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BATTERY POWER 2008

November 11-12

Hilton Anatole Hotel • Dallas, Texas

The International Conference Highlighting the Latest
Developments and Technologies in Batteries and Power Management



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BATTERY POWER 2008

Battery Power 2008, an international conference highlighting the latest developments and technologies in the battery industry, will be held November 11-12 in Dallas, Texas.

This sixth annual event will feature presentations on portable, stationary and automotive battery technology, as well as battery manufacturing, materials and research & development.

Topics will include new battery designs, emerging technologies, battery materials, power management, charging and testing systems, as well as the latest market trends affecting the industry.

The conference is designed for OEM design engineers, system engineers, technical and management professionals involved in battery powered products and systems, battery manufacturing, battery technology research & development and power management technology.

Our Commitment to You:

Whether this is your first time participating at the Battery Power conferences, or if you have attended in the past, the 2008 event will provide you with the most up-to-date developments and technologies in the battery and power management market.

What's New for 2008

- Capital Ventures Investment Panel
- Product Demonstrations in the Exhibit Hall
- New Topics on:
 - International Regulatory Issues
 - Advanced Characterization Techniques
 - Battery Counterfeit Prevention Technology
 - Expanded Coverage on Power Management

Who Needs to Attend:

- OEM design engineers of portable electronic products and battery-powered systems
- Developers and integrators of rechargeable battery products and systems
- System engineers of standby, backup and uninterruptible power systems
- System integrators, vendors, distributors
- Manufacturers of batteries and battery packs
- IC and chipset providers
- Manufacturers of charging, conditioning, monitoring and testing equipment
- System engineers of electric vehicles
- Product managers seeking new applications, and partnering opportunities
- Charging and testing system component providers
- Specialized energy materials suppliers
- Battery component providers



Photos courtesy of the Dallas Convention and Visitors Bureau

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Monday, November 10th

1:00 - 5:00 Pre-Conference Workshops

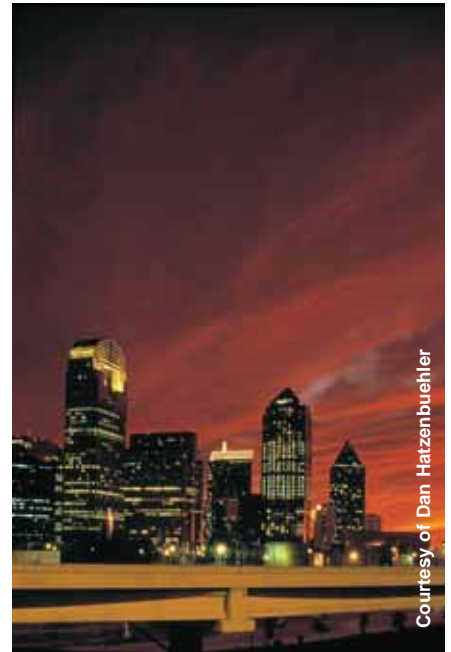
Tuesday, November 11th

7:00 Registration Opens
8:00 Welcome and Introductions
8:05 Keynote Address
9:00 Featured Presentation
10:00 Networking Break
Exhibit Hall Opens
10:30 Product Demonstrations
10:45 General Sessions*
12:00 Networking Luncheon
1:30 General Sessions*
2:45 Networking Break
3:00 Product Demonstrations
3:15 General Sessions*
5:00 Cocktail Reception

Wednesday, November 12th

7:30 Registration Opens
8:15 Keynote Address
9:15 Featured Presentation
10:00 Networking Break
Exhibit Hall Opens
10:15 Product Demonstrations
10:30 General Sessions*
12:15 Networking Luncheon
1:15 General Sessions
2:30 Conclusion of Battery Power 2008

* Three Tracks will be Running Simultaneously



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Monday, November 10th

Li-Ion Battery Safety, Maintenance, Charging and Fuel Gauging

Presented by Texas Instruments

This half-day workshop will start by covering Li-Ion battery characteristics including self-discharge, useable capacity and battery impedance, Li-Ion battery cell safety and UL testing and Li-Ion battery safety requirements. Basic battery maintenance and transportation will be discussed, as well as Li-Ion battery pack electronics safety and design. Attendees will also learn about front-end safety and power path management charging, which allows charging the battery while powering the system simultaneously. We will present how to charge the battery faster from USB and support USB On-The-Go by using a 3 MHz bidirectional switching charger. Finally, we will review voltage based on coulomb counting fuel gauges and also talk about the system-side fuel gauging techniques and design challenges in battery powered portable devices.

