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## INTRODUCTION

Dear Reader,

Welcome to the fifth edition of Aludrive, the newsletter from the *European Aluminium Association (EAA)*. Aludrive provides readers in the automotive sector with updates on innovations and projects in the aluminium industry directly affecting the automotive sector.

The Automotive Market Group at the EAA is responsible for this newsletter. This group comprises seven aluminium companies that are supplying the automotive industry.

We hope you find it a useful and enjoyable publication. Feel free to forward it and invite others to subscribe.

To either subscribe or provide comments, email us at [auto@eea.be](mailto:auto@eea.be)

## THE AUDI SPACE FRAME (ASF), A WINNING TECHNOLOGY

On 7<sup>th</sup> of May 2008, the European Patent Office and the European Commission unveiled the winners of the European Inventors of the Year 2008 Award. In the category "industry", the trophy went to Audi's Norbert Enning, Ulrich Klages, Heinrich Timm, Gundolf Kreis, Alois Feldschmid, Christian Dornberg and Karl Reiter (Germany) for revolutionising automotive manufacturing by making car frames lighter and safer through the use of aluminium.

In 1993, Audi patented the aluminium car frame system, including respective methods of mass production. Since then, the frame system has been marketed as the Audi Space Frame (ASF) with major success and continuous improvements. Direct benefits of the technology include better fuel efficiency, increased road handling, better cornering characteristics and ease of repair. Tests have proven that the frame's high rigidity also offers better crash protection than steel frames. In terms of durability, aluminium is the only corrosion-free material on the market. With a high degree of pliability, aluminium also offers designers more possibilities for shaping new, more efficient parts.

For further information: [www.epo.org](http://www.epo.org)

After the A8, A2 and TT, the latest ASF application to date is the Audi R8.

The entire body shell of the Audi R8 weighs just 210 kilograms. In terms of lightweight design quality, this is an absolute top figure compared with competitor sports cars: it is based on the ratio of body weight to torsional rigidity, as a function of the vehicle's size.

The structural components of the R8 are moreover made from innovative aluminium alloys; they exhibit superior strength and as such offer scope for further weight reduction. (Source: Audi)



THE EAA WOULD LIKE TO THANK AUDI FOR THE USE OF THE AUDI R8 PICTURE IN THIS NEWSLETTER

## ALUMINIUM SHOCK ABSORBERS SAVE WEIGHT

For more than a century, ZF Sachs, the “Driveline and Chassis Technology” segment of the ZF Group, has been a globally active components and systems supplier and development partner of the automotive industry.

For example, there are several aspects of “intelligent lightweight construction” which can be used to fully exploit the weight saving potential of a shock absorber.

ZF Sachs manufactures lightweight shock absorbers by making the so-called tubular housing out of aluminium instead of steel. “It is possible to save up to four kilos in weight per vehicle”, claimed Raimund Weiffen, Head of Production in this sector.

The round bars used for the outer tubing of the absorbers are supplied by Aleris Aluminum Vogt GmbH and have a diameter between 37 and

54 mm. At the Schweinfurt ZF Sachs plant, they are sawn, annealed, cold rolled, coated, heat-treated and, in some cases, lightly machined, and then mounted in various German plants.

The shock absorbers are used in, among others, the 5 and 7 series BMWs, the BMW M5 and the VW Lupo, as well as at Ferrari and Maserati.

Depending on the respective customer demands, ZF Sachs will continue to work on optimising the shock absorbers as well as on their integration and networking in intelligent vehicle systems in order to ensure even greater safety, comfort and driving dynamics.

For further information and full article, as published in Aluscope magazine, please contact [renate.kunz@aleris.com](mailto:renate.kunz@aleris.com)



## COMPLEX ALUMINIUM COMPONENTS FOR NISSAN GT-R

The recently introduced Nissan GT-R features cast aluminium inner-door and rear-seat structures.

The GT-R door was particularly challenging as its size, approximately 1300 by 700 mm, in combination with wall gauges of only 2 – 3 mm, required significant casting capability. Furthermore, Nissan's performance requirements, in particular strength and deformation characteristics, also mandated a highly-engineered alloy.

The sports sedan's rear seat structure also presented its own safety performance challenges, in this case strength and stiffness.

