



# INNOTRANS 2022

Meeting point of the international railway industry



## MAFEX INFORMS

Mafex renews its Steering Committee for the period 2022-2026



## IN DEPTH

The railway, on a path towards universal accessibility



## TRIBUNE

Raquel Sánchez, Minister of Transport, Mobility and Urban Agenda



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Towards carbon neutral steel



ArcelorMittal Rails & Special Sections with production facilities in Poland, Luxembourg and Spain, offers a wide portfolio of products, covering rails for subways, trams, trains, light rails, crane rails, crossings and rail accessories. ArcelorMittal is a specialist in rails for high-speed networks, with over one million tonnes produced and is present in infrastructure projects in over 30 countries. Its high technologic quality allows us to participate in the more demanding tenders all over the world.

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- **Climate Action: XCarb™** will bring ArcelorMittal's reduced, low and zero-carbon products, steelmaking activities, wider initiatives and green innovation projects, into a single effort focused on achieving carbon neutral steelmaking.
- **R&D:** ArcelorMittal operates a dedicated rail research and development unit which includes pilot plants and prototyping facilities. Its Rail Excellence Centre also includes a dedicated welding unit which can provide advice and support for current and future grades for its customers.
- **Digitalisation:** ArcelorMittal Rails & Special Sections is extending its 4.0 transformation with the launch of several digital tools. New Rail Tool version available.
- **Increasing the length of rails:** in order to provide further track safety, welding, track laying and maintenance cost savings.
- **Increasing the service life of rails:** with the most appropriate solutions related to different applications: for Light Rail Transit operators a complete range of Low Carbon Vanadium (LCV) grades of grooved rails; for ports and heavy loads, R340, a top wear performance crane rail and for transport rails, new hardness grades for heavy haul.

## InnoTrans 2022

20-23 September, Berlin

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Hall 26 - Booth 808

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## InnoTrans 2022: the Spanish railway industry shows the world the developments and innovations that make it an international benchmark



countries as part of the most important projects in recent years.

It is worth mentioning the guest writer of this extensive paper, managed by the Minister of Transport, Mobility and Urban Agenda Raquel Sánchez, who analyses the evolution of the Spanish railway sector and it emphasises the key role played by our industry.

On the other hand, the current issue of the Mafex magazine offers a broad analysis of the challenges that all the stakeholders that make up the railway sector must face in terms of accessibility. Because achieving a public transport that is fully accessible to all, without barriers and with an infrastructure and rolling stock that adapts to the needs of each individual, is a priority for governments, operators, and companies in the sector. Not surprisingly, the universality in the use of transport is one of the basic lines of action in the provision of railway services in the Spanish network, one of the countries where more developments have been introduced in recent years. In this respect, in our country improvement and modernisation programmes are designed to contribute to meeting the objective of making infrastructures and facilities an accessible space, without limitations.

All these topics are analysed in issue Nº 32 of the Mafex magazine, which also includes current news from more than 30 members and the development of new innovative solutions.

We hope that all these contents will be of interest to you, and we look forward to meeting you in the Spanish Pavilion at InnoTrans 2022.

Visit us at the Mafex stand!  
Hall 22 Stand 710

After the standstill in 2020 due to the Covid-19 pandemic, Berlin hosts once again InnoTrans 2022 this September, the most important trade fair worldwide in the railway sector. The event will have, once again, a wide participation of the Spanish industry and from Mafex we offer in our current magazine a wide coverage of our members in such an outstanding event.

You will find a detailed description of the companies participating in InnoTrans 2022, as well as the stands where they can be visited to learn first-hand about their multiple solutions and products to contribute to a modern, safe, connected, and sustainable railway.

In addition, we review the milestones achieved by the Spanish railway industry, which has become an international benchmark and, at present, exports its know-how to the five continents. A recognition that, without a doubt, our companies have earned thanks to the work and effort made in each of the aspects that make up the value chain, offering a "turnkey" service that ranges from the first steps of planning and financing to the final commissioning. Currently, Spanish companies are present in more than 90

### MANAGEMENT: MAFEX.

**MAFEX COMMUNICATION COMMITTEE:** Alstom Transporte, ArcelorMittal, Caf, Icon Multimedia, Grupo Trigo, Idom, Indra Sistemas, Ingeteam, La Farga Yourcoopersolutions, Patentes Talgo, Sice, Siemens Rail Automation, Stadler Rail Valencia, Teltronic, Thales España, TPF Gentina Euroestudios y Zitron. **ADMINISTRATION:** mafex@mafex.es **ADVERTISING:** mafex@mafex.es **SUBSCRIPTIONS:** mafex@mafex.es. Mafex magazine is not responsible for the opinions, images, texts and works of authors and readers that will be legally responsible for their content. It is understood that the signing authors have given their consent to be included, for which he or she will be responsible. Also, the magazine is not responsible for typographical errors contained in the original documents submitted by the authors.



# New Mafex members

The number of companies joining Mafex continues to increase:

MAFEX CONTINUES TO GROW WITH THE RECENT ADDITION OF TWO NEW MEMBERS. MAFEX HAS WITH THESE ADDITIONS A TOTAL OF 102 COMPANIES AND ENTITIES REPRESENTING ALL THE SUBSECTORS OF A LEADING INDUSTRY THAT IS MAKING ITS WAY AROUND THE WORLD.



## HASLERRAIL (SECHERON HASLER GROUP)

The Sécheron Hasler Group is one of the world's leading suppliers of electrical and electronic safety components and solutions, traction power systems for the railway industry, as well as solutions for renewable energy and power grids.

HaslerRail provides on-board data acquisition and recording equipment, speed and odometry sensors, visualisation solutions and speed indicators, energy measurement, control, protection and I/O, software and data management solutions, and cybersecurity for the railway industry.



## LLALCO FLUID TECHNOLOGY

Llallo Fluid Technology is one of the few manufacturers and suppliers of impact absorption technology for end of track rail lines -Buffer Stops. World Class Technology that protects people, machinery and the Environment. Their products are highly sophisticated end of rail track shock absorbers with a unique performance. Llallo has a wide range of models with gas hydraulic buffers, sliding friction shoes or a combination of both. Their technology allows to control the deceleration to the desired value. They have been delivering high quality Buffer Stop projects in Spain & Portugal since 1970 and in America and other European Countries since 2004. Llallo is also ISO9001, 14001 & 45001 Certified.

# Mafex promotes the Rail Innovation Alliance (RVIIF)

Mafex will boost the Rail Innovation Alliance (RVIIF) with the aim of encouraging a powerful collaboration between academia and industry to promote the improvement in the innovation of the railway sector and speed up the adoption of new technologies and products from the research phase to their subsequent application in the market worldwide.

To this end, the RVIIF will develop three Centres of Excellence trained by Technological Centres members of the Basque Science and Technology Network and Universities based in the Autonomous Community of the Basque Country, in collaboration with the testing and trialling facilities present in the industry.

These centres of excellence will focus on the following areas: (1) Digital systems, (2) Rolling stock and (3) Infrastructure and will offer the possibility of commercialising new products and technologies more quickly, helping the railway industry to place itself in a privileged position in the technological field.

Centre of Excellence in Digital System

Centre of Excellence in Rolling Stock

Centre of Excellence in Infrastructure

# Mafex renews its Steering Committee for the period 2022-2026 and elects its internal positions

THE ASSOCIATION OF THE SPANISH RAILWAY INDUSTRY (MAFEX) RENEWS ITS STEERING COMMITTEE AND ELECTS ITS INTERNAL POSITIONS.

Sice, Siemens Mobility, Stadler Rail Valencia, Tecnivial, Thales España and Tyspa. Furthermore, Citef and Gaiker Foundation technology centres join as members.

## Victor Ruiz, re-elected as president of Mafex

Mafex, the Association of the Spanish Railway Industry, recently held the first meeting of its Steering Committee after its renewal at the last General Assembly, which consists of representatives from the following companies: Alstom, Amurrio Ferrocarril y Equipos, ArcelorMittal España, Caf, Comsa, Icon Multimedia, Idom, Indra, Ineco, Ingeteam Power Technology, La Farga YourCooperSolutions, Metalocauchó, Patentes Talgo, Sener,

Victor Ruiz, Senior Industrial Technical Engineer from the Polytechnic University of Madrid and currently CMO Rails & Special Sections of ArcelorMittal Europe-Long Products, has been re-elected as president for the period 2022 - 2026. It should also be noted that, at the meeting on 10th June, Mafex Steering Committee also elected its two vice-presidents: María Concepción Ortega from



Idom, as First Vice-President, and Luis Fernández, from Thales España, as Second Vice-President. These appointments join the executive vice-presidency held by the General Director Pedro Fortea and the secretariat in the person of Jaime Hernani.



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- Railway Transportation
- Urban Mobilities
- Hoisting, Piling & Lifting Equipment



# Rail Live! 2022 will be held on the 29<sup>th</sup> November - 1<sup>st</sup> December 2022 in Malaga



**R**ail Live! 2022 will be held in Malaga on the 29<sup>th</sup> November - 1<sup>st</sup> December to bring together high-level industry leaders who are driving sustainable development, investment and digital transformation in the Global rail sector.

The organizing entity Terrapinn, that has the support and collaboration of Mafex is excited to present the 2022 Congress edition where new trends in railway transport and the main challenges that the sector will face are to be addressed for three days.

With seven different conference tracks representing the different aspects of the rail system including

RAIL LIVE! 2022, THAT WILL BE HELD IN MALAGA, HAS AGAIN THE SUPPORT OF MAFEX, IN THE ORGANIZATION OF THE EVENT.

Freight, Mega Projects, Finance and Funding, Metro Rail, Light Rail, Digital Train Control & Telecommunications, Sustainability & Energy, BIM and Digital Transformation, there's something for everyone.

Digitalization, sustainable mobility and liberalisation are some of the topics that will be addressed by the more than 250 speakers. Attendees will also be able to learn more about the latest technological advances in the exhibition area.

All current issues for the future development of the industry will be addressed by the more than 250 speakers

Under the heading "DIGITISATION, SUSTAINABILITY AND LIBERALISATION. THE RIGHT TRACK FOR A ZERO CARBON FUTURE", the event will host an agenda full of panels, presentations, and round tables. The agenda covers all current issues for the future development of the industry.

In addition to these summits the Spanish Symposium will be an opportunity for the industry to be updated on developments and initiatives from key Spanish networks and operators including Renfe, Adif and Metro de Malaga.

Rail Live is pleased to announce a strong international speaker faculty who will be attending the event face-to-face. Some of the confirmed speakers so far are: already confirmed, to date, Mauro Alabuenas, President of Subterranos de Buenos Aires, Herbert Hui, Finance Director of MTR Corporation, Dyan Crowther, Chief Executive Officer of HS1, Lucie Anderton, Head of Sustainability of UIC, Carlo Borghini, Executive Director of Europe's Rail.




Around 2,500 people from 40 countries will attend this international event where more than 100 companies will announce their latest innovation and technological developments

The event will also count on the presence of top international companies

in the sector. The wide national participation stands out, as well as the participation as sponsors of companies such as NGRT, ABB, Cpcs, Esri, Indra, Stadler, Grupo CAF, Schneider Electric y Teltronic, and many more.

The participation of more than 100 companies is expected, and they will introduce their latest innovation and technological developments.

Rail Live! 2022 has again the support of Mafex, in the organization of the event. Renfe, Adif, as well as the Regional Government of Andalusia, Malaga City Council, Malaga Metro, the Spanish Railway Foundation, the Spanish Railways Technological Platform, and ICEX collaborate in the development of the event.

More details about the congress and fair, the speakers and the participating companies on the following website: [TERRAPINN.COM/RAILLIVE/](https://TERRAPINN.COM/RAILLIVE/) MAFEX-NEWS. 





## III Edition of the Master in Railway Engineering UC-Mafex, the gateway to the railway world

The Master in Railway Engineering is organised by the University of Cantabria and the Spanish Railway Industry Association – Mafex, which currently brings together 100 companies that represent the entire value chain. The Master has an important team of collaborators, who provides added value to the programme and contents.

The main objective of the master's degree is to train professionals in different areas of the railway sector. In this sense, a curricular itinerary has been designed under a multidisciplinary approach in order to complete the training of an industrial, telecommunications, electrical, civil engineer, a graduate in science, business administration or economics, covering the different aspects of railway engineering as a whole.

From this perspective, the student receives valuable training, providing knowledge on issues related to rolling stock, facilities and signaling, with the study of the behavior of

the railway superstructure, the design and simulation of railway operations, the management of human resources and the regulatory framework, among others.

With the aim of adapting to the needs of the students, the master's degree, of 1 year's duration, is organised in 4 modules, which can be taken independently, offering specific contents in each of the four major areas of knowledge of the sector. The completion of the 4 modules will grant the title of Master in Railway Engineering. These modules are:

- University Specialisation Course in Railway Systems.
- University Expert Degree in Railway Design, Construction and Maintenance.
- University Specialisation Course in Railway Rolling Stock.
- University Specialisation Course in Railway Planning and Operation.

The subjects have been endowed with an eminently practical content, encouraging learning from experimentation related to real-life conditions and situations explained by professionals in the sector with extensive experience. These concepts are reinforced with the completion of paid external internships with a duration of 6 months in the collaborating companies of the master's degree.

All the speakers of the master's degree belong to companies of recognised national and international prestige in the railway sector, making available to our students their high experience and knowledge.

In addition, they will tutor the student in the development of their master's thesis, being able to expand their knowledge under their supervision in a much broader and more extensive way in the area of their interest. The high "know how" of all of them together with the scheduled visits and the aforementioned internship programme will help to acquire the necessary experience to focus their professional future on one of the most productive sectors not only of our country but of the whole world, the railway.



# MÁSTER EN INGENIERÍA FERROVIARIA



## La puerta de acceso al mundo ferroviario

Un máster con un fuerte enfoque profesional, con la participación de expertos y de las empresas más representativas del sector

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**LADICIM**  
LABORATORIO DE LA DIVISIÓN DE  
CIENCIA E INGENIERÍA DE LOS MATERIALES

## MÁSTER EN INGENIERÍA FERROVIARIA (65 ECTS)



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1 AÑO DE DURACIÓN  
SEMIPRESENCIAL: CLASES PRESENCIALES Y ONLINE.  
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## COLABORAN:





CAF T&E is leading the comprehensive project of the Tel Aviv new Light Rail Purple Line

**CAFTE**  
NTA (Metropolitan Mass Transit Systems) has chosen the transport consortium made up of the CAF Group and the construction firm Shapir for the Tel Aviv LRV Purple Line.

The new line will cover 27 kilometres connecting a planned total of 45 stations and will also include a depot where maintenance work will be carried out on the fleet of vehicles.

CAF Turnkey & Engineering is in charge of the comprehensive management of the new Purple Line of the Tel Aviv Light Rail, it will also work on the design, technical man-



gement, integration management and construction management of tramway systems and subsystems, in addition to maintaining its infras-

tructure for a period of 25 years. CAF T&E will also supply and install the traffic light and control systems, energy and communications.

Ardanuy Ingenieria is awarded the detailed design for the intermodal platform in Sagunto (Valencia)

**ARDANUY INGENIERIA**  
The joint venture will be in charge of carrying out the study of the future intermodal platform to be located in the logistics area of Sagunto.

This project will take into account the redesign of the initial layout of the plots due to the construction of a large factory that will manufacture batteries for vehicles in this area.

The platform was initially designed to serve two types of traffic: intermodal by containers and swap bodies, and rail transport by direct shipment, of the Modalohr or RoLa type. However, the implementation of this industrial facility



takes into account the new needs for the land transport of goods. The objective is to be able to classify and manage trains of 750 meters in length, with direct access to the factory in blocks of 6-8 railcars, and on the other hand, to maintain the intermodal service for

operators external to the factory and its suppliers.  
  
The project will be carried out with BIM technology, thus ensuring that all information is maintained throughout the life cycle of the project.



CETEST's sustained growth

**CETEST**  
The Spanish testing laboratory CETEST is consolidated as an internationally recognized laboratory, working day by day with the most diverse manufacturers, as well as with different entities such as engineering companies, NoBos, opera-

tors, infrastructure managers, etc... Since its creation in 2007, CETEST has maintained sustained growth, having increased both its turnover and its workforce, even in difficult years.  
  
The execution of tests takes place both at its facilities in Beasain,

where components from manufacturers worldwide are received to be tested in the different test benches, as well as test campaigns wherever required, which have been carried out in Australia, New Zealand, India, Türkiye, Europe, South America or the United States. Anywhere, anytime.



CAF wins contract to supply regional trains to the Swedish operator SJ AB

**CAF**  
The Swedish state-owned operator SJ AB has selected CAF to supply the 25 regional units, which could be extended to a total of 60 units should the contract extension options be triggered. The volume of the basic con-

tract secured for these 25 units amounts to approximately €300 million, with the first trains scheduled to be commissioned for revenue service in 2026.  
  
