

The Use of Magnesium in Airplane Interiors

Use of Magnesium in Airplane Cabins

The FAA has had several recent inquiries regarding the use of magnesium in airplane cabins. Specifically, magnesium alloys have been suggested as substitute for aluminum alloys in seat structure. The FAA's central concern regarding the use of magnesium in the cabin is flammability. The current regulations do not address the potential for a flammable metal to be used in large quantities in the cabin. Therefore, if such a material were introduced to the cabin, the **FAA would have to be convinced that the level of safety was not reduced**. Special conditions may be required to establish appropriate criteria. While the FAA are aware that there have been changes in magnesium alloys over the years, magnesium remains a material that, once ignited, presents a fire hazard that is almost impossible to cope with. If there is widespread interest in assessing the potential requirements and data necessary to demonstrate that the level of safety is not reduced, the FAA will work with industry to do that. Both the post crash, as well as inflight, fire scenarios should be addressed. At this point, the FAA does not have any research underway to address the use of magnesium in the cabin.

Magnesium Use in Aircraft Interiors

Points of Discussion

Possible Locations of Magnesium Use

Potential Threats from Various Use Scenarios

Development of Test Protocol Based on Threats

Magnesium Use in Aircraft Interiors

Possible Locations of Magnesium Use

seat components

overhead ducts

galley components

lavatory components

floor components, seat track

Magnesium Use in Aircraft Interiors

Potential Threats from Various Use Scenarios

In-Flight

Electrical arc to magnesium component

Hidden fire adjacent to magnesium component

O₂ canister fire next to magnesium component

Intact components, or shavings?

Consider terroristic threat?

Magnesium Use in Aircraft Interiors

Potential Threats from Various Use Scenarios

Postcrash

External fuel fire entering cabin

Primary concern – safety of passengers

Secondary concern – safety of firefighters?

Magnesium Use in Aircraft Interiors

Development of Test Protocol Based on Threats

Clearly defined threat

Full-scale test findings

Lab-scale test development

Magnesium Use in Aircraft Interiors

Development of Test Protocol Based on Threats

In-Flight Test

Electrical Arc

Size, power, of electrical arc?

Size, shape of test sample?

Pass/Fail criteria?

Magnesium Use in Aircraft Interiors

Development of Test Protocol Based on Threats

Postcrash Test

Oil burner apparatus, what heat flux?

Oil burner apparatus, with or without seat cushion?

Size, shape of test sample?

Duration of test, 2-min or 5-min?

Pass/Fail criteria?

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Discussion?

Transport Airplane Directorate Comments?