch.com

**REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009
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CHECK OUT THESE KEY TOPICS

THIN FILM BATTERY

SOLID STATE BATTERY

Portable Consumer Device Battery

Wireless Handset Battery

Electronic Vehicle Thin Film Battery

Automotive Thin Film Battery

Nanotechnology Thin Film Battery

Nanotechnology Lithium-Ion Battery

Thin film battery

Nanotechnology Battery

Thin film Battery Power

MULTICOMPONENT SERIAL THIN FILM BATTERY

Lithium-Ion Thin film Battery Adoption

Battery Efficiency

Power Density

Automotive Industry Adoption of Thin film batteries

Thin film battery Matrix With Input And Output

Thin film battery on Internet

Network Access

Enterprise Networks

Metropolitan Area Networks

Thin film battery Architecture

OPPORTUNITY ABOUNDS

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412 PAGES

112 TABLES AND FIGURES

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Worldwide Nanotechnology Thin Film Lithium-Ion Battery, Market Shares, Strategies, and Forecasts, 2009-2015

WinterGreen Research announces that it has a new study on Worldwide nanotechnology thin film lithium-ion battery markets. The 2009 study has 412 pages, 112 Tables and Figures. Worldwide Nanotechnology lithium-ion batteries are poised to achieve significant growth as units become smaller and less expensive broadening the types of energy applications in which they are included.

Worldwide nanotechnology thin film lithium-ion batteries are poised to achieve significant growth as units become more able to achieve deliver of power to electric vehicles efficiently. Less expensive lithium-ion batteries allow leveraging economies of scale and proliferation of devices into a wide range of applications. According to Susan Eustis, lead author of the study, "Economies of scale leverage the lithium-ion battery nanotechnology advances needed to make lithium-ion batteries competitive. Nanotechnology provided by lithium-ion research solves the issues poised by the need to store renewable energy. Lithium-ion batteries switch price reductions are poised to drive market adoption by making units affordable."

Nanotechnology results obtained in the laboratory are being translated into commercial products. The processes of translating the nanotechnology science into thin film lithium ion batteries are anticipated to be ongoing. The breakthroughs of science in the laboratory have only begun to be translated into life outside the lab, with a long way to go in improving the functioning of the lithium-ion batteries. Unlike any other battery technology, thin film solid-state batteries show very high cycle life. Using very thin cathodes (0.05 μ m) batteries have been cycled in excess of 45,000 cycles with very limited loss in capacity. After 45,000 cycles, 95% of the original capacity remained.

Then there is the problem of translating the evolving technology into manufacturing process. What this means is that the market will be very dynamic, with the market leaders continuously being challenged by innovators, large and small that develop more cost efficient units. Systems integration and manufacturing capabilities have developed a broad family of high-power lithium-ion batteries and battery systems. A family of battery products, combined with strategic partner relationships in the transportation, electric grid services and portable power markets, position vendors to address these markets for lithium-ion batteries.

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Electric Vehicles depend on design, development, manufacture, and support of advanced, rechargeable lithium-ion batteries. Batteries provide a combination of power, safety and life. Next-generation energy storage solutions are evolving as commercially available batteries. Lithium-ion batteries will play an increasingly important role in facilitating a shift toward cleaner forms of energy.

Innovative approaches to materials science and battery engineering are available from a large number of very significant companies -- GE, Panasonic Sanyo / Matsushita Industrial Co., Ltd., NEC, Saft, Toshiba, BYD / Berkshire Hathaway, LG Chem, Altair Nanotechnologies, Samsung, Sony, A123 Systems with MIT technology, and Altair Nanotechnologies.

Markets for lithium-ion batteries at \$911 million in 2008 are anticipated to reach \$9.1 billion by 2015, growing in response to decreases in unit costs and increases. Lithium-ion batteries used in cell phones and PCs, and in cordless power tools are proving the technology. Units are shipped into military markets and are used in satellites, proving the feasibility of systems. Small, lithium-ion prismatic batteries prove the feasibility of this technology. The large emerging markets are for hybrid and electric vehicles powered by renewable energy systems.