These are CAF Civity Nordic platform units, designed for regional and inter-regional service and equipped to withstand the extreme weather conditions in Sweden,

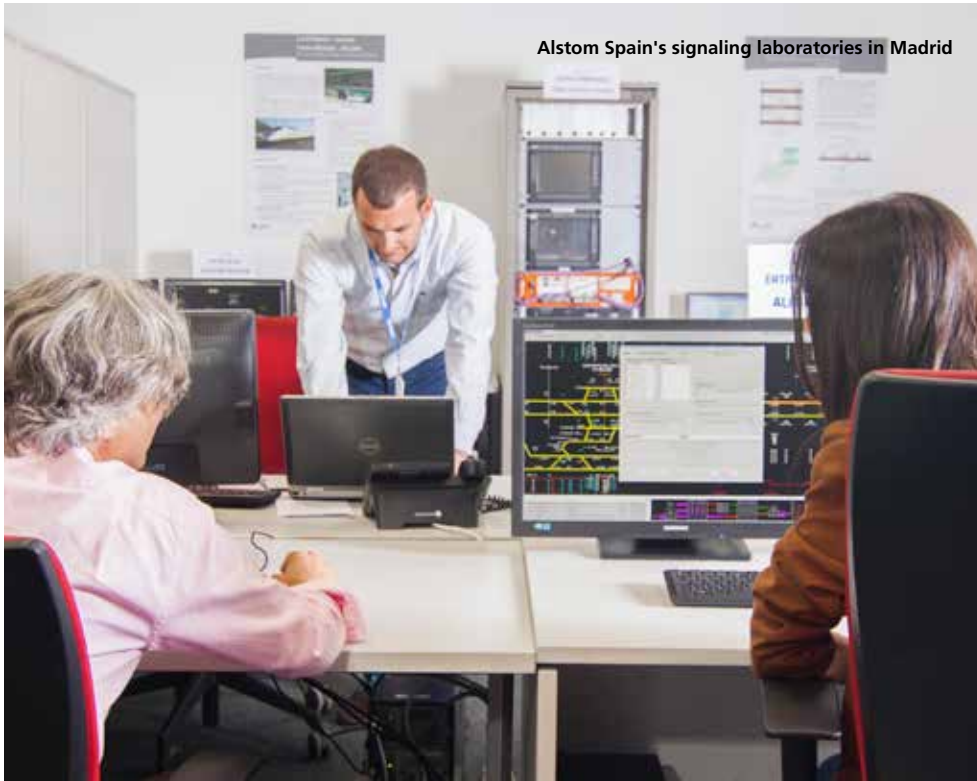
in a snowy environment with temperatures falling as low as -40°C.  
  
The trains will be made 5-car consists and will run at speeds of 200 km/h. They will also have ample capacity (3 coupled trains will provide approximately 1,000 available seats) securing easy access and flexibility for all types of passengers.



**New AVE line Madrid - Burgos with Alstom Spain signaling technology**

**ALSTOM**  
The Madrid - Burgos high-speed line was inaugurated on July 21. The new line features Alstom's ETCS/ERTMS technology, which brings significant benefits in terms of interoperability, safety, system capacity, service reliability and energy efficiency.

This section thus adds to the state-of-the-art signalling projects that Alstom has been developing in Spain in recent decades, which include, among others, the commissioning of the first ATP on the Mediterranean Corridor, the first driverless railway system in Madrid-Barajas, and the first ERTMS level 2 without level 1 support, on the Albacete-Alicante connection. In addition, Alstom Spain has installed more than 600 onboard equipment in different commuter and high-speed trains.



Alstom Spain has more than 650 engineers for the development of signalling solutions, two centers of excellence and test laboratories in Madrid, and project management

centers in Leon, Sitges and Malaga. Alstom develops and supplies signalling and digital mobility solutions from its facilities in Spain for more than 20 countries.

**ArcelorMittal launches new crane rail grade**

**ARCELORMITTAL**  
ArcelorMittal Rails & Special Sec-

tions launches R340, a top wear performance crane rail grade for heavy loads, allowing customers to optimise their Life Cycle cost.



Designed in our ArcelorMittal Rail Excellence Center (Global R&D), R340 combines optimum process parameter with ad-hoc chemical composition. This new grade with higher mechanical properties and hardness was specifically designed for heavy loads.

A specific wear test was designed to assess in-service performance. The results show that R340 is benchmark in wear resistance compared with other crane rail grades available in the market thanks to the customised microstructure.

Our new R340 grade, which is approved for welding, is now integrated in the ArcelorMittal crane rails technical specifications and is available on the entire crane and special rails range.

NOW MORE THAN EVER, GO WITH  
THE MOST SUSTAINABLE TRANSPORT



*Travel  
the way  
You  
Think*

**renfe**  
*Tu tren.*



### The equipment and components area of CAF Rail Services leads operational and productive improvement projects at its facilities

#### CAF RAIL SERVICES

One of the objectives of the CAF Rail Services Equipment and Components Area is to be able to lead the CAF Group's service response through an Area with a clear vocation for service and customer orientation.

This challenge has resulted in an operational improvement project in the Refurbishment and Accident Repair business line; and a project to improve productivity in the Equipment and Components Maintenance business line focused on the maintenance lines for wheelsets and brake systems.

Both projects have achieved a clear positive impact on aspects such as



competitiveness, quality, lead time, safety, flexibility and know-how. Promoting in turn, a cultural change in the management of operations that allows more people to be involved.

The ultimate goal is to be able to ensure the availability, reliability, safety and sustainability of rail vehicles, providing quality and innovative solutions to our customers.



### CAF Signalling commissions a new Traffic Remote Control System at the Bilbao CTC

#### CAF SIGNALLING

CAF Signalling, a technological subsidiary of the CAF Group specialising in Railway Signalling Systems, has commissioned a new Remote Controller for ADIF, the Bilbao CTC of the Metric Width Net-

work. This work is part of the CTC renovation projects that ADIF and CAF Signalling are developing in the Infrastructure Administrator's North and Northwest Sub-directorates.

This is the fourth Centralised Traffic Control System that both entities have jointly implemented in

less than two years, after those of León, Oviedo and Santander, and which uses CAF Signalling's NAOS technology under ADIF's new remote control architecture. This combination provides the highest flexibility and availability for the operation of these systems, which meets the standards required by ADIF.



### Duisburg and DVG invite LANDER to the Ruhrgebiet

#### LANDER

The German transport operator DVG and LANDER have recently agreed to create a tram-train simulation system for the entire Duisburg rail network and for its two most representative vehicles,

one of which is in the design and manufacturing process.

With this new project, LANDER continues to strengthen its position in the German market, as well as its leadership in the tram driving simulator segment in the world. With more than 17 tra-

mmway simulator projects installed and underway in the last 8 years, the trust deposited by a large proportion of operators at a European level, above all, is allowing LANDER to create world-class simulation systems, adapted to each operation and local casuistry.

### Spanish consortium conformed by SICE and COBRA is awarded the Contract to implement the electromechanical installations in Fehmarnbelt tunnel for over 500 million EUR

#### SICE

Fehmarnbelt tunnel, the biggest infrastructure project in Denmark and one of the most ambitious in Europe, will become the world's longest immerse rail & road tunnel thanks to its length (18 km). It will connect Scandinavia and continental Europe through a green corridor that will reduce the travel time between Denmark and Germany to just seven minutes by train and ten minutes by car.

The Spanish consortium conformed by the companies SICE and COBRA has been awarded the project for the Design and Construction of the electromechanical installations in Feh-

marnbelt tunnel for over 500 million EUR.

This Design & Build contract will include the design, supply, installation, testing, commissioning, and maintenance of the electromechanical systems in the five tubes of the tunnel (two for highway road, two for high-speed rail, and one for the service gallery) over the next six years. The

scope of the contract includes the technology behind the MEICA systems (Mechanical, Electrical, Instrumentation, Control & Automation).

This award becomes one of the biggest contracts within this line of work in the history of both companies and will position both SICE and COBRA at the leading edge of technology.







**COLWAY Ferroviaria has been selected by FGC to carry out the half-life tasks and modernization of the interiors of EMUs 112**

COLWAY

The works consist of the complete renovation of the seats, improve-

ment of the lighting, change of the floors and pavement, incorporation of area for bicycles, improvement of accessibility, standardization of the driver's desk, installation of USB chargers and integration of passenger information systems and safety equip-

ment, as well as a painting of the entire interior.

Units 112 will be transported to the facilities intended for this project that allow COLWAY to carry out the work and facilitate FGC to receive the units.

**Line 10 of Metrovalencia in revenue service**

ENYSE

On May 17th, Line 10 of Metrovalencia was opened for revenue service. This new tramway line links the city centre with the Nazaret quarter, serving also the “Arts and Sciences City” facility. Valencia’s mayor was joined by the president of the autonomous community and the general manager of the region’s railways, FGV, Anaïs Menguzzato.

Line 10 runs along five kilometres of tracks, serving three underground and five surface stations to cross the city in around 15 minutes. The Signalling and Automatic Train Control solution has been designed, manufactured, installed, tested and commissioned into Revenue Service by an ENYSE/ELECTRANS consortium. The system provides the end user FGV with remarkable advantages in the included sub-systems, including its integration and a migration plan for the upgrade of the existing li-



nes – granting the success of the implementation plan. It’s also worth mentioning a thorough use of the BIM technology throughout the project.

From a technological standpoint, the contract includes the first commissioning in Spain of an Operational Control Center based on an Open Platform. Enyse’s ENYSIC OA system manages the main sub-systems of the project – ATP, CTC and the Exploitation Aid Systems EAS,

with a high degree of connectivity and scalability, whilst providing great flexibility to adapt to the operator’s different functionalities.

The contract moves on now to upgrade the existing Signalling and Telecommunication systems for lines 4, 6 and 8. By the end of the project, Metrovalencia network will be equipped with an ENYSIC OA Centralized Traffic Control controlling 26 km of network with 51 stations, 44 trains and 2 depots.

**Technical inspection of works on Sections 5 and 6 of Line 7 of the Santiago Metro**

TPF GETINSA EUROESTUDIOS

As part of the government’s Urban Transport Investment Plan for the city of Santiago, a programme was drawn up for the development of the Santiago Metro network. The scheme includes, among other projects, the construction of Line 7, which runs entirely underground and consists of six sections.

Since March 2022, TPF GETINSA EUROESTUDIOS carries out the Technical inspection of construction works on Sections 5 and 6 of Line 7 of the Santiago Metro system. The assignment covers the supervision of the works undertaken by the ci-



Tramo 5 – Metro Línea 7

vil engineering contractors in charge of the construction of shafts, galleries and tunnels. Some of the most significant works comprise

six station shafts, five construction shafts, one ventilation shaft, main and secondary galleries as well as 7,560 m of tunnel.



**GMV continues the evolution of its successful SAE-R® comprehensive suite for fleet management of rail vehicles by incorporating a new module called DMS (Depot Management System)**

GMV

This software module combines the functions traditionally assigned to

systems of this type with the efficient management of train movements (entrances/exits to/from the line) and track occupancy in the different depots based on a set of track occupancy policies to be defined by the Operator company as well as real-time monitoring of the status of the signaling system elements installed in depots (signs,

points, axle counters, track circuits...).

To this are added other advanced functionalities related to the operation like automatic control of trains in aspects such as the dynamic establishment of routes, the request for priority at crossings, etc.



Renfe awards the maintenance of the digital information system for passengers to ICON Multimedia

ICON MULTIMEDIA

With the aim of promoting Digital Signage as a strategic media of communication, RENFE has chosen the DENEVA content management software to deliver messages, strategies, information, etc. to customers, remotely, planned and dynamic.

In this way, ICON Multimedia will implement its software in a total of 800 points, for a period of two years, in different stations in various geographical areas. The project includes the adaptation to the new content and metadata settings, the installation and configuration of the



players, consultancy of the channel management to RENFE staff, and technical helpdesk services.

The platform will be distributed in different displays, including the

network assigned to self-service machines, providing corporate information and integrating external data such as weather, news or other feeds.

Ineco will advise Poland for the development of its railway high speed

INECO

Ineco will be in charge of carrying out a review of the technical standards prepared by the Polish Railway Institute, in collaboration with CPK, for the development of high speed in the country, en-

suring the technical cohesion of the infrastructure and integration with the existing network, as well as ensuring uniform guidelines for contractors at all stages of the investment process.

This project will contribute to strengthening Spain's position in terms of high-speed rail develop-

ment capabilities. As highlighted by the President of Ineco, Sergio Vázquez Torrón: "this agreement highlights the great work that Spanish engineering companies are doing in the world and will surely enable future collaborations with more companies in our country, because Polish high-speed It will have a Spanish stamp.



# BE MOTION.

The energy transition is an unstoppable process. To face this challenge, **The Real Dream Team** is born, a movement based on Heroes and Heroines that just like you do, share the same dream: a world where the energy production and consumption are clean. Will you join?



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**Siemens Mobility increases its workforce by 24% in Spain during the pandemic**

SIEMENS MOBILITY ESPAÑA

The leading multinational in transportation solutions has added 273 new professionals in Spain and reaches 1,400 employees, an increase that has been distributed among all areas and professional profiles,

always promoting diversity and gender equality.

The company has a highly qualified workforce with more than 20 different nationalities. Its main drivers are Engineering and R&D, in the second one it has more than 200 professionals and invests 34 million euros per year, being a

Competence Center in Spain. In addition, Siemens Mobility Spain maintains several active programs for the promotion of internal talent and for the recruitment and training of external talent, such as the Dual Master of Sciences Rail Mobility Technologies in collaboration with the Polytechnic University of Madrid and Nertus.

**Thales technology is put into service on the new Chamartín - Torrejón de Velasco section**

THALES

This is a key section, since it means the connection of all the high-speed corridors linking the north and the south, creating a unique and transversal network between the main cities of the country.

Thales executed the works for the signalling installations, train protection systems, fixed telecommunications, video surveillance and centralised traffic control on the section from Chamartín to Torrejón de Velasco. The project includes the Atocha-Chamartín tunnel, which is just over seven kilometres long, as well as the maintenance of the installations for 36 months.

In addition to the new Atocha-Jardín Botánico interlocking, Thales has also extended the electronic interlocking of the complex node at Bifurcación de Torrejón de Ve-

lasco (belonging to the Madrid-Seville line), with the inclusion of the ERTMS protection system at this node, as well as on the entire line.



**Teltronic deploys digital radio network for new Mongolian mining railway**

TELTRONIC

Teltronic is responsible for the deployment of the TETRA network that will serve the new railway corridor linking the Tavantolgoi coal mine, one of the largest untapped coking and thermal coal deposits in the world, with Gashuunsukhait border port, in southern Mongolia.

Teltronic has installed a complete communications solution on TETRA digital technology based on its NE-BULA infrastructure, with two control nodes and the base stations necessary to cover the 250 kilometres of the track, which will have to withstand the extreme conditions that occur in such a hostile environment as the Gobi of Mongolia.



The company has also supplied the on-board radios; terminals used by control, security and maintenance

personnel and its control centre and call dispatching solution, CeCoCo, with two operator stations.

**TALGO brings to INNOTRANS its latest developments in composite materials for primary train structures**

TALGO

As part of the Shift2Rail initiative and in the historical line of Talgo of lightening of structures, a single axle independent rotating wheel running gear frame "Rodal" made of novel lightweight materials for the railway environment (carbon fibre,

titanium, and high-strength steel) and a section of the high-speed carbody made of carbon fibre and aluminium will be presented. The carbody has been made jointly with Aernnova, Tecalia and FIDAMC.

The main aim is to increase the bearing capacity thanks to the significant weight reductions achieved, close to 50% in the running gear and 25% in the carbody structure.

re. This increase in capacity means improvements in efficiency, energy consumption and life cycle.

The running gear frame has successfully passed the 10 million cycles of the EN 13749 fatigue test and the carbody is pending completion of the EN 12663 tests. This validation has been complemented with electrical conductivity, resistance to impact, fire and smoke, etc. All this experience is being transferred to the standardization group for the development of an acceptance process for new materials, CEN TC256/SC2/WG54.

The light running gear frame received a great reception when it was presented at the international fair for composites JEC World, in May in Paris. These works in composite materials in the railway field have been recognized by AEMAC (Spanish Association of Composite Materials) with the award for Excellence in the Industrial Contribution of Composite Materials.





## Ricardo: A Spanish rail team with a global outlook

**R**icardo is a global transport engineering and environmental consultancy that has operated in the Spanish rail market from its offices in Madrid for almost 20 years.

The rail business within Ricardo consists of more than 500 railway engineers, technicians and auditors based around the world, working on projects ranging from the expansion of South Korea's high-speed network to Denmark's migration to ETCS technology, as well as the construction of new metros in cities such as Amsterdam, Dubai and Hong Kong, and light rail systems in smaller centres such as Copenhagen and Tel Aviv.

