Industry Benefits from the 2013-2015 ALABC Program

ALABC 2013-15

The ALABC and its members have produced several positive outcomes that have benefited the entire lead battery industry, and the 2013-15 ALABC program has produced what may be some of the most ground-breaking results related to advanced lead-acid battery technology in some time. Here is a brief summary of three of the most important achievements of this three-year program:

Fundamental study reveals new understanding of carbon additives for lead batteries

In recent work on developing advanced lead-carbon batteries for electric port cranes and lifts (Project 1315 STD1) Chinese member Narada Power carried out fundamental studies on the influence of various carbon powder additives before batteries were designed, built and tested for the application. The data regarding paste and plate production, as well as the influence of carbon additives on capacity and cycle life will be of significant interest to the industry, along with the findings about the critical importance of electrolyte concentration and of the end-of-charge profile for cycle life at mediu deeppartial state-of charge-cycling. The information is highly valuable for researchers and engineers developing advanced lead batteries and alleviates the need for further studies in this area.

Demonstration projects produce cost-effective hybrid electric vehicle solutions for OEMs

The most efficient automotive battery demonstration project of the ALABC was the development of a 48-volt micro/mild hybrid vehicle with downsized engine with optimized performance using lead-carbon (LC) batteries (Project 1315 48VLCSH). The concept was to build upon the encouraging results obtained from the 12V LC SuperHybrid project in which a spiral-wound Exide Orbital lead-carbon battery provided adequate energy and power, as well as charge acceptance and life, under the specific high-rate partial state-of-charge cycling conditions necessary for mild/micro hybrid automotive duty and still offered a 7-20% reduction in CO_2 emissions. The concept has already attracted a great deal of interest from OEMs. Kia/Hyundai has produced in cooperation with the ALABC and other partners two highly-promising demonstration vehicles ("T-power" design) with diesel engines for the European market, and Ford Motor Company UK is working on a similar project (ADEPT) – both using advanced lead-carbon batteries in a 48V high-power architecture.

PV project sets high mark for advanced lead batteries in energy storage applications

Early battery testing for renewable energy storage application revealed that lead batteries were not optimal because of their low charge efficiency and short cycle life. However, a continuing study initiated in an earlier ALABC program (Project SPSoC1), which focused on extending the cycle life of batteries for photovoltaic (PV) systems, resulted in a significant improvement and life extension. The project utilized cost-effective and production-ready enhancements, such as additives and new separator/gauntlet materials. As a result, the best performing cells completed over 3150 cycles at 40oC while retaining more than 90% of their initial capacity, which is considered the equivalent of more than 17 years of cycle life at room temperature. This result demonstrates that the service life of these batteries would be as long as the life of the PV system itself, making battery replacement unnecessary. In essence, PV systems with lead batteries will have not only the highest environmental value (98% recycling rate) but also the highest economic efficiency.

Current ALABC Projects

Here is a complete list of the projects that are ongoing through the ALABC's 1315 program. For a description of these projects, visit www.alabc.org/r-d-program.

Projects of the 1315 Program

- 1315-STD1
- 1315-48VLCSH
- 1315-RN1
- 1315-AVD
- 1315-ADEPT
- 1315-SR1 9213 REV-LC
- 1315-SR2 9213 REV-DKTest
- 1315-NGHV

Projects Continued from Previous Programs

- SPSoC1
- 1012KD-F
- DP18-DC1
- 1012N

ALABC

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