Companies Profiled

Market Leaders

Saft
Panasonic / Sanyo

A123 Systems
BYD
EnerDel
NEC
Nissan
Boston Power

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Market Participants

Advanced Cerametrics
Altair Nanotechnologies
Applied Data
Bekaert
Robert Bosch GmbH
Boston Power / Sonata
BYD / Berkshire Hathaway
Cymbet
Dow
E-One Moli Energy Group
Ener1
Excellatron
Exon
ExxonMobil Chemical / Tonen Chemical Corporation
Front Edge Technology (FET)
GE
GM
Ignite
IPS
Johnson Controls-Saft
KSW Microtec
LG Petrochemical
LG Chem
MMT Funds
NEC
Nissan Motor Co.,
NEC TOKIN Joint-Venture Company –
Automotive Energy Supply Corporation (AESC) -
Oak Ridge Micro-Energy
QuantumSphere
Saft
Johnson Controls-Saft
United States Advanced Battery Consortium (USABC)
Samsung
Solicores
Think
Valence
Ulvac

Worldwide Nanotechnology Thin Film Lithium-Ion Battery Market Shares, Strategies, and Forecasts 2009-2015

REPORT METHODOLOGY

THIS IS THE 399TH REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPANT IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS IS A CENTRAL PART OF THE STUDY. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

YOU MUST HAVE THIS STUDY

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Table of Contents

THIN FILM BATTERY EXECUTIVE SUMMARY

THIN FILM LITHIUM ION BATTERY EXECUTIVE SUMMARY	ES-1
Worldwide Nanotechnology Thin Film Lithium-Ion	
Battery Market Driving Forces	ES-1
Market Driving Forces	ES-2
Nanotechnology Forms the Base for Lithium-Ion Batteries	ES-7
Competitors	ES-7
Lithium-Ion Battery Market Shares	ES-7
Lithium-Ion Battery Market Forecasts	ES-9

THIN FILM BATTERY DESCRIPTION AND MARKET DYNAMICS

1. THIN FILM LITHIUM ION BATTERY	
MARKET DESCRIPTION AND MARKET DYNAMICS	1-1
1.1 Lithium-Ion Battery Target Markets	1-1
1.1.1 Project Better Place and the Renault-Nissan Alliance	1-2
1.1.2 Largest Target Market, The Transportation Industry	1-3
1.1.3 Electric Grid Services Market	1-4
1.1.4 Portable Power Market, Power Tools	1-5
1.2 Lithium-Ion Battery Technologies Transportation	
Industry Target Market	1-7
1.3 Energy Storage For Grid Stabilization	1-11
1.3.1 Local Energy Storage Benefit For Utilities	1-12
1.4 Applications Require On-Printed Circuit	
Board Battery Power	1-13
1.4.1 Thin-film vs. Printed Batteries	1-13
1.5 Smart Buildings	1-14
1.5.1 Permanent Power for Wireless Sensors	1-16
1.6 Battery Safety / Potential Hazards	1-17
1.7 Thin Film Solid-State Battery Construction	1-18
1.8 Battery Is Electrochemical Device	1-20
1.9 Battery Depends On Chemical Energy	1-21
1.9.1 Characteristics Of Battery Cells	1-21
1.9.2 Batteries Are Designed Differently For Various Applications	1-23

REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009

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THIN FILM BATTERY SHARES AND MARKET FORECASTS

2. THIN FILM LITHIUM ION BATTERY MARKET

SHARES AND MARKET FORECASTS	2-1
2.1 Worldwide Nanotechnology Thin Film Lithium-Ion Battery Market Driving Forces	2-1
2.1.1 Market Driving Forces	2-2
2.1.2 Nanotechnology Forms the Base for Lithium-Ion Batteries	2-7
2.1.3 Competitors	2-7
2.2 Lithium-Ion Battery Market Shares	2-7
2.2.1 ExxonMobil Affiliate in Japan / Tonen Chemical	2-10
2.3 Lithium-Ion Battery Market Forecasts	2-11
2.4 Electric Vehicle and Hybrid Vehicle Lithium-Ion Battery Market Shares	2-14
2.4.1 BYD 2-16	
2.4.2 Johnson Controls-Saft	2-16
2.4.3 Saft Battery Technologies	2-17
2.4.4 A123Systems 32 Series Automotive Class Lithium Ion™ Cells: 2-17	
2.4.5 NEC and Nissen	2-19
2.4.6 LG Chem	2-20
2.4.7 EnerDel	2-20
2.4.8 Competition	2-20
2.5 Electric and Hybrid Vehicle Lithium-Ion Battery Market Forecasts	2-21
2.5.1 Largest Target Market, The Transportation Industry	2-25
Thin Film Advanced Lithium-Ion Battery EV Market	2-27
Thin Film Lithium-Ion And Lithium Polymer Automotive Batteries	2-27
2.6 Thin-Film and Printed Batteries: On-Board Solutions for Low-Power Electronics	2-29
2.6.1 Solicore Tiny Flat Battery	2-31
2.6.2 Thin-Film, Organic, and Printed Batteries: On-Board Solutions for Low-Power Electronics	2-32
2.7 Cell Phone, Communications, And PC Lithium-Ion Battery Technology Markets Discussion	2-33
2.7.1 Samsung SDI	2-33
2.7.2 BYD 2-33	
2.7.3 Saft 2-33	
2.7.4 Portable Power Competition	2-34
2.8 Lithium-Ion Battery Technology Portable Power Market, Power Tools Market Shares	2-34
2.8.1 A123 Systems	2-36
2.9 Lithium-Ion Battery Technology Portable Power, Power Tools Market Forecasts	2-37
2.10 Lithium-Ion Battery Technology Electric Grid Services Markets	2-40
2.10.1 Electric Grid Services	2-42
2.11 Thin Film Lithium-Ion Battery Market Positioning	2-43
2.11.1 US And Its Allies Are Changing The Military Landscape	2-48
2.12 Digital Device Battery Forecasts	2-51