Their specialism is in the 'complex and critical' aspects of modern railways. Though its teams are comprised of experts with extensive backgrounds in rolling stock, signalling, safety and operations, their major focus is systems integration: ensuring sub-systems, processes – even entire new-build railways – are optimised and successfully integrated.

This means they typically provide input throughout the entire project lifecycle, from requirements definition through to technical specification, procurement, design, testing and commissioning.

### A project team separated by 16,000 miles

It is this global network that enables the team in Spain to provide such a broad range of services, both for Spanish clients exporting to foreign markets and for international businesses looking for a technical partner in the Spanish rail sector. No project illustrates this better than the 16,000 miles separating the Ri-



cardo teams supporting a major rolling stock investment by Transport for New South Wales (TfNSW).

The Regional Railway Project will see the introduction of Australia's first ever bi-mode fleet, which is to be supplied by CAF from their facility in Beasain.

Ricardo's team in Sydney was appointed to the project in 2017, during its early planning phase, and tasked with writing the technical specifications for the Expression of

Interest (EOI) and Request for Proposals (RFP) phases. The team continued to provide advisory services during the delivery phase, including the rolling stock, simulator and maintenance facility technical packages.

However, once the contract to supply the new fleet was awarded to CAF, Ricardo was able to provide TfNSW with local production inspectors who could be on-site to undertake checks throughout the manufacturing process.

Ricardo's experts study every aspect of each vehicle, from the integration of sub-systems such as doors, lighting and air conditioning, to the quality of the welding, exterior painting and interior fixtures. A final check is also undertaken as each vehicle undergoes dynamic testing. This ability to provide specialist support simultaneously across two continents is one of the reasons Ricardo has become so integral to the project. The relationship proved particularly valuable amid the periods of international travel restrictions caused by COVID-19, which prevented TfNSW from making their own inspections of the CAF facility.

And this assignment is not unique: Ricardo is performing similar work for the supply of new Spanish-built fleets that will eventually operate in the Netherlands and Belgium.

### Established certification supplier for the domestic market

The trust placed in the Ricardo team stems from their recognised expertise of Spain's railway industry and its regulatory environment.

For many years, the Madrid office has been one of Spain's leading ac-



credited assurance providers, offering services such as Independent Safety Assessments, Notified Body, Designated and Assessment Body.

The team is an approved supplier to ADIF, providing interoperability certifications for the infrastructure, energy and CCS subsystems for the national High-Speed rail network, where, for example, the team delivered Verification of Interoperability support on construction works between Atocha Station and Torrejón de Velasco, the construction works

of La Sagrera Station in Barcelona or the electrification of the high-speed line between Plasencia and the Portuguese border among many other certification work of new or upgraded infrastructure.

Ricardo also provides certification work for the main vehicle manufacturers and integrators for Rolling Stock and on-board CCS subsystems. For example, Ricardo has been the Designated Body for the instruction of the new high-speed vehicles V300 Zefiro in Spain.

### Deep pool of international expertise

With projects often reaching critical junctures at the same time, it is Ricardo's ability to call upon colleagues across Asia, the Middle East and Europe that gives clients confidence the necessary resources will always be available to them.

Even at the pinch points of a project – when urgent decisions must be made and time is running out – there will always be a deep pool of experience and capability to draw upon, ensuring even the most complex projects – even those spanning different continents – will be supported through to a successful conclusion.





# The railway, on a path towards universal accessibility

ACCESSIBILITY HAS BECOME A PRIORITY IN THE RAILWAY SECTOR AND THE OBJECTIVE IS TO ACHIEVE PUBLIC TRANSPORT FOR ALL, FREE OF ARCHITECTURAL BARRIERS, WITH AN INFRASTRUCTURE AND ROLLING STOCK ADAPTED TO PEOPLE WITH REDUCED MOBILITY AND EQUIPPED WITH THE MOST ADVANCED TECHNOLOGICAL ADVANCES TO FACILITATE TRAVEL.

Free mobility in railway systems is a priority for administrations, institutions and companies in the sector. Universal accessibility is one of the objectives governing the projects both, in the new networks, and in the modernisation of existing infrastructure or rolling stock. All this also to comply with the Universal Declaration of Human Rights or the current regulations, such as Law 51/2003, of December 2,

which in its article 3 defends equal opportunities, non-discrimination, and universal accessibility of people with disabilities (LIONDAU).

At European level, Regulation No. 1371/2007 of the European Parliament and of the Council of 23 October 2007 establishes the rights and obligations of railway passengers at European Union level. The main measures included regarding

people with disabilities or reduced mobility are the obligation for railway companies to:

- Facilitate the acquisition of tickets for users, which will have no added cost for people with disabilities or reduced mobility.
- Ensure, as far as possible, the accessibility of trains and the range of railway services available.





## Public transport means and the railway industry have been incorporating over the last few years remarkable advances to make total accessibility a reality

- Inform people with disabilities and people with reduced mobility about the accessibility of railway services and the conditions of access to rolling stock.

- Provide free assistance on board trains and at staffed stations.

In addition, at the beginning of 2021, the European Council adopted improvements to railway passengers' rights, a reform aimed at "strengthening the rights of all passengers, in particular those

with disabilities or reduced mobility".

Among the key points, the following stand out:

- The strengthening of the rights of people with disabilities or reduced mobility, as the current exemption of regional trains from most provisions relating to people with disabilities or reduced mobility will be completely eliminated by 2023 at the latest. "From that date, the right to re-

ceive assistance when boarding and disembarking from trains will apply to all regional and long-distance trains in the EU."

- The right to buy a ticket on board if there is no accessible option to buy the ticket in advance.
- The improvement of information flow and staff training.
- The reduction of the minimum notice period for people with disabilities or reduced mobility who need assistance from 48 to 24 hours, and voluntary agreements will be encouraged to shorten these notification periods.

To make accessibility a reality, public transport means and the associated railway industry have been incorporating over the last few years remarkable advances in this field to solve the aforementioned barriers.



One of the priority measures is to ensure, as far as possible, the accessibility of trains.



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With our expert knowledge of the Spanish rail market's standards and practices, we advise both domestic suppliers and businesses around the world who require a local technical partner. Key services include:

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# Infrastructures: ensuring full mobility



Having stations accessible to travellers in every aspect is one of the main challenges. Although this goal is constantly evolving, as the needs of travellers increase, Spanish transport networks stand out for introducing actions aimed at adapting their infrastructures to these new requirements.

The universality in the use of transport is one of the basic lines of action in the provision of railway services in the Spanish network, one of the countries where more advances have been introduced in recent years. For this reason, the improvement and modernisation programmes in stations are designed to contribute to fulfilling the

objective of making infrastructures and facilities an increasingly valuable space for citizens.

Thus, and as stated in es.movilidad, the Safe, Sustainable and Connected Mobility Strategy 2030 prepared by the Ministry of Transport, Mobility and Urban Agenda and which will guide the actions of

## IMPROVEMENT ACTIONS FOR THE PROMOTION OF ACCESSIBILITY IN THE STATIONS

### ACCESS

- Improvement of access and immediate surroundings
- Accessible car parks reserved for people with disabilities
- Adaptation of handrails and access doors

### DEPARTURE LOUNGES

- New visual and auditory systems of information to the traveller
- Installation of elements to save unevenness: lifts, escalators, and access ramps
- Adaptation to the regulations of stairs and handrailings
- Fully accessible interactive information points. They offer information about the services available and the commercial offer of the station; routing, through the podotactile signalling strips
- New signposted paths in the departure lounges to allow the passage of the blind
- Extension of fixed stair banisters whenever necessary
- Marking of stair banisters with Braille labels, indicating the direction of the stairs
- Braille text on lifts signage
- Installation of voice cards on lifts with more than two stops
- Ticket machines with Braille information and voice navigation system

### PLATFORMS

- Regrowth and extension of platforms to facilitate passenger access to trains
- Installation of proximity bands and yellow stripes on the edge of the platform to be detected by visually impaired travellers
- Non-slip rubber steps between platforms
- Installation of ramps and lifts on platforms
- Higher and longer platforms
- Adaptation of steps between platforms
- Platform edge signage with longitudinal pavement with buttons
- Boarding and/or disembarking from fixed stairs signalling with ribbed pavement in the longitudinal direction on travel
- Installation of ischial supports
- Signage of platforms to know in which area of the platform the low-floor car is going to be parked, to enable travellers with reduced mobility to place themselves in the exact places

### STATIONS IN THEIR ENTIRETY

- Lighting improvements
- Adapted toilets
- Braille map
- Special lighting and public announcement system
- Safe zone signage with grooved paving
- Marking of step edges with non-slip strips
- Reinforcement of vertical signage to the traveller, with large signs, and highlighting the number of the line and the direction, whenever necessary
- Obstacle and pillar signage with red vinyl bands
- Removal of obstacles and danger points
- Information on the arrival of trains accessible through the public announcement system and through TV monitors
- Adaptation of self-service machines to accessibility regulations (electronic payment systems, digital intercom, etc.)

Source: In-house/Mafex

Achieving an accessible railway that allows to exercise one's right to mobility involves working towards an accessibility reaching all contact points between stations and passengers



MITMA in terms of mobility, infrastructure and transport in the next 10 years, "all agents involved in the transport sector have the responsibility to ensure reasonable mobility opportunities for all people and universal accessibility must be articulated around 5 axes, interrelated with each other: infrastructures or fixed installations; rolling stock or vehicles; the link between the two of them, which conditions the basic movements of boarding and disembarking; the information, signalling and orientation systems, and the provision of the service itself".

Renfe's Accessibility Plan 2020-2028 also stands out among the improvement programmes in terms of accessibility, which aims at promoting real and universal accessibility in all phases of the journey, from the departure station to the destination, including the inclusive train. The operator's goal is for 77% of trains and stations with more than 750 daily passengers to be accessible by 2023, to achieve 100% by 2028.

Achieving an accessible railway that allows to exercise one's right to mobility and that eliminates limiting barriers requires, precisely, working for an accessibility that reaches all contact points between stations and passengers, from self-service machines, information and communication channels, training for workers and collaboration with social agents and specialised entities.

These objectives guide the station modernisation plans of the Railway Infrastructure Manager (Adif), which are developed according to four main lines of action: passenger buildings rehabilitation and modernisation; accessibility improvement; safety increase and environmental actions.

## Axis 1 of the Safe, Sustainable and Connected Mobility 2030 strategy: 'Mobility for all'

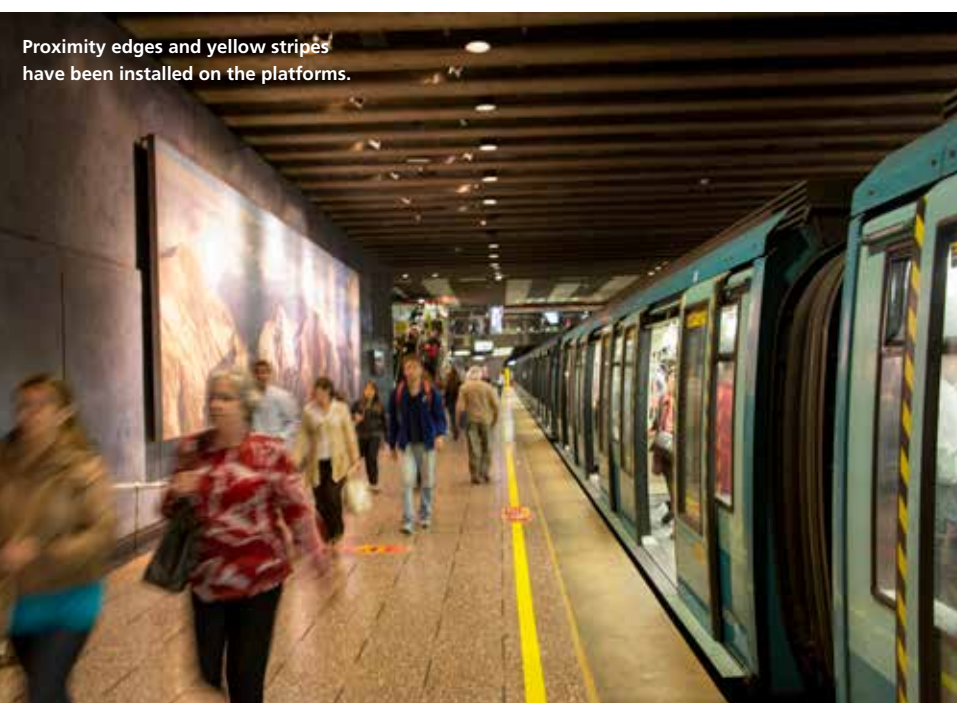
The Mobility Strategy has universal accessibility as one of its essential objectives.

### Principles:

- Mobility as a right of citizens and an essential element of social cohesion.
- Sustainable, safe, accessible, and cost-reasonable mobility solutions for all citizens.
- Universal accessibility.

### Objectives:

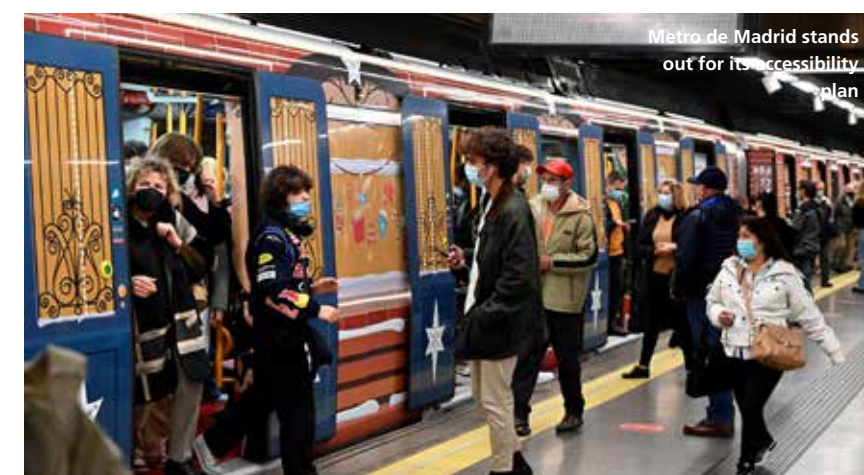
- To offer everyone, everywhere, alternative mobility solutions to the private vehicle.
- To ensure the mobility of people with disabilities and MIP.
- To integrate urban development and mobility policies, promoting urban developments based on criteria of proximity and autonomy of the citizen.



Proximity edges and yellow stripes have been installed on the platforms.

Mobility as a right held by all citizens and an essential element of social cohesion is one of the principles of axis 1. Mobility as a right held by all citizens and an essential element of social cohesion

## Services to improve accessibility at stations



### Acerca

In December 2020, the assistance service for people with disabilities or reduced mobility that the Railway Infrastructure Manager, Adif, provides in stations for passengers of all railway operators launched a new brand, 'adif acerca', a free service that until then Renfe provided with the brand 'Atendo'.

This is a personalised care and support designed for passengers with

disabilities or reduced mobility that guides, informs, and facilitates the travellers' access and transit through the stations, also supporting them in the boarding and disembarking from the trains. The service includes welcoming passengers at the meeting point of the departure station, assistance in the transit through the station, and with their boarding and settling in on the train, as well as the collection at destination in the assign-

ned place on the train and their disembarkation and accompaniment to the place previously established in the station of destination.

### Dialoga Service

Dialoga is a service aimed at improving communication and access to information for people who are deaf or hard of hearing. The stations that have this assistance have information monitors with pre-recorded videos in Spanish sign language, as well as text messages. They represent, for example, in textual form the public announcement system of the station.

### Pulse

The PULSE system is a device that will allow blind people to call the lift with an application installed on their mobile. It is a proposal from ONCE that has not yet been developed, but that will be a universal solution, compatible with all types of lifts.

## 4.0 Station: A model for all types of travellers

In the quest for universal accessibility, the Spanish railway network is beginning to implement the 4.0 model in its stations. One of the characteristic points of these new infrastructures is the new toll equipment, a series of lathes that have a new technology that implies improvements in terms of information to the traveller and accessibility.

These are modern validation control equipment, some specifically intended for users with reduced mobility, which take up less space than traditional ones, have a more intuitive interface and a screen that informs the user about the validation of the transport ticket using graphics and text in the contactless reader and on the ground, in addition to LED lighting on the doors, to inform the traveller about the result of the validation.



Barcelona Metro.





