

# BATSO and BATSO Technical Committee

## General Matters Safer L(EV) batteries ...

Presenter: Tim Schäfer,  
Chairman Techn. Committee  
LiTec Battery GmbH, Kamenz/Germany



# Technical Committee as part of the BATSO scheme

## BATSO scheme

- The BATSO Scheme is a system based upon a cooperation between Extra Energy e.V. (Tanna, Germany) and TÜV Rheinland LGA Products GmbH (Nuremberg, Germany).
- Partners today: ITRI (Taiwan), UL, TÜV Rheinland, EE, other institutes as interested parties
- Interested parties: Phyllion, BAK, PHET, GP, Samsung SDI, Ener1, BMZ, SK, Citic MGL, Sony, Sanyo, NEC Tokin, Amita, Coslight, Sky, Lishen...
- Others: ZVI, ZSW, Universities...
- BATSO Board of Management (today)
  - Extra Energy e.V.
  - TÜV Rheinland LGA Products GmbH
- BATSO Technical Committee

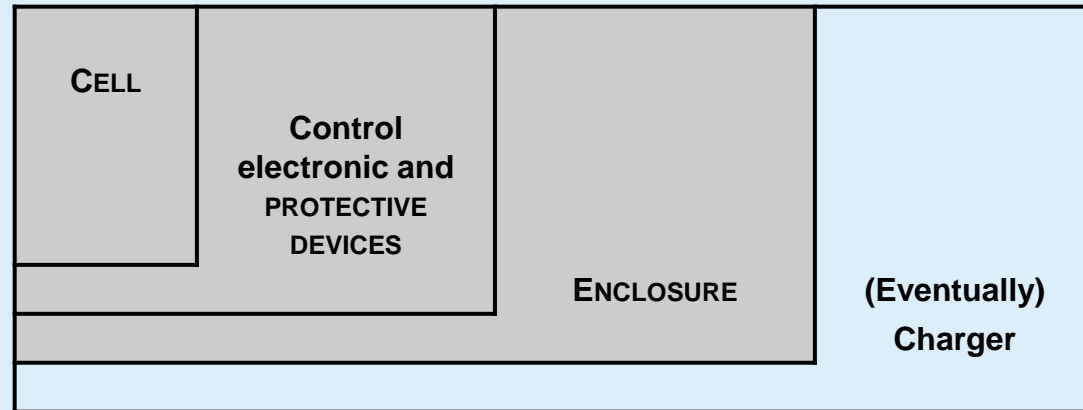


## ■ The goal of BATSO

- Is to increase safety of existing and new battery technologies.

Testing methods of this manual will support a fast and economic way of battery testing.

The BATSO test seal will help all parties involved in the (Light) Electric Vehicle business to find and utilize safer batteries.



# HIGH LEVELS OF SAFETY WITH LARGE RECHARGEABLE LITHIUM BATTERIES...and what's about Reliability?

- Electric vehicles are particularly susceptible to environmental extremes.
- Vibration, Moisture, corrosion, and temperature extremes which are common place for fossil fueled vehicles, can significantly degrade electric vehicle performance.



# ■ BATSO 01 Manual for Evaluation of Energy Systems for Light Electric Vehicles (LEV) - Secondary Lithium Batteries

## BATSO 01

**Electrical tests**  
(Overcharge, short circuit, vibration endurance, partial short circuit)

**Mechanical tests**  
(Crush, shock, drop)

**Environmental tests**  
(Low pressure, thermal)

United Nations (Transport)  
(UN-T 38.3)

# BATSO – Testing and certification of LEV batteries

## Testing at manufacturer site

- In general, principles of ISO / IEC 17025 (General requirements for the competence of testing and calibration laboratories) apply
- Optional: design review and testing program discussion prior to testing
- TÜV Rheinland engineer is present during testing
- Particular focus on:
  - Qualification and training of laboratory staff
  - Laboratory must be fully equipped with required test equipment
  - Maintenance of test equipment
  - Calibration of test equipment

