

Leichtbaupotenzial eines
aluminium-intensiven Fahrzeugs

The Lightweight Potential of an Aluminium-Intensive Vehicle



The developments in automotive body manufacturing are being more and more dominated by the question of lightweight design. The aim is not only to compensate for the increase in weight due to the rising numbers of comfort and safety functions but also to counteract the general trend towards weight increase in recent years. What is more, cutting fuel consumption and emissions also plays an important role. This article by the fka and the members of the European Aluminium Association (EAA) presents the investigation of the lightweight potential of aluminium for a compact car in steel design.

1 Introduction

The use of aluminium in passenger cars has risen continuously in recent years. In 1998, the average amount of aluminium in a car was 85 kg. It is estimated that this rate will increase to 130 kg per car by the year 2008 [1]. Many aluminium applications can already be found in the engine, drive train and chassis. Aluminium is primarily used in luxury class cars. In the Mercedes CL, for example, a large number of aluminium components are used in the body, especially in outer blanks. The BMW 3-Series uses aluminium among other materials as castings in the front end. Chassis parts in the

Audi A4 and the Porsche Boxster are made of forged and cast aluminium. In the Mercedes A-class, the bumper cross members and the dashboard member are made of aluminium. There are also cars made completely of aluminium. These include, for example, the Audi A2, Audi A8, BMW Z8, Ferrari 360 Modena and Honda NSX.

In this theoretical study, the lightweight potential of aluminium in today's vehicle technology is analysed, **Figure 1**. An estimate is made of the weights in an aluminium-intensive design, including all relevant components in a compact-size car. The result is the weight estimate of an aluminium-intensive vehicle, taking into consider-

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