

## New Materials

The LKR Light Metal Competence Center is a subsidiary of the AIT Center for Low Emission Transport and deals with lightweight metal construction for vehicle transmissions. Research areas include materials, process technology and material-related structural design.

With over 20 years of experience, the 50-person strong team researches materials and process technologies of the future. This research team has achieved some groundbreaking developments, such as aluminium which can be formed at  $-150^{\circ}\text{C}$  and modified light metal alloys in wire form that can be used for additive production. The work of the LKR thus makes an important contribution to the development of efficient, safe and environmentally friendly mobility solutions.

### Ice Cold Aluminium Forming

The lighter a car is, the lower the fuel consumption, meaning less air polluting emissions. With climate protection in mind, it is therefore desirable to focus production efforts on lightweight transport. Aluminium alloys are particularly well suited for lightweight construction. However, until recently aluminium sheets were easily deformed at high temperatures, which in turn changed the microstructure and made additional production processes necessary. During the course of the "KryoAlu" research project, LKR scientists successfully formed aluminium at very low temperatures for the first time.

This not only reduces manufacturing costs, but it also increases flexibility of materials in production. The KryoAl project won the Upper Austrian Regional Prize for Innovation in 2015. In January 2016, the follow-up project "KryoAlu02" was launched, in which the focus is primarily on the industrial implementation of the process and on expanding the range of materials that may undergo the same process. "This globally unique process used at the Ranshofen center means that the production of manufacturing parts can take place at temperatures as low as minus  $150^{\circ}\text{C}$ . We have a complete monopoly of the process involved in this project. This makes it all the more important for us to continue making strides in the development of the process" insists Andreas Kraly, Managing Director of the LKR.

### Materials of Tomorrow

In cooperation with the LKR, the AIT has also committed to researching magnesium. Until



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now, magnesium has been considered highly flammable. However, LKR

scientists have now succeeded in developing flame-retardant magnesium alloys that extinguish themselves in the event of a fire. This specially manufactured alloy has no influence on the mechanical properties and is also significantly cheaper than alloys with a comparable fire resistance. The material also withstands the FAA fire test. Possible applications of this material include armrests and backrests of aircraft seats and cases or covers of aircraft engines.