

The Use of Magnesium in Airplane Interiors
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Abstract. The airframe industry continually investigates methods of saving weight and reducing fuel consumption. One area that has been discussed is to use magnesium in certain cabin interior areas where aluminum is currently being used, for example the seat frames. Although magnesium is 30% lighter than aluminum, there are safety concerns over its flammability. Once ignited, magnesium is very difficult to extinguish, and current handheld extinguishers used on passenger-carrying airplanes are ineffective against this threat.

In order to determine the feasibility of using magnesium-alloy in the construction of aircraft seat frames, a series of full-scale tests were conducted. The tests simulated a survivable, postcrash accident in which a fuel fire enters an intact aircraft cabin. The fire quickly involves the cabin materials in the immediate vicinity of the fire entry point, and spreads from there. The tests determined if the use of the magnesium alloys resulted in an increase in hazard when compared to the current aluminum alloys in use. Measurements of temperature, gas levels, smoke, and heat flux were measured continuously inside the cabin during the tests. This data was used in an analytical model to help determine the influence of the materials on survivability.