Pre-conference workshops require an additional registration fee.

Pre-conference workshops will be held on Monday, November 10th from 1:00 to 5:00.

Developing Flexible Linear and Switching Charger Designs

Presented by Microchip Technology, Inc.

Designing battery systems for portable applications, topology selection and feature set can make or break the success of new products. This four-hour seminar will explain the development of flexible linear and switching charger designs. Embedded charger design and the advantages of certain topologies over others will be discussed, in light of how to meet the many new global standards of today. Attendees will receive the MCP1631 Multi-Chemistry Battery Charger Reference Design, a complete stand-alone, constant-current battery charger for NiMH, NiCd or constant-current/constant-voltage Li-Ion battery packs. With an input voltage range of 5.5 to 16 V, the reference design utilizes Microchip's MCP1631HV high-speed Pulse-Width Modulation (PWM) device and a PIC16F883 microcontroller.



Tuesday, November 11th

8:00 Welcome and Introductions

8:05 Keynote

Market Trends - Markets, Technologies and Major Players

Increasing demand on energy and energy efficiency continues to drive battery technology innovations in many markets. Hear an overview of key markets, leading technologies and major players in new and improved battery technologies. In particular, three major markets will be covered: consumer electronics, electric vehicles and grid applications. Critical technology and market barriers will be discussed in each of the three areas, and a review of corporate, private and government investments in various battery technologies will also be included.

Mike Holman, Research Director, Lux Research, Inc.

9:00 Featured Presentation

Venture Capitalist Investor Panel

This exciting session brings together some of the industry's leading VC investors to provide the audience with their insight and a chance to interact with some of the most knowledgeable investors in the market today. Leading investors are funding fast growing battery companies and here you will find out about their investment criteria and how they go about making investments. Ample time will be made available for audience questions and answers in this panel discussion.

Neal Kaufman, Ardour Capital Investments, LLC

William Lese, Braemar Energy Ventures

Matt Jones, Nth Power

Mark Cox, New Energy Fund, LP

Peter Shannon, Atlas Ventures

10:00 Networking Break/Exhibit Hall Opens

10:45

Silver-Zinc Rechargeable Batteries: Changing the Game in Portable Power

Today's consumer has the ability to watch an entire movie on a palm-sized device, but the ability to power that portable device has not kept up. While mobile technology has advanced exponentially, power technology has lagged behind. Engineers admit that they are "hitting the wall" on lithium-ion and lithium-polymer performance. In addition to performance challenges, lithium-ion batteries cannot be recycled and reused. And unstable lithium-ion batteries causing notebook computer fires has resulted in high product recalls of notebook computers in recent years. As an alternative to lithium-ion, ZPower batteries feature a patented, rechargeable silver-zinc chemistry that delivers important benefits to mobile consumers.

Dr. Ross E. Dueber, President, Chief Executive Officer and Director, ZPower

Accurate, Low Cost Fuel Gauge for Primary Lithium Batteries

This presentation will discuss a fuel gauge design for primary lithium battery packs that are used in the oil and gas industry for monitoring downhole battery capacity. A unique measurement technique that allows a low cost yet accurate (<5 percent error) measurement of remaining battery capacity will be detailed and laboratory and field data will be presented, which confirms the predicated accuracy of the gauge. The communication protocol for the gauge with its uphole reader will be discussed as well as a description of the PC based software that manages and reads the fuel gauge data. The application of this technique could be expanded to other markets including oceanography and seismic exploration.

Dean Perkins, President, SouthWest Electronic Energy Group

William D. Lese has more than 24 years of research, operating and venture capital experience in the energy and environmental businesses. Prior to co-founding Braemar, William was a partner with Mantis Holdings, Inc., a venture capital firm focused on investing in environmental and energy efficiency companies.

James Kim joined CMEA Ventures in 2007 and is a Senior Partner. Previously, Jim was a Vice President at GE Commercial Finance where he led technology venture investments in the cleantech, advanced materials, and digital media sectors.

