

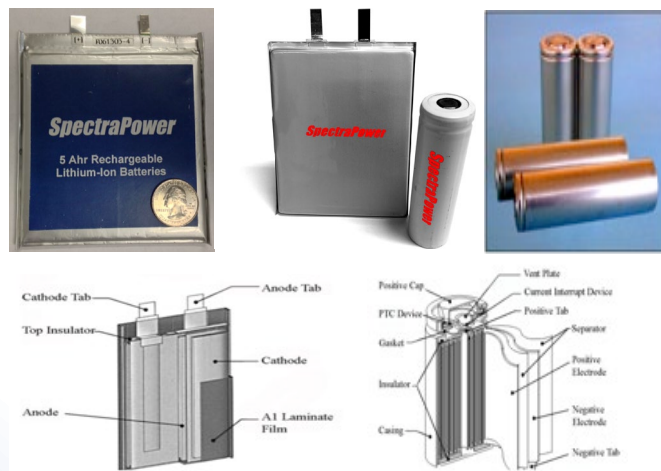
SpectraPower

“Silicon Valley’s Battery Lab”

Located minutes from the heart of Silicon Valley, SpectraPower offers contract services, expert consulting, and expert witness services for Li-ion and other types of batteries, as well as supercapacitors. Contract services include electrode, cell and pack fabrication and test. SpectraPower personnel have experience in all aspects of battery research, materials, design, manufacturing, test and analysis. SpectraPower’s team is unique in having actual high-volume Li-ion production experience with all common form factors: pouch, cylindrical, prismatic and coin cells; wound, stacked, and z-fold. Our customers include major corporations, law firms, startups, investors, government and defense. Our low overhead means we can provide world-class technical capabilities at affordable cost.



SpectraPower’s Battery Lab
in Livermore, CA



SpectraPower has experience and expertise in many types of battery chemistries:

- Li-ion:
 - Anodes: graphite, silicon, LTO
 - Cathodes: LCO, NCA, LMO, LFP, NMC
 - Electrolytes: carbonate/LiPF₆, gel, ionic liquids
 - Separators: polyolefin, laminate, non-woven
- Low (-50C) and high temperature (200C) Li-ion
- Solid-state batteries
- Li metal batteries
- Aqueous systems:
 - Ni-Zn, Ni-Fe
 - Supercapacitors: Symmetric, Hybrid
- New and Novel Chemistries welcome

SpectraPower has complete facilities for making cells, from raw materials through final test and data analysis:

- Cell design
- Slurry preparation with different active materials, binders, solvent types, etc.
- In-house roll-to-roll electrode fabrication
- High-loading electrodes are a specialty!
- Cell assembly and formation
- Cycle life testing
- Environmental testing
- EV, HEV, PHEV testing
- Cell failure analysis and autopsy



Let us quote your requirement today!

Visit our website and contact us at: info@spectrapowerllc.com

SpectraPower LLC, Livermore, CA 94551, USA
www.spectrapowerllc.com

James Kaschmitter

30 years of experience in Li-ion batteries, supercapacitors and fuel cells

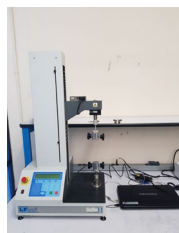


Founder and Managing Member SpectraPower LLC

Jim started work in supercapacitors and Li-ion batteries at Lawrence Livermore National Laboratory in 1989 as the power engineer for the Strategic Defense Initiative Office ("Star Wars") Brilliant Pebbles project. Jim and his team developed some of the first Li-ion cells in the U.S. and invented the carbon aerogel supercapacitor. They started PolyStor Corporation in 1993 with a grant from President Clinton's TRP program. PolyStor became the first commercial Li-ion manufacturer in the U.S. In 1997, Jim founded PowerStor Corporation to manufacture carbon aerogel supercapacitors. PowerStor was acquired by Cooper Bussmann (now Eaton) who produces and ships over 1M supercaps/month. In 2002 Jim founded UltraCell Corporation to commercialize a unique Reformed Methanol Micro Fuel Cell. UltraCell was acquired by Brentronics and supplies these fuel cells to the U.S. military.

Analytical and Material Testing

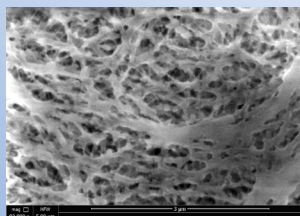
- Thermal Shrinkage
- Air Permeability (Gurley)
- Mechanical Testing



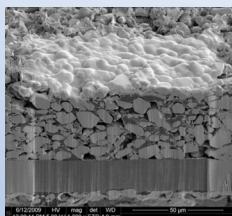
SpectraPower routinely uses characterization partners to get high quality work at affordable pricing with short lead times for many types of materials testing.

- Electrolyte Analysis
- Thermal characterization
- Mercury Intrusion Porosimetry
- Scanning Electron Microscope (SEM)
- Focused Ion Beam (FIB) and FIB-SEM

• SEM



• FIB



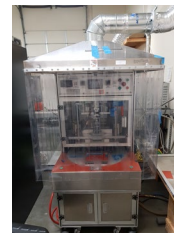
Electrode Fabrication

- Slurry preparation with different active materials, binders, solvent types, etc.
- In-house roll-to-roll electrode fabrication
- Thermal controlled Vacuum Mixer



Cell Assembly and Formation

- Full Assembly Process Setup
- Cup forming, Punching, Calendering, Tab Scraping, Electrolyte Filling, Formation, and more.
- Lamination
- Vacuum and Degassing
- Calender and Punch



Battery and Cell Testing

- Cycle life testing
- Environmental testing
- EV, HEV, PHEV testing
- High Rate testing (1000A)
- Cell failure analysis and autopsy
- Cell Swelling Testing
- EIS



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