european aluminium association

FACTSHEET

ALUMINIUM IN TRANSPORT

Introduction

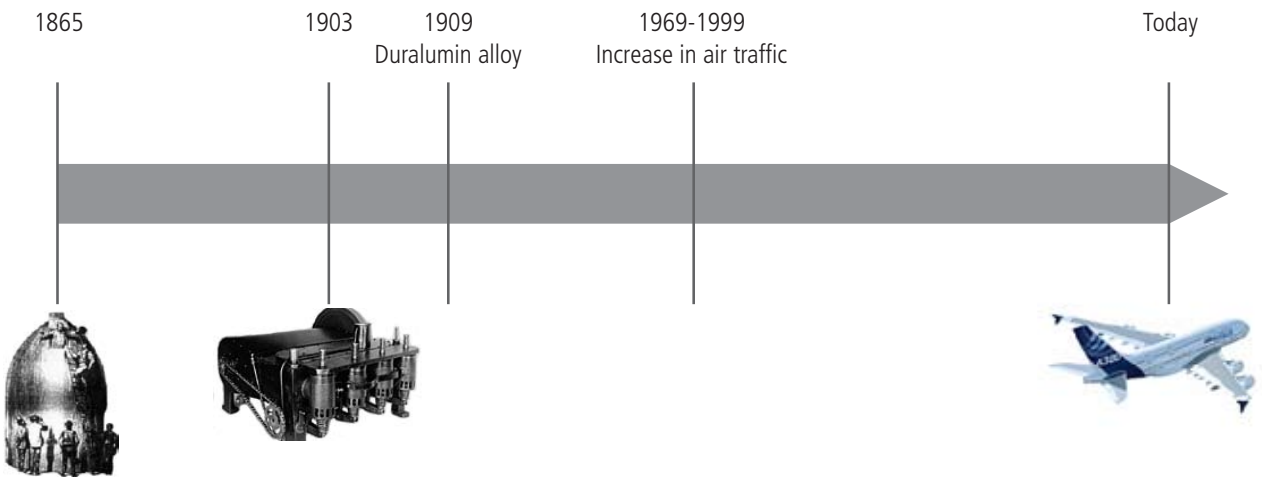
The transport industry plays an important role in the European Union economy. It accounts for 7% of GNP, 7% of jobs, 40% of investments by member states and 30% of energy consumption.

Aluminium use yields, through its contribution to vehicle lightweighting, substantial energy savings and reduced emission and fuel consumption levels in today's environmentally conscious society. Its strength and corrosion-resistance guarantee durability, reliability and security, coupled with cost-effectiveness. Its formability ensures complete flexibility of design and ease of handling, while its flawless aspect promises maximum aesthetic impact. Finally, its total recyclability allows the aluminium industry to fulfil its commitment to the principles of sustainable development and its pledge to future generations.

Air

Ever since Jules Verne sent a man to the moon in an aluminium rocket in his fictitious but prophetic 1865 novel, "From the Earth to the Moon", aluminium's enormous potential has been waiting to be tapped. In 1903, the Wright brothers made aviation history when they achieved the world's first sustained, controlled flight, powered by a lightweight engine made with aluminium components. In 1909, duralumin was created, soon becoming the aluminium alloy of choice for air applications.

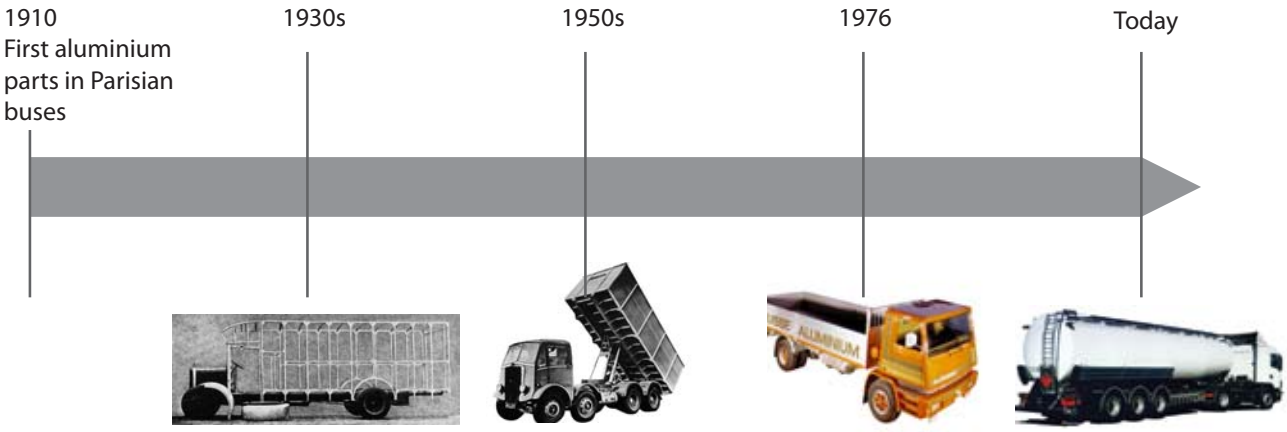
Today, lightweight aluminium accounts for more than 60% of the structural weight of large commercial aircraft, like the Airbus A380, and up to 80% of short- and mid-range aircraft. This constitutes 80% of the market share, making it fundamental to the aviation industry.