THIN FILM BATTERY PRODUCTS

3. THIN FILM LITHIUM-ION BATTERY PRODUCT DESCRIPTION	3-1
3.1 A123 Systems	3-1
3.1.1 A123 Systems Lithium Ion Cell Construction Based On A Dual Plate Tubular Design	3-4
3.1.2 A123Systems 32 Series Automotive Class Lithium Ion™ Cells: 3-5	
3.1.3 GM and A123Systems Co-Develop Lithium-Ion Battery Cell for Chevrolet Volt	3-11
3.1.4 A123Systems / GE Production Contract for Norewegian Think Electric Vehicles	3-12
3.1.5 A123Systems Patent for Nanophosphate™ Lithium Ion Battery Technology	3-14
3.2 LG Chem	3-15
3.2.1 LG Lithium-Ion Cylindrical Battery	3-15
3.2.2 LG Lithium-ion Polymer Battery	3-15
3.2.3 LG Lithium-ion Battery Prismatic Type	3-17
3.2.4 LG Chem	3-17
3.3 SAFT	3-18
3.3.1 Saft Lithium-ion (Li-ion) Batteries	3-18
3.3.2 Saft is Li-ion Batteries For Commercial GEO Satellites to JSC ISS of Russia	3-19
3.3.3 Saft Contract To Power Hybrid Electric Mobile Utility Systems From Titan Energy Development	3-21
3.3.4 Saft and ABB Develop New High Voltage Li-ion Battery System 3-22	
3.3.5 Saft Hybrid Battery Technology for Wisconsin Clean Energy	3-24
3.3.6 Saft High-Energy Lithium-Ion (Li-ion) Batteries For Raytheon	3-25
3.3.7 Saft Lithium-Ion (Li-ion) Battery Backup Systems	3-25
3.3.8 Saft Energy Storage As A Key Renewable Energy Enabling Technology	3-26
3.3.9 Saft / Solion Large Li-ion batteries	3-27
3.3.10 Saft Lithium-Sulfur Dioxide (Li-So ₂) Batteries	3-31
3.3.11 Saft Lithium Technologies	3-32
3.3.12 Saft Lithium-thionyl chloride (Li-SOCl ₂)	3-32
3.3.13 Lithium-thionyl chloride (Li-SOCl ₂) - LS/LST/LSG cell ranges	3-35
3.3.14 Saft Small LS/LST bobbin cells	3-36
3.3.15 Saft Large LS/T bobbin cells	3-38
3.3.16 Saft Lithium-Manganese Dioxide (Li-MnO ₂)	3-43
3.3.17 Saft Lithium-ion (Li-ion)	3-43
3.4 BYD 3-50	
3.4.1 Warren Buffett Buys 10 Percent Stake In BYD Chinese Battery Manufacturer	3-50
3.4.2 BYD Battery Expertise	3-52
3.5 Panasonic / Sanyo	3-53
3.6 Samsung	3-54
3.7 Ener1 / EnerDel	3-55
3.7.1 EnerDel Lithium-Ion Prismatic Design	3-56
3.7.2 EnerDel Addressing Market Demand for Hybrid Electric Vehicles (HEVs)	3-56
3.7.3 EnerDel 5Amp Battery Pack	3-60
3.8 Imara 3-60	
3.9 ExxonMobil Affiliate in Japan / Tonen Chemical	3-62
3.9.1 Tonen Chemical Leading Supplier Of Separators	