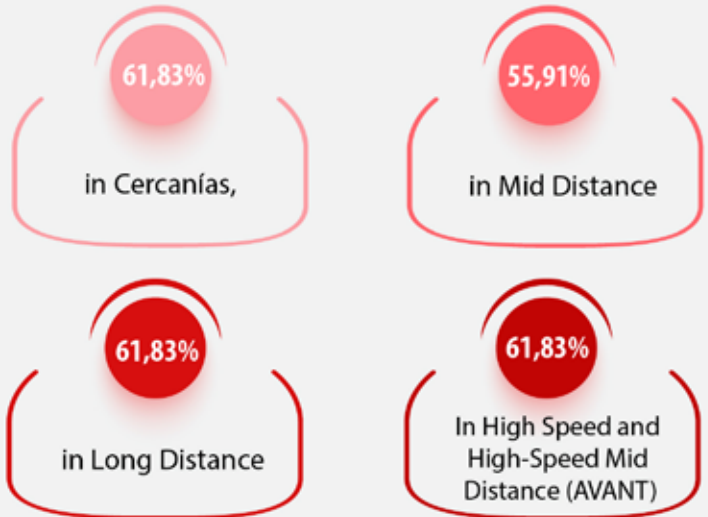
es.movilidad articulates accessibility in 5 axes: infrastructures; vehicles; the link between the two of them; information systems and the provision of the service

# Trains ready for the new demands

BEYOND ACCESS TO RAILWAY STATIONS AND INFRASTRUCTURES, ANOTHER KEY POINT IN THE SEARCH FOR FULL ACCESSIBILITY MUST INVOLVE ROLLING STOCK AND ITS ADAPTATION TO ALL TYPES OF PASSENGERS. ANOTHER ASPECT IN WHICH THE ADVANCES ARE ALSO MORE THAN REMARKABLE.

Another current challenge in which the Spanish railway industry works is to achieve full accessibility in mobile units: ac-

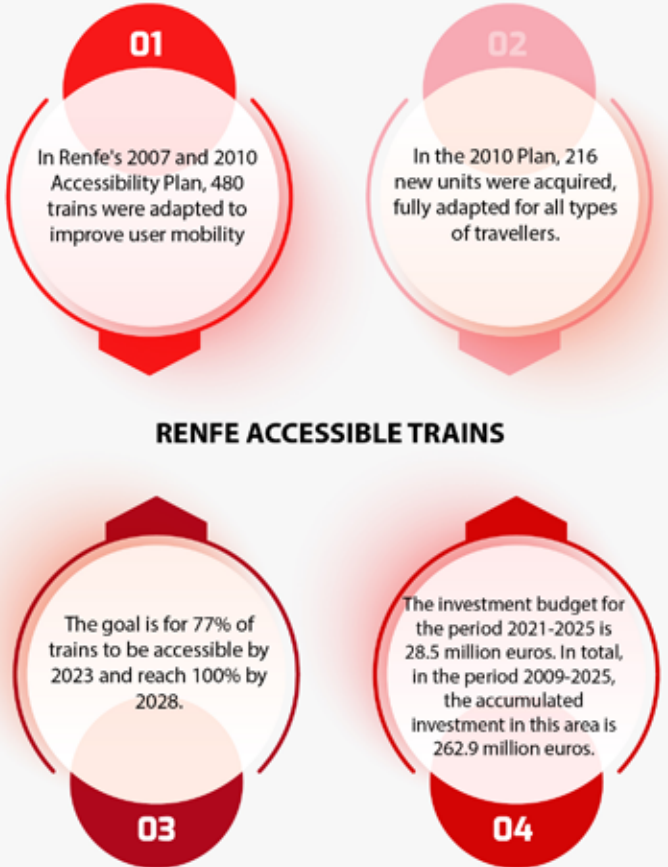
## DID YOU KNOW THAT ACCESSIBLE TRAINS ARE THE...?



Source: Ministry of Transport, Mobility and Urban Agenda dated December 31, 2020.

cessing the correct car and locating the seat, placing the luggage in the right place, locating the toilets, or knowing how to interact with the different elements that are in such space.

To achieve objectives such as usability and simplicity, mobile builders prioritise in their manufacture the entrances and exits adapted to all types of travellers, spaces reserved for wheelchairs, the installation of assistance systems, as well as another series of components which facilitate the entrances, exits and the travel on board.



Source: Renfe and Ministry of Transport, Mobility and Urban Agenda.

## ACTIONS TO ACHIEVE ACCESSIBILITY IN ROLLING STOCK

- Devices, which can be external or be part of the vehicle itself, such as ramps or lifting platforms to bridge the difference in height between the platform and the floor of the train.
- Strong chromatic contrast between the doors and the rest of the train frame
- Chromatic contrast of the door opening button and its indication in Braille.
- Chromatic contrast of grab bars and seats along the entire length of the train.
- Visual and acoustic signage of opening and closing, inside and outside the car doors.
- Spaces reserved for anchoring wheelchairs and ischial support, with allusive pictograms.
- Partition panel of reserved space.
- Incorporation of handles on the inside of the far ends of the doors to facilitate entry and exit to people with reduced mobility.
- Indication of the closing of doors via audio and pilots.
- Chromatic



# The role of industry, key to designing 100% accessible trips

The Spanish railway industry plays a key role in this path towards the design and provision of an infrastructure and rolling stock completely adapted to the needs of each passenger

This network of companies contributes its solutions and the most avant-garde advances to make the different accessibility plans of administrations around the world a reality. The products, services, and technology they have developed make it possible for users to have at their disposal a transport of simple use, comfortable for any type of travel, and free of barriers.

One of its main characteristics is that they make available to the market a wide range of products and technological developments that covers all the requirements, specifications and demands of infrastructure managers,

## ► COMPLEMENTARY ACCESSIBILITY MEASURES

Tactile-visual ceramic flooring

Non-slip and photo-luminescent strips

Panels with high relief and Braille in lifts

Setback protections

Obstacle signalling

Easy opening systems in screen doors

Ischial supports on platforms and departure lounges

Braille labels on stair banisters

Folding tables in rolling stock

Communication intercoms

Escalators

Lifts

Information and ticketing systems

operators, and service coordinating companies. These solutions range from the design stage of new lines, drafting of projects for the modernisation of networks and stations, to the supply of the most diverse elements and systems.

## Screens with audible information on the position of the vehicles

Some stations on the railway network already have new information screens whose function will be to indicate to passengers the exact location in which the train cars are placed on the platforms. Thanks to them, passengers know in advance the exact point of the platform where the vehicle will be parked, facilitating its access not only to blind people or those with reduced mobility, but also to other travellers.

## App with real-time information

Another point in which work is being done to improve accessibility is the creation of applications that provide information in real time. This is how the Renfe Cercanías application 'Accessibility and Real Time' stands out, which, through a search engine, offers the possibility of selecting accessible stations and of showing, in the stretch of line chosen for the trip, which trains are accessible in the different timetables.



## Braille Guide

Another of the actions of the sector to advance in terms of accessibility is the collaboration with entities that represent handicapped/disabled groups to continue introducing improvements that facilitate their travel by train. In this sense, the first Metro Braille Guide, designed by the Spanish National Organisation of the Blind (ONCE), has been recently

presented. The purpose of this initiative, which is currently available on Madrid Metro is to offer blind or visually impaired passengers the public transport network with greater safety, while at the same time aiming to be an exceptional tool for use in programmes to promote the autonomy of school children with this disability.

## SEVERAL MAFEX MEMBERS WITH SOLUTIONS AND PRODUCTS FOR RAILWAY ACCESSIBILITY



## ► ALSTOM

From the offer phase or the first sketches to the final delivery to the customer, Alstom applies the seven universal design principles in its solutions, which seek to create places, technologies, policies and systems that eliminate barriers and achieve a more inclusive, accessible and user-friendly environment.

In addition to having teams specialized in traveller experience or design, Alstom relies on external organizations and experts who validate the solutions from the user's point of view. Alstom has been working in Spain with Fundación ONCE since 2019, collaborating on several projects, such as the new subways in Barcelona or the High Capacity trains for Renfe. As

a result of this experience, Fundación ONCE has become a strategic partner of the entire Alstom Group. Furthermore, as part of the Group's advisory committee on inclusion, it evaluates innovations and developments to ensure that new solutions further increase accessibility and facilitate transport for passengers with any disability or particular need.

## ► CAF

The modularity and versatility of CAF's trains are accompanied by its com-

mitment to maximum accessibility. CAF units are designed to meet the needs of people with reduced mobility,

passengers in wheelchairs, and people with visual or hearing disabilities.

Among the main accessibility solutions, we can find the incorporation of handles at the ends of the doors to facilitate the entry and exit of people with reduced mobility, areas for wheelchairs and universal adapted toilets, the indication of the closing of doors via audio and through pilot lights or individual acoustic signaling for the location of enabled doors and T-mode intercom and public address system.

CAF also pays special attention to access to the train. In order to facilitate the access of PRMs to the train, the units can be equipped with steps, ramps and lifts for wheelchairs.





## SEVERAL MAFEX MEMBERS WITH SOLUTIONS AND PRODUCTS FOR RAILWAY ACCESSIBILITY

### ► COLWAY

As a company specialized in the development, validation and supply of toilet modules and tanks for waste, fresh and grey water, COLWAY Ferroviaria offers accessible products in compliance with the TSI interoperability technical specification.

We keep in mind the accessibility and the requirements committed by the client in all phases of development and it culminates with the certification of the PMR module in accordance with the TSI.

Our toilet modules offer comfortable and visual environments for people with reduced mobility.



Likewise, we offer accessible areas for disabled people according to UIC 565-

3, TSI, Regulation No 107 ECE. 565-3, TSI, Reglamento No 107 ECE.

### ► GMV

The Intelligent Transportation Systems allow technology to be applied to improve the accessibility. The "Beacons" Project from TMB in collaboration with GMV is an example of ITS solutions for accessibility for people with visual disabilities. This project, initially deployed on buses, is applicable

to high-density tram networks. The project consists on the installation of BLE bluetooth beacons in each vehicle, which publish frames with a very high frequency, compatible with mobile devices, indicating the proximity of the bus to the stop and the different states (stopped or moving, doors open or closed, etc.).

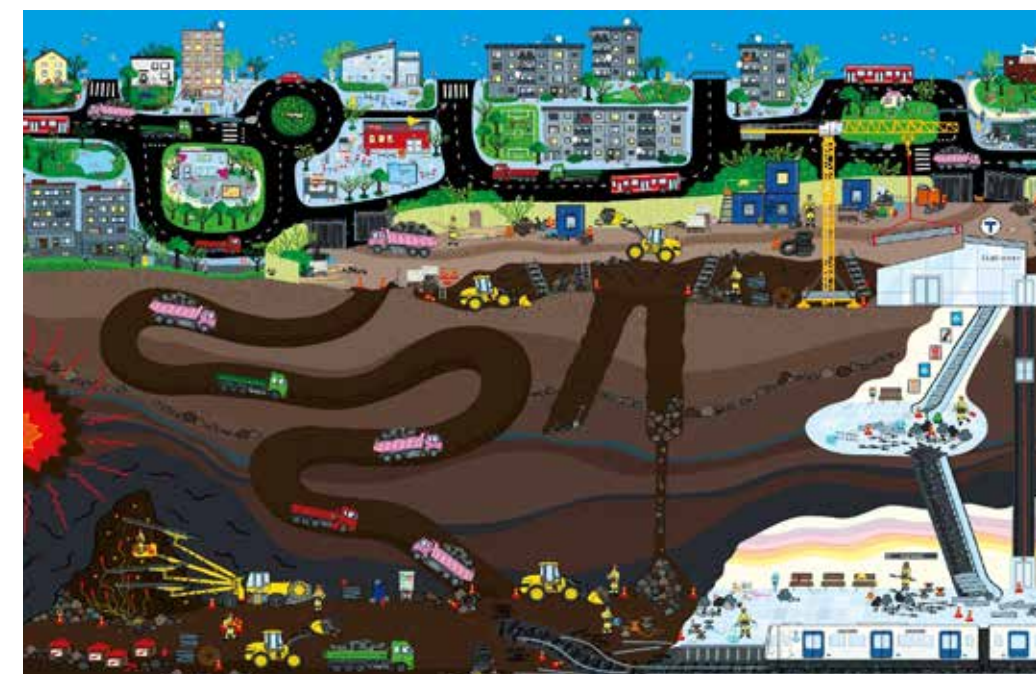
When a visually impaired person wants to get on a bus, using the TMB App on their mobile device they can choose the line and the destination. The application will inform by voice about the arrival time of the first bus at the stop and will also notify when the vehicle is detected approaching.



### ► TYPESA

TYPESA and its design partner for the expansion of Stockholm's metro have investigated the consequences of this project in children, with special attention to station accessibility, to make the design as optimal as possible for younger passengers.

The focus of the study is on the new stations' connection with the urban surroundings, the stations' design and the impact during the construction and operation periods. Eight working groups were set-up in schools from the surroundings of the planned new metro stations and almost 200 children have participated with great interest and commitment. The main conclusion is that it is important for children that the metro is clean, safe and that information is provided in a clear manner through pictograms and simple language. Furniture and



lighting should be adapted to their specific needs both at entrances and stations. Connection between metro

and other means of public transportation should be made as easy as possible.

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## SEVERAL MAFEX MEMBERS WITH SOLUTIONS AND PRODUCTS FOR RAILWAY ACCESSIBILITY

### ► IDOM

The Valle del Cauca Commuter Train (TCV) proposes a connectivity and mobility solution for the integration of the Cali conurbation and surrounding municipalities, to achieve an improvement in the quality of life of more than 3 million inhabitants.

The TCV will be conceived as a mass transport system whose objective is to strengthen the social, economic and spatial integration between Cali and the municipalities of Jamundí, Yumbo and Palmira and its articulation with six other municipalities in the region (Pradera, Candelaria, Vijes, La Cumbre and Dagua) that make up the Southwest Agglomeration of Valle del Cauca represent 70% of the population and 72.6% of the GDP of the Department. The main corridor will use the tracks of the old railway and will enhance the connectivity of the municipalities as well as their accessibility, including a sustainable transport system that contributes to the economic development of the area.



The TCV is part of a complete system that connects the District of Santiago de Cali and the municipalities of Jamundí and Yumbo in a North-South line with 38.7 km and 31 stations; as well as a West-East corridor, with 30.6 km, 16 stations and a 5 km branch to the Airport, for a total of 73.4 km and 48 stations. Due to the scope of the project, it was planned to develop it in phases, identifying in 2020 the prioritized corridor, on which the integral structuring will be advanced, which corresponds to the Jamundí-Cali section. This corridor consists of 23.6 km and 21 stations, with an at-grade in-

frastructure with traffic light priority, a standard gauge double track platform and electric catenary power supply.

For this project, the Region has as a strategic partner the British Government's Prosperity Programme and the FDN, which contracted IDOM to carry out the Feasibility Studies and Technical Structuring. IDOM has developed similar studies that include the use of old routes in Guatemala City (MetroRiel), and in the metropolitan area of San José de Costa Rica (Rapid Passenger Train) and that promote accessibility and mobility in metropolitan areas.

### ► SIEMENS MOBILITY ESPAÑA

Siemens Mobility is committed to inclusion as one of the fundamental pillars of present and future mobility, always placing the passenger at the center of its priorities. With its products and solutions, the company works to make the concept of universal accessibility of transport a reality, with the railway as the backbone.

Proof of its commitment are the activities carried out in collaboration with different stakeholders to learn about the accessibility problems faced by people with special needs. From one of them came the design of an application that would allow to reproduce the information on the screens or the audio of the loudspeaker systems of the stations, as well as to know which is the best route for passengers, considering their needs and the state of the different elements such as elevators, escalators, etc.



2022

INNOTRANS





## The Spanish railway industry, a benchmark for safe and sustainable mobility

RAQUEL SÁNCHEZ, MINISTER OF TRANSPORT, MOBILITY AND URBAN AGENDA

Spanish railways have substantially changed and improved in the last 25 years and nowadays it is considered a benchmark for safe and sustainable mobility. For 4 years we have been promoting railways as never before to improve our daily and long-distance transport systems, with the aim of improving our connectivity and mobility.

For this reason, the railway is the central piece of the investments

included in the Recovery, Transformation and Resilience Plan. In fact, of all the investments in mobility, MIMTA will directly execute 6,200 million euros in railways.

In the General State Budgets for this year, we have allocated more than 40% of the total budget of MITMA to the railway. A budget boost that will be reflected both in our long-distance network and in Cercanías.

And in this impulse, we are paying special attention to the improvement of our conventional network for which we increased investments by 55% in our aim to achieve a less carbonized, more efficient, closed and diversified logistic. A key to improve safety, competitiveness and resilience of our industrial and foreign sectors.

To do so, 4 out of every 10€ budgeted are being dedicated to advancing

in railway works, projects and action plans. Railway investments that are going to become improvements for citizens and also for freight traffic. A territorial and socioeconomic backbone that will be based on an increase of new services, connections and the creation of new itineraries as we expand the network and complete corridors.

In this way, some of our most important railway projects are linked to the development of the Trans-European transport networks: the Mediterranean Corridor and the Atlantic Corridor.

In the last 4 years we have increased the length of the Mediterranean

## Railway is the central piece of the investments included in the Recovery, Transformation and the Resilience Plan

Corridor by 233 kilometers after having put into service the AVE to Granada, the Alcudia-Moi-xent section, the Vandellós diversion and the connection between Monforte del Cid and Beniel -which has allowed to run AVEs to Elche and Orihuela- where, in addition to radically improve Alicante connections, we have also approach towards the AVE route to Murcia, which we are planning to finish by the end of the year. A milestone that which will allows us to continue with the works towards Almería and Granada, a connection in which, thanks to the work carried out in these 4 years, we have practically all the civil contract sections awarded or in execution, having tendered more than 1,650 million euros in this connection.

