4th EVS meeting in Beijing

Safety Standards of EV and battery in China

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## Safety Standards on vehicle level in China

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>equivalent</th>
<th>status</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Part 2: functional safety means and protection against failures</td>
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<tr>
<td></td>
<td>Part 3: Protection of persons against electric hazards</td>
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<tr>
<td>GB/T 19751-2005</td>
<td>HEV safety requirement</td>
<td>/</td>
<td>valid</td>
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<tr>
<td>GB/T 24549-2009</td>
<td>FCV safety requirement</td>
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Safety Standards on vehicle level under development in China

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<thead>
<tr>
<th>No.</th>
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<th>equivalent</th>
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<tbody>
<tr>
<td>GB/T XXXX</td>
<td>Post crash requirement for EV</td>
<td>ISO 6469.4 ECE R94, R95</td>
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</tbody>
</table>
Research object of battery safety

Material, production process the basic safety

Modularization Increase protect

BMS, relay, fuse, case, System protection

Overall arrangement, passive/active protection, thermal management, communication, functional safety

Battery safety is achieved through layers of protection.
Research object of battery safety

- Battery safety involves interactions from cell component to the whole vehicle level.
- Unsafe cell is hard to be made into a system by the use of a design or operating parameters that can ensure highly reliable and safe system.
- An apparently robust cell can fail due to the improper choice of module/pack system parameters.
- Cell/battery manufacturers and vehicle OEMs should work very closely together to ensure the safety of battery system.
- The safety standards of battery should include cell, module, back/system, vehicle level.
## Battery safety standards published in China

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>QC/T 741-2006</td>
<td>Ultra-capacitors for electric vehicles.</td>
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<tr>
<td>QC/T 742-2006</td>
<td>Lead-acid batteries for electric vehicles</td>
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<tr>
<td>QC/T 743-2006</td>
<td>Li-ion battery for electric vehicles</td>
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<tr>
<td>QC/T 744-2006</td>
<td>Nickel-metal hydride batteries for electric vehicles</td>
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<tr>
<td>GB/Z 18333.2-2001</td>
<td>Zinc-air batteries for electric road vehicles</td>
</tr>
<tr>
<td>QC/T 897-2011</td>
<td>Technical specification of Battery Management System for Electric vehicles</td>
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battery safety standards under development

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<tr>
<th>GB/T XXXX</th>
<th>Electrically propelled road vehicles — Test specification for lithium-ion traction battery packs and systems — Part 3: Safety requirement</th>
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<td>Zinc-air battery</td>
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Overview of battery safety standards

- IEC 62660-2, -3
- ISO 12405
- ECE R 100

- cell
- module
- pack
- system
- case
- BMS

- QC/T 741 super capacitor
- QC/T 742 lead acid
- QC/T 743 li-ion
- QC/T 744 NiMH
- QC/T XX Zin-air

- GB/T XXX pack /system safety requiremtns

- QC/T 897 BMS
- QC/T XXX case
Thank you for your attention