For Lithium Ion Batteries	3-63
3.10 NEC 3-63	
3.10.1 Nissan and NEC Group	3-64
3.10.2 Nissan And NEC Joint Venture	3-65
3.10.3 NEC High-Performance Lithium-Ion Batteries	
Employ A Compact Laminated Configuration	3-66
3.10.4 NEC / Nissan Low-Cost Lithium-Manganese Batteries	3-67
3.10.5 NEC Lamilion Energy	3-68
3.10.6 NEC Subaru	3-68
3.10.7 NEC Thin Film Battery Has Sixteen Modules	
Consisting Of Twelve Cells, Serially Connected	3-69
3.10.8 NEC / Subaru Thin Film Battery Flat Shape	3-69
3.11 Sony 3-71	
3.12 Matsushita Industrial Co., Ltd. (Panasonic)	3-73
3.12.1 Panasonic Lithium Batteries	3-74
3.12.2 Panasonic Lithium-Ion Rechargeable Batteries	3-75
3.13 E-One Moli Energy	3-79
3.13.1 Product Data Sheets	3-81
3.14 QuantumSphere	3-82
3.15 Solicore Ultra Thin-Film Battery	3-84
3.15.1 Solicore's Flexion Lithium Polymer Batteries	3-86
3.15.2 Solicore Flexion Lithium Powered Cards	3-87
3.15.3 Solicore RFID (Radio Frequency Identification) Devices	3-89
3.15.4 Solicore's Flexion® Batteries Bluechip Million Unit Purchase	3-90
3.15.5 Solicore Supports Smart Cards	3-91
3.16 Cymbet EnerChip™ Solid-State, Rechargeable	
Thin-Film Batteries	3-92
3.16.1 Cymbet Enerchip™ Sensors Support	3-94
3.17 Front Edge Technology	3-95
3.18 Excellatron Thin-Film Micro-Batteries	3-95
3.18.1 Contrast To Conventional Lithium Cells	3-95
3.18.2 Excellatron Market Advantage	3-97
3.18.3 Excellatron Battery Current State of the Art	3-99
3.18.4 Excellatron Battery Intrinsically Safe	3-101
3.18.5 High Temperature Performance of	
Excellatron Thin Film Batteries	3-101
3.18.6 Excellatron Long Cycle Life	3-109
3.18.7 Excellatron Polymer Film Substrate for Thin Flexible Profile	3-111
3.18.8 Excellatron Unique Proprietary Passivation	
Barrier and Packaging Solution	3-113
3.19 Front Edge 50,000 Prototypes Of Nanoenergy Batteries	3-117
3.19.1 Front Edge Technology (FET)	3-117
3.20 Infinite Power Solutions (IPS) Flexible Thin-Film Batteries	3-127
3.20.1 Infinite Power Solutions	3-129
3.21 Oak Ridge Micro-Energy	3-130
3.21.1 Oak Ridge Micro-Energy Thin Film Batteries	3-132
3.22 Energizer	3-132
3.22.1 Energizer Holdings	3-133
3.23 Valence 3-134	
3.23.1 PVI for Valence's U-Charge(R) XP Energy Storage Systems	3-134
3.23.2 Valence Lithium Phosphate	3-135
3.23.3 Valence Lithium Phosphate Stability and Dependability	3-137
3.23.4 Valence Safety Focus	3-137
3.23.5 Valence Lithium Phosphate Alternative to Lead-Acid	3-138
3.23.6 Valence Lithium Phosphate Storage and Run-Time	3-138
3.23.7 Valence Lithium Phosphate Safety and Maintenance Free	3-138

3.24	ITN Energy Systems	3-139
3.24.1	ITN Intelligent Processing, Sensors, & Controls:	3-142
3.24.2	ITN Control:	3-144
3.24.3	ITN Sensors	3-147
3.24.4	ITN Unique Sensors: X-Ray Fluorescence And Parallel Detection Spectroscopic Ellipsometer	3-148
3.25	ULVAC 3-159	
3.26	Intersil 3-159	

