



UK Aluminium Industry Fact Sheet 1

Aluminium in Transport

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Introduction

Aluminium is a strong, durable and lightweight metal. In today's energy-conscious society, these three basic properties combine to make the metal the preferred material of construction for transport applications, where weight reduction to reduce fuel consumption and to increase load carrying capacity is vital. Products like motor cars, aircraft, ships, lorries and trains are all obvious examples. It is not surprising therefore, that the use of aluminium in all its various forms - plate, sheet, extrusions, castings and forgings - is increasing across the whole range of transport applications.

At present over 130 kgs of aluminium goes into the average European car, and this is rising steadily. Little over a decade ago the figure was under 100 kgs. This is driven by the desire to make our vehicles more fuel efficient. Typically, a component designed in aluminium would weigh about half its steel equivalent. For this reason, there is increasing use of aluminium space-frames, form with extrusions and castings, and also aluminium body sheet.

Whilst the automotive passenger car market is capturing all the headlines concerning aluminium sheet and extrusion uses, other areas of transport are steadily increasing the usage of aluminium in all its forms.

Passenger coaches for rail transport are now virtually all aluminium in construction. On the road, tankers and freight carriers of all kinds are increasingly turning to aluminium for chassis and subframe design. It is estimated that 25% of the aluminium used in transportation is used in road and rail commercial transport; much of this product is in the form of rolled products and extrusions.

In the air, aluminium has been the natural choice for aircraft construction for many years. Indeed without aluminium there would not be a commercial aircraft industry. The European Airbus consortium is a fine example of aluminium usage in aircraft. Their new A380 employs 66% aluminium in the airframe, and the projected range of short and medium haul aircraft where up to 76% of body weight is aluminium, ensures a healthy future.

At sea, the use of aluminium for the construction of ships' hulls and superstructures, is increasing year on year. Modern developments feature new



families of vessels, the so-called high speed ferries, single hulled boats and catamarans, made entirely of aluminium alloy. The largest can carry cars and trucks, and be over 100 metres in length. Shipping gives the most per capita use of aluminium in a single transport item. A 96 metre wave piercing catamaran can contain up to 400 tonnes of aluminium compared to 1 tonne in a large, "all aluminium" car.

Military applications too, are increasingly turning to aluminium as an alternative to steel. Specially formulated high-strength alloys having a combination of light weight and good ballistic properties are now regularly used for vehicles such as armoured troop carriers and mobile rocket launchers.

Recycling

End-of-life vehicle legislation is now developed to optimise recycling of all materials used in cars. Clearly the more aluminium used in the vehicle the more readily will it be recycled and the more profitable does that recycling become since the recovered aluminium metal retains a high value. Current legislation requires that 85% of the vehicle weight is recovered or re-used and this this figure is to be raised. What makes aluminium unique in the recycling aspect of materials used in vehicles is

that it is “closed-loop” recycling, so an aluminium extruded space frame can be recycled back into an extruded space frame, a sheet pressing back to another sheet pressing and a cast block back into another cast block.

For a more detailed look at many aspects of aluminium in transport, we suggest you visit:

<http://transport.world-aluminium.org>

and also www.eaa.net