

Alstom has a long **history of innovation and commitment to Spain's economic and industrial development**, and is also one of the main players in the mobility sector in the country. The company employs more than 3,000 people in the country. Among others, Alstom has an industrial plant in Barcelona dedicated to the manufacture of all types of rolling stock, a propulsion systems factory in Basque Country and, in Madrid, different technological innovation centres for the development of projects in the fields of railway safety, signalling, maintenance and digital mobility.



over
3,000 employees

4 R&D Centres

2 Rolling Stock & Components industrial sites

2 JV with Renfe (Irvia and Btren)

27 Sites

A COMPREHENSIVE PORTFOLIO OF MOBILITY SOLUTIONS

Alstom is the only manufacturer and technologist **with local industrial and technological presence for all activities** related to rail transport and sustainable mobility: signalling, infrastructure, train manufacturing, maintenance and digital mobility.



TRAINS AND TRACTION SYSTEMS.

Alstom has one of Europe's most advanced rolling stock industrial plants in Barcelona capable to manufacture all types of trains. In addition, Trápaga (Basque Country) is one of the company's centre of excellence for traction and control systems serving the whole world.



SIGNALLING AND DIGITAL MOBILITY.

Alstom Spain employs over 650 technicians and engineers dedicated to the development and implementation of state-of-the-art signalling and safety solutions for all types of railway infrastructure and rolling stock. The R&D laboratories located in Madrid develop digital solutions to respond to the mobility challenges of the 21st century.



SERVICES

Alstom offers a variety of customised services to public and private operators. The objective is to guarantee optimised, safe and overall management of rolling stock and other railway equipment over their life cycle whether manufactured by Alstom or by third parties: maintenance, renovation, spare parts management, support and technical assistance. Alstom also has its own industrial sites in Getafe and Pinto (Madrid) equipment and components repairs.



INFRASTRUCTURE AND SYSTEMS.

The infrastructure unit provides turnkey projects, integrated systems and other infrastructure solutions: installation of track and electrification systems, maintenance workshops, electromechanical and tunnel safety systems, etc. Barcelona Tramway and APM at Adolfo Suárez airport in Madrid are examples of turnkey projects developed by Alstom's teams in Spain.

INNOVATING FROM SPAIN

- **Barcelona.** The industrial site in Barcelona is developing an ambitious **digitalisation and growth** plan. It includes the application of the latest technologies to design and build the trains of the future, the enhancement of human capital and the development of new production lines with a strong sustainability approach. Furthermore, with a significant portion of its activity dedicated to export over the last decade, the factory is a global benchmark in the manufacturing of urban and suburban vehicles such as trams (Athens, Frankfurt and Sydney, among others), metros (Barcelona, Lima, Panama, Singapore), and commuter and regional trains (Luxembourg, Chile, Spain).
- **Madrid Smart Mobility Lab.** The R&D centre located in Madrid develops and implements innovative mobility solutions, applying the latest technologies available in Smart Data, the Internet of Things (IoT), video analysis, etc. The Mastria multimodal solution has already been applied in five different countries (France, Italy, Panama, Canada and Spain) to improve mobility and passenger flow in cities.



- **HealthHub™.** The Alstom in Spain Services team implements digital maintenance tools, IoT technologies and predictive algorithms with the aim of improving train availability, reducing time spent in workshops and, in short, decreasing the total life cycle costs of urban and intercity fleets. Recently, Alstom has opened in Pinto (Madrid) a site dedicated to digital services with 24-hours fleet surveillance.
- **Leaders in Signalling.** Alstom has installed the first operational ERTMS level 2 systems in Spain and has fitted on-board systems with this technology to over half of the trains operating in our country. In addition, 50% of Metro de Madrid passengers travel under the supervision of signalling systems developed by Alstom's teams in Spain.

A SUSTAINABLE APPROACH.

We promote the transition to sustainable and accessible mobility systems, while managing our operations with a socially responsible business model.



- Alstom **innovates in response to the growing need for sustainable mobility solutions.** Pioneers in hydrogen, Alstom is the only manufacturer to have already developed a hydrogen train and put it into commercial operation.
- The solutions developed by Alstom are designed with a **focus on sustainability throughout the life cycle:** choice of raw materials, manufacturing processes, energy efficiency and recycling.
- Alstom Spain has obtained certification of **compliance with the ISO 26000 standard**, related to integrating sustainable development into the company's strategy. This certification demonstrate the application of the principles of social responsibility in aspects such as company governance, respect for human rights, labor practices, environment, fair operating practices, treatment of consumers, and participation in community development, among others.

FOR MORE INFORMATION:

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MAIN REFERENCES IN SPAIN

One out of every three trains running in Spain was manufactured by Alstom.



Avelia Pendolino for Renfe (S114).

ROLLING STOCK AND COMPONENTS.

TRAINS

- High-speed: Avelia Pendolino for Renfe, Ave S100 for Renfe. Avelia Euroduplex for Ouigo.
- Freight locomotives for Renfe: 100 Traxx locos (S253).
- Regional trains: S 490 – Renfe.
- Metros: Barcelona, Madrid.
- Suburban for FGC (S213 and S113) and Renfe (CIVIA).
- Tramways: Barcelona, Madrid, Tenerife, Murcia, Parla, Jaén, Valencia and Alicante.
- APM (Automated People Mover) Adolfo Suárez Madrid Barajas Airport.

