

**SAE INTERNATIONAL**

# **STATUS OF SAE G-27 LITHIUM BATTERY PACKAGING PERFORMANCE COMMITTEE**

Presented to International Aircraft Systems  
Fire Protection Working Group  
Toulouse, France  
May 19, 2016

Doug Ferguson, Co-Chair G-27 Committee  
Claude Chanson, Co-Chair G-27 Committee



## SAE Technical Committee Members:

- **Function as individuals and not as agents or representatives of any organization with which they may be associated.**
- **Governmental employees participate in accordance with government regulations.**
- **Maintain balance among various interest groups (user, producer, general interest)**

# Committee Charter

Draft posted under Committee Work Area of G-27 website, <http://www.sae.org/servlets/works/committeeHome.do?comtID=TEAG27>

SAE Standards Works

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## G-27 Lithium Battery Packaging Performance Committee

Main    WIP    Documents    Committee Work Area    Roster    Ballots    Email    SAE Members Only

Resources	Manage	Upcoming Meetings	Manage	Minutes and Presentations	Manage
<ul style="list-style-type: none"><li><a href="#">Aerospace Council Organization and Operating Guide</a></li><li><a href="#">Awards</a></li><li><a href="#">Document Development and Sponsor Guidelines</a></li><li><a href="#">Document Sponsor Checklist</a></li><li><a href="#">FAQs</a></li><li><a href="#">New Project Request Form</a></li><li><a href="#">Participation Request</a></li><li><a href="#">SAE Standards eNewsletters</a></li><li><a href="#">TSB Governance Policy</a></li><li><a href="#">Reference Tools</a></li><li><a href="#">Virtual Meetings - A Best Practice Guide</a></li><li><a href="#">SAE Standards Works Guidelines</a></li><li><a href="#">Committee/Systems Group Chairman's Workshop (June 2012)</a></li><li><a href="#">Committee Quad Charts</a></li><li><a href="#">Organizational Chart</a></li><li><a href="#">SAE Request for Permission to Reprint Material</a></li></ul>		<p><b>February 1, 2016</b> WebEx/Conference Call, PA United States</p> <ul style="list-style-type: none"><li><a href="#">Registration</a></li><li><a href="#">Meeting Information</a></li></ul> <p><a href="#">Send Meeting Notification &gt;</a> <a href="#">Send Updated Meeting Notification &gt;</a> <a href="#">Notify Unregistered Members &gt;</a></p>			

SAE Staff Representatives: [Jordanna Lehman](#)

# Standards Development Process

- **Writing Team develops strawman (~20 people)**
- **Draft standard circulated to entire G-27 committee (over 160 people) for review**
- **Balloting process involves all stakeholders with opportunity to comment on draft**