Trucks, Trailers and Buses

Having made its debut in Parisian buses in 1910, aluminium was used for a variety of elements in road and rail transport in the 1930s, when the industrial development of components actually began. The 1950s saw the first aluminium tankers, vans and tipping vehicles. For commercial vehicles, traditionally "heavy" vehicles, the advantages of aluminium were put to good use with the manufacture of the first aluminium systems to meet weight-sensitive transport requirements in the 1970s. By 1976, Alusuisse had produced the first all-aluminium truck prototype.

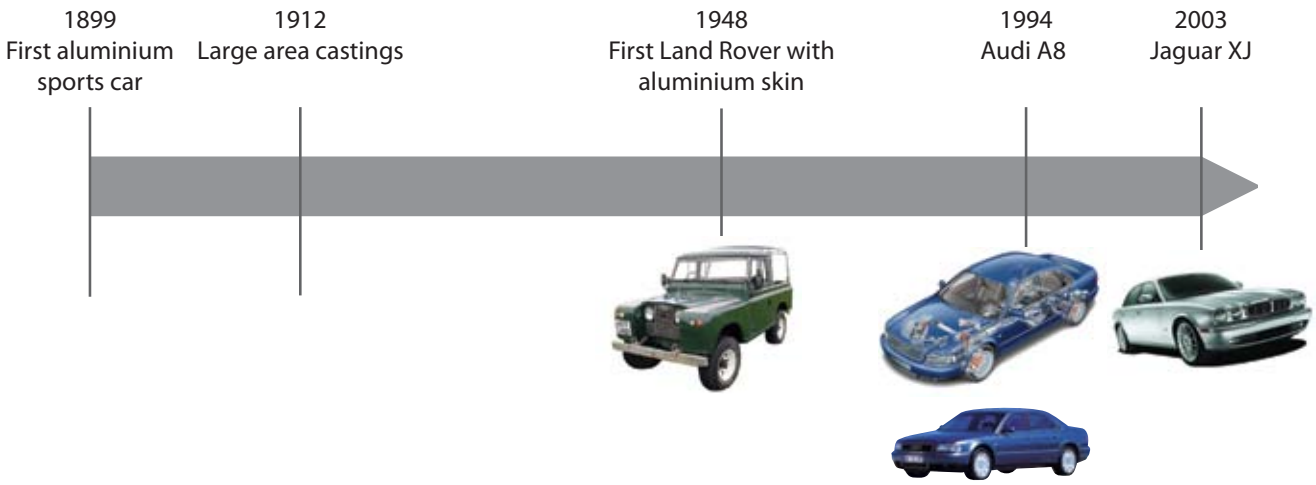
Today, most tankers and silo semi-trailers are made entirely of aluminium. Aluminium is also frequently used for vans, tipping and self-discharging bodies. Without aluminium, the average articulated vehicle would be 800kg heavier.



Automotive

Carl Benz produced the first combustion engine-driven car in 1886. Then, in 1899, a small sports car with an aluminium body was unveiled at the Berlin international car exhibition. In 1948, Land Rover made intensive use of aluminium outer skin sheets and, in 1953, the Panhard Dyna was the first volume-produced car to have an aluminium body. It was in 1965 that large-scale production of aluminium engine blocks began, while 1975 saw accelerated production of aluminium bonnets in US cars, due to stricter fuel consumption legislation resulting from the oil crisis. In 1994, Audi launched the all-aluminium passenger car in its Audi A8, which was followed in 1999 by the A2, geared for high-volume production.

