CENELEC
EUROPEAN COMMITTEE
FOR ELECTROTECHNICAL STANDARDIZATION

CONSORTIUM FOR
BATTERY
INNOVATION

sponsored by

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Measurement System Experts

# Scientific Workshop: **High-Temperature Durability Tests for Advanced Lead–Acid 12-V Batteries**

## Agenda

Compact plenary talks (7-10 minutes) and interactive breakout sessions (90 minutes) will cover six key topics. Within each breakout session (except F), small groups of participants will discuss aspects of the topic with moderators in front of poster displays for 15 minutes each. Additional plenary talks will provide OEM perspectives, and a panel discussion will address opportunities for co-ordinated research. Participants will receive slides, posters, and back-up material for download and as printed hand-outs upon arrival.

Location: Crowne Plaza Hotel, Burg 10, 8000 Bruges, Belgium, within 90 min train or car ride from Brussels international airport. Wednesday evening program will be in walking distance from the hotel.

Dress code: casual

**Wednesday, 22 May 2019**

**12:00 Registration, business lunch (hotel lobby)**

**13:00 Opening, Introductions, Objectives**
A. Davidson (CBI), T. Hildebrandt (CENELEC), E. Karden (Ford)

**13:30 Plenary Session introducing topics A, B, C**

### A Testing battery durability for stop/start microcycling

*moderator: Rainer Wagner, Moll Batterien*

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| *Roberto Aliberti, Fiamm FET* | Stop/start battery durability – Overview of OEM test methods and requirements |
| *Torsten Hildebrandt, Clarios* | Test development and parameter variation for MHT, 2019 draft |
| *Christian Mondoloni, PSA Group* | |

**Breakout topics A** (15:30-17:00, meet in room Burgh 3)

- Review of MHT trial runs with parameter variation
- Planning 2019 validation of CENELEC draft Micro-Hybrid Test (MHT) v2.0
- Can we achieve global harmonization?

### B Water loss and oxygen cycle in EFB real-world operation

*moderator: Francisco Trinidad, Exide Europe*

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| *Eberhard Meissner, Battery Specialist* | Oxygen intermediate storage as buffer for energy and charge in EFB microcycling operation |
| *Plamen Nikolov, Bulgarian Acad. of Sciences* | Experimental study and model for the side reactions during steady-state overcharging |
| *Daisuke Hosaka, Hitachi Chemical* | Half-cell potential and gas measurements in EFB during simulated driving cycles |

**Breakout topics B** (15:30-17:00, meet in room Burgh 1)

- Why is hydrogen evolution accelerated for EFB+C during steady-state overcharging, but often only marginally higher during microcycling?
- Experimental investigation of the oxygen cycle in EFB – next steps
- What are implications for durability test methods?

**C Measuring DCA and water loss in test cells**

*moderator: Boris Monahov, CBI*

*Matthew Raiford, CBI*
*Shane Christie, ArcActive*
*Kate Alspaugh, Energ2*
*Paul Everill, Black Diamond Struct.*
*Sophia Matthies, Tech.Univ.Berlin*
*Benjamin Hübner, Moll Batterien*
*Jesús Valenciano, Exide Europe*
*Begüm Bozkaya, Fraunhofer ISC*

Test cells and cell testing – from lab to reality:
1) Best Practices for test cells
2) Dynamic Charge Acceptance (DCA) on cell level
3) Water consumption on cell level

**Breakout topics C** (15:30-17:00, in the main meeting room)

- Examples of test cell designs
- ALABC/CBI cell-test manual
- How can we sensibly scale down “fresh” and “run-in” DCA tests?
- Can we test high temperature durability in small lab cells?

15:00 Coffee

**15:30 Breakout Sessions**
**A, B, C** (simultaneously in different rooms, see above)

**17:00 Moderators’ report-out from breakout sessions A, B, C**

**17:30 Plenary Discussion: "Bridging the gap:**
**How closely can material and cell test methods approximate field relevant conditions?"**

18:00 Break

**18:30 Sightseeing Tour**
starting from Crowne Plaza Hotel, finishing at our dinner place

**19:30 Reception & Dinner**
De Halve Maan, brewery / restaurant in Bruges’ old town

**<u>Thursday, 23 May 2019</u>**

**8:30 OEM Presentations**

*moderator: Geoffrey May, CBI*

*Egbert Lodowicks, Audi* — A carmaker’s view on high temperature test methods for micro-hybrid batteries

*Christian Mondoloni, PSA Group* — Upcoming changes in 12V battery requirements

**9:00 Plenary Session introducing topics D, E, F**

## D Test methods for battery durability in hot climate

*moderator: Bernd Engwicht, East Penn Manufacturing*

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| *Eckhard Karden, Ford* | Do we need a new key life test for corrosion and water consumption? |
| *Jonathan Wirth, RWTH Aachen ISEA* | Laboratory simulation of hot climate driving cycles |
| *Luca Brisotto, Exide Europe* | Choosing parameters for new Key Life Test (nKLT), CENELEC 2019 draft |

**Breakout topics D** (11:00-12:30, meet in room Burgh 3)

- Deep Dive of test & teardown results for nKLT and reference drive cycles
- How can we launch field tests by OEMs and suppliers?
- Comparison of EFB and AGM with and without "high DCA" additives

## E Corrosion under PSoC microcycling conditions

*moderator: Travis Hesterberg, RSR Technologies*

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| *Jun Furukawa, Furukawa Battery* | Corrosion behavior of positive grid under high temperature and overcharge condition |
| *Shawn Peng, Trojan Battery* | A study on the PAM/grid corrosion layer during motive power cell cycling |
| *Subhas Chalasani, EastPenn Mfg.* | A grid corrosion study for AGM cells with varied negative active mass additives |
| *Tim Fister, Argonne National Lab.* | In-situ observation of corrosion layer by high-energy X-ray diffraction |

**Breakout topics E** (11:00-12:30, meet in room Burgh 1)

- Localized post-mortem results from lab test cells and actual 12V batteries
- How to measure corrosion during tests:
  in-situ (relative comparison) and ex-situ (sample preparation effects)?
- Recent results from ongoing XRD study – can it be used for corrosion?

## F Measuring gas evolution directly

*moderator: Jörn Albers, Clarios*

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| *Heinz Rottmann, measX* | Development and applications of the new electronic gas analysis system (eGAS) |

**Breakout topics F** (11:00-12:30, in the main meeting room)

- First user workshop for CBI's electronic gas analysis system (eGAS)
- Laboratory applications from Tafel slopes to drive cycles
- In-vehicle applications – first examples

10:30 Coffee

**11:00 Breakout Sessions**
**D, E, F** (simultaneously in different rooms, see above)

12:30 Lunch (buffet)

**13:30 Moderators' report-out from breakout sessions D, E, F**

**14:00 Plenary Discussion: Next steps / participants' feedback**

15:00 End of meeting