



INNOVATION IN ENERGY STORAGE

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Hilton San Diego Resort & Spa
San Diego, CA



Exhibitors



Bitrode Corporation, a Sovema Company, offers an extensive product line of formation and laboratory test equipment, user-friendly software and manufacturing automation tools appropriate to all battery applications and chemistries.

BRÜCKNER GROUP USA



Innovative line concepts for a profitable battery separator film production

Brückner Maschinenbau provides line concepts for an efficient, flexible and profitable production of battery separator film for Li-Ion-batteries used in portable electronic devices. Further on intense R&D is done on solutions for electric vehicles such as E-bikes, scooters and cars as well as stationary power storage applications. Brückner production lines with a film width of 4.2 m, an output capacity up to 30 million sqm/year and a film thickness range from 12 – 30 μm , stand for unmatched production efficiency, high yield, consistent film quality and highest safety standards.



The Center for Automotive Research (OSU CAR) is the preeminent research center in sustainable and safe mobility in the United States and an interdisciplinary research center in The Ohio State University's College of Engineering. OSU CAR research focuses on: advanced electric propulsion and energy storage systems; advanced engines and alternative fuels for

reduced fuel consumption and emissions; intelligent transportation and vehicular communication systems; autonomous vehicles; noise, vibrations, and dynamics; vehicle chassis systems; and vehicle and occupant safety.

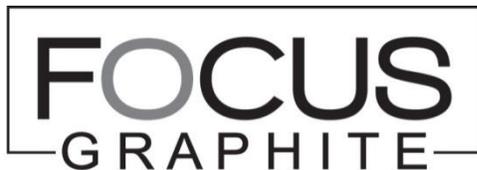
EboNEXT

EboNEXT produces a range of electrically conductive and corrosion resistant materials for use in batteries and other electrochemical devices. These are “Magneli Phase” sub-oxides of titanium of the form $M_xTi_yO_z$ which are sometimes called Metal Titanates. The term

“Magneli Phase” denotes a structure of stacked planes, very similar to graphite. This delivers electrical conductivity, lubricity and corrosion resistance. It also allows for the injection, storage and removal of metal ions such as Li. Earlier Magneli Phase titanium sub oxides such as Ti_4O_7 and Ti_5O_9 , (which are often referred to as Ebonex™) are not stable at the nano-scale. Consequently it has been impossible to use Ti_4O_7 in the form of nano-structures or as thin film coatings. EboNext’s materials are a new class of Structurally Stable Magneli Phase (SSMP) materials which are stable as nano-fibers, coatings, composites and ceramics. Our materials are finding applications in a variety of battery and related products.



EnerSys® is the largest industrial battery manufacturer in the world, operating manufacturing and assembly facilities worldwide for customers in over 100 countries. EnerSys is uniquely positioned to provide expertise in designing, building, installing and maintaining a comprehensive stored energy solution for industrial applications throughout the world. The company's products and services are focused on three primary markets: Motive Power, Reserve Power and Aerospace & Defense. Motive Power applications include material handling, railway and mining equipment, while Reserve Power applications consist of telecommunications, datacenters, electronics, security, portable power, switchgear/utility, and sports and leisure. Aerospace & Defense applications include military planes, submarines and tactical vehicles. www.enersys.com



Focus Graphite Inc. is an emerging mid-tier junior mining development company, a technology solutions supplier and a business innovator. It is the owner of the NI 43-101 compliant Lac Knife graphite deposit grading 16% carbon as graphite. The company's goal is to assume an industry leadership position by becoming a low-cost producer of technology-grade graphite. As a technology-oriented enterprise with a view to building long-term,

sustainable shareholder value, Focus Graphite is invested in the development of graphene applications and patents through Grafoid Inc. Focus trades on the TSX-V under the symbol FMS and on the OTCQX in the U.S. under the symbol FCSMF. See: www.focusgraphite.com



Ideal Power Inc. (NASDAQ: IPWR) has developed a novel, patented power conversion technology called Power Packet Switching Architecture™ (PPSA). PPSA improves the size, cost, efficiency, flexibility and reliability of electronic power converters.

PPSA can scale across several large and growing markets, including solar photovoltaic generation, electrified vehicle charging, and commercial grid storage. Ideal Power has won multiple grants for its PPSA technology; including a \$2.5 million grant from the Department of Energy's Advanced Research Projects Agency – Energy program, and market-leading customers are incorporating PPSA as a key component of their systems. For more information on Ideal Power, visit www.IdealPower.com.



K2
ENERGY

K2 Energy is an innovative developer and manufacturer of cells, batteries and energy storage systems utilizing its proprietary K₂LiFePO₄ chemistry. Our field-proven products offer industry-leading energy density, superior power, and are made of environmentally friendly, lightweight materials, providing increased cycle life and enhanced safety. From cells, to batteries, to large complex battery systems, K2 Energy's

scientists and engineers have decades of combined experience researching, developing and bringing to customers next generation battery technologies. This commitment to innovation continues at the *K2 - Advanced Battery Laboratories* located at our Henderson, Nevada headquarters which feature cutting edge robotic automation, battery pack lines, research and development facilities.



Maccor Inc. was the pioneer, and is the world's largest commercial manufacturer of automated test systems for a wide range of energy storage devices (i.e. batteries, capacitors, fuel cells, etc.) and device chemistries. In addition to standard cycling, drive cycle tests (i.e. FUDS, HPPC, US06 Drive Profile, etc.), sophisticated electrochemical experiments (i.e. cyclic voltammetry, GITT Testing, PITT Testing, etc.), and high-speed pulse testing

Maccor systems can perform impedance spectroscopy experiments in conjunction with a Solartron Analytical or Princeton Applied Research frequency response analyzer as well as temperature cycling experiments in conjunction with a Maccor temperature chamber. The test systems can also be configured with optional SMB and CAN communication hardware to allow interfacing with battery BMS systems. Maccor also supplies cell formation equipment for a variety of cell formats and sizes. Today Maccor has over 1,700 systems in more than 50 countries with local sales and customer support services available in many areas.



MCV Energy, Inc. (MCV) founded in 2009 designs, manufactures and markets energy storage and power distribution systems for commercial, industrial and utility applications. MCV integrates the safety of lithium-ion battery with power electronics to deliver reliable and high performance energy storage capable of optimizing Volt/VAR management. MCV DESS accomplishes round-trip charge and discharge cycle in 150 micro-seconds. MCV DESS offers multiple control function options:

- Peak Load Management;
- Frequency Regulation;
- PV Voltage Transient Support and Intermittency Smoothing;
- Constant Power Charge and Discharge;
- Reactive Power; and,
- Remote control monitoring.

MCV DESS have compact footprint and deliver long life expectancy from large format prismatic lithium-ion battery. From 35kW/35kWh rack mounted unit (24"W x 36"D x 62"H) scalable to multi-megawatt container system, MCV DESS innovation is giving rise to a new vision to offer fully integrated renewable energy micro-grid solution with seamless transition between grid-tied and micro-grid within few milliseconds.



S&C ELECTRIC COMPANY
Excellence Through Innovation

Building on its over 100 year heritage of innovation in power systems, S&C has become a pioneer in battery energy storage with over 17 operational projects totaling 150 MWh of stored energy. This experience includes the

first storage projects used to help connect both wind and solar to the grid as well as projects used for islanding, peak shaving, frequency control, energy arbitrage, and in microgrids. S&C's PureWave® SMS and PureWave® CES use field-proven power electronics technology to control battery output and provide rapid response to changing system conditions in utility and community scale energy storage. Learn more at www.sandc.com