



Magnesium Elektron

SERVICE & INNOVATION IN MAGNESIUM



Magnesium in Aircraft Seats SAE Update

**International Aircraft Materials
Fire Test Working Group**

June, 2015 Meeting
Bremen, Germany

Bruce Gwynne – VP Divisional Strategic Development



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The FAA and Where We Stand Today

FAA Full-Scale Test Report Issued January 2013(DOT/FAA/AR-11/3)

DOT/FAA/AR-11/3

Federal Aviation Administration
William J. Hughes Technical Center
Aviation Research Division
Atlantic City International Airport
New Jersey 08405

Evaluating the Flammability of Various Magnesium Alloys During Laboratory- and Full-Scale Aircraft Fire Tests

Timothy R. Marker

January 2013

Final Report

This document is available to the U.S. public through the National Technical Information Services (NTIS), Springfield, Virginia 22161.

This document is also available from the Federal Aviation Administration William J. Hughes Technical Center at actlibrary.tc.faa.gov.



U.S. Department of Transportation
Federal Aviation Administration

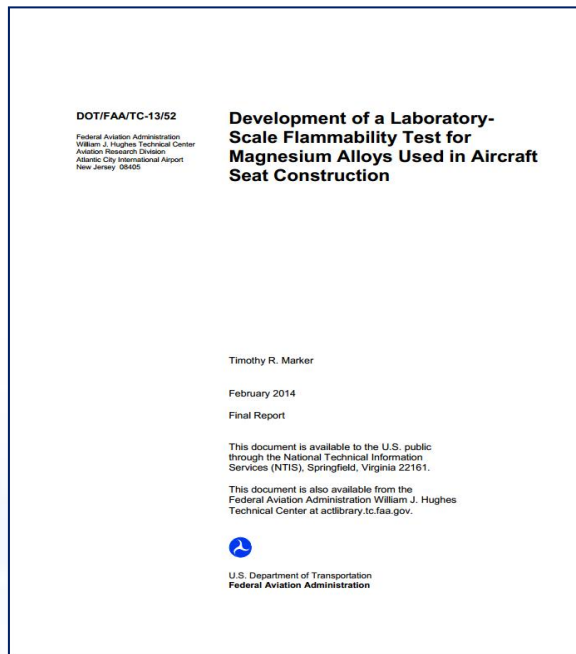


<http://www.fire.tc.faa.gov/pdf/AR11-13.pdf>

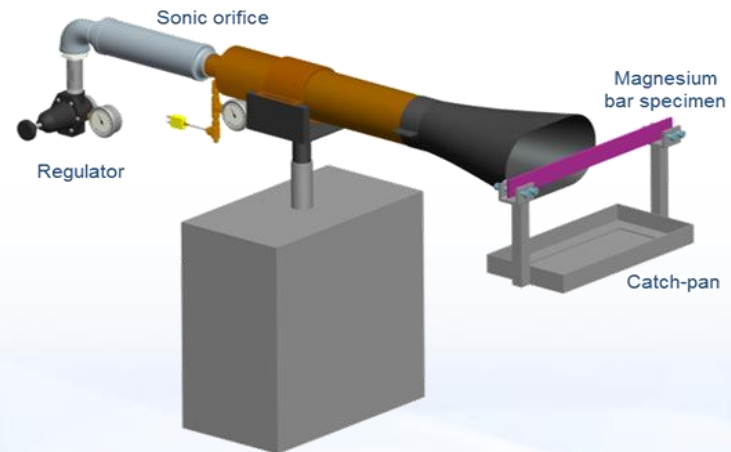


The FAA and Where We Stand Today

- ⊕ FAA Full-Scale Test Report Issued January 2013(DOT/FAA/AR-11/3)
- ⊕ FAA Test Lab-Scale method report and specification now completed, issued February 2014 (DOT/FAA/TC-13/52)



<https://www.fire.tc.faa.gov/pdf/tc-13-52.pdf>



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- ④ FAA Full-Scale Test Report Issued January 2013(DOT/FAA/AR-11/3)
- ④ FAA Test Lab-Scale method report and specification now completed, issued February 2014 (DOT/FAA/TC-13/52)
- ④ Method now added to Fire Safety Group Handbook October, 2014.
http://www.fire.tc.faa.gov/pdf/handbook/00-12_ch25.pdf

Chapter 25

Oil Burner Flammability Test for Magnesium Alloy Seat Structure

25.1 Scope

25.1.1 Applicability

This test method evaluates the ignition resistance and flammability of magnesium alloy when used in the construction of aircraft seat primary structural components by using a high-intensity open flame to show the material adequately resists involvement in a postcrash fire.



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- ④ FAA Test Lab-Scale method report and specification now completed, issued February 2014 (DOT/FAA/TC-13/52)
- ④ Method now added to Fire Safety Group Handbook October, 2014.
http://www.fire.tc.faa.gov/pdf/handbook/00-12_ch25.pdf
- ④ FAA advise Mg Installation certification possible using Special Conditions provisions.



The FAA and Where We Stand Today

- ④ FAA Full-Scale Test Report Issued January 2013 (DOT/FAA/AR-11/3)
- ④ FAA Test Lab-Scale method issued February 2014 (DOT)
- ④ Method now added to Fire <http://www.fire.tc.faa.gov/>
- ④ FAA advise Mg Installation Conditions provisions.
- ④ Proposed Special Condition D-32 “Use of Magnesium Alloys for Passenger Seat Components (Applicable to Airbus A350-941)” initiated with EASA





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



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

Agreed re-wording:

Magnesium alloys ~~shall not be used~~ may be used in aircraft seat construction provided they are tested to and meet the flammability performance requirements in FAA Fire Safety Branch document: Aircraft Materials Fire Test Handbook – DOT/FAA/AR-00/12 , Chapter 25 - Oil Burner Flammability Test for Magnesium Alloy Seat Structure



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 balloted Dec 12, 2014 SAE Aircraft Seat Committee, passes, but comments to be addressed
- ⦿ Re-ballot (limited ballot) end March for May meeting discussion
- ⦿ Ballot passes unanimously, sent to SAE Aerospace Council for formatting and final approval



SAE AS8049

SAE AS8049 - Aircraft Seat Standard

Evil Para 3.3.3 “Magnesium alloys shall not be used.”



⦿ AS8049C issues mid 2015

⦿ AS8049 magnesium ban removed.





But there is a fly in the ointment

New TSO-C127b and new AS8049c don't align!



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.
- ⊕ Deviations to TSO-C127b are achievable and made more accessible with the inclusion of the Mg test method in the Handbook.
- ⊕ TSO deviations will be further eased when AS8049C is published.
- ⊕ FAA will continue to require Special Conditions for installation certification on an aircraft.



FAA & SAE Summary

Thank you for your kind attention



Magnesium Messiah has arisen

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