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Application of Aluminium in Automotive Structure and Hang on parts

Markus Pfestorf, BMW GROUP, Munich
Peter Mueller, BMW GROUP, Munich

Summary

Aluminium is used by many car manufacturers for weight saving, especially for the Closures such as the bonnet, fenders and doors. In the following, the application of aluminium in the bonnet, fenders and selected structural parts in the new BMW 7 series is described. To ensure the quality of a part in the manufacturing process and to fulfil the demands during the lifetime, totally different alloys are used. This is mainly divided into 6xxx materials for skin panels and for 5xxx materials for inner and structural panels. Due to the small hemming radius of the outer panels a 6xxx alloy is used which was developed for these challenging hemming operations. When using 5xxx materials for structural applications, special problems like intercrystalline corrosion must be considered. Due to the sensitivity of Aluminium to adhesive bonding, which is done to increase the stiffness of the assembled components, a Ti/Zr passivation is used. The influence of the Ti/Zr layer to the stiffness of bonding during the lifetime of a car is also described. Another very important issue is the prevention of corrosion of the aluminium, especially in mixed material applications with steel parts. Thus the organic coating Bonazinc is used in some special applications. In the article the advantage of Bonazinc is shown in comparison to uncoated assembled parts during corrosion tests.

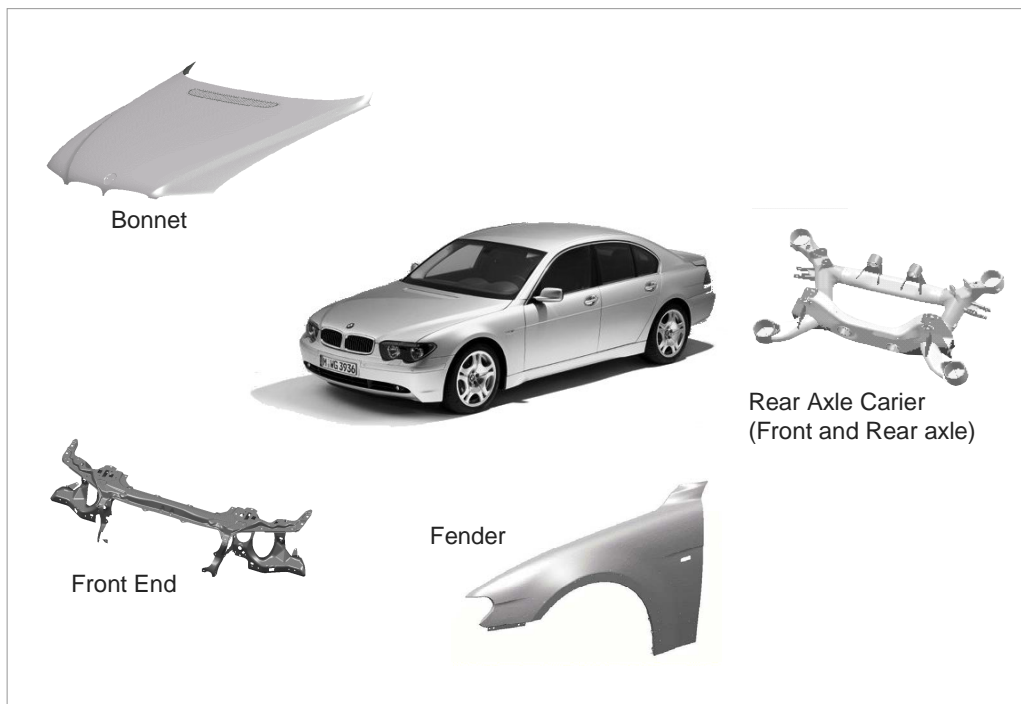


Fig. 1: Major aluminium components of the BMW 7 series