PROPULSION SYSTEMS

- Propulsion systems for Renfe's high-speed trains (AVE S102, AVE S112 and AVE S130/730).
- Propulsion and control equipment for more than 650 Madrid Metro units.
- Propulsion systems for regional trains. FGC (S112, S115) and Renfe(S121 and S120).
- Propulsion and control equipment for the Bilbao Metro.

LATEST AWARDS IN SPAIN – PROJECTS ONGOING

- Design and manufacturing of 152 High Capacity suburban trains for Renfe.
- Installation of APS catenary-free solution on Barcelona Tram
- Design and manufacturing of 10 Coradia Stream regional trains to FGC for Barcelona airport connection

SERVICES. MAINTENANCE.

ROLLING STOCK

- High and very high-speed trains for Renfe: S102, S104, S114, S100, S112, S130/730.
- Very high-speed trains for Ouigo: Avelia Euroduplex.
- Locomotives for Renfe: S252, S253.
- Commuter trains for Renfe : S446, S450, S451, S447, S470 and Civia.
- Metro trains for TMB: S9000.
- Tramways: Barcelona, Madrid and Murcia.
- Traction systems for Renfe: S121, S120.
- Energy management systems for Renfe. S102 S112 and S130.

SIGNALLING

- OPTIFLO signalling for Madrid Metro, Adif network, Barcelona Metro, Bilbao Metro and Seville Metro.
- Signalling systems for Barcelona's suburban trains.

SYSTEMS

- APM Adolfo Suárez Madrid Barajas Airport shuttle system.

MODERNISATION.

- High Speed - Renfe AVE S100. Half life overhaul. Renovation of interior design, adaptation and technology updates.
- High Speed - Renfe AVE S100. Adaptation and validation to operate on high-speed and regular lines in France.
- Commuter trains – Renfe. Accessibility for 165 coaches
- Metro Madrid - Modification of S3000 units to make them dual voltage.
- FGC – S112 – Passenger information System upgrade.



D&IS MAIN REFERENCES IN SPAIN

Leaders in level 2 ERTMS and on-board equipment.



Interlocking laboratory – Madrid

SIGNALLING

ERTMS /ETCS

- Trackside ERTMS Technology in high speed lines. Eje Atlantico* (N1), Valladolid-León-Burgos (N2), Zaragoza-Huesca (N1), Albacete Alicante (N2), Plasencia-Merida-Cáceres-Badajoz* (N2)
- Trackside ERTMS Technology suburban lines: Madrid, Barcelona*, L'Hospitalet-Port Aventura*
- Over 600 ERTMS/ETCS onboard equipment installed in high speed, regional and commuter trains for different manufacturers

INTERLOCKINGS

- More than 100 interlocks in operation. Smartlock 200 and Smartlock 300.
- Interlocks at Chamartín station.

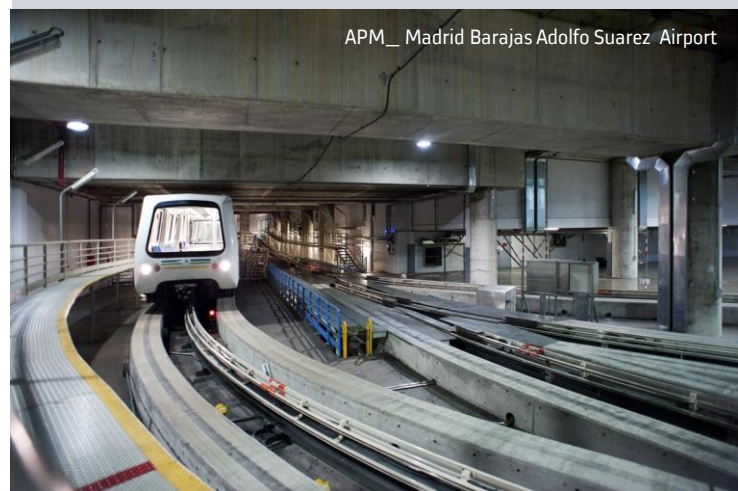
URBAN

- Metro: CBTC Malaga and Madrid.
- Metro: Barcelona, Bilbao and Seville Metro.
- Train- tram: Chiclana-San Fernando train-tram.
- Tramways: Barcelona and Madrid

* Projects on-going

SYSTEMS AND INFRASTRUCTURE.

- Tramway systems: Barcelona, Granada, Parla, Jaén, Murcia.
- Automatic APM system- Shuttle linking terminals T4 and T4S at Adolfo Suárez Airport.
- Electromechanical and safety systems for tunnels on the high-speed network.
- Catenary and electrification for high speed and commuter trains.
- Substations for high speed lines.
- Track and catenary maintenance at Renfe's Integria depots.



APM_ Madrid Barajas Adolfo Suarez Airport



Barcelona Tram System