

AGV (Automotrice à Grande Vitesse) [High-speed Self-propelled Train]



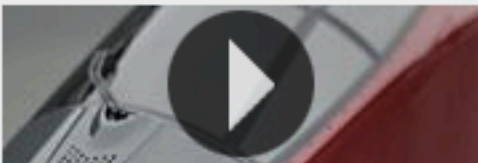
AGV (automotrice à grande vitesse) [high-speed self-propelled train], model. Alstom Design and Styling Studio, Alstom Transport. France, 2006–present. Courtesy of Alstom

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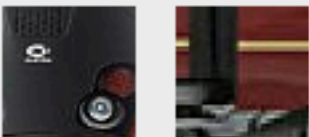


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Trains are among the most sustainable forms of transportation, and currently there is great international interest in replacing air and automobile regional travel with fast trains. The AGV, designed in France by [Alstom Transport](#)'s Design and Styling Studio, is at the forefront of high-speed, energy-efficient trains being produced for fast and reliable medium-distance service between major cities. In 2011, the new, privately owned Italian train company Italo will introduce the AGV and provide rail service between Naples and Turin. The 350-mile trip will last about three hours, and the train will travel at speeds of up to 225 miles per hour.

The AGV's design differs from those of conventional trains in a number of respects. Ninety-eight percent of the train is built from recyclable materials, such as aluminum, steel, copper, and glass. Its low weight and efficient traction systems make for a 15% reduction in energy use compared to current trains. The AGV is the first train powered by compact and energy-efficient permanent magnet synchronous motors, which create electricity and minimize energy

loss. It also produces its own electricity from a regenerative braking system: while the train is slowing down, up to eight megawatts of unused electricity is returned to the train's power network. The train's architecture offers both energy savings and improved safety: by locating the bogie between, rather than under, cars, there is no accordion effect in case of derailment.