



## FLAME RESISTANT MAGNESIUM ALLOYS

- Increased flammability resistance and good mechanical properties
- Flammability resistance certified acc. to the Federal Aviation Administration
- Remarkable cheaper than alloys with comparable flame resistance
- Processability in various casting processes (e.g. high pressure die casting, Thixomolding)

### MATERIALS FOR TOMORROW

Because of its low density, its high specific strength and its almost unrestricted availability, magnesium is a **very popular lightweight material**. It is particularly suitable for applications in the mobility sector when it comes to **weight and emissions reduction**.

Up to now, the applicability of magnesium alloys was limited due to its light flammability. Reason therefore is the oxidation tendency of the alloys.

In a research project, LKR scientists managed it to develop magnesium alloys, which show the capability to self-extinguish in case of a fire.

This improvement in the fire resistance was achieved by means of the specific addition of elements which positively influence the oxidation behavior of the material:

***„Our investigations are focused mainly on alloys containing small amounts of calcium – calcium is cost-effective and widely available. Additionally, rare earth elements can be added to increase specific properties and to create tailored alloys for different applications.“***

Stefan Gneiger, AIT Scientist at the LKR



## BEFORE: MAGNESIUM ALLOYS AZ91 AND AM60



## AFTERWARDS: ADDITION OF CALCIUM AND YTTRIUM



## CERTIFICATION

Passed flammability test according to FAA:

FAA Aircraft Materials Fire Test Handbook, Chapter 25; Oil Burner Flammability Test for Magnesium Alloy Seat Structure

TEST RESULTS:	Sample 1	Sample 2	Sample 3	Conditioning / Calibration
Initial Weight Measured in Grams	<b>210</b>	<b>210</b>	<b>209</b>	<b>Test Passed</b> (min 24 HRS) 21° +/- 3°C 55% +/- 10 % relative humidity in 04.07.2016 15:30 out 24.08.2016 11:00 Please refer to Vauth „LAB LOG“ Ref: <b>No. 13736</b> for detailed calibration results and references
Residual Weight Measured in Grams	<b>210</b>	<b>210</b>	<b>209</b>	
Weight loss Calculated in %	<b>0,00</b>	<b>0,00</b>	<b>0,00</b> (Max. Avr. < 10%)	
Start of Melting (Exposure time sec)	<b>65</b>	<b>67</b>	<b>65</b>	
Sustained ignition (Exposure time sec)	-	-	- (Min. ≤ 120 sec)	
Extinguished (Timed in Seconds)	-	-	-	

**The average weight loss is: 0 % (limit Max .10 %)**

**No ignition**

## APPLICATION

- Arm- and backrests of aircraft seats
- Housings and covers of aircraft engines



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Das **LKR Leichtmetallkompetenzzentrum Ranshofen** ist ein Tochterunternehmen des AIT und forscht an der gesamtgesellschaftlichen Betrachtung des Leichtbaus im Fahrzeugbereich – vom Material über die Prozesstechnologie bis hin zum werkstoffbezogenen Strukturdesign.



Das macht das LKR zum leistungsstarken und unabhängigen Partner für Ihre Entwicklungsprojekte.

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