THIN FILM BATTERY TECHNOLOGY

4. THIN FILM LITHIUM ION BATTERY TECHNOLOGY	4-1
4.1 Vendor Lithium-ion Battery Strategy	4-1
4.1.1 Rechargeable Lithium Batteries Characteristics	4-2
4.2 Challenges in Battery Design	4-3
4.2.1 Advanced Lithium-ion Batteries Requirements	4-7
4.3 Vendor Lithium-Ion Battery Positioning	4-8
4.3.1 High-Quality, Volume Manufacturing Facilities	4-10
4.4 Applications Of Lithium-Ion Batteries	4-11
4.5 Mobile Phone Industry	4-12
4.5.1 Nanowires	4-13
4.5.2 Thin Film Battery Enabling Chemistries	4-13
4.5.3 The Cathodes	4-14
4.5.4 Solid State Devices Provide More Energy Density	4-14
4.6 Advantages of Lithium-Ion Batteries	4-15
4.6.1 Lithium-Ion Battery Shortcomings	4-18
4.6.2 Charging	4-19
4.6.3 Applications	4-19
4.6.4 Costs 4-20	
4.7 Lithium Cell Chemistry Variants	4-20
4.7.1 Lithium-ion	4-21
4.7.2 Lithium-ion Polymer	4-22
4.7.3 Other Lithium Cathode Chemistry Variants	4-23
4.7.4 Lithium Cobalt LiCoO ₂	4-23
4.7.5 Lithium Manganese LiMn ₂ O ₄	4-23
4.7.6 Lithium Nickel LiNiO ₂	4-24
4.7.7 Lithium (NCM) Nickel Cobal Manganese - Li(NiCoMn) ₂ O ₂	4-24
4.7.8 Lithium Iron Phosphate LiFePO ₄	4-24
4.8 Operating Performance Of The Cell Can Be Tuned	4-25
4.9 Lithium Metal Polymer	4-26
4.9.1 Lithium Sulphur Li ₂ S ₈	4-26
4.9.2 Alternative Anode Chemistry	4-26
4.10 ExxonMobil affiliate, Tonen Chemical Polyethylene-Based, Porous Film	4-27
4.11 Cymbet Alternate Manufacturing	4-27
4.12 Thin-Film Batteries Packaging	4-27
4.13 ITN Energy Systems Fibrous Substrates, PowerFiber	4-28
4.13.1 ITN Sensors	4-31
4.14 Cell Construction	4-32
4.15 Impact Of Nanotechnology	4-33
4.16 Thin Film Batteries	4-34
4.16.1 Thin Film Battery Timescales and Costs	4-37

REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009**\$3,400 SINGLE COPY \$6,800 WEB SITE HOSTING**

4.16.2	High Power And Energy Density	4-37
4.16.3	High Rate Capability	4-38
4.17	Comparison Of Rechargeable Battery Performance	4-39
4.18	Polymer Film Substrate	4-45
4.19	Micro Battery Solid Electrolyte	4-46

THIN FILM BATTERY COMPANY PROFILES

5.1	NANOTECHNOLOGY THIN FILM BATTERY LITHIUM-ION COMPANY PROFILES	5-1
5.1	Nanotechnology Thin Film Battery Lithium-Ion	5-1
5.2	A123 Systems	5-1
5.2.1	A123 Systems Revenue	5-1
5.2.2	A123Systems Registration Statement for Initial Public Offering	5-2
5.2.3	A123 Systems Batteries Benefits	5-2
5.2.4	A123 Systems Competitive Advantage	5-4
5.2.5	A123 Systems Strategy	5-7
5.2.6	A123Systems and GE	5-8
5.2.7	A123 Acquisition of Hymotion	5-9
5.2.8	Procter & Gamble Duracell and A123 Systems Collaborate	5-10
5.2.9	Cobasys and A123 Systems	5-10
5.3	Advanced Cerametrics	5-11
5.4	Altair Nanotechnologies	5-12
5.4.1	Altair Nanotechnologies Power and Energy Group	5-12
5.4.2	Altair Nanotechnologies Performance Materials Division	5-12
5.4.3	Altair Nanotechnologies Life Sciences Division	5-14
5.4.4	Altair Nanotechnologies One-Megawatt Battery System Available for Commercial Operation by AES Energy Storage, LLC	5-14
5.4.5	Altair Nanotechnologies Revenues	5-15
5.5	Applied Data	5-16
5.6	Bekaert	5-16
5.7	Robert Bosch GmbH	5-17
5.8	Boston Power / Sonata	5-17
5.9	BYD 5-21	
5.9.1	Warren Buffett Buys 10 Percent Stake In BYD Chinese Battery Manufacturer	5-21
5.10	Cymbet 5-23	
5.10.1	Cymbet Thin-Film, Solid-State Battery Technology	5-23
5.10.2	Cymbet and ANT Wireless Sensor Network	5-23
5.10.3	Garmin International ANT™ Wireless Network	5-25
5.11	Dow 5-25	
5.12	E-One Moli Energy Group	5-26
5.13	Ener1 5-27	
5.13.1	Ener1 Third Quarter 2008 Revenue	5-27
5.13.2	Ener1 Positioning Technology Originally Pioneered By Argonne National Lab	5-30
5.13.3	Ener1 Acquires Enertech Leading Korean Lithium-ion Battery Cell Producer	5-31
5.13.4	Ener1 / Enertech Specializes In Producing Large Format Flat ("Prismatic") Cells	5-32
5.13.5	EnerDel Operations	5-34
5.14	Energizer	5-39