We have also recently presented the Granada-Almería functional study, with an estimated investment of more than 615 million euros, with which the Mediterranean Corridor is completely defined.

In addition, we are currently working on the change of track gauge between Castellón and Tarragona, which will be one of the most relevant actions for the development of the Mediterranean Corridor as a

strategic axis for the promotion of rail transport and the socioeconomic development of the Mediterranean arch and its area of influence.

Meanwhile, in the Atlantic Corridor, we have broadened its definition to include Galicia and Asturias so that that they can also benefit from the funds to improve these stretches of the network. Also, we have already put into service the AVE to Galicia, the first phase of the high-speed line to Extremadura and we are currently performing the required infrastructure tests on the Pajares diversion.

Likewise, in relation to freight transport, we must highlight the actions that we are carrying out to improve the Bobadilla-Algeciras and Zaragoza-Teruel-Sagunto lines, where our objective is to electrify the two lines and provide them with the capacity to operate 750m trains.

Finally, we put into service the standard gauge railway connection from Madrid-Puerta de Atocha to Madrid-Chamartín Clara Campoamor, an essential infrastructure for the development of an international gauge backbone network in Spain, since it allows the interconnection of the high-speed lines that passes

Some of the most important railway projects are linked to the development of the Trans-European transport networks: the Mediterranean Corridor and the Atlantic Corridor





The promotion of railway will help reduce Spanish's dependence on imported oil and reduce greenhouse gas emissions

through Madrid in order to create a single, transversal network.

These examples are not, far from it, all the actions in which we are currently working on, but they undoubtedly constitute some of the most

important challenges for the improvement and enhancement of our railway network. And liberalization comes to strengthen the sector.

The development of European corridors, the increase in interoperability

and intermodality will facilitate mobility and trade, increasing industrial competitiveness and allowing access to national and international markets more efficiently, which will bring associated increases in activity economic. Likewise, the development of these corridors will provide Spain with greater territorial cohesion, both internally and externally, shortening travel times and making them safer and more efficient economically and environmentally.

Also, the promotion of efficient and sustainable methods of transport, such as the modal transfer from road to rail, will help reduce Spain's dependence on imported oil and reduce greenhouse gas emissions. Additionally, the boost to the railway will contribute to reducing another series of negative externalities associated with road transport, such as congestion, noise or accidents.

Finally, concepts such as security, interoperability, sustainability, digitization... in short, quality and competitiveness are key in modern language. And these concepts have been internalized by the Spanish railway companies and have been embedded in their daily work. This is why they are present worldwide, offering innovative solutions, with maximum safety and sustainability standards and transferring our vision of the railway beyond our borders.

#### Innotrans 2022

In this new edition, the largest worldwide exhibition of the railway sector that will take place in Berlin between 20<sup>th</sup> and 23<sup>rd</sup> of September, will involve the highest number of participants to date.

More than 60 Spanish companies, in addition to Adif and Renfe, representing the Ministry of Transport, Mobility and Urban Agenda as support and showcase of the Spanish railway sector.

## The mobility OF THE FUTURE travels by *train*





# The Spanish railway industry, a worldwide benchmark

THE SPANISH RAILWAY INDUSTRY HAS A IS WELL RENOWNED NOT ONLY WITHIN SPAIN, BUT ALSO INTERNATIONALLY. A RECOGNITION THAT COMPANIES HAVE EARNED THANKS TO THE WORK AND EFFORT MADE IN EACH OF THE ASPECTS THAT MAKE UP THE VALUE CHAIN. THIS IS IN ADDITION TO ITS COMMITMENT TO INNOVATION AND ITS INVESTMENTS IN R&D. ITS BEST COVER LETTER? THE SPANISH RAILWAY NETWORK, EQUIPPED WITH CUTTING-EDGE TECHNOLOGY THAT PLACES IT AMONG THE BEST IN THE WORLD.

## FEATURES OF THE SPANISH RAILWAY INDUSTRY

Presence throughout the railway value chain.

Know-how consolidated after more than 30 years of the arrival of high speed in Spain.

Own technological development, exported to the five continents.

Source: In-house/Mafex

Great diversity of companies, added to the implementation of synergies.

Adaptation to the different realities and needs of each country and project.

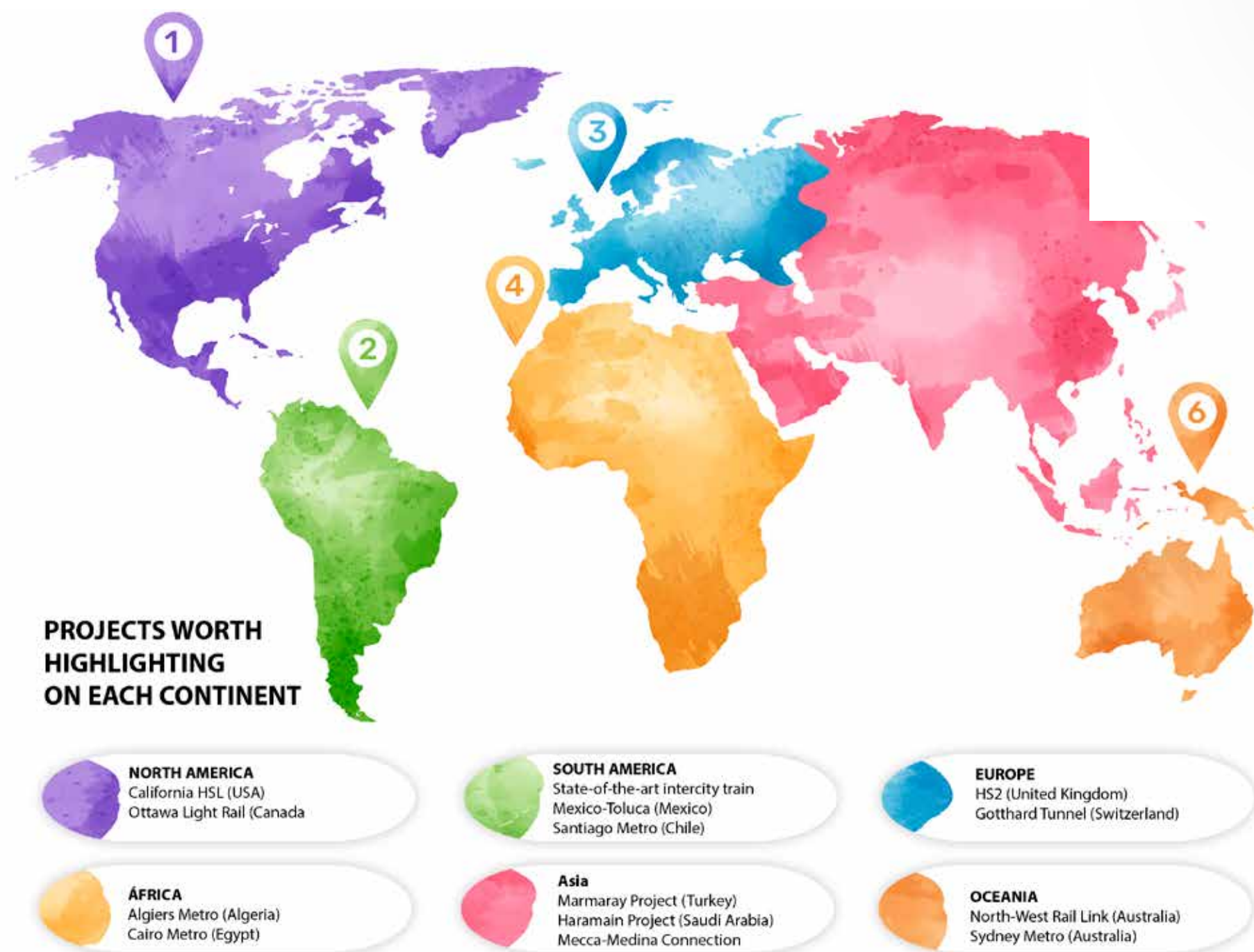
The Spanish railway industry has established itself as one of the main providers of cutting-edge solutions for transport in the twenty-first century

The Spanish railway industry experienced a before and after 30 years ago, with the arrival of high speed in our country. Since then, Spanish companies have placed themselves at the top of mind of the sector and today they are an international benchmark that exports their know-how to the five continents.

An expertise and specialization that covers the entire value chain or life cycle of the railway infrastructure and that is currently present in more than 90 countries, particularly Australia, Colombia, Turkey, or New Zealand. The Marmaray project in Turkey; the CrossRail in the United Kingdom; or the Gotthard tunnel, - which have been three of the most technically difficult underground works in Europe, stand out among the most relevant international milestones.

The Spanish industry is able to offer a "turnkey" service that ranges from the first steps of planning and financing to the final commissioning. And this is precisely where the value of Spanish companies lies, which are able to design, build and maintain metro, tram, traditional or high-speed railway lines anywhere in the world, with national technology, but adapting to the needs and particularities of each country.

All in all, the Spanish railway industry has established itself as one of the main providers of cutting-edge solutions for transport in the twenty-first century. Its portfolio of state-of-the-art services is based on the experience acquired in the construction of the Spanish railway network, one of the most extensive and advanced in the world. The contribution to the implementation of a modern high-speed system,







the second most important in the world with more than 3,200 kilometres, as well as the largest deployment of ERTMS in Europe or the numerous metro and tram systems in the country have earned them international recognition.

Its main cover letter is the Spanish railway network itself, one of the most extensive and modern in the world. It is home to high speed, mid distance, commuter trains and metro lines in the main cities, as well as innovative light rail and tram systems.

This own know-how makes them a leading partner to support transport administrations around the world in the development of new infrastructures, public transport plans, network upgrades and implementation of the most avant-garde technologi-

## Mafex, an industry with muscle

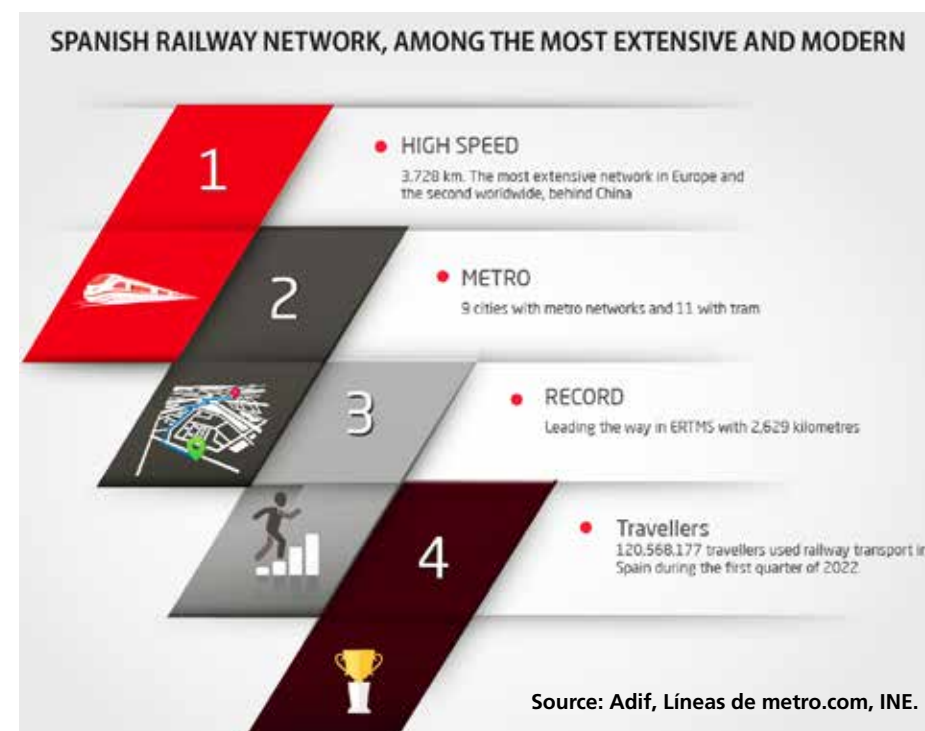
The more than 100 Mafex partners form a complete, representative value chain and are highly qualified to respond to the challenges posed by the implementation of the railway of the future: digital, connected and environmentally friendly.

This chain integrates all the subsectors of the industry, from engineering, consulting, certification, and infrastructure, to rolling stock manufacturers that are currently leading pioneering projects. A large number of companies specialised in signalling, telecommunications, traffic control, as well as a robust auxiliary industry in equipment and components are also part of it.

This constitutes an integral model which combines the high expertise of each of them and that allows them to provide customised solutions with turnkey projects, with the endorsement of having launched the most relevant transport projects around the world, both in high speed and in urban mobility and goods.

cal advances. An experience that, in addition, is reflected by the figures of the sector: over the past year, the

total turnover reached 17 billion euros and created more than 30,000 jobs.



The know-how of the Spanish railway industry makes it a leading partner



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## THE OFFER OF SPANISH COMPANIES COVERS ALL PROJECT CYCLES



Source: In-house/Mafex

### A unique and highly competitive value chain

One of the strengths of the Spanish railway industry, and the key to its strength at an international level, is its value chain. The offer of Spanish companies covers all project cycles, which allows them to adapt to the needs of each project and each client.

The great diversity of the companies that make up this industry is one of its most characteristic factors and, often, it is achieved thanks to the creation of ideal synergies to adapt each proposal to the specific demands of the client; a competitive advantage makes it possible to have global solutions.

### Commitment to research and innovation

Another characteristic feature of the Spanish railway industry is its clear commitment to research and innovation (an average of 2% of its turnover is invested in R+D+i) and technological development, with the creation of its own technology within the framework of digitalisation, sustainable mobility, and energy efficiency. This contribution has had a very positive impact on the promotion of avant-garde, efficient and sustainable transport networks. A technological development that, in addition, is applied

## TURNKEY PROJECTS

The competitive value chain of the Spanish railway fabric allows the offer of customised solutions adapted to each project and the delivery of turnkey projects:



Source: In-house/Mafex

in all segments of each project, from the design phase to commissioning, of course, going through rolling stock and maintenance.

In short, a cutting-edge technology that offers significant and constant advances in environmental management, interoperability, system automation, accessibility, user comfort and safety.

### Digitalisation

Digital transformation has reached all sectors and it is here to stay, and the industry that does not commit to digitalisation will be left behind. The Spanish railway industry, aware of this situation and the many advantages of implementing new technologies on railway transport, is working to introduce the most avant-garde advances. One of the most outstanding achievements in this regard is the use of technology that allows the operation of driverless trains, which makes the country have the longest automated line in Europe.

Another great challenge where the Spanish experience is playing a key role is in the implementation and development of the CBTC in metro lines, compatible with the European ERTMS signalling standard (European Rail Traffic Management System).

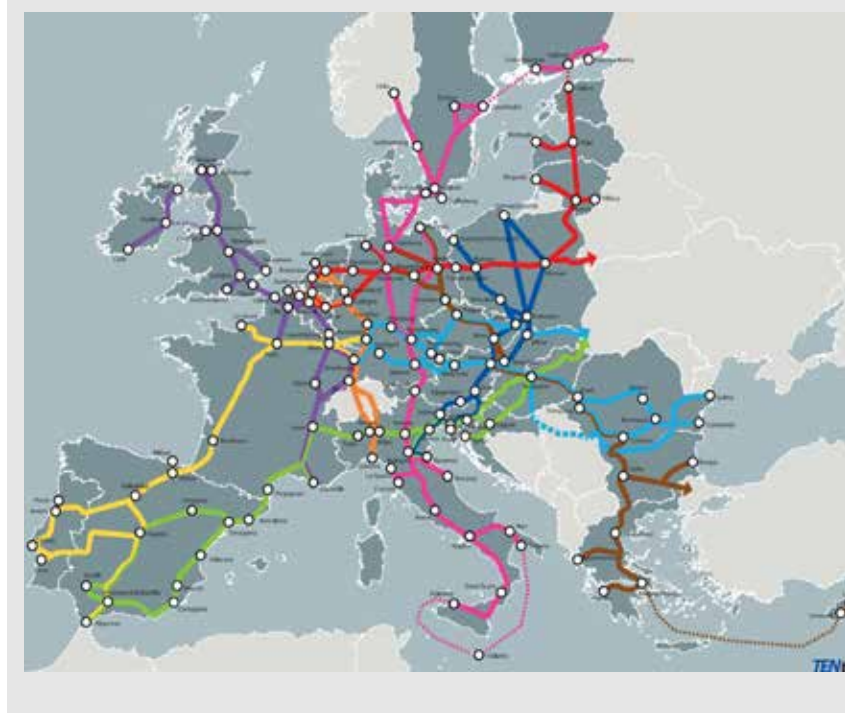
It is also worth mentioning the use of Big Data and Artificial Intelligence to be able to analyse a myriad of data to know in real time the correct functioning of the train fleet and transport infrastructures and thus, perform highly reliable predictive maintenance.

