Magnesium Elektron

SERVICE & INNOVATION IN MAGNESIUM

Magnesium in Aircraft Seats

SAE Update

International Aircraft Materials Fire Test Working Group

October, 2015 Meeting

Atlantic City, New Jersey, USA

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LUXFER GROUP

ENVIRONMENTAL • HEALTHCARE • PROTECTION • SPECIALITY

Authorities Update

- FAA
- SAE
- EASA

FAA - Current Status

- FAA allow Mg Installation certification using Special Conditions provisions – June 2013
- FAA Magnesium Test Method added to Fire Safety Group Handbook October, 2014. New Chapter created for purpose: Chapter 25 Oil Burner Flammability Test for Magnesium Alloy Seat Structure
  http://www.fire.tc.faa.gov/pdf/handbook/00-12_ch25.pdf
- FAA concerns about testing coatings resolved with simple solution, Chapter 25 method modified.
- Handbook updated July 2015 to include these changes.

EASA – Current Status

- Proposed Special Condition D-32 "Use of Magnesium Alloys for Passenger Seat Components (Applicable to Airbus A350-941)" initiated with EASA.
- Final Special Condition issued to Airbus June 2015, but not yet published.
- Airbus SC names 5 seat parts specified in Chapter 25 method plus tray table arm.

Status of the magnesium ban contained in:

SAE Aerospace Standard – AS8049B

"Performance Standard for Seats in Civil Rotorcraft, Transport Aircraft, and General Aviation Aircraft"

Para: 3.3.3 Magnesium alloys shall not be used

Custodian – SAE Aircraft Seat Committee

SAE AS8049

SAE AS8049 - Aircraft Seat Standard

Evil Para 3.3.3 "Magnesium alloys shall not be used."

- AIR6160 technical case for Mg alloy ban removal - published May 2014
- AS8049C Para 3.3.3 re-worded to allow magnesium in seat structure
- AS8049C revision passes Seat Committee ballot unanimously May 2015
- AS8049C published, August 14, 2015
- AS8049 magnesium ban removed

Applause!

Problem:

OH?

FAA Minimum Performance Standard for Aircraft Seats TSO-C127b, does not align with the new SAE Standard AS8049C

FAA & SAE Summary

TSO – C127

- TSO-C127b issued in June 2014.
- References SAE Standard AS8049B containing Mg ban not AS8049C with ban removed.
- Ban will not be fully erased until TSO-C127c is issued. Timing uncertain.

However:

- Deviations to TSO-C127b are achievable and made more accessible with the inclusion of the Mg test method (MOC) in the Fire Testing Handbook.
- TSO deviation approval is further eased with AS8049C publishing.
- Harmonization Workshop held by EASA June 17 to detail FAA/EASA agreement to allow reciprocal acceptance of each others TSO/ETSO's.
- Agreement signed September 29, 2015.

But wait……..

Just when you thought it was safe to go back in the water?

A new peril appears:

What?

Again!

Where?

AS8056, Section: 3.2.1.8: Magnesium Alloys Shall Not Be Used

FAA & SAE Summary

SAE AS8056 *Minimum Design and Performance of Airplane Galley, In-Flight Carts, Containers, and Associated Components*

- Section 3.2.1.8 – "Magnesium alloys shall not be used"

TSO – C175 Galley Carts, Containers and Associated Components

SAE S-9 Cabin Safety Committee – Custodian of AS8056

S-9 ban in AS8056 is due to the fire concerns Mg presents and no regulatory agency accepted method to mitigate this fire concern. Current TSO C175 utilizes AS8056 as the MPS basis hence the TSO also bans the use of Mg by reference.

S-9 will work with recommendations stemming from ongoing FAA magnesium evaluations for applications other than seats if a clear path for type certification/airworthiness approval for these components is established.

FAA & SAE Summary

Thank you for your kind attention

Happy Halloween