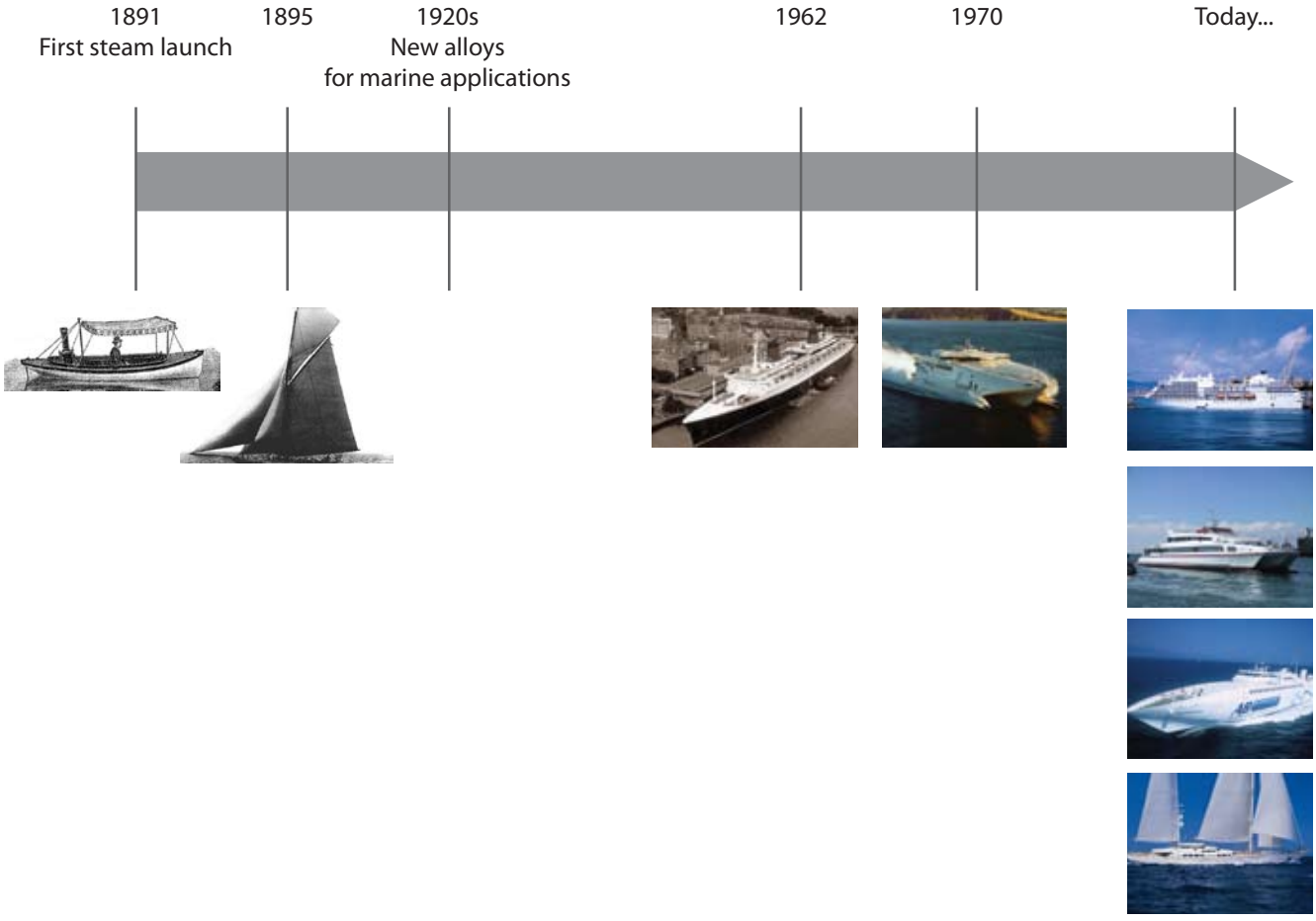
Today, many cars contain surprisingly significant amounts of aluminium, as designers become increasingly aware of the metal's proven advantages. The Peugeot 307, for example, has an aluminium bonnet and the Jaguar XJ is the first all-aluminium body-in-white (BIW-the car's metal structure) to employ structural adhesive bonding as one of its joining methods. Several high-performance sports cars, such as Ferrari and Lotus, are also produced in different variations and grades of aluminium.