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5.15	Excellatron	5-44
5.16	Exon 5-45	
5.16.1	ExxonMobil Chemical / Tonen Chemical Corporation	5-46
5.17	Front Edge Technology (FET)	5-47
5.18	GE 5-47	
5.18.1	GE Global Research	5-48
5.18.2	GE Energy Financial Services	5-48
5.19	GM 5-48	
5.19.1	General Motors Faces Bankruptcy	5-50
5.20	Ignite 5-51	
5.21	IPS 5-51	
5.22	Johnson Controls-Saft	5-52
5.23	KSW Microtec	5-52
5.24	LG Petrochemical	5-53
5.24.1	LG Chem	5-54
5.25	MMT Funds	5-54
5.26	NEC 5-54	
5.26.1	Nissan Motor Co., Ltd., NEC, And Subsidiary NEC TOKIN Joint-Venture Company - Automotive Energy Supply Corporation (AESC) -	5-55
5.26.2	First Commercial Application For AESC's Li-Ion Batteries	5-57
5.26.3	NEC TOKIN Lithium-Manganese Electrodes by 2009	5-59
5.26.4	Nissan Partnership With NEC	5-59
5.26.5	NEC Lamilion Energy	5-60
5.27	Oak Ridge Micro-Energy	5-60
5.28	Panasonic / Sanyo	5-61
5.29	QuantumSphere	5-63
5.30	Saft 5-64	
5.30.1	Saft Battery Technologies	5-66
5.30.2	Saft Industrial Battery Group (IBG)	5-68
5.30.3	Saft Specialty Battery Group (SBG)	5-69
5.30.4	Saft Rechargeable Battery Systems (RBS)	5-71
5.30.5	Saft Research and Development	5-71
5.30.6	Johnson Controls-Saft United States Advanced Battery Consortium (USABC)	5-72
5.31	Samsung	5-73
5.32	Solicore 5-73	
5.32.1	Solicore's Flexion® Batteries Bluechip Million Unit Purchase	5-74
5.32.2	Solicore Embedded Power Solutions	5-75
5.33	Think 5-75	
5.34	Valence 5-76	
5.34.1	Valence Strategy	5-77
5.34.2	Phases Of Valence Business Strategy	5-78
5.35	Ulvac 5-80	

List of Tables and Figures

THIN FILM BATTERY EXECUTIVE SUMMARY

Table ES-1

ES-4

REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009
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Lithium-Ion Battery Market Driving Forces Table ES-2	ES-6
Energy Advantages Of Thin-Film Batteries Figure ES-3	ES-8
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2008 Figure ES-4	ES-10
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2009-2015	

THIN FILM BATTERY MARKET DESCRIPTION AND MARKET DYNAMICS

Table 1-1	1-3
Principal Features Used To Compare Rechargeable Batteries Figure 1-2	1-8
BMW's Mini E Electric Car Powered By A Rechargeable Lithium-Ion Battery Table 1-3	1-9
Examples of Hybrid Electric Vehicles Figure 1-4	1-19
Typical Structure Of A Thin Film Solid State Battery Table 1-5	1-22
Characteristics Of Battery Cells	

THIN FILM BATTERY SHARES AND MARKET FORECASTS

Table 2-1	2-4
Lithium-Ion Battery Market Driving Forces Table 2-2	2-6
Energy Advantages Of Thin-Film Batteries Figure 2-3	2-8
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2008 Table 2-4	2-9
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2008 Figure 2-5	2-12
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2009-2015 Figure 2-6	2-13
Worldwide Lithium-Ion and Advanced Lithium-ion Battery Market Forecasts, Automotive, Power Tools, Electric Grid, and PC Card, Dollars, 2009-2015 Figure 2-7	2-14
Worldwide Lithium-Ion Thin Film Automotive Advanced Battery	

REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009**\$3,400 SINGLE COPY \$6,800 WEB SITE HOSTING**