# Certification of batteries according to BATSO

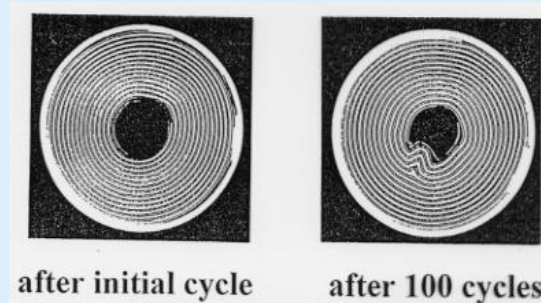
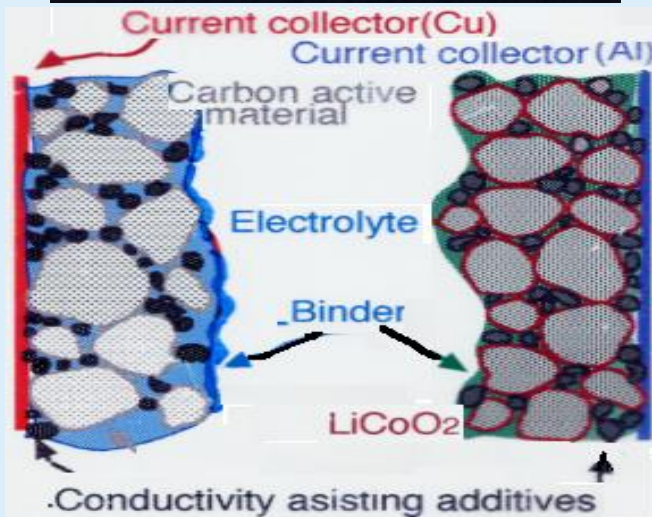
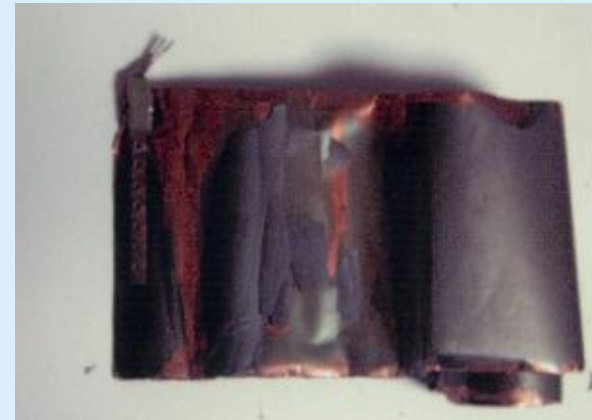
## Certification

- Cooperation model of the BATSO scheme foresees currently a certification by TÜV Rheinland only
- Once type testing and factory inspections were successful, the BATSO-TUVdotCOM mark is granted



- TUVdotCOM:  
Platform for displaying information of certified batteries  
→ [TUVdotCOM portal](#)

# Let us see inside...



Source: Presentation Prof. T. Takamura "Carbon Material in Power Sources". June 2005, ZSW Ulm

# Certification of batteries according to BATSO

## Factory Inspections

- **First inspection** (for each factory manufacturing the certified battery, prior to issuing the certificate): CIG 022 / 023 plus BATSO requirements
- **Annual inspection**: CIG 022 / 023 plus BATSO requirements
- **Check items**: (examples, in addition to CIG 022 / 023)
  - Incoming Quality Control of critical components and materials
  - Handling and storage of components and materials
  - In-process Quality
  - Control of critical operations
  - Packaging for (air) transport
  - Outgoing Quality Control
  - Regular production tests and control of records
  - Test items:
    - a) Weight check
    - b) Visual inspection
    - c) Short-circuit test
    - d) Overcharge test