# Standards Development Process

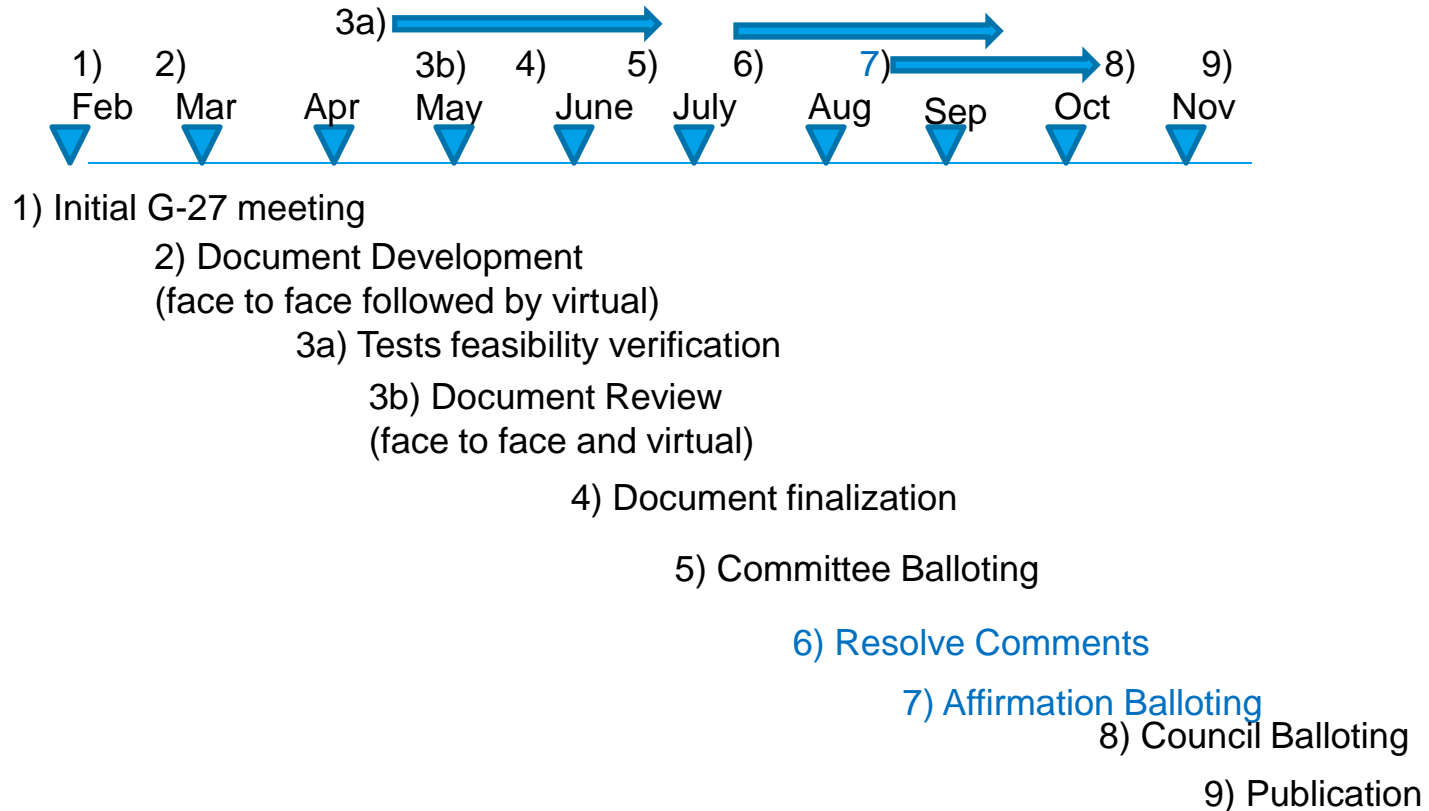
- One telephone conference meeting/month since February
- Draft standard writing team of ~20 people met for one week face-to-face in March.
- Preliminary draft of AS6413 on SAE G-27 website for comments
- Face to face meeting of G-27 committee May 19-20 in Toulouse, France
- Writing team meeting in June at FAA Tech Center to finalize draft with incorporation of G-27 comments and lessons learned from Tech Center testing.

## Writing Team

**Approximately 20 individuals with standards and test experience balanced with geographic representation from the following stakeholders:**

- Aircraft cargo fire protection specialists**
- Regulatory authorities**
- Operators**
- Pilots**
- Packaging manufacturers**
- Battery manufacturers**
- Test houses**

# Optimistic Projected Timeline



## The specific aircraft level hazards addressed within this standard would be:

- a) uncontrolled fire; and
  - b) rapid overpressure pulse within a cargo compartment.
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- The package will be placed in a transparent box with a [0.3] m<sup>3</sup> free volume that will contain the gases generated from Thermal Runaway (TR). The box will have a rapid overpressure opening that will be sealed with a rupture foil. A spark ignition source will be energized continuously within the box volume, capable of igniting vapors reaching a flammable concentration within the box.
  - For testing individual cells, use a heat source (tape, cartridge, etc) to create a temperature rise at a [terminal base] at [5 to 10 C/minute]. Monitor [both terminals] and hold at 200 C as measured at the [coldest terminal base] for 1 hour, unless there is clear external evidence of cell (TR).
  - For testing batteries, the goal is to use the same methodology applied to a single cell within the battery, but there may be more than one single method for triggering TR, depending on the battery type and construction.



- The pass test criteria shall include evidence of:
  - Non-hazardous flame:
    - A flame exiting the package under test that does not contain sufficient energy to ignite adjacent packages.
    - Evidence a flame is non-hazardous may include a short duration [less than 3 seconds] flame not capable of igniting cardboard or fibreboard at a distance of [5] cm from the source of the flame.
  - Non-hazardous Fragment:
    - A fragment that has exited the package with insufficient energy to pass through or ignite adjacent packaging.
    - Evidence of a non-hazardous fragment may include a fragment not capable of igniting or passing through a UN Packaging cardboard or fibreboard package at a distance of [5] cm from the package under test.
  - Non-hazardous Surface temperature:
    - Temperature measured at center of each package surface will not exceed a peak maximum temperature of 200 C for [3] minutes with a tbd minute integrated average not to exceed 150 C.
  - Non-Hazardous Quantity of Flammable Vapor:
    - Evidence of a non-hazardous quantity of flammable vapor will be no rupture of the foil panel of the containment box.

# QUESTIONS?

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