



# WE TEST & EVALUATE BATTERIES.

BW Energy & Innovation offers a broad range of battery testing and certification services across the increasingly diverse set of battery chemistries, enabling a growing circular economy.

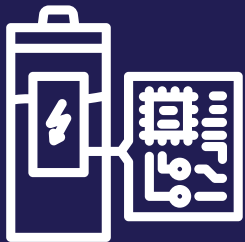
 [dmarshall@bw-ei.com](mailto:dmarshall@bw-ei.com)

 1752 Fields Blvd. Greenfield, IN 46140

 [www.bluewhalematerials.com/testing-evaluation](http://www.bluewhalematerials.com/testing-evaluation)



## 700+ CHANNELS



With 700+ test channels in 8,000 sf Lab/Building and a new partnership with Photon Automation, BWE&I has the capacity to accommodate out-of-the-box testing requirements with engineering support to realize challenging solutions.

## NEW OFFERINGS UP TO 420V



21 new testing machines, including high voltage module cyclers, advanced cell cyclers, and temperature chambers enhance our capacity for rigorous testing and to address specific industry pain points.

## SINCE 2012



BWE&I, formerly Eclipse Energy, has been in the battery testing business since 2012. The team, with 100+ years of experience, offers battery development and test services as well as **new in-person trainings.**



## ISO/IEC 17025

BWE&I is ISO/IEC 17025 accredited and has maintained this certification in electrical testing of industry standards and parameter-based tests since 2017.



# SERVICES & CAPABILITIES

<p style="text-align: center;"><b>EQUIPMENT CAPABILITIES</b></p> <p><b>CIRCUITS:</b></p> <ul style="list-style-type: none"> <li>• ~700 test circuits</li> <li>• Various ranges/circuit: 0V to 420V; 0A to 1000A, up to 2000A parallel; up to 170kW; and constant current, voltage, and power modes</li> </ul> <p><b>THERMAL CONTROL:</b></p> <ul style="list-style-type: none"> <li>• Waterbath 25C to 75C</li> <li>• Programmable thermal chambers -70C to 170C</li> <li>• Steady-state ovens &amp; freezers</li> <li>• Custom built thermal control boxes</li> </ul>	<p style="text-align: center;"><b>ACCREDITATION</b></p> <ul style="list-style-type: none"> <li>• ISO/IEC 17025:2017</li> <li>• Certificate #: 3307.01</li> <li>• Field of: Electrical Testing</li> <li>• Scope includes industry standards and parameter-based tests</li> </ul>
<p style="text-align: center;"><b>LI-ION &amp; OTHER ADVANCED CHEMISTRY</b></p> <p><b>FORMATS:</b></p> <ul style="list-style-type: none"> <li>• Cylindrical cell • Prismatic cell • Pouch cell • Module • Pack</li> </ul> <p><b>APPLICATIONS:</b></p> <ul style="list-style-type: none"> <li>• EV • HEV/PHEV • Heavy industrial • Data center • Industrial tool</li> </ul> <p><b>COMMON TESTS:</b></p> <ul style="list-style-type: none"> <li>• Rate capacity - charge &amp; discharge • HPPC</li> <li>• High/low temperature performance • Cycle life/capacity loss • Storage life/capacity loss • Customer specific test programs • End of line testing • Abuse testing - up to 5kWh modules, mechanical, nail penetration, thermal cycle/thermal shock, electrochemical, and overcharge and overheat</li> </ul>	<p style="text-align: center;"><b>LEAD ACID BATTERIES</b></p> <p><b>FORMATS:</b></p> <ul style="list-style-type: none"> <li>• Flooded • Enhanced Flooded (EFB) • Glass Mat (AGM) • Bipolar • 2V cells to 48V packs</li> </ul> <p><b>APPLICATIONS:</b></p> <ul style="list-style-type: none"> <li>• Automotive • Motorcycle • Golf cart • Forklift • Telecom • UPS • Heavy industrial</li> </ul> <p><b>COMMON TESTS:</b></p> <ul style="list-style-type: none"> <li>• Reserve capacity • Rate capacity • Cold cranking • Charge acceptance • HPPC • Water loss • Cycle life</li> </ul> <p><b>STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• SAE J537 • SAE J2801 • SAE J2185 • IEC 60095 • EN 50342-1 • EN 50342-6 • BCIS-04, -05, -06 • ABNT NBR 15940 &amp; 15941 • Various OEM standards</li> </ul>
<p style="text-align: center;"><b>REUSE &amp; REFURBISHMENT</b></p> <ul style="list-style-type: none"> <li>• EOL state of health testing for packs, modules, and cells • Service model for recalls or EOL determination for warranty batteries • EIS testing</li> </ul>	

\*Summary of services and capabilities include but is not limited to those listed.



# EDUCATION, TRAINING & CONSULTING

## COURSE OFFERINGS INCLUDE:

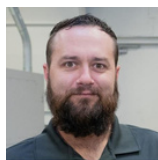
<b>CELL 101</b>	<ul style="list-style-type: none"><li>• Cell theory of operation • Cell production</li><li>• Li-ion • Advanced chemistries</li></ul>
<b>VALIDATION &amp; SAFETY</b>	<ul style="list-style-type: none"><li>• Best practices • Emerging methods</li><li>• Safety Emergency Response Standards</li></ul>
<b>BATTERY MANAGEMENT SYSTEMS (BMS)</b>	<ul style="list-style-type: none"><li>• Operation/Performance/Safety</li><li>• Transportation systems • Stationary systems</li></ul>
<b>SECOND LIFE &amp; RECYCLING/REFINING</b>	<ul style="list-style-type: none"><li>• Tools &amp; support • Circular economy</li><li>• Reuse/Reman/Recycle/Refine</li></ul>

\*CEU Accreditation offered through:  **PURDUE UNIVERSITY**

## HANDS ON, IN-PERSON & LED BY INDUSTRY EXPERTS:



**Danny Marshall**  
Lead Manager  
Testing &  
Evaluation



**Rodney Kidd**  
Battery Abusive  
Test Lead



**Ben Wrightsman**  
President,  
ReElement  
Technologies  
(Partner)

BWE&I's team, with more than 100 years of Battery Development and Test Experience in house as well as an extended network of battery specialists and consultants, can provide support as needed. Additional consultation topics include but are not limited to:

- Validation planning
- Project management
- Custom test profiles
- Safety standards
- Streamlined automated manufacturing to end-of-life testing

In collaboration with



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