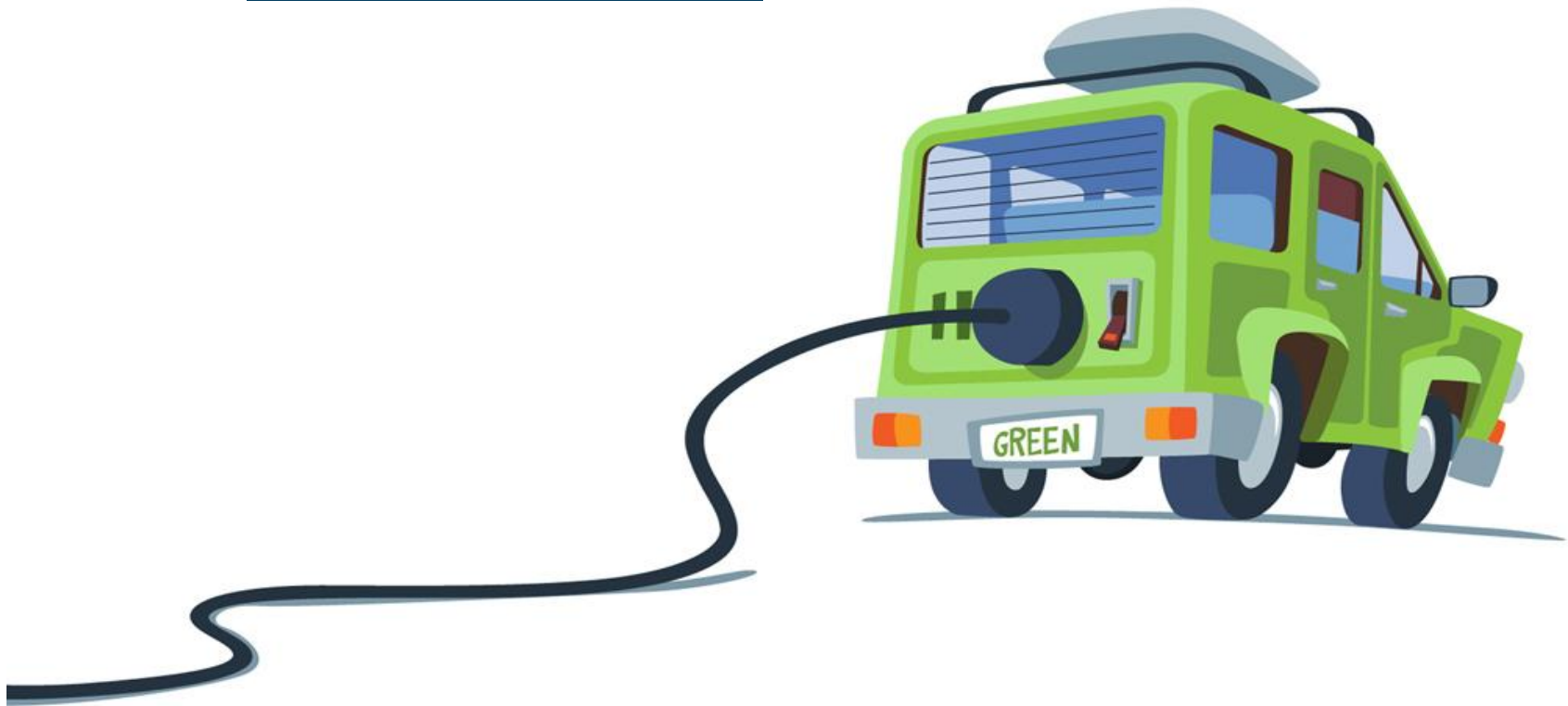
# Certification of batteries according to BATSO

## Documentation

- **BATSO certificate**

Zertifikat	Certificate		
Zertifikat Nr. Certificate No. QB 60026877	Blatt Page 0001		
Ihr Zeichen Client Reference Refer.	Unser Zeichen Our Reference 0001-- 01234567 011	Ausstellungsdatum 15.01.2010	Date of Issue (day/month/yr)
Genehmigungsinhaber License Holder Dummy Core 1 TRPS Nicht zur Verrechnung Am Grauen Stein 51105 Köln Deutschland		Fertigungsstätte Manufacturing Plant Dummy Core 1 TRPS Nicht zur Verrechnung Am Grauen Stein 51105 Köln Deutschland	
Prüfzeichen Test Mark 	Geprüft nach Tested acc. to BATSO 01:2008/03.08 		
Zertifiziertes Produkt (Geräteidentifikation) Certified Product (Product Identification)	Lizenzentgelte - Einheit License Fee - Unit		
<u>Akkumulator</u> Lithium Battery			
Type Designation:	Rated Voltage:	Rated capacity:	
Test Model	DC 37V	10Ah	
The labelling requirements acc. to EU Directive 2001/95 have to be observed for distribution within the EEA.			
ANLAGE (Appendix): Anlagen			
Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde. Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht. This certificate is based on our Testing and Certification Regulation. The product fulfills above mentioned requirements, the production is subject to surveillance.		Zertifizierungsstelle	
TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg Tel.: +49 221 806-1371 e-mail: cert-val@tly@de.tuv.com Fax: +49 221 806-3935 http://www.tuv.com/safety		 Dipl.-Ing. A. Klinker	

Thank You!  
[Tim.Schaefer@li-tec.de](mailto:Tim.Schaefer@li-tec.de)



**Annex**



## ■ Summary BATSO A

- BATSO furthermore provides guidance to the international and constantly changing shipping regulations which are very complex.
- Based in general on principles of ISO / IEC 17025 (General requirements for the competence of testing and calibration laboratories) apply, and optional design review and testing program prior to testing were introduced.
- Inspection procedures were introduced into BATSO including first inspection (for each factory) combined with annual factory inspection (check items specific for battery industry, re-testing).

## ■ Summary B

- Criteria No thermal runaway in the event of crash, No explosion/rupture or flying parts
- BATSO suitable for (L)EV application and HEV up to several KW but, indeed
- Other actual applicable standard for EV Li-Ion battery like SANDIA, SAEJ2464 and criteria Eucar hazard level:
  - No correlation between crash force and battery weight,
  - Classification of risk potential...
- Amendments, new standards will be launched soon,