Matt Jones joined Nth Power in 2000. Prior to joining Nth Power, Matt worked at Accenture (Andersen Consulting) in their Utility practice group. While at Accenture, Matt worked on a variety of IT, process and management consulting engagements with a primary focus on the deregulating energy market.



Peter Shannon is a Principal in the technology group, and joined Atlas Venture in 2005. Before joining Atlas Venture, Peter was an MBA student at the University of Chicago

Graduate School of Business. During business school, he worked as a Summer Associate at Bain & Company's San Francisco office, serving a life sciences instrument manufacturer supporting genomic and proteomic research.

Dean Perkins serves as president of SouthWest Electronic Energy Group (SWE). Dean has 30 years engineering and management experience, having held positions at Gearhart-Owens, Compaq Computer, and SWE. He has been awarded 12 US and foreign patents, including two for battery charging techniques. Additionally, US Patent applications for a solar panel with integrated high capacity battery, and a fuel gauge for primary batteries are pending.

Jonathan Dillon is a senior applications engineer supporting Microchip Technology's shunt regulators and low pin-count microcontrollers. He also develops application notes and training materials. Prior to this role, Jonathan worked for several years in corporate applications engineering at Microchip, where he analyzed issues with customer designs and debugged software problems.



Jinrong Qian is an applications manager and distinguished member of the technical staff for the Portable Power Battery Management group at Texas

Instruments. He has published more than 40 peer-reviewed power electronics transactions and power management articles, and holds 20 US patents.



Brian Kuhn is a founder and senior engineer at SmartSpark. Brian handles most testing and design problems on the battery equalizer and remote power

technologies. For six years, Brian worked at Purdue University as a research engineer, investigating power electronics based systems.



John James is president, CEO and managing member of GEM Power, LLC. His corporate responsibilities included sales, marketing and product development, with operational responsibilities for production, warehousing and distribution, and interfaced with aircraft manufacturers such as Cessna, Beech and Learjet. Prior to his term as president, he was the vice president of Engineering for Teledyne Battery Products.

Battery's Role in Zero Emission Motorbike Grand Prix

TTXGP is the world's first carbon free/clean emission motorbike grand prix. Held on the 100 year old Isle of Man TT Mountain circuit, it offers platform for different battery technologies to prove their performance credentials. This presentation will provide a case study into the challenges in creating an alternative energy Grand prix. Safety systems, regulatory challenges and different battery configurations are discussed.

Azhar Hussain, Director • TTXGP

11:25

Implementing Charging Algorithms in Firmware

Microcontrollers have moved into almost every aspect of power management, from managing point-of-load regulators in blade-server cabinets to monitoring battery charge levels. Many designers tasked with creating the firmware for these systems are not familiar with software development, and are often at a loss as to where to start and how to structure the firmware design. This presentation will demonstrate a simple loop-based design for implementing even the most complicated charging algorithms with simple software state machines. Attendees will leave with a template for developing complex charging algorithms, and experience with tools and processes required for creating reliable firmware systems.

Jonathan Dillon, Senior Applications Engineer, Microchip Technology Inc.

How to Design System-Side Fuel Gauge for Portable Devices

Battery operated portable devices are essential to almost everyone's life today. Determining the remaining battery capacity is just as critical. Previously, many portable devices relied on voltage measurement alone to approximate the remaining battery capacity with a few bar indicators, which is not accurate. A combination of voltage measurement with coulomb counting using the system-side fuel gauge, versus the traditional pack-side fuel gauge, has become much more attractive for this reporting. This presentation discusses how to improve fuel gauge accuracy and system-side battery management system design challenges. The real test results using blackberry show that more than 99 percent accuracy can be achieved.

Jinrong Qian, Applications Manager, Texas Instruments

Performance Improvements of Electric Vehicle Battery Packs with Active Equalization

In the electric vehicle industry, the vehicle battery is the primary factor limiting growth of the market. Present battery technologies do not have as much capacity or lifetime as desired. Improvements are slowly being made but these are only occurring incrementally and for the near term, there is no significant improvement in sight. In order to get the most out of the present battery technologies, proper battery management is paramount. Discover battery management needs of electric vehicles, focusing on equalization to get greater performance from the battery pack including increased capacity and lifetime.

