

How Magnesium Alloys are Making Planes Lighter

Siv Padhy - September 28th, 2017

Magnesium alloys were once forbidden for use in airplanes due to flammability concerns, but in recent years the situation has begun to change.

Magnesium has a reputation for being highly flammable, and in the past magnesium alloys were not allowed to be used in airplane interiors.

However, magnesium alloys are a promising alternative to the [aluminum](#) currently used widely in airplane interiors, and in recent years there has been a push for regulators accept magnesium alloys a safe alternative.

The benefits of using magnesium alloys in airplane interiors were outlined in a [2014 article](#) by Marisa Garcia of Runway Girl Network. In the article, Garcia notes that magnesium alloys have advantages over aluminum in terms of stiffness and density, and also have excellent ductility. Those qualities are all “significant considerations” in terms of crash testing.

Magnesium alloys are also highly machinable, making them versatile and reasonable to implement into modern operations, says Garcia. And while they are more expensive than aluminum, they are also up to 50 percent lighter — that means using magnesium alloys could offset the fuel costs associated with flight and help reduce carbon emissions.

Magnesium Elektron's influence

One company that recognizes the advantages of using magnesium alloys in airplane interiors is materials manufacturer Magnesium Elektron, which has invested roughly a decade into working with aircraft manufacturers, seat manufacturers and regulatory bodies across the world to gain acceptance for the use of magnesium alloys in the aerospace industry.

Specifically, Magnesium Elektron has been pressing for changes to provisions of [SAE Aerospace Standard 8049](#) that would allow magnesium to be used in commercial airplanes with 20 or more seats.

In 2013, the company saw indications that it had reached its goal when the US Federal Aviation Administration (FAA) [changed regulations](#) from outright banning magnesium alloys in planes to allowing them under special conditions and flammability testing.

The FAA, as well as the European Aviation Safety Agency (EASA) and the aircraft industry overall, are still working to finalize a framework for the safety of commercial aircraft applications.

In 2014, Magnesium Elektron [announced](#) that Zim Flugsitz, a German manufacturer of seating for the aerospace industry, had begun using the company's proprietary Elektron® 43 alloy in major structural components of aviation seating.

The European technical sales manager of wrought products for Magnesium Elektron commented at the time, “[a]lthough it is still a little early to expect a breakthrough into high-volume applications, this project is an important step and will demonstrate the benefits that Elektron magnesium alloys can bring to future lightweighting strategies for commercial aircraft designers and operators.”

Magnesium Elektron is not the only company singing the praises of magnesium alloys in the production of aviation seating. Keiper Recaro Group has also [argued that there are benefits](#) to using magnesium alloys in airplane seats.

Current developments

Currently, the FAA is developing a new flammability test for magnesium used in inaccessible areas, [according to documents](#) presented to the International Aircraft Materials Fire Test Working Group. EASA is also [revising its special conditions](#) to include fire testing based on the FAA's handbook — the conditions already include safety precautions for both in-flight and post-crash fire scenarios.

To be sure, magnesium alloys are light enough that their use could garner significant advantages in weight reduction for the aerospace industry if they gain widespread traction as an interior construction material. It will be interesting for magnesium investors to watch the aviation space, and to keep an eye on whether the industry can seed greater demand for the metal.

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