

AGV™

Performance and modularity

> The challenge

Air transport currently presents travellers with numerous problems, from extended check-in times to overcrowded airports. The challenge for very high speed rail travel is to offer a commercial service speed of 360 km/h, passing the threshold of 1,000 km in three hours to further increase the appeal of train travel over other modes of transport.

Pressure on energy costs have also led rail operators to demand exceptional cost performance. The ratio between train capacity and energy consumption has, as a result, become a decisive market factor.

Alstom has developed a new generation of very high speed trains, AGV (Automotrice Grande Vitesse), to meet these new requirements.

> The concept

Designed to travel at 360 km/h, the AGV is the first train in the world to combine articulated architecture with distributed power. The principle of the articulated train set is based on a design that places bogies between the cars. This technique, which has ensured Alstom's success for 25 years, eliminates much of the vibration and rolling noise on board, cushions movement between cars, optimizes aerodynamic performance, guarantees maximum security, and reduces maintenance costs by 15%. The distributed power principle spread along the train increases on-board capacity by 20%.

The combination of articulated architecture, composite materials, and improved traction systems have made it possible to reduce the mass of the AGV by 70 tonnes compared to competitors' trains. The AGV is therefore particularly efficient from an environmental point of view, consuming 15% less energy.

Distributed power also offers the advantage of modularity in relation to car numbers. Based on an AGV range comprising between 7 and 14 cars, each operator can built up a fleet to match their capacity requirements.

> Key figures

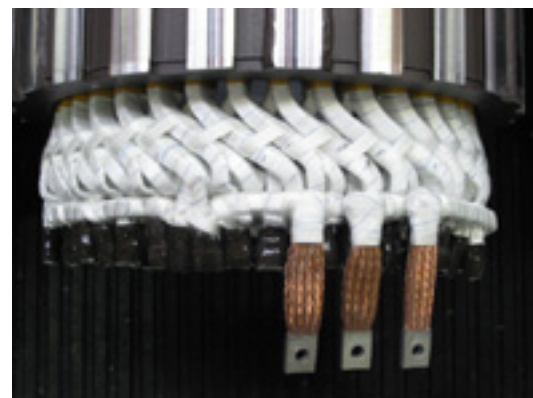
- **Modular design:** 7 to 14 cars (130 to 250 m)
- **Seats:** 250 to 650
- **Mass:** 270 to 510 tonnes
- **Power:** 6,000 to 12,000 kW (22 kW/t)
- **Traction equipment:** Quadri-voltage 25 kV 50 Hz / 15 kV 16.7 Hz / 3 kVdc / 1.5 kVdc, water-cooled IGBT traction converters, permanent magnet motors



The sleek and fluid design of the AGV is based on the aerodynamics principles. It stands out on account of an elongated profile of the front-end.



The AGV's powered bogie formed part of the traction system for the train that broke the world rail speed record by travelling at more than 574.8 km/h on 3 April 2007.



Advances in the electrotechnology field relating to permanent magnetic motors has enabled Alstom to significantly reduce the mass and volume of the AGV's traction equipment.