Brian Kuhn, Founder and Senior Engineer, SmartSpark Energy Systems

12:00 Lunch

1:30

Intelligent Battery Charging Technology

An intelligent battery charging technology has been enhanced to include battery diagnostics and prognostics. Derived from the analysis of a matrix of battery parameters that includes intrinsic electrochemical parameters, diagnostics and prognostics can determine the battery's power, its state of charge (SoC) at the current cycling point and a prediction of its ability to deliver a certain number of cycles. Accurately determining a battery's ability to sustain required energy and power allows battery replacement prior to failure, eliminating unnecessary, unsafe, inconvenient and costly down time while attaining maximum battery life. Practical applications of this technology are highlighted in both the passive and active vehicle battery monitoring systems currently in development.

John James, President and CEO, GEM Power, LLC

Battery Pack Electronic Design for Lithium Based Products

A wealth of new products for the professional and consumer markets are being developed with high power lithium based battery packs for performance as well as environmental issues. Product developers are working to achieve the lowest cost solutions while customers are demanding higher performance as well as enhanced safety. Can the products under development meet all these requirements and are the right features being included in the battery pack electronics? Take an in depth look into the different battery pack electronics designs that are being developed for several classes of products. We will identify what features should be incorporated in various types of packs based on usage profiles as well as total power provided. A comparison of features and benefits of the various battery pack electronics designs as well as the cost of deployment for these designs will also be discussed.

Michael Coletta, Principal Engineer, Intersil

2:10

Battery Charger Efficiency Standards and Strategies for Improvement

Pressure for efficient use of increasingly limited electric power resources together with ever increasing use of portable, battery operated electronic devices, has prompted interest by both users and government agencies in battery charger efficiency. Charger designers have long been interested in power conversion efficiency because minimizing waste heat is a prime design goal in all but the smallest of chargers. With the increasing popularity of lithium chemistry batteries comes the added restriction of maintaining the cells at less than 45°C during charge for safety and increased cycle life. Excess energy waste during battery charge is not only a bad idea for the environment and poor design practice; it's becoming an international regulatory agency issue as well. This talk explores the existing and in-development battery efficiency standards and relates these to various battery charger design topologies. It presents methods for analyzing conversion efficiency and strategies for improvement.

David Gunderson, Sr. Electronics Engineer, Micro Power Electronics, Inc.

Dual Mode Converter Maintains Output Regulation Over Wide Input Range

DC to DC power converters employed in battery powered systems must operate over a very wide input voltage range. If the output voltage is very low, a simple buck regulator can be used to efficiently step-down and regulate the output voltage. In many applications the output voltage is greater than the minimum input voltage as the battery discharges. In these applications a buck regulator will drop out of regulation as the input voltage approaches the output voltage. A buck-boost regulator can maintain regulation for input voltages either higher or lower than the output voltage. The challenge is that buck-boost power converters are not as efficient as buck regulators. A new dual mode power converter has been developed whereby the power converter acts as a buck regulator while the input voltage is above the output and as the input voltage approaches the output voltage a gradual transition over to buck-boost mode occurs.

David Pace, Director, Power Management Phoenix Design Center, National Semiconductor

2:45 Networking Break



Mike Coletta has worked for Intersil for the past ten years in technical marketing and new product development roles. He is currently a principal engineer located in

Irvine, Calif. where he is leading the development of Intersil's next generation battery management and power management products for high voltage battery systems. Mike has several patents in the areas of power management and battery safety circuits.



David Gunderson has more than 30 years of electronic product development experience. He designs charger and battery-protection circuits and develops embedded

software for Micro Power Electronics, Inc. in Redmond, Wash.



David Pace joined National Semiconductor in 2001 as founding member of the Phoenix Design Center where he has led the development of National

Semiconductor's LM5000 series of high voltage power management products. He is currently involved in setting strategic direction and product development for dc-dc power converter products employing high voltage, mixed signal technologies.