Alcoa's new C-446 alloy for inner door and C-611 for rear seat structure, in combination with the unique advantages of Alcoa's proprietary vacuum die casting process (AVDC) at the company's plant in Soest, Germany, enabled to meet Nissan's needs.

AVDC process enables to "build in" critical reinforcing ribs where enhanced strength is required and to "design in" very specific details to help consolidate parts and streamline assembly.

The weights of the complete door assembly and the rear seat structure have respectively been reduced by 35% and 25% over conventional designs and materials.

For further information, please contact [jaspervan.zon@alcoa.com](mailto:jaspervan.zon@alcoa.com)



## ALUMINIUM CRASH MANAGEMENT SYSTEM FOR MERCEDES-BENZ C-CLASS

Alcan is supplying Mercedes-Benz with an all-aluminium innovative Crash Management System for the new C-Class. Having made its debut in European dealerships, the Mercedes-Benz C-Class is the first car model to use such an aluminium crash management system, featuring crash boxes in-

serted in the front structure of the car for improved safety. The bumper beam and crash boxes are produced at Alcan's Automotive Structures Europe plant in Gottmadingen, Germany.

For further information: [chrystele.ivins@alcan.com](mailto:chrystele.ivins@alcan.com)



## ALUMINIUM LASER-CUT SHAPED BLANKS NOW AVAILABLE FROM ROLLING MILLS

The supply of shaped blanks eliminates the need for the blanking operation in the press shop, avoids investments in blanking tools, optimises material logistics and reduces the cost for handling and transport of process scrap. The quality of the Laser cut edges is excellent, there is no debris and the cut blanks can be directly introduced into the stamping line without further preparation. The possibility to order sheet blanks of any pre-determined geometry is a most valuable asset in the range of products and services offered by Novelis to its automotive customers.

The new, fully automated Laser cutting centre in the rolling mill of Novelis Switzerland in Sierre

extends the cost-efficient supply of shaped blanks to the automotive industry towards larger production volumes of up to 100'000 parts per year and complements the existing four robotised Laser cutting cells in the Nachterstedt plant. With a cutting speed of up to 40 meters per minute, the 5kW CO<sub>2</sub> Trumpf Laser of the Sierre centre allows the fabrication of up to 2.2 million shaped blanks per year with a maximum dimension of 4 meters in length and 2.2 meters in width.

For further information, please contact [automotive@novelis.com](mailto:automotive@novelis.com)

## NEW LINE FOR EXTERIOR BODY SHEET

Hydro will soon upgrade its supply to carmakers with aluminium strip for exterior body applications. Currently, a new annealing line is being built at the rolled products plant in Grevenbroich, Germany - ready to deliver special AlMgSi qualities for exterior body sheet.

Additional customer contracts are signed. The new line should be operational during second half of 2008.

Exterior body sheet is expected to be the fastest-growing segment in rolled aluminium products for the automotive industry.

For further information, please contact: [michael\\_peter.steffen@hydro.com](mailto:michael_peter.steffen@hydro.com)

## BROCHURE "ALUMINIUM IN CARS"



The new brochure "Aluminium in Cars" highlights the numerous advantages of aluminium applications in passenger cars.

The brochure can be downloaded from the website: [www.aluminium.org](http://www.aluminium.org)

## FRICTION STIR WELDED TAILORED BLANKS

The friction stir welding process produces low stress joints of consistently high quality in a wide range of alloys, material conditions and thicknesses. No wonder that AUDI has chosen this joining technology for an aluminium tailored blank which is used for the centre tunnel of the Audi R8 Le Mans.



For this part, Novelis supplies an Ecodal-608 PX sheet (pre-aged T4 temper) with a thickness of 1.7 mm and an Ecodal-608 2.4 mm (T4 temper). The sheets are joined by friction stir welding by RIFTEC GmbH, Geesthacht and subsequently formed by Metallwarenfabrik Reichertshofen Karl Binder GmbH. The special characteristics of the friction stir welded joint enable the forming of the final part without problem. The alloy Ecodal-608 (AA6181A), the supplied tempers and sheet thickness were specifically chosen to guarantee the required final mechanical characteristics of the part.

For further information, please contact [automotive@novelis.com](mailto:automotive@novelis.com)