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EMPLOYMENT

QuantumScape **February, 2013 – Present**
SR. DIRECTOR, CELL DEVELOPMENT – SR. DIRECTOR, CELL ENGINEERING SAN JOSE, CA

- Managing a staff of 25+, thru advanced materials engineering, platform design engineering, process engineering and execution, and electrical testing of an ultra-high energy density energy storage technology.
- Built the cell engineering team from the ground up. Institutionalized engineering processes and tools including CAD, PDM, FMEA, and change management.
- Led the successful development and implementation and sustaining of highly adaptable, scalable R&D material fabrication and cell assembly processes for coin, pouch, and prismatic can cells in small and large formats.
- Co-invented a process for achieving a low resistance interface between lithium-stuffed garnet solid electrolytes and lithium metal, demonstrating <2 $\Omega \cdot cm^2$ at 25°C and cycling >20 um Li at >2 mA/cm^2 thru a <100 um thick membrane. Described in US20170214084
- Co-invented a battery design capable of maintaining compressive pressure on an electrode stack that incorporates a lithium metal anode and changes volume by 10-40% during cycling. Described in US20140093760
- Developed, released and sustained a suite of data visualization tools utilizing JMP scripting language and SQL that substantially reduced time spent querying, manipulating, and analyzing process and electrical test data.
- Negotiated key terms of pilot production agreements and managed overseas project execution.

A123 Systems, Inc. **October, 2006 – February, 2013**
CELL PRODUCTS GROUP WALTHAM, MA

DIRECTOR, CORE CHEMISTRY AND ADVANCED ENGINEERING **September, 2011 – February, 2013**

- Retooled, retrained, and redeployed existing personnel, demonstrating new form factor, can based prismatic HEV cell with industry leading life, power, and abuse tolerance - concept to demonstration in 5 mos.
- Organized and led implementation of a phases and gates based product realization process, integrated with core technology development. Successfully rolled out across R&D and Engineering organizations.
- Led development of next generation automotive start/stop battery concept to support business plan, demonstrating double digit cost reduction. Successfully presented and defended design concept to multiple automotive OEM's.
- Led development of EV cell hardware concept, achieving double digit gain in volumetric efficiency and reduced cost at system level by implementing holistic design analysis approach. Successfully presented and defended design concept to multiple automotive OEM's.

DIRECTOR, CELL PRODUCT DEVELOPMENT **July, 2010 – September, 2011**

- Staffed an organization of Chief and Development Engineers from ground up in 6 months, resulting in successful validation and production implementation of 2 2nd generation cylindrical li-ion cell products.
- Developed and implemented product development resource planning tool, capable of accurately projecting resources to complete product development phases from concept through production launch, improving accuracy of program budgets and enabling data based go/no-go decision making.
- Consistently demonstrated compliance of cell development engineering organization to automotive TS16949 quality standard through annual continuous compliance audits.
- Championed implementation of DFMEA as a core tool in development of design records, design verification plans, risk analysis, and program planning.

SENIOR DEVELOPMENT ENGINEER – ENGINEERING MANAGER **October, 2006 – July, 2010**

- Introduced FMEA to A123 and led development of first nanophosphate technology based li-ion cell DFMEA. Led organization and implementation of DFMEA process, rigorously embedding the tool into the design process driving out risk prior to production launch.
- Led engineering development through launch and PPAP approval of 1st generation automotive cylindrical HEV cell, including implementation in Asia based manufacturing and supply infrastructure - both developed concurrently with product design.
- Successfully mentored an incumbent team of bright, energetic startup company scientists and technical

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- Designed and implemented a multiple web winding model, capable of accurately predicting impact of micron level changes in electrode geometry on wind geometry, eliminating multiple iterations of cell build+test to optimize wound cell design.
- Added multiple tools to the engineering core toolkit that demonstrated continued value, including handheld XRF, high precision thickness gaging, sealing simulation, KF moisture measurement, Minitab statistical analysis, ANSYS FEA, Monte Carlo simulation, and IQ-FMEA.

Electrochem Commercial Power **August, 2005 – October, 2006**
SENIOR ENGINEER, PRODUCT DEVELOPMENT CANTON, MA

- Led the development of an 11 Ah cell capable of fitting within 21 mm diameter constraint of tractor-trailer monitoring devices, overcoming challenges of electrode utilization efficiency and manufacturability by analyzing historical data to create predictive cell capacity and electrode winding models.
- Identified opportunities and implemented changes to reduce product cost through material selection, increasing manufacturability of component designs, and utilizing six sigma methods to increase first pass yield.
- Managed the successful development of an improved low temperature performance lithium thionyl chloride product meeting program cost targets and exceeding customer requirements.

Double E Company, Inc. **December, 1999 – August, 2005**
ENGINEERING MANAGER, COMPOSITE ROLLS, CORES, AND REEL SPOOLS WEST BRIDGEWATER, MA

- Led company to a 130% increase in roller sales over 5-year span after 3 consecutive flat years by working directly with customers to propose solutions, standardizing product components, and increasing product quality through optimized design and manufacturing processes.
- Developed abuse resistant reinforced polymer coating for carbon fiber composite unwind/rewind shafts, reducing product weight and allowing sales into applications previously unserviceable.
- Developed failure model for composite shafts based on statistical field data, reducing warranty repair costs.
- Developed, implemented, and sustained product configurators for 2 product lines, utilizing MS Visual Basic for Applications, reducing customer quotation turnaround time and engineering errors by >50%
- Developed and managed business relationships with suppliers to become a least cost producer of composite film tower and converting idlers.
- Conducted finite element analyses utilizing ANSYS software to design and optimize shrink fit joints as robust replacements for weldments in heat-treated steel assemblies.

Duracell, Inc. **October, 1994 – December, 1999**
PRODUCT ENGINEER - PROJECT MANAGER, CELL ASSEMBLY NEEDHAM, MA

- Managed a group of 11 technical and professional level employees in the fabrication of over 100,000 alkaline, Li/MnO2, Li - ion, and zinc air development cells annually.
- Successfully merged the operations of two assembly groups to boost efficiency through reduction of redundant systems and effective utilization of cross training, resulting in a 30% productivity increase.
- Designed an electronic requisition, quality control and data collection system including an electronic request approval cycle and providing a permanent storage location for requisition documents, as well as all data collected during assembly trials.
- Developed polymer and metal components and assemblies for high volume production in manufacturing sites worldwide. Manufacturing processes utilized include injection molding, progressive metal stamping and forming, deep drawing, laser welding, and powder compaction.
- Used ANSYS finite element methods extensively to model highly non-linear behaviors experienced during the production, use, and abuse of product components and assemblies. Some analyses performed include assembly simulation of an alkaline battery, prediction of plastic battery seal rupture under abuse conditions, metal forming, and laser weld failure prediction.

PATENTS

- 11 US patents on battery and web handling technologies issued, 2 published applications pending: US6025090, US6042967, US6126704, US6127062, US6716148, US8119280, US8163410, US8236441, US8501345, US8632907, US8871373

EDUCATION

B.S. Mechanical Engineering **October, 1994**

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