3:15

Advances in Characterization Techniques for Understanding Degradation and Failure Modes in Lithium-Ion Cells

A novel cross-sectioning technique has been developed that enables direct imaging and characterization of degradation mechanisms inside lithium-ion cells. Unlike conventional techniques that require harvesting of materials from a cell, this cross-sectioning technique preserves the electrode structure and the spatial relationship between the various components in the electrodes. Internal defects and degradation mechanisms, long suspected to be linked to safety, reliability and performance problems, have been directly observed and characterized using this new cross-sectioning technique. Learn as several examples of these defects and degradation mechanisms are shown. In addition, the applicability of the cross-sectioning technique to failure analysis, design and performance evaluation demonstrated.

Kevin C. White, Senior Engineer, Exponent, Inc.

Charging Systems for High-Power Cells

High power li-ion batteries support pulses over 100 amps. Taking advantage of the high rate charge/discharge capabilities adds new electrical and mechanical challenges to a traditional charger design. Micro Power will address both electrical and mechanical design considerations/guidelines for designing chargers that can utilize the new capabilities offered by these high power batteries. Topics in this talk will include fast charging, power supply selection, electrical contacts and connections, thermal management and prevention of Electromagnetic Interference (EMI).

David Nierescher, CTO, Micro Power Electronics

Understanding Battery Pack Performance Issues

Most portable devices, electric hybrid vehicles and energy storage applications require proper configurations of battery packs. Besides typical cell operating and performance issues, there are additional issues related to pack operation. To meet the complex power demands in these applications, the pack also requires handling stressful duty cycles. It is therefore much more challenging to deal with pack performance under these complex operating conditions. In this presentation, we will discuss how to establish cell baseline behavior via testing and characterization, which is used to model cell performance. We will then discuss how cells in a batch can be characterized to assist us understand their variations and develop criteria to select cells for pack assembly. We will also discuss how these variations comprise to intrinsic imbalance of the pack and how to quantify other factors in the pack control and management.

Matthieu Dubarry, Electrochemical Power Systems Laboratory, Hawaii Natural Energy Institute

3:50

Lithium Ion Cell Evaluation - Going Beyond the Manufacturer's Data Sheets

A cell manufacturer's data sheets typically give the performance of cells under conditions that encompass the majority of usage conditions that are a reflection of their customer base. For most lithium ion cell manufacturers the largest segment is of course the consumer electronics segment made up largely of the mobile phone and notebook PC OEMs. However, lithium ion is now commonly used in many non-consumer applications that include portable medical devices, power tools, military devices, asset tracking, various wireless applications and professional electronics of all types. These applications can have a variety of unique requirements that require testing to verify performance under these conditions. These could include operation outside of the normal temperature ranges, high discharge pulse rates, extreme cycle life, fast charging, shallow cycling and intrinsic safe operation. This presentation will show the performance for a variety of lithium ion cells highlighting those that can deliver under unusual conditions.

Chris Turner, Director of Battery Technology, Nexergy, Inc.

Dr. Kevin White's core discipline is electrochemistry, with extensive experience in electrochemical energy conversion, analytical chemistry, and materials science. Kevin consults on a broad range of topics related to chemistry, materials, material processing, and failure analysis. His specialties include battery science, corrosion processes, interfacial chemistry/electrochemistry and fuel cell electrochemistry.



David Nierscher is CTO and was founder of the SelfCHARGE division of Micro Power Electronics. David has designed dozens of chargers over the last decade, is highly regarded in his field and

widely known as an innovative designer with numerous patents to his credit.

Matthieu Dubarry is a research engineer at the Electrochemical Power Systems Laboratory of the Hawaii Natural Energy Institute (HNEI) leading the task on electric and hybrid vehicle data acquisition and the evaluation, analysis, modeling and simulation of lithium rechargeable batteries and fuel cells in the laboratory and in the field.



Chris Turner contributes more than 15 years of multi-disciplined battery industry experience to the strategic development of portable power solutions at Nexergy.

For six years, he led battery research and strategic planning in energy technology for Sony Ericsson Mobile Communications USA (SEMC). Chris holds a Degree in Chemistry from the University of South Carolina.

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Optical State of Charge Sensing

Learn the theory and practice of state of charge sensing in lead-acid batteries using a unique fiber optic based approach. This approach senses the index of refraction changes due to electrolyte concentration and demonstrate a direct and linear correlation to electrolyte specific gravity measurements. The principle of operation of these unique fiber optical devices is explained and experimental results are presented. We conclude that this method of sensing provides a substantial increase in simplicity over current methods with undiminished accuracy and increased speed and suitable for real time continuous monitoring of state of charge in battery installations.