The technological solutions that the industry provides are present from the control and signalling systems, to communications or passenger information. A cutting-edge technology with which the Spanish railway industry faces the



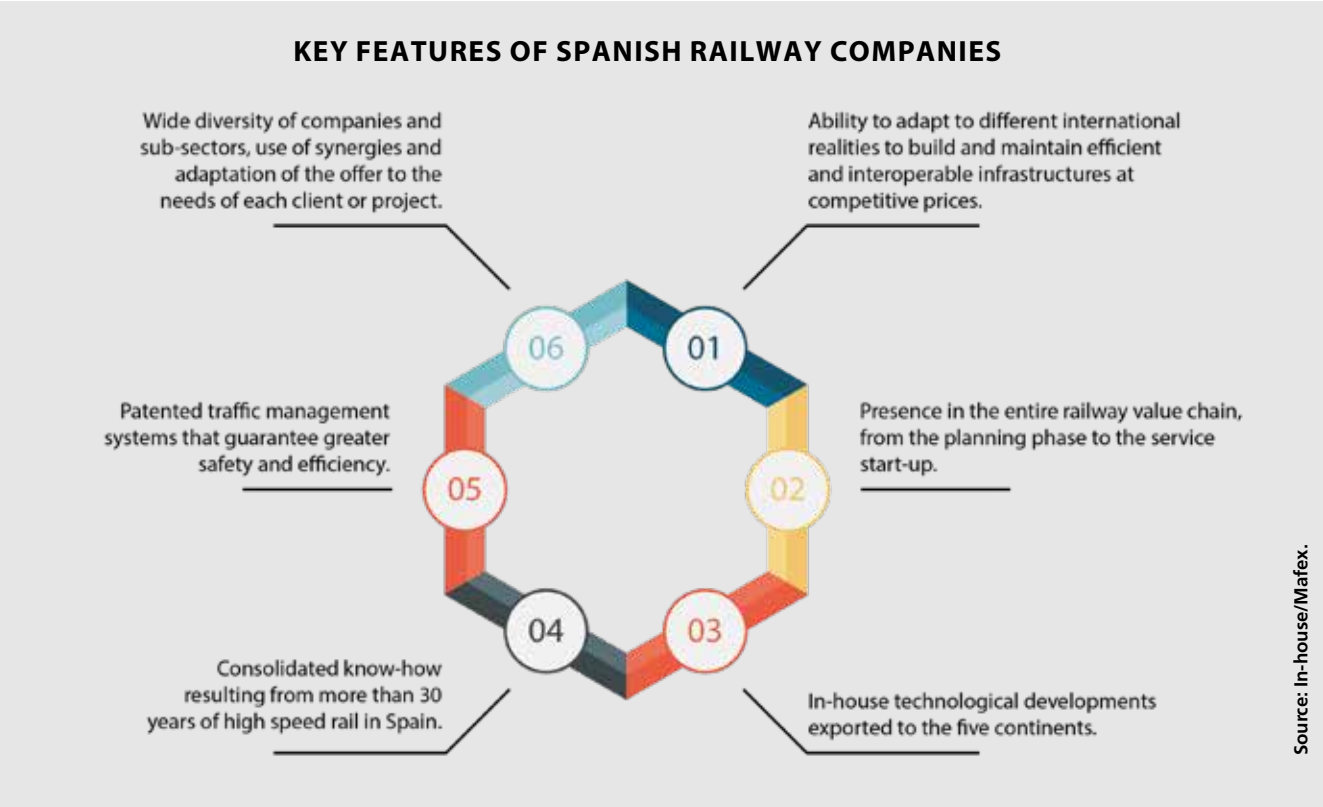
## Spanish presence in innovation projects at European level

A clear example of their expertise and experience in this area is its presence in far-reaching technological programmes such as the European R&D instrument Shift2Rail and its successor, Europe's Rail. Both initiatives have a wide representation of Spanish companies, either as founding members, or as collaborators or subcontractors working on the railway of the future and improving the quality of infrastructures and services.



A characteristic point of the Spanish railway industry is its clear commitment to innovation

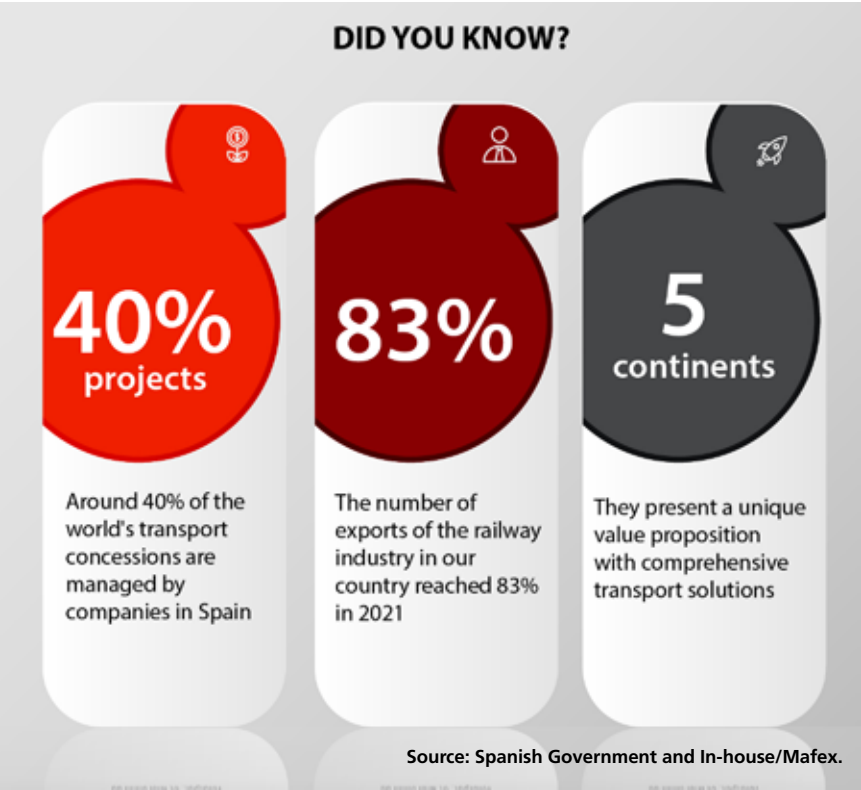




digitalisation of the sector and the need to include the railway within a sustainable mobility. In short, own technologies that aim to promote energy efficiency and environmentally friendly transport that will help achieve the goals to

which the European Green Deal and the UN SDGs aspire. Spanish companies are constantly evolving to build the most advanced trains for all types of networks, a high-quality product with a clear

commitment to innovation. Some of the latest contributions are the tram-train, which efficiently combines railway with tram and becomes the ideal means to connect different municipalities; new high-speed platforms; or systems for the circulation of trams without catenary.



**The Spanish industry, a demand outside our borders**  
The Spanish footprint is present in railway infrastructures around the world, where they have invested their experience and expertise to develop the most efficient, safe, and sustainable networks.

The extensive experience of Spanish professionals has been requested for metro, trams, conventional railway lines and high-speed projects in countries such as India, Canada, the United States, Australia, Poland or countries in the Middle East and Latin America, where they have helped plan the transport programmes of the main cities and of numerous metro networks.



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# Spanish high speed, an example to be followed internationally

Spain's high speed, with its 3,728 kilometres in length, is the largest network in Europe and the second in the world, only behind China. One of the keys to success has been the synergy and joint work of multinationals, Spanish manufacturers, and SMEs, to launch the most pioneering solutions and become a worldwide benchmark.

And the challenge was not small, especially at infrastructure level, since the particularities of the orography have led to the construction of large tunnels in long sections to overcome the technical difficulties of the terrain. Challenges that, however, the industry knew how to face successfully.

The successful achievement of the challenges that the Spanish industry has faced for the construction of the national high speed has now translated into a world leadership, whose expertise is demanded for the planning and construction of the largest high-speed projects in the world. Not surprisingly, Spanish companies are international benchmarks in the construction and management of high-speed railway infrastructures.

In addition, Spanish companies also participate in studies prior to the construction of high-speed lines, as is the case in countries such as Egypt or India. In the Indian case, its transport administrations relied on Spanish advice to analyse the feasibility of a high-speed line between New Delhi and Kolkata.

THE ARRIVAL OF HIGH SPEED IN SPAIN, IN ADDITION TO THE PARADIGM SHIFT IN TERMS OF NATIONAL MOBILITY, BROUGHT ANOTHER MILESTONE WITH IT: THE INTERNATIONALISATION OF OUR INDUSTRY, WHICH BECAME A BENCHMARK FOR THE REST OF THE COUNTRIES.



Spanish industry expertise is demanded for the planning and construction of the largest high-speed projects in the world

## SOME OF THE MAIN HIGH-SPEED PROJECTS IN THE WORLD THAT HAVE A SPANISH HALLMARK

### HS2 (United Kingdom)

It is planned that it will be in 2026 when the high-speed line will be inaugurated, which, in its first phase, will link the cities of London and Birmingham. Afterwards, the infrastructure will be extended to Manchester and Leeds. The Spanish railway industry also has a decisive role in this line, contributing its expertise in the design, engineering, and preparatory work for the implementation of the largest current European infrastructure project (531 km with speeds of up to 350 km/h). Ferrovial, Ineco and Sener take part in this project.

### Oslo-Ski

22.5 kilometres will link the cities of Oslo and Ski in a project that is the largest civil work of transport infrastructure in the Norwegian country. Spanish companies have participated in the civil works and electrification.

### Follo Line (Norway)

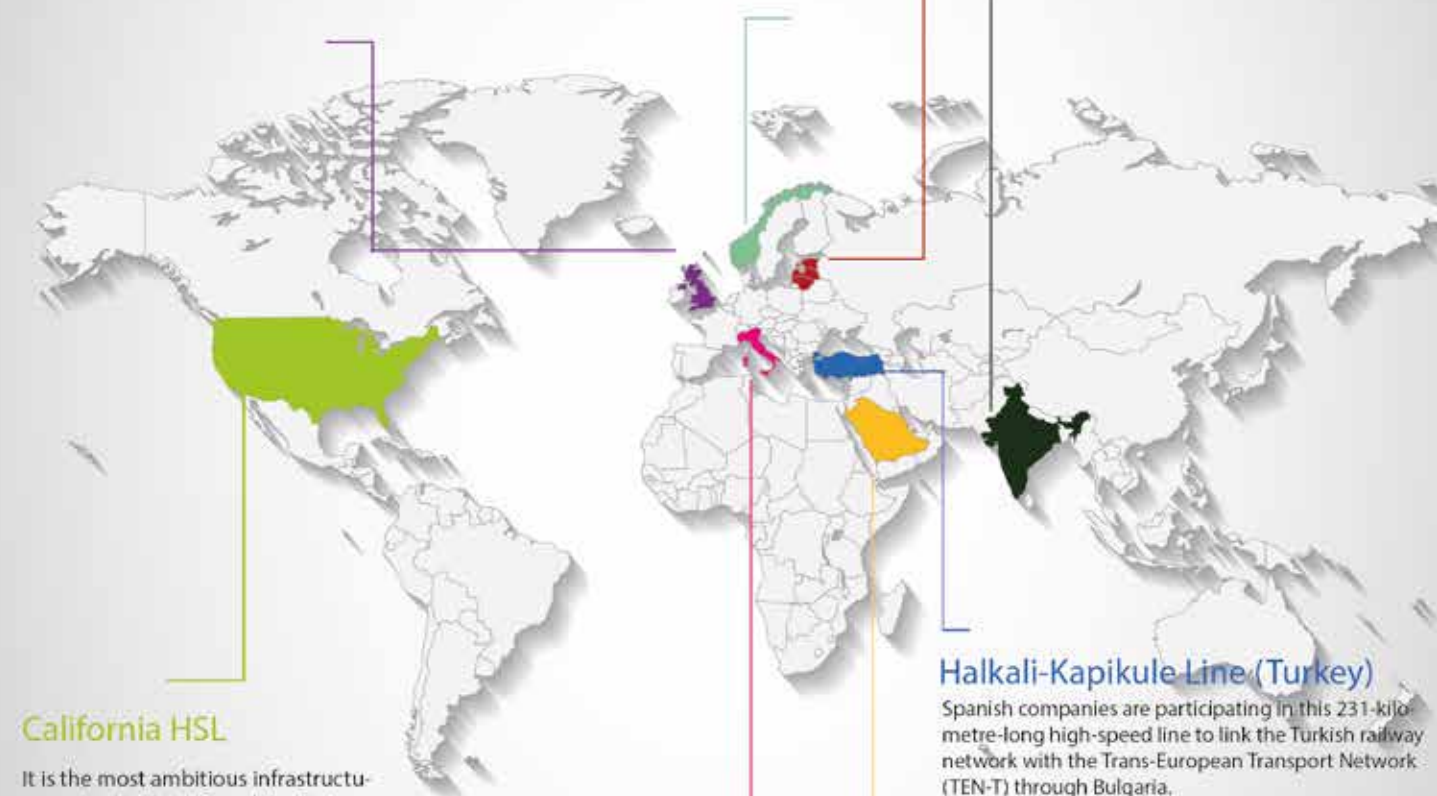
Three Spanish companies, Acciona, OHL and Elecnor, are involved in Norway's largest infrastructure project, consisting of a new 22-kilometre double-track railway line between Oslo Central Station and the new station at Ski, to the south of Oslo.

### Rail Baltica

Finland, Estonia, Latvia, Lithuania, and Poland will be linked by a high-speed line in one hour and 42 minutes. Spanish engineering and signalling companies are involved in the development.

### New Delhi-Kolkata Line (India)

The Spanish industry has participated in the consultancy that analysed the viability of this high-speed line. A project with which the Indian government aims to rejuvenate the country's railway network.



### California HSL

It is the most ambitious infrastructure project in the U.S. and the first high-speed line in California. It will allow travel from Los Angeles to San Francisco in less than three hours. The US state has also counted on Spanish companies for feasibility studies and their construction. Specifically, ACS and Ferrovial are taking part.

### Milan-Naples

The neighboring country of Italy also had the Spanish experience for the adaptation of 400 kilometres of single track, as well as for mobile detours for high speed or the laying of 184 kilometres between Rome and Naples. Acciona designed and built the Bologna connection of this line.

### High-speed train from Texas (United States)

Spanish presence as well in the project called Bullet Train, which will connect the 386 kilometres that separate the cities of Houston and Dallas / Fort Worth in less than 90 minutes.

### Rome Naples

Comsa was responsible for the construction, which involved more than 400 km of single track, 50 mobile detours for high speed, four stations and the laying of the 184 km that separate both locations.

### Halkali-Kapikule Line (Turkey)

Spanish companies are participating in this 231-kilometre-long high-speed line to link the Turkish railway network with the Trans-European Transport Network (TEN-T) through Bulgaria.

### Ankara-Istanbul

The renewal of the high-speed line linking Europe and Asia also relied on the expertise of the Spanish companies Ineco, CAF and OHL. Specifically, they participated in the design and engineering phase, as well as in the signalling and provision of rolling stock.

### Connection Mecca-Medina

This is the most important infrastructure project in the Arab world in recent decades, built by the Spanish-Saudi consortium 'Al Shoula', in which 12 Spanish companies participate: Renfe, Adif, Ineco, Talgo, OHL, Copasa, Cobra, Consultrans, Imathia, Inabensa (Abengoa), Dimetronic (currently Siemens) and Indra.

Source: In-house/Mafex



# Urban transport: Tailor-made solutions for each city

The experience and expertise of the Spanish industry is not only demanded for the development of high-speed networks, but countries around the world want to count on the work of Spanish companies for public transport networks, such as commuter trains, tram, or metro. What is the goal they pursue? To implement modern, sustainable, and highly efficient systems.