Shipments, Market Shares, Dollars, 2008 Figure 2-8	2-15
Worldwide Lithium-Ion Thin Film Automotive Advanced Battery Shipments, Market Shares, Dollars, 2008	
Figure 2-9	2-21
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Dollars, 2009-2015	
Figure 2-10	2-22
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Units, 2009-2015	
Figure 2-11	2-23
Worldwide Lithium-Ion Thin Film Advanced Battery Shipments, Market Shares, Units and Dollars, 2009-2015	
Figure 2-12	2-30
Worldwide PC Card On Board Lithium-Ion Batteries Market Forecasts, Dollars, 2009-2015	
Figure 2-13	2-35
Worldwide Lithium-Ion Thin Film Cordless Tool Advanced Battery Shipments, Market Shares, Dollars, 2008	
Table 2-14	2-36
Worldwide Lithium-Ion Thin Film Cordless Tool Advanced Battery Shipments, Market Shares, Dollars, 2008	
Figure 2-15	2-38
Worldwide Lithium-Ion Battery Portable Power Tool and Advanced Portable Battery Shipments, Market Forecasts, Dollars, 2009-2015	
Figure 2-16	2-41
Worldwide Electric Grid Lithium-Ion Battery Storage Market Forecasts, Dollars, 2009-2015	
Table 2-17	2-45
Commercialization Challenges Of The Automotive, Truck, and Bus Thin Film Battery Industry	
Table 2-18	2-47
Integrated Thin Film Battery Personal Transport Power Systems	
Table 2-19	2-49
Requirements For Advanced Power Sources In A Variety Of Military Applications	
Table 2-20	2-50
Large-Format Lithium-Ion Battery Key Advantages Table 2-20 (Continued)	2-51
Large-Format Lithium-Ion Battery Key Advantages	

THIN FILM BATTERY PRODUCT POSITIONING

Figure 3-1	3-2
A123 Systems Lithium Ion Battery	
Table 3-2	3-3
A123 Systems APR18650M1 Features	
Figure 3-3	3-4
A123 Systems lithium ion battery Cells: 26650	
Figure 3-4	3-5
A123 Cells: 32 Series	
Figure 3-5	3-7
A123 Systems Hybrid Characteristics	
Figure 3-6	3-8
A123 Systems Hybrid Discharge Characteristics	
Table 3-7	3-9
A123 Systems Benefits...	
Table 3-8	3-10
A123 Systems Heavy Duty Custom and Standard Solutions	
Figure 3-9	3-16
LG Chem Lithium-Ion Batteries	
Table 3-10	3-32
Saft Lithium Technologies	
Table 3-11	3-33
Saft Lithium-Ion Battery Main applications	
Table 3-11 (Continued)	3-34
Saft Lithium-Ion Battery Main applications	
Figure 3-12	3-35
Saft Non Rechargeable Battery	
Table 3-13	3-39
Saft Lithium-Ion Construction Features	
Table 3-14	3-40
Saft Lithium-Ion Battery Benefits	
Figure 3-15	3-42
Saft Lithium-Sulfur Dioxide (Li-SO ₂) Batteries	
Table 3-16	3-44
Saft Lithium-Ion Battery Variations	
Table 3-16 (Continued)	3-45
Saft Lithium-Ion Battery Variations	
Table 3-16 (Continued)	3-46
Saft Lithium-Ion Battery Variations	
Table 3-16 (Continued)	3-47
Saft Lithium-Ion Battery Variations	
Table 3-16 (Continued)	3-48
Saft Lithium-Ion Battery Variations	
Table 3-16 (Continued)	3-49
Saft Lithium-Ion Battery Variations	
Figure 3-17	3-57
EnerDel Automotive Battery	
Table 3-18	3-58
EnerDel Lithium Ion Battery System for HEVs	
Table 3-19	3-59
EnerDel Automotive Battery Features	

Table 3-20	3-60
Imara Thin Film Battery Cells	
Figure 3-21	3-65
NEC Fuel Cells and Catalysts	
Table 3-22	3-72
Key Features of Sony NP-FP71 Hybrid Lithium Ion Rechargeable Battery	
Table 3-22 (Continued)	3-73
Key Features of Sony NP-FP71 Hybrid Lithium Ion Rechargeable Battery	
Figure 3-23	3-74
Panasonic Lithium Batteries	
Figure 3-24	3-75
Panasonic Lithium-Ion Rechargeable Batteries	
Table 3-25	3-76
Panasonic Rechargeable Lithium ion Batteries Features:	
Table 3-26	3-76
Panasonic Rechargeable Lithium ion Batteries	
Table 3-27	3-77
Panasonic Rechargeable Lithium ion Batteries	
Table 3-28	3-85
Solicore Flexion Battery Product Features:	
Table 3-29	3-86
Solicore's Flexion Lithium Polymer Battery Applications	
Table 3-30	3-87
Solicore's Flexion Lithium Polymer Battery Uses	
Figure 3-31	3-88
Solicore Flexion High Temperature Batteries Survive Lamination	
Table 3-31A	3-89
Solicore RFID (Radio Frequency Identification) Applications	
Table 3-32	3-96
Excellatron Nanotechnology Thin Film Battery Features	
Table 3-33	3-97
Excellatron Battery Advantages	
Table 3-34	3-99
Excellatron Battery Thin Film Solid State Battery Components	
Figure 3-35	3-102
Excellatron Thin Film Battery Charge/Discharge Profile at 25°C.	
Figure 3-36	3-103
Excellatron Thin Film Battery Charge/Discharge Profile At 150°C.	
Figure 3-37	3-104
Excellatron High Temperature (150°C) Charge And Discharge Capacity	
Figure 3-38	3-106
Excellatron Capacity And Resistance Of Thin Film Battery As A Function Of Temperature	
Figure 3-39	3-106
Excellatron's Battery (0.1 mAh) Discharged By A 100 mA Pulse at 80°C.	
Figure 3-40	3-108
Excellatron High Rate Pulse Discharge	