Joseph S. Accetta, Founder, JSA Photonics, Inc.

4:30

Battery Power 2008 Innova Award Panel

The Innova Awards are designed to recognize companies that are striving for excellence and are achieving technology breakthroughs. The panel will be sharing what their companies are working on, the impact it can have on the power industry and what is ahead for 2009.

*Pete Roth, Sandia National Laboratories
Ross Dueber, ZPower*

5:00 Cocktail Reception

Share Your Expertise with the Power Industry

Submit a presentation abstract today for Battery Power 2008, the international conference dedicated to battery technology and power management.

Space is limited and speaking tracks are already filling up. Submit an abstract today to ensure a spot in your desired track.

Battery Power 2008 provides an excellent forum to discuss new developments in technology, market conditions and end-user requirements that are driving innovation, capabilities and features, application trends and performance improvements today and in the future.

For more information about Battery Power 2008 or on submitting an abstract, please contact Shannon Given, program manager, at 720-528-3770 or Shannong@infowebcom.com.



Joseph Accetta is senior executive engineer/scientist with more than 35 years of experience and broad technical background in electro-optical systems, laser and directed energy and radar remote sensing, sensors, electronic systems and software development. Since 2003 he has been a principal scientist and a member of the research faculty at Georgia Tech Research Institute in Albuquerque, N.M. and manager of the GTRI field office.



Wednesday, November 12th

8:15 Keynote - To Be Announced



Bob Taylor is the General Manager of the Security Solutions business within the Graphic Communications Group at Kodak. His primary responsibility is to drive the adoption of proprietary anticounterfeiting technologies into security solutions for customers in pharmaceuticals, cosmetics, luxury goods, consumer electronics and other industry segments.



Arden Johnson is the Research & Development manager for Electrochem Commercial Power, a subsidiary of Greatbatch, Inc., a supplier of batteries for

implantable medical devices. He has been engaged for the past 18 years in research on primary and secondary lithium batteries, with a special focus on high-energy batteries that operate under extreme conditions.

9:15 Featured Presentation

Technology to Prevent Counterfeiting in the Battery Industry

The worldwide battery industry is struggling to fend off the growing threat of counterfeits, an epidemic that contributes to an estimated \$500 billion in global trade. As the use of electronic devices soars, the demand for batteries grows rapidly, and so are the problems caused by counterfeiters who are inserting fakes into legitimate sales outlets everywhere. Battery makers need a powerful, robust solution to aggressively deal with the counterfeiting issue. Kodak discusses this worldwide problem and the various needs of brand owners and battery manufacturers, and the high-tech solutions that are being deployed to prevent the rising tide of dangerous fakes.

Robert Taylor, General Manager, Security Solutions, Eastman Kodak Company

10:00 Networking Break

10:30

Extended Run Backup Power for Critical Communications Networks - Battery/Fuel Cell Combinations

In combination with batteries, fuel cell technology can be used to improve reliability and significantly extend run times at mission critical sites when compared to battery-only configurations. As fuel cell technologies advance, more solutions are developed to combat power outages. Proton Exchange Membrane (PEM) fuel cell systems offer a compelling value proposition to telecommunications carriers and others who require highly reliable critical backup and remote power solutions.

Pedro Yarahuan, Director of Sales, Latin America, IdaTech

Performance Comparison of Lithium Primary Batteries for High Temperature Operation

The lithium oxyhalide primary batteries, lithium/thionyl chloride and lithium/sulfuryl chloride, are noted both for their extremely high energy density and for their excellent performance at temperatures above 100°C. In spite of their superficial similarity, these two chemistries actually perform quite differently across the full range of temperatures. Sulfuryl chloride cells can give superior rate capability at lower temperatures, but thionyl chloride cells are advantageous at higher temperatures, above 135°C. The differences are more pronounced under the constant power and pulsed discharge conditions that are increasingly important in newer applications. In this presentation we will compare the performance of these two cell chemistries over a range of temperatures, with a focus on intelligent design of pulse profiles to maximize battery life during prolonged high temperature exposure.

