



CONSORTIUM FOR  
**BATTERY  
INNOVATION**

**CENELEC**  
EUROPEAN COMMITTEE  
FOR ELECTROTECHNICAL STANDARDIZATION

# Maximizing hot-climate durability and brake energy recuperation: an automotive workshop on battery technology and standards

## DCA and Heat: Testing Charge Acceptance and High Temperature Durability for Advanced Lead 12 V Batteries

The *Consortium for Battery Innovation* (CBI, formerly ALABC), in collaboration with *European Committee for electrotechnical standardization* (CENELEC), is holding a workshop bringing together global technical experts from the advanced lead battery and automotive industries to discuss testing methods and research challenges. This follows meetings in Kloster Eberbach (2017), Alcalá de Henares (2018), and Bruges (2019).

The “DCA and Heat” Workshop will trigger discussion and establish co-operation between battery experts working in all parts of the value-added chain, emphasizing:

- ◆ Battery durability data from field applications and from laboratory testing for vehicle application in hot climate
- ◆ Improved understanding of parasitic reactions in modern automotive batteries: gas evolution, oxygen cycle and corrosion
- ◆ New / improved test methods and standardization: high temperature durability (nKLT), microcycling (stop/start) durability (MHT), dynamic charge acceptance (DCA)
- ◆ From small test cells to real batteries: how to evaluate performance and durability through R&D

Compact plenary talks will expose up-to-date material on each of the following 6 topics to all participants. In subsequent break-out sessions, each participant will have the opportunity to discuss in depth 3 of the topics and plan collaborative work streams associated with them.

When: 7-8 October 2020

Where: Edinburgh, Scotland

**Wrap-up Session**  
Activities & results since „Kloster Eberbach“:  
Wednesday, 7 Oct., 8 a.m.



Topic	Plenary and Breakout topics
1. New Key Life Test (nKLT) for battery durability in hot climate	<ul style="list-style-type: none"> <li>• Can nKLT predict water consumption in the field?</li> <li>• Can nKLT predict corrosion-limited high-temperature battery life?</li> <li>• Introduction scenario for a new standard test?</li> </ul>
2. Dynamic Charge Acceptance (DCA): Definitions and test methods	<ul style="list-style-type: none"> <li>• OEM perspective: DCA motivation and observations – run-in vs. fresh battery</li> <li>• Comparing DCA test methods (external standards, OEMs): all about the same?</li> <li>• Essentials for a global DCA test norm</li> </ul>
3. Cell-level testing of negative electrode modifications	<ul style="list-style-type: none"> <li>• DCA evaluation / screening of material additives: fresh and run-in DCA tests</li> <li>• Test cell design effects on DCA measurements</li> <li>• Evaluation of NAM additives for their impact on water loss and corrosion</li> <li>• From CCA to cycle life: scaling from cell to battery?</li> <li>• Participants will again show &amp; tell about their example test cells</li> </ul>
4. PAM effects on DCA and high-temperature durability	<ul style="list-style-type: none"> <li>• Corrosion under microcycling conditions</li> <li>• Positive Active Mass (PAM) effects on DCA</li> <li>• Additives Discussion – Effects of NAM additives on PAM, PAM additives for DCA or high temperature durability</li> <li>• Analytical Techniques for PAM and positive grid</li> </ul>
5. Studying NAM morphology and mechanisms	<ul style="list-style-type: none"> <li>• Case study: DCA Memory Effect (freshly discharged / charged / run-in)</li> <li>• Analysis Technique Best Practices: preparation, SEM, XRD, ...</li> <li>• Typical micrographs of NAM without and with high-surface carbons</li> <li>• A simple impedance spectroscopy experiment: in-situ DCA tracking?</li> <li>• Mechanisms by which high-surface carbons act in NAM</li> </ul>
6. Tools and Methods: Handling complex battery test regimes	<ul style="list-style-type: none"> <li>• Measuring gas flow &amp; composition in laboratory and vehicle: CBI's electronic gas analysis system (eGAS)</li> <li>• Tools for MHT, nKLT data evaluation and plot generation</li> <li>• Modelling DCA: computer simulation models (<i>to be confirmed</i>)</li> </ul>
In additional plenary talks, representatives of OEMs and battery suppliers will report <ul style="list-style-type: none"> <li>• new battery requirements and ongoing standardization activities,</li> <li>• validation results of new MHT Version at 40 °C – is the procedure mature to be published in EN 50342-6 ?</li> </ul>	

An **“DCA & Heat” wrap-up session** (Wednesday morning) will summarize objectives, activities and results of the joint activity since the “Kloster Eberbach” workshop 2017. The **“DCA & Heat” 2020 workshop** will begin on Wednesday 7 October (12pm) with a working lunch and finish in the early afternoon of Thursday 8 October (3pm).

The “DCA & Heat” workshop will be followed on 8 October (3.30pm-6pm) and 9 October (9am-3pm) by a **Consortium for Battery Innovation (CBI) European Technical Workshop**, to discuss the progress of the newly launched CBI technical program and new requests for proposals.

Both events will take place at The Royal Scot's Club in Scotland's capital city of Edinburgh. Further information, including updates on the workshop agenda, online registration for both meetings, and a discounted hotel room block, are available on this [link](#) or by visiting the CBI website here: [www.batteryinnovation.org/dca-and-heat-workshop-2020/](http://www.batteryinnovation.org/dca-and-heat-workshop-2020/). Hotel rooms must be booked by **17 August 2020**.

The registration fee covers the cost of seminar rooms and handout material, the cultural tour, as well as lunches, coffee breaks and Wednesday dinner. 50% discount is available to students attending the meetings. Please contact [Anita Wright](#) to obtain the student discount code.

Wednesday, 7 October	8:00 - 12:00	wrap up DCA & Heat
	12:00 - 17:30	workshop DCA & Heat
	18:30	cultural tour, dinner
Thursday, 8 October	8:30 - 15:00	workshop DCA & Heat
	15:30 - 18:00	CBI Technical Workshop
	19:00	get-together, dinner
	Fri, 9 Oct.	9:00 - 15:00