## MAIN CONVENTIONAL LINES

The East Side Access (ESA), New York  
London Crossrail Project  
Electrification Ghaziabad-Moradabad (India)  
North-West Rail Link, Sydney  
Electrification Network Rail - Southern Region (United Kingdom)  
Rail Baltica. Sestokai-Marjampole section  
Vidin-Calafat Bridge over the Danube (Bulgaria)  
State-of-the-art intercity train Mexico-Toluca

## EUROPE

Karlsruhe Tram-train (Germany)  
Berlin Metro (Germany)  
Cologne Metro (Germany)  
Jena Tram (Germany)  
Erfurt Tram (Germany)  
Augsburg Tram (Germany)  
Chemnitz Tram-Train (Germany)  
Postdam Tram (Germany)  
Gmunden Tramlink (Austria)  
Vienna Tram (Austria)  
Brussels Metro (Belgium)  
Lijn-Antwerp and Ghent tramway (Belgium)  
Liège Tram (Belgium)  
Copenhagen Tram (Denmark)  
Odense Tram (Denmark)  
Helsinki Metro (Finland)  
Besacon Tram (France)  
Nantes Tram (France)  
Saint Etienne Tram (France)  
Tbilisi Metro (Georgia)  
Athens Tram (Greece)  
Utrecht Trams (Netherlands)  
Amsterdam Tram (Netherlands)  
Pamukova-Köseköy Line (Turkey)  
Amsterdam Metro (Netherlands)  
Palermo Trams (Italy)  
Metro LAN (Line Afragola-Naples) (Italy)  
Rome Metro (Italy)  
Milan Trams (Italy)  
Cosenza Tram (Italy)  
Naples Metro (Italy)  
Cagliari Tram (Italy)  
Dublin Metro-Metro link (Ireland)  
Cork Tram (Ireland)  
Luxembourg Tram (Luxembourg)  
Oslo Tram (Norway)  
Warsaw Tram (Poland)  
Mondego Metrobus. Coimbra (Portugal)  
Lisbon Metro (Portugal)  
Docklands Light Railway. London. (United Kingdom)  
London Underground (United Kingdom)  
Sheffield Tram-train (United Kingdom)  
Birmingham Trams (United Kingdom)  
"Wales and Borders" network Tram-Train (United Kingdom)  
Glasgow Metro (United Kingdom)  
Belgrade Tram (Serbia)  
Stockholm Metro (Sweden)  
Lund Tram (Sweden)  
Lugano-Ponte Tresa Tram-train (Switzerland)  
Limmattal Light Rail (Switzerland)  
Bern Tram (Switzerland)  
Basel Tram (Switzerland)  
Ankara Metro (Turkey)  
Izmir Metro (Turkey)  
Istanbul Metro (Turkey)  
Bucharest Metro (Romania)

## AMERICA

Buenos Aires Metro (Argentina)  
San Isidro Tram (Argentina)  
East Line of the Fortaleza-Metrofor Metro (Brazil)  
Sao Paulo Metro (Brazil)  
Rio de Janeiro Metro (Brazil)  
Salvador Monorail (Brazil)  
Porto Alegre Metro (Brazil)  
Cuiabá Tram (Brazil)  
Fortaleza Metro (Brazil)  
Santos Tram (Brazil)  
Eglinton Crosstown Light Rail. Toronto (Canada)  
Light Rail in Ottawa (Canada)  
Santiago de Chile Metro (Chile)  
Valparaiso Metro (Chile)  
Medellín Metro (Colombia)  
Bogotá Metro (Colombia)  
Ayacucho Tram (Colombia)  
Medellín Metrocable (Colombia)  
Quito Metro (Ecuador)  
Boston Light Rail (United States)  
New York City Subway (United States)

Washington Metro (United States)  
Kansas City Tram (United States)  
Cincinnati Tram (United States)  
Houston Tram (United States)  
Miami Metro (United States)  
MetroRiel (Guatemala)  
Guatemala Metro (Guatemala)  
Electric train of Guatemala (Guatemala)  
Mexico City Metro (Mexico)  
Mexico Light Rail (Mexico)  
Guadalajara Light Rail (Mexico)  
Monterrey Metro (Mexico)  
Puebla Light Rail (Mexico)  
Panama Metro (Panama)  
East Side Access Project (New York)  
Lima Metro (Peru)  
Santo Domingo Metro (Dominican Republic)  
Caracas Metro (Venezuela)  
Maracaibo Metro (Venezuela)  
Mayan Train (Mexico)  
Port of Montevideo Line (Uruguay)

## AFRICA

Algiers Metro (Algeria)  
Constantine Tram (Algeria)  
Ouargla Tram (Algeria)  
Cairo Metro (Egypt)  
Cairo Monorail (Egypt)  
Casablanca Tram (Morocco)  
Mauritius Tram (Mauritius)

## MIDDLE EAST

Riyadh Metro (Saudi Arabia)  
Integrated fare management of public transport in Riyadh (Saudi Arabia)  
Ouargla Tram (Algeria)  
Algiers Metro (Algeria)  
Doha Metro (Qatar)  
Lusail Trams (Qatar)  
Dubai Tram (United Arab Emirates)  
Abu Dhabi Trams (United Arab Emirates)  
Muscat public transport master plan (Oman)  
Astana Tram (Kazakhstan)  
Kuwait City Metro Master Plan (Kuwait)  
Gold Line Monorail of Bangkok (Thailand)

## ASIA AND OCEANIA

Parramatta Light Rail (Australia)  
Sydney Metro (Australia)  
Canberra Tram (Australia)  
Newcastle Tram (Australia)  
Ho Chi Minh Metro (China)  
Shanghai Metro (China)  
Seoul Metro (South Korea)  
Manila Metro (Philippines)  
New Delhi Metro (India)  
Chennai Metro (India)  
Nagpur Metro (India)  
Mumbai Metro (India)  
Dhaka Metro (India)  
Kochi Metro (India)  
Bangalore Metro (India)  
Ahmedabad Metro (India)  
Palembang Tram (Indonesia)  
Kuala Lumpur Metro (Malaysia)  
Singapore Metro Jurong Region Line (Singapore)  
Bangkok Automated Monorail (Thailand)  
Kaohsiung Tram (Taiwan)  
Almaty Tram (Kazakhstan)  
Hanoi Light Rail (Vietnam)

## MAJOR METRO AND LIGHT RAIL PROJECTS

Source: In-house/Mafex



# Infrastructure: consolidated experience in achieving major challenges

THE SOLID EXPERIENCE  
ACQUIRED BY THE SPANISH  
SECTOR IS NOW REFLECTED  
IN ITS INTERNATIONAL  
PROJECTION.

**T**he high degree of experience  
accumulated by the railway  
industry translates into over-  
coming major challenges at an in-  
ternational level also at the level of  
infrastructures, both for its con-  
struction and maintenance. Entities  
from the five continents seek the  
technical advice of Spanish com-

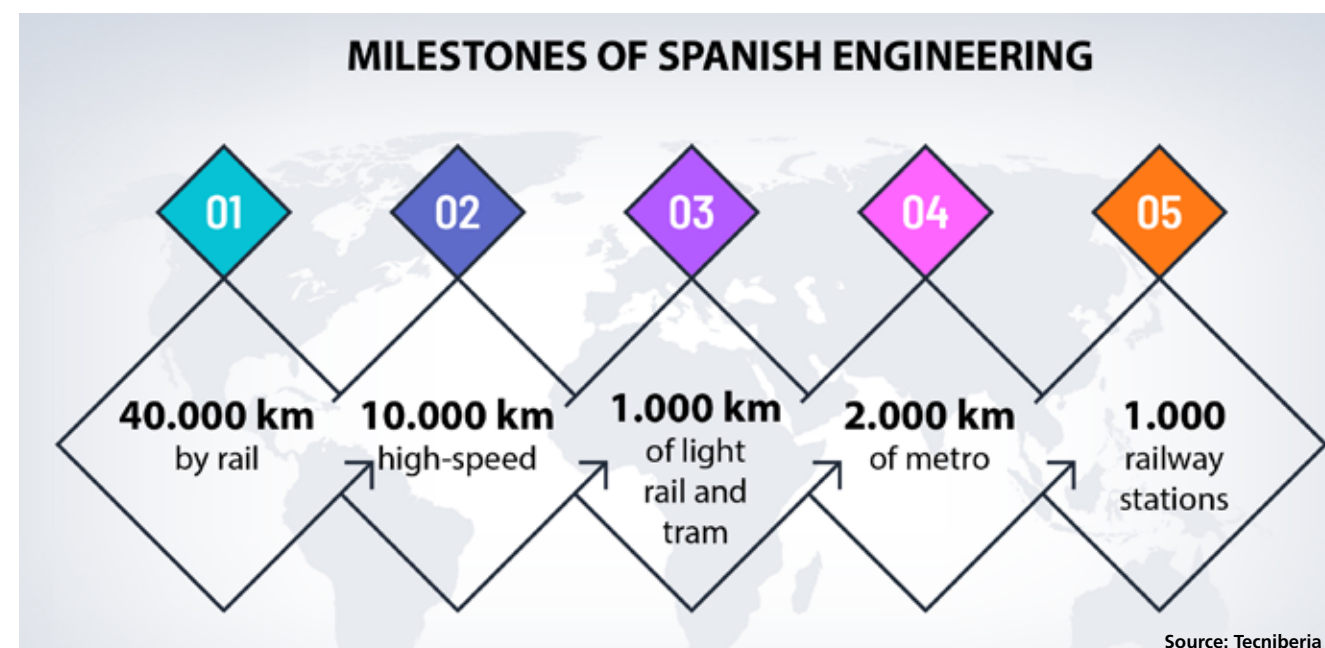
The largest infrastructures of  
recent years have had  
Spanish engineering for their  
implementation

panies to implement the most mo-  
dern and efficient networks. Not in  
vain, the largest infrastructures of  
recent years have had Spanish en-  
gineering for their implementation in  
countries such as the Middle East,  
India, Australia, the United States or  
Canada. 🌐

## SOME EMBLEMATIC INFRASTRUCTURES OF THE SPANISH INDUSTRY



## MILESTONES OF SPANISH ENGINEERING



This is  
our job

A task so simple that even a  
child could do it... or may be  
not?  
At Amurrio we have been  
designing, producing and  
installing railway equipment  
since 1880.

Experience has taught us to  
apply the most advanced  
technologies to make very  
complex problems appear  
simple.  
And to create junctions, links  
and turnouts for all types of  
paths: conventional, high

speed, urban rail and heavy  
haul.  
Would you like to move your rail  
project forward like child's play?  
Come to Amurrio.  
We will help you connect all the  
dots.





## GMV's its systems present at the Innotrains Fair

GMV

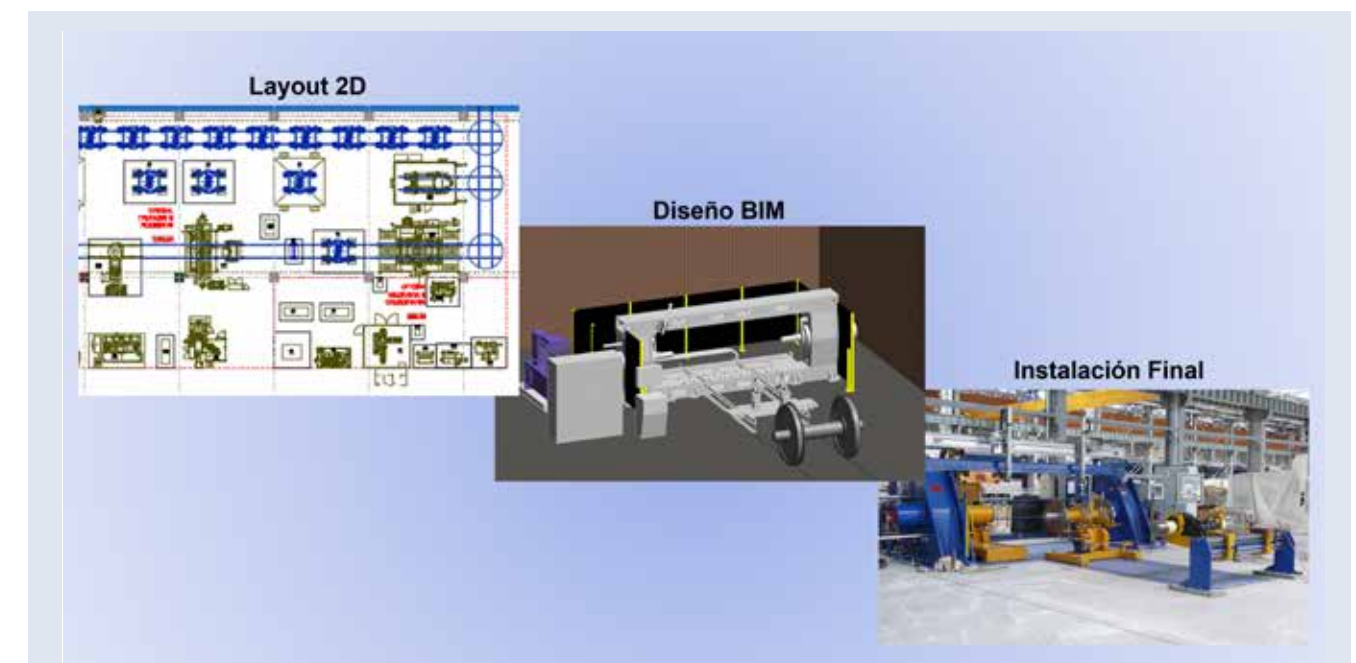
At the next 2022 edition of the Innotrains fair, GMV will present its innovations in intelligent transport systems, where it has a long international track record. GMV will present its ticketing systems for rail transport, both on board and at the station, including compatibility with EMV bank cards and its new backoffice systems capable of managing account-based ticketing.

The advanced fleet management systems will also be present the innovations in the SAE-R product, successfully implemented in a large number of clients and with constant evolution. Without forgetting the onboard systems, integrated or not with SAE-R, from passenger



information systems to onboard video surveillance or public address and intercom systems. GMV will

also present its innovations in planning and optimization systems for rail transport.



## ACYGS has as mission to offer comprehensive rail maintenance solutions to customers around the world

ACYGS

ACYGS provides cost-effective engineering and equipment supply services. Its vision is To be a world reference in the design of railway

workshops that improve the efficiency of maintenance processes. At this Innotrains exhibition, the aim is to publish the engineering services in the design of railway depots and the latest references that have had since the last edition.

Feasibility studies, definition of workshop equipment, "BIM mo-

deling" workshop layout, optimization of workflows, definition of purchase requirements, technical evaluation of offers and project management, are the services that they provide to their clients. HITACHI, ACCIONA, Metro de Madrid, Trenitalia, RENFE, ALSTOM, FGC... have the support of ACYGS in different projects.

**NEW PRODUCTS AND TECHNOLOGIES**  
MAFEX'S MEMBERS DISPLAY THEIR INNOVATIONS AT INNOTRANS





### ArcelorMittal at the forefront of innovative rail solutions

#### ARCELORMITTAL

ArcelorMittal continuously brings new solutions with breakthrough advantages for rail market, in order to increase service life of our rails, adapted to different railway applications:

For tramway, our low carbon vanadium grades solution provides

better performance due the right combination of excellent wear resistance and good weldability for gauge corner restoration.

A new crane rail grade has been developed by R&D to optimize Life Cycle Cost thanks to top wear performance for an increased service life especially for heavy loads and port operations. The combination of a customized microalloying in the chemical composition along

with specific rolling process results in a new steel grade with improved hardness and mechanical properties.

Our new family of corrosion resistant rails designed and tested under most extreme corrosion conditions in track, with an outstanding performance. The product family includes an electrical insulation product specifically developed to reduce corrosion due to stray currents.

### Ardanuy Ingenieria presents the ISA accreditation at Innotrans

#### ARDANUY INGENIERIA

Ardanuy participates in the new edition of Innotrans. The Consultant Company will present the accreditation granted by the Spanish National Safety Authority that recognizes Ardanuy as an Independent Security Assessor. Ardanuy maintains the ISA accreditation in all railway subsystems: infrastructure, energy, rolling stock, Control-Command and Signaling Systems, Safe Integration, and Maintenance.

This Accreditation allows Ardanuy to carry out Safety Evaluations in the railway field. Ardanuy has already carried out about 100 di-

fferent contracts in recent years. Being capable to carry out the Evaluation in all the Subsystems

allows the company to offer a comprehensive service.



### CAF is ready to show its most digital side at innotrans

#### CAF

In this Innotrans edition, CAF will present the evolution of its railway solutions as well as the latest digital developments. Emphasizing the most digital part of CAF; its services and solutions will be reflected in a virtual environment.

The Digital Depot and operational excellence concept will also be in Innotrans in this 3D format showing the new equipment and services for optimizing the operation and maintenance of any type of the railway fleet.

All these solutions will be endorsed by success stories where different aspects, such as energy efficiency, safety and passenger experience have been worked; in addition to successful projects based on Condition



Based Maintenance and Predictive Maintenance.

Applying the LeadMind digital platform is the basis for providing service improvement solutions and competitiveness to operators and maintainers; through quality data management in a cyber secure way. The benefits of having real-time information and applying advanced analytics to improve ser-

vice reliability and fleet availability will be shown, where automatic measurement equipment such as WaySide solutions, contribute significantly.

Under the slogan TRUST IN MOTION, the possibility of interacting with CAF's Smart Urban Mobility solutions will be offered in a complete virtual portfolio, thus leading the way to futures mobility.



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Booth 700**

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**FOR OVER 100 YEARS**



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### Revenga Smart Solutions (RSS) presents the latest generation of its rail solutions at Innotrans

#### REVENGA SMART SOLUTIONS

Revenga Smart Solutions will be present at Innotrans 2022, as customary since the company attended the event for the first time near 15 years ago. In this edition, RSS will fo-

cus its presence on the presentation of the latest generation of its safety and user experience solutions: XThings, RailXcan and RailRox.

XThings, RSS's solution for real-time sensorization and control of stations and terminals, allows the digitization of all operational processes of the facility.