Arden P. Johnson, R&D Manager, Electrochem Commercial Power

Laser Welding for Battery Pack Manufacture

Welding for battery pack manufacture has been and continues to be successfully provided by resistance welding technology. However with growing manufacturing volume and diversity for battery packs there are a number of welding applications that are starting to favor laser welding. Laser welding is a non contact process that has no mechanical contact with the part to be welded. This offers the following benefits; instantaneous welding (a single weld typically takes 10ms), the laser can access small or recessed areas, there are no process consumables such as electrodes that need to be maintained, there is no limitation on the proximity of welds (shunting is not a factor) and the laser is geared for flexibility and automation. The basic technology of laser welding will be introduced with examples of battery welding applications.

Geoff Shannon, Laser Product Manager, Miyachi Unitek Corp.

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11:10

Fuel Cell Integration Into a Battery Electric Utility Vehicle

Battery only electric turf vehicle designers struggle with the trade-offs between weight (payload and vehicle), range and cost. Fuel cell technology, along with batteries, offers a range extension solution. Learn about how batteries are still an integral part of an compact, lightweight all electric turf vehicle.

Mark Anderson, Senior R&D Engineer, Toro

Key Roles of Carbon Materials in Power Sources

Carbon materials are an essential component in the modern portable and stationary power sources. Chemical inertia and electric conductivity of carbon materials support their extensive use as conductive additive in most primary and rechargeable battery chemistries. Other physico-chemical properties allow carbon materials to play other roles such as active material or principal components or fillers of composite electrodes. The main carbon materials currently used in modern batteries are conductive carbon black and graphite. Their properties and roles will be reviewed and discussed, and trends in development of new carbon materials will be emphasized.

Jean-Yves Huot, PhD, Product Manager, Mobile Energy, Timcal Graphite and Carbon

Evaluation of Atmospheric Plasma Surface Modification for Continuous Processing of Flexible Battery Components

The advantages for enabling manufacturing of thin flexible sources of power by roll-to-roll processes are evident. In addition to extremely low production costs, the flexible nature of these devices dramatically enables not only their application within a broader range of stationary and remote devices, but also their integration with other flexible materials. This presentation studies data generated from using atmospheric glow discharge plasma technology as an integrated roll-to-roll or continuous production line process for manufacturing power-generating materials. The use of atmospheric plasma protocols and gas chemistries positively modified surface properties of these materials, removed organic contaminations, significantly increased wettability for separators and promoted interfacial adhesions between similar and dissimilar materials.

Rory A. Wolf, Vice President Business Development, Enercon Industries Corporation

11:45

New Rechargeable Power Source for Consumer Applications Requiring Typical 1.5 Volt User Replaceable Batteries

The theoretical advantages of nickel-zinc batteries have been known for some time. They can be up to 35 percent lighter than conventional nickel-cadmium or nickel-metal hydride batteries and up to 30 percent smaller. However, problems associated with the instability of zinc have hampered their development. Previous batteries of this type have had problems with dendrite formation and also from changing electrode shapes over multiple charges and discharges. PowerGenix has solved the technical problems associated with nickel-zinc batteries, allowing their practical use in a number of applications. Using both a patented electrolyte and a patented electrode composition, PowerGenix has eliminated issues of dendrite formation and shape change of the zinc electrode. The result is a effective power source with low internal resistance and higher voltage 1.6 volt nominal significantly higher than other conventional rechargeable batteries such as nickel-cadmium and Nickel Metal Hydride enabling significant space and cost savings. Obvious applications include power tools, high drain military equipment, consumer 1.5 alkaline battery alternatives and the emerging light electric and Hybrid vehicles.

Joseph Carcone, Vice President Business Development, PowerGenix



Mark Anderson has been at Toro 13 years, and is responsible for research and development of the Commercial Division of Toro. He works on machines that will hopefully be in production within two to 10 years. He has had a variety of engineering experiences, most of them in the controls and human interface end of machine design. Mark is a 1979 graduate of North Dakota State University in Fargo.



Jean-Yves Huot has been acting as product manager in Mobile Energy at Timcal for three years. He has been active in development and marketing of battery materials for more than twenty years. He completed his PhD in Chemistry in 1985 and he spent about 18 years as research scientist in Industrial R&D, and a year as consultant in zinc battery and electrochemistry.