Marine

Aluminium was used for boat construction as far back as 1891 in the first steam launch by Escher Wyss, followed in 1894 by the first torpedo boat by Yarrow & Co. In 1895, the alu-skinned "Defender" won the America's Cup. It was in the 1920s that aluminium shipping applications started to expand in both the civil and military domains, due to new alloys becoming available for marine applications. By 1960, aluminium was firmly established in all marine sectors around the globe. In 1962, the "France" was built using 1600 tonnes of aluminium for its superstructure. The first high-speed catamarans were produced in 1970.

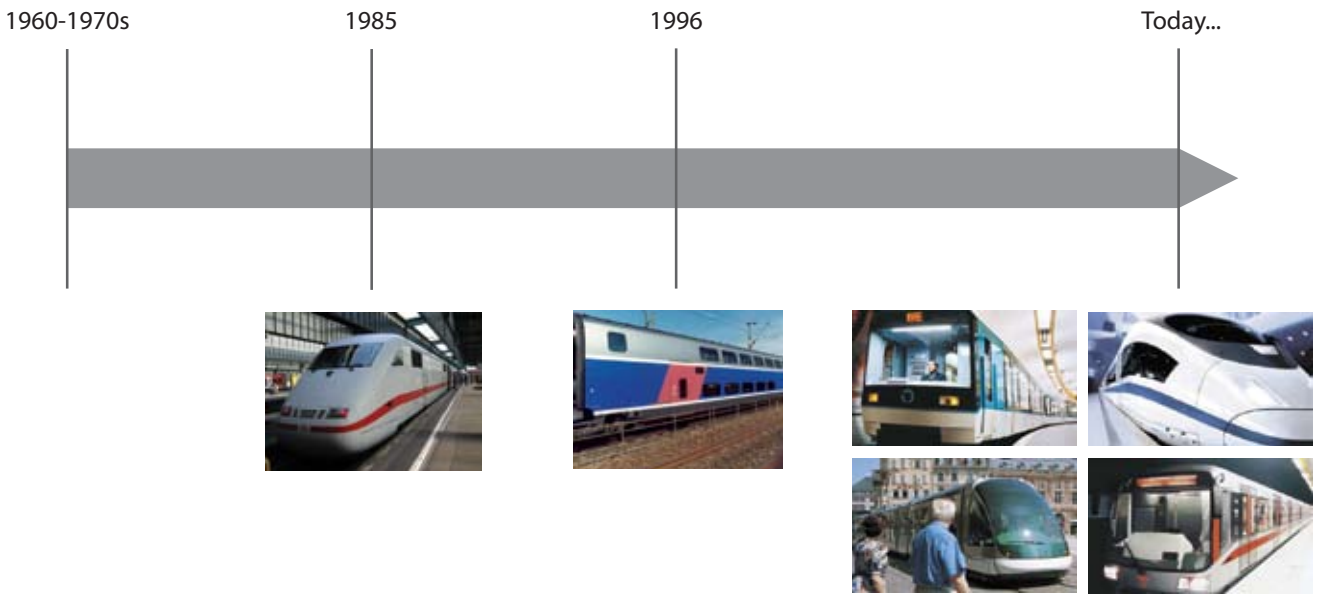
Today, 1000 high-speed passenger ships are in service, most of which have a structure and superstructure made of aluminium. Cruise ship superstructures continue to be made of aluminium, while over half of all yachts have aluminium hulls. These ships take full advantage of aluminium's lightness and strength, as well as its other indispensable property for marine environments, corrosion-resistance, significantly reducing maintenance costs.



Rail

In the 1960s, aluminium was used in the niche market for cog railways. Then, in the 1980s, aluminium emerged as the metal of choice in the rail sector with the introduction of high-speed trains, which benefited from lower running costs and improved acceleration. In 1996, the TGV Duplex train was introduced, combining the concept of high speed with that of optimal capacity, transporting 40% more passengers while weighing 12% less than the single deck version, all thanks to its aluminium structure.

Today, aluminium metros and trams operate in many European capitals and aluminium intercity trains are used all over Europe.



For further information, please contact us or go to our website:

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Thanks to its unique properties, aluminium is able to provide intelligent solutions for present and future generations. It is lightweight yet strong, durable and corrosion-resistant, formable, highly conductive, aesthetically pleasing and, above all, recyclable. The European Aluminium Association, founded in 1981, represents the European aluminium industry, from alumina and primary production, to manufacture of semi-finished and end-use products, right through to recycling. This industry currently employs around 255 000 people in Western Europe.