Figure 3-41	3-109
Long Term Cyclability Of A Thin Film Solid State Battery	
Figure 3-42:	3-110
Excellatron Thin Film Battery Long Term Cyclability	
Figure 3-43	3-111
Discharge Capacity Of Several Typical Cathode Materials	
Figure 3-44:	3-112
Excellatron Thin film batteries deposited on a thin polymer substrate.	
Figure 3-45	3-114
Excellatron Proprietary Passivation Barrier and Packaging	
Table 3-46	3-115
Comparison Of Battery Performances	
Figure 3-47	3-131
Oak Ridge Construction of a Thin Film Battery	
Table 3-48	3-136
Key Features of Valence Lithium Phosphate Technology	
Table 3-49	3-139
ITN Commercial Markets:	
Figure 3-50	3-140
ITN Thin Film Battery:	
Table 3-51	3-141
ITN Thin Film Battery Design Features/Advantages	
Table 3-52	3-142
ITN Thin Film Battery Economical production	
Table 3-53	3-143
ITN Thin Film Battery Strengths	
Figure 3-54	3-145
ITN Intelligent Process Control	
Figure 3-55	3-146
Framework of Intelligent Processing of Materials	
Figure 3-56	3-149
XRF Instrument Developed by ITN Used on a System	
Figure 3-57	3-150
Thin Film Deposition	
Figure 3- 58	3-150
ITP Thin-film Process	
Table 3-59	3-151
Thin-film Process Capabilities	
Table 3-60	3-152
ITNThin-film Material Processing Experience Metals	

THIN FILM BATTERY TECHNOLOGY

Table 4-1	4-4
Challenges in Lithium-ion Battery Design	
Table 4-2	4-35
Thin Film Battery Unique Properties	

REPORT # SH29821682	412 PAGES	112 TABLES AND FIGURES	2009
\$3,400 SINGLE COPY	\$6,800 WEB SITE HOSTING		

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Table 4-3	4-38
Comparison of battery performances	
Table 4-4	4-40
Comparison of battery performances	
Table 4-5	4-42
Thin Films For Advanced Batteries	
Table 4-6	4-43
Thin Film Batteries Technology	
Table 4-7	4-44
Thin Film Battery / Lithium Air Batteries Applications	
Figure 4-8	4-45
Polymer Film Substrate Thin Flexible battery Profiles	
Figure 4-9	4-46
Design Alternatives of Thin Film Rechargeable Batteries	

THIN FILM BATTERY COMPANY PROFILES

Table 5-1	5-3
A123 Systems Batteries Benefits	
Table 5-2	5-5
A123 Systems Competitive Positioning	
Table 5-2 (Continued)	5-6
A123 Systems Competitive Positioning	
Table 5-2 (Continued)	5-7
A123 Systems Competitive Positioning	
Figure 5-3	5-19
Boston-Power Charge Curve	
Figure 5-4	5-20
Boston-Power Discharge Curve	
Figure 5-5	5-35
EnerDel Operations	
Figure 5-6	5-36
EnerDel Lithium Power Systems	
Figure 5-7	5-37
EnerDel Lithium Power USABC Contracts	
Figure 5-8	5-38
EnerDel Lithium Power Think Project	
Figure 5-9	5-63
Sanyo Battery Targets 2020	
Figure 5-10	5-65
Saft Sales Segments Half 1, 2008	
Figure 5-11	5-67
Saft Revenue H1 2008	
Figure 5-12	5-81
Ulvac Vacuum Pumps, Gauges, and Valves	

REPORT # SH29821682 412 PAGES 112 TABLES AND FIGURES 2009**\$3,400 SINGLE COPY \$6,800 WEB SITE HOSTING**

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