Rory Wolf is currently the vice president of Business Development at Enercon Industries Corp. Mr. Wolf has 26 years of experience within national and international positions in the plastics and paper industries. He has specific experience in polymer-based flexible packaging, surface modification systems, corrugated, point-of-sale display, folding carton and electronic prepress industry segments.





Joe Carcone joined PowerGenix in 2006 where his duties include business development, product development and sales implementations for portable power

applications. Before joining PowerGenix, he was the vice president of Marketing and Sales for Sanyo Energy Corp.



Shane Thompson has over 10 years of experience in the metals reclamation and recycling industry. Prior to joining Kinsbursky Brothers as a Vice President,

Shane most recently worked for the Rechargeable Battery Recycling Corporation. It was the result of his long-standing experience with the recycling of the metals found in rechargeable batteries that gave Shane unique insight in his capacity as the Northeast Regional Recycling Manager for the RBRC.

Dr. Sankar Das Gupta is chairman and CEO of Electrovaya and an internationally recognized scientist in electrochemistry. Sankar has more than 25 years experience in materials engineering and battery science. Dr. Das Gupta received his doctorate from Imperial College, London and is a graduate of Presidency College, India. He serves as an Adjunct Professor in the Faculty of Engineering at the University of Toronto.



André Roux is a senior engineer at the Council for Scientific and Industrial Research DPSS. He conducts research on newer battery technologies in military applications to find

batteries with a high performance, which included a reliable use to the soldier. He has also researched the measurement of the shock waves caused by underwater explosions specifically to protect electronic equipment and batteries in close proximity to the explosion.

The Economics of Battery Recycling

The increase in metal prices, particularly nickel, lead and cobalt, has been of significant benefit to the existing battery recycling industry. Concurrently, the higher prices have fostered the proliferation of a new type of "recycler" for certain batteries. These companies are seeking out batteries seemingly as a "commodities only" business where the batteries are managed only for their metallurgical or re-use value regardless of any negative environmental impact associated with the improper transportation, handling and/or recycling of the batteries and with no regard the far reaching implications of what an inevitable down turn in the metal market could result in. This presentation will provide an overview of the Kinsbursky Brothers/Toxco business model and present some recommendations on how to best proceed in this dynamic market, while ensuring the safe, effective, and sustainable management and recycling of batteries

Shane Thompson, Vice President, Kinsbursky Brothers, Inc.

12:15 Lunch

1:15

Integrated, Intelligent Lithium Ion SuperPolymer Battery Systems For Ultra-Safe, Long Range ZEVs and PHEVs

A lithium ion SuperPolymer battery systems for ZEV and PHEV applications feature Electrovays's MN-series chemistry, balanced energy-power optimization and integrated iBMS (intelligent battery management system). The system designs range from 4 kWh to over 100 kWh systems with corresponding 48 V to over 700 V configurations. Applications similarly range across heavy duty, medium duty, passenger, specialty and off-road all electric and plug-in hybrid electric vehicles. Electrovaya is working on these programs with a variety of OEM partners.

Dr. Sankar Das Gupta, Chairman and CEO, Electrovaya Corp.

1:55

Portable Power: Smaller, Lighter and Affordable

As the technology behind consumer electronic devices continues to evolve and advance, product designers are in a race to make them smaller, lighter and thinner with each new generation. This trend will continue and it is imperative for OEMs and their partners to stay ahead of the curve by working together to design smaller, lighter and thinner devices using new and innovative primary battery solutions.

Tony Mazzola, Manager of Product Technical Support, Energizer

Experimental Survey of the Application of Commercial-Graded Lithium Polymer Batteries in Military Systems in Conjunction With Solar Panels and Fuel Cells

Hear the results of an experimental survey into the characteristics of commercial lithium ion and lithium polymer batteries when applied in a range of man portable military radios. The focus is on when the expected load currents varies significantly across the battery's cycle. The study also considers the use of solar panels and fuel cells for in-field replenishment. Limited environmental/temperature stress screening was performed. Several pros and cons will be discussed, but in general the commercial product stood up well in the warmer climates and with a good cost to performance ratio.

Andre Roux, Senior Engineer, Council for Scientific and Industrial Research

2:30 Conclusion of Battery Power 2008

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