RailXcan, the most advanced solution for real-time sensorization and control of rail tracks and train parameters at a central location.

RailRox, the level crossing protection system that stands out for its adaptability to country-specific operation and safety processes.



### ICF- axle counter system AC-900

#### ICF

ICF, a Spanish railway signalling technology company, will present the AC-900 Axle Counter System at Innotrans. Developed and validated 100% by ICF, its manufacture and verification are carried out entirely in Spain and is exported all over the world.

The AC-900 system is the first in the world that allows the axle sensors to

be connected by bus, which translates into a saving of up to 80% in cable. The simplicity of assembly thanks to this architecture, elimination of drilling, self-adjustment system and 100% software configuration, means that installation, modification, temporary situations, testing and commissioning times are dramatically reduced.

Installed on conventional and high speed lines, it allows centralised

maintenance through IP connection with the interlocking and continuous reporting of parameters, such as axle speed among others, in real time.

The AC-900 Axle Counter System has successfully completed all the SIL4 and interoperability tests required for its installation outdoors and in such a demanding environment as the railway, highlighting its immunity to electromagnetic noise.

### ABB captures, stores and regenerates braking energy

#### ABB

ABB's 1,500 Volt DC Enviline energy storage system (ESS) stores and recycles surplus braking energy from trains, reducing energy consumption and peak demand.

Antonio Colla, global railway marketing and sales manager at ABB, says: "The energy management system stabilizes the network power demand and reduces energy costs. Regenerative braking systems improve energy efficiency of traction systems due to the regular braking that takes place each day, recovering up to 30 percent of otherwise wasted energy".

ABB's ESS is also used to manage voltage drops: trains draw peaks of power during acceleration which

can lead to performance problems causing operation delays. Projects such as Melbourne Metro and LAX

demonstrate the vast environmental, cost and operational benefits afforded by this technology



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**MAFEX** Revista corporativa de Mafex  
Asociación Ferroviaria Española





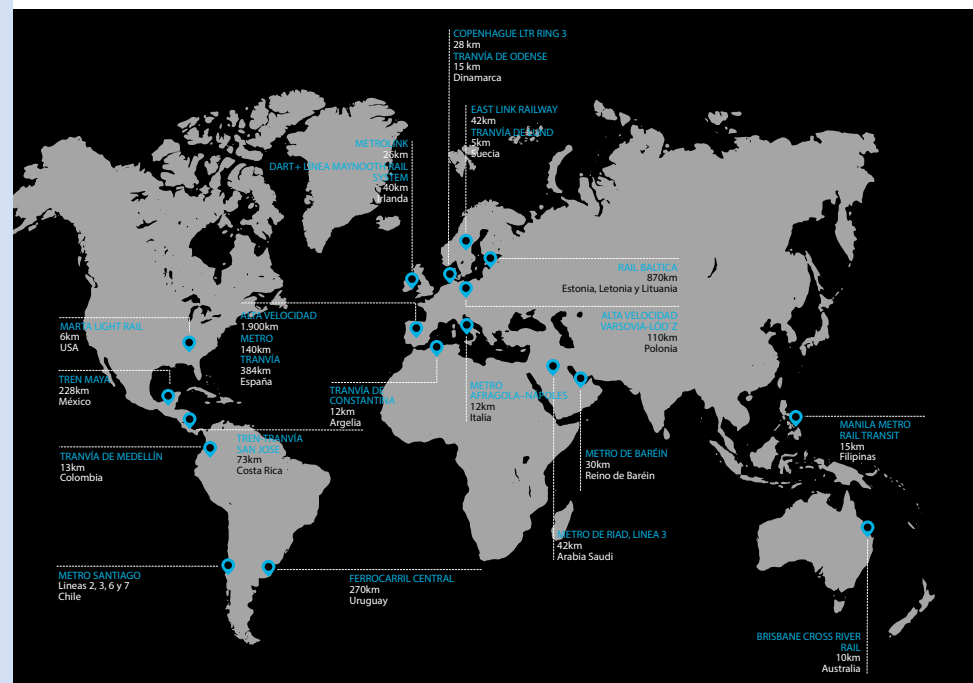
## IDOM, more than 50 years leading the railway sector

### IDOM

IDOM has accumulated experience over more than 50 years, designing metro, light rail, bus rapid transit, and high-speed railway projects. During this time we have developed more than 7,000 km of railway lines, 1,200 Km of tramways, and about 400 km of Metro lines.

Among our latest projects there are the urban light rail of Odense (Denmark), the metrolink in Dublin (Ireland), the mega project of Rail Baltica crossing Latvia, Estonia and Lithuania and various metro lines like the one in Santiago del Chile and Metro Manila in the Philippines. We have carried out projects in many different countries across Europe, South America, Middle East and Asia.

At IDOM we work with our sights set on a sustainable future, provi-



ding our clients with bold and innovative engineering solutions that

guarantee financial, social and environmental sustainability.

## Indra: railroad digitalization to achieve more connected and sustainable mobility

### INDRA

Indra is continuing to develop its advanced technology for the railroad sector with the aim of leveraging all the benefits of CyberRail IoT, the satellite-based ERTMS, big data and Artificial Intelligence to place the train at the center of the new mobility.

At Innotrans it will showcase its breakthroughs in open signaling systems (low-cost ERTMS) and wireless signaling solutions, facilitating progress towards more automated, safer and smarter rail management and the handling of secure assets.

Indra will also display its solutions for smart stations, smart ticketing and Account Based systems. In particular, its stand will feature the innovative access control systems developed for Metro de Madrid.

The technological company will also unveil the new generation of rail traffic planning, scheduling, control

and management systems for greater reliability and efficiency in operation.



## Cas-e automatic speed supervision and control system for trams and light rail

### ELECTRANS

At ELECTRANS we are experts in providing integrated ATP solutions for tram and metro networks. Our journey for more than 45 years has allowed us to accumulate great knowledge, have a wide return on experience and invest in constant R&D through projects carried out around the world.

The experience has allowed us to see first-hand the great differences between a new construction project and the extensions to an exist-

ing network. In the latter case, closed systems, proprietary software and technological incompatibilities pose significant challenges as they severely limit viable options.

Our solution is the ATP CAS-E system, which allows automatic speed supervision and control to be carried out simply by means of an on-board processing unit and passive beacons located on the track, which do not require any type of connection not even for its power supply or relation to existing signalling systems.

The on-board unit makes it possible to monitor driving speed through

speed maps for the entire track route, receive fixed telegrams from the beacons or establish temporary speed restrictions and define three braking curves with their respective configurable warnings and action levels in each case.

This architecture allows simple integration into existing networks, improves the cost-efficiency ratio and the possibility of future extensions of functionalities, such as protection of restrictive aspects of signals, route requests, priority management at traffic signalized junctions or rolling stock detection among others, thanks to the modularity of the system.

## CERTIFER celebrates 25 years

### CERTIFER

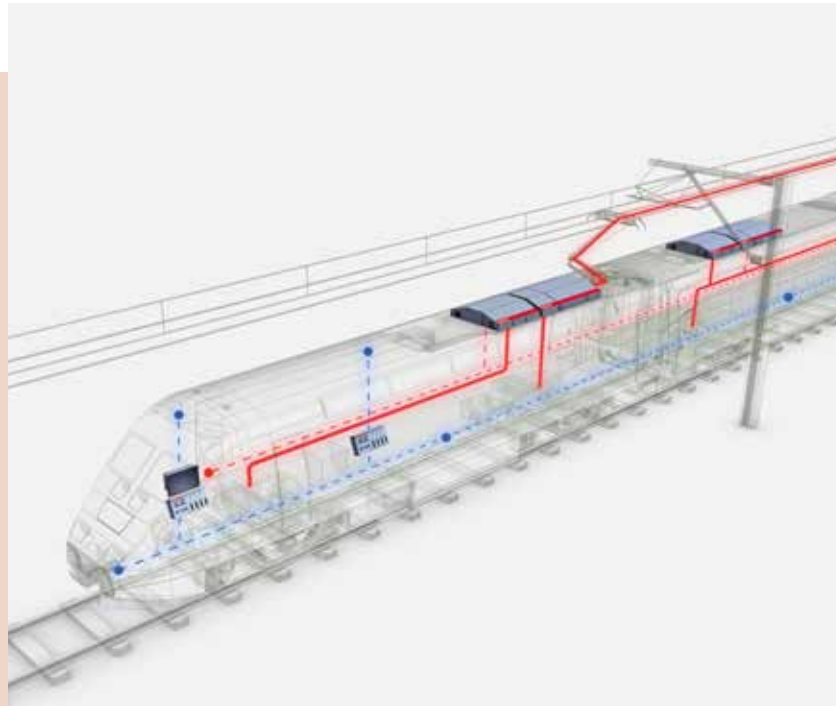
And we want to celebrate with you! Join us at our stand to celebrate and discover our recent global expansion after the creation and acquisition of various entities around the world. CERTIFER is now positioned with 21 locations and projects in over 50 countries. We are committed in offering our clients the best and simplest solutions to meet the requirements of an international market.

Come and check our ISA, NoBo, AsBo accreditations and DeBo recognitions to discover how we can support the placing into the market of your products. Come and listen to our success stories, including rail-

way cross-border, light rail, urban insertion, testing campaigns and innovation projects. At CERTIFER we believe in rail transport as the future of transport and the solution towards a sustainable world.







### Ingeteam will extend its presence at innotrans 2022

#### INGETEAM

INGETEAM designs and supplies complete Traction systems and converters, control (TCMS & Subsystem controllers) and predictive maintenance solutions, based on in-house developments of power and control electronics.

Our traction systems offer high energy performance, maximum

reliability and reduced maintenance costs, adapted to our clients' requirements, based on INGETRAC traction converters, electrical machines and auxiliary elements, and cover the entire range of catenary voltages (750 Vdc, 1,500 Vdc, 3,000 Vdc, 15 kVac, 25 kVac) and powers, for light tramcars, metros, EMUs, locomotives and high-speed vehicles. At InnoTrans 2022, we will be showcasing products applied on latest railways rolling stock.

INGETRAC traction converters are based on Basic Power modules, applying the latest advances in the field of power semi-conductors; they are the key to modularity on our designs along with a high degree of standardization.

Our stand on Hall 9 will be showcasing the basic power modules which are at the basis of INGETRAC converters.

INGETEAM boosts its railway and sustainable mobility activities including on its offer traction motors and generators adapted to the individual requirements of each project.

INGETEAM will show on Hall 27 its INGESYS control range, specifically designed for railway applications with EN50155 and EN45545-2 certification, responds to both the automation needs existing in the train (VCU, RIO, RCM, Dataloggers, Communication Gateways, etc.), and in its subsystems (HVAC, WC, doors, etc.).

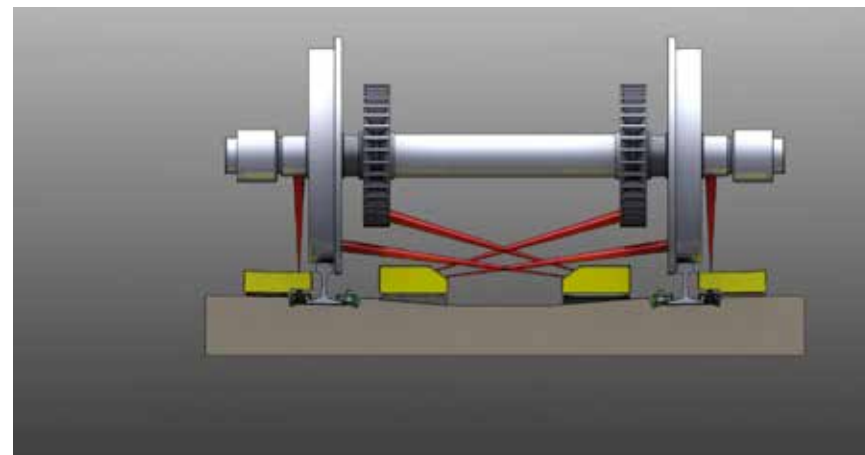
### The new generation of DCC/DFA detectors has greater versatility

#### IBERICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS (ITSS)

IBERICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS SL (ITSS) is currently implementing a new generation of hot axle box/hot wheel detector (HABD/HWD).

After reviewing feedback and an analysis carried out by their engineering team, ITSS has made a substantial shift in the performance and design of the new PEGASUS-GENIUS in order to meet the needs of their customers.

The greatest technological leap lies in the installation: a new solution allows for temperature measurement rea-



dings to be taken in different monitoring areas and the new design allows for the device to be installed without the need for a hollow sleeper. The installation and dismantling is now cost efficient and comfortably carried out at any point on the network.

ITSS is proud to introduce the Pegasus Genius which is shaking up the railway marketplace due to the quality of service, product features and considerable reduction in cost this solution brings to its customers.



### MainRail develops predictive algorithms for risk of rail buckling in ballasted tracks

#### MAINRAIL

Buckling in ballasted tracks is caused by the accumulation of energy due to the thermal variation experienced by the RAIL. MainRail has deployed a pilot to predict buc-

ling on Mallorca Railway Network (SFM) with the support of Azvi and Yeltech.

This deployment lies in buckling prediction algorithms and IoT devices for temperature measurement. The algorithms allow to predict the risk of buckling while the IoT devices send real-time alerts of track

temperature collecting data to optimize the algorithms.

MainRail keeps developing predictive algorithms for track quality and rail wear. This development is carried out through Hybrid Models thanks to the use of digital twins, track data and AI algorithms.

### Ineco strengthens its leadership in the deployment of ERTMS and the digitisation of the railway in Europe

#### INECO

Since 2015, Ineco has provided technical services for the coordination and supervision of the deployment of the ERTMS system in the TEN-T network of strategic European corridors. The company has signed a new contract that reinforces its leadership in the deployment of this system in European railway corridors.

The focus of this project, which Ineco has been awarded with its partner EY, is located in the European Transport Corridors (ETC), where there are commitments from the different Member States to deploy ERTMS, but technical support will also be provided to other projects, including neighboring countries of the Member States such as the EEA (Norway and Switzerland) or the



Western Balkans. In addition, we will promote digitisation projects that will improve the efficiency and safety of the railway, among which the future mobile telecommunications system (FMRCS) and the digital automatic wagon coupling system (DAC) stand out.

This new contract reinforces our position in the most innovative areas of the Railway and with the European Commission's Directorate - General for Mobility and Transport (DG MOVE), Europe's Rail Joint Undertaking, ERA and CINEA.



## Digitalización de la logística ferroviaria

CEIT

Ceit will be present at the INNOTRANS 2022 fair, in the booth in Hall 24 stand 330, and Outdoor Display Track 04 Stand 17 with the Extended Market Wagon, a rolling stock demonstrator resulting from the FR8RAIL4 project of the European Shift2Rail initiative. In both places you will be able to appreciate the advances presented around the digitalization of the freight rail sector. On the one hand, it will be possible to witness the detail of an axle mounted energy harvesting ring that provides the necessary electrical power for the Wa-



gon On Board Unit systems. With these telematic systems distributed in the wagons, the composition of the train is provided and its integrity is ensured, among other functions. On the other hand, the Digital Automatic Coupler

controller designed for the DELLNER company can be seen in action. This will be included in the Extended Market Wagon system that also adds relevant positioning and sensor functions to improve logistics applications.

## CETEST monitoring systems and services

CETEST

CETEST, as an accredited laboratory, offers solutions both through the provision of testing services and through the provision of monitoring systems and/or services. Special systems have been developed for vehicle and infrastructure monitoring, such as, for example, vehicle dynamics measurements, wheel-rail contact force monitoring systems using instrumented wheelsets, monitoring of ride comfort parameters, contact forces for pantograph-catenary interaction, energy consumption or measurement of harmonics, among others.

These different systems have been installed in vehicles that circulate in different countries: Spain, India, Saudi Arabia, South Africa, the United States, Turkey or New Zealand... Among customers, public administrations and operators (RDSO, Transnet, Metro Madrid...), engineering/construction companies (COPASA, Dogus, Yapi Merkezi,...), rolling stock manufacturers (CAF, Tesmec, ALSTOM...).



## Fully digital network rail infrastructure

SIEMENS MOBILITY ESPAÑA

Moving infrastructure to the cloud means an entirely digitally network-

ed rail infrastructure controlled from a single place, a single data center.

The "Distributed Smart Safe Sys-



tem" or DS3 platform by Siemens Mobility provides the basis for moving interlockings and radio block centers to the cloud. Just a few elements such as point machines and balises remaining in the field, while all other components (e.g. axle counters, track circuits) move to the cloud. DS3 is compatible with existing systems and supports current standards like Eulynx or Neupro.

It paves the way for a cost-efficient country-wide approach with seamless geo-redundancy of one data center.

This increases train punctuality thanks to highest availability, reduces hardware costs, and ensures future-proof infrastructure investments while meeting the highest safety standards in operation, SIL4.

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PERFORMANCE  
ON TRACK®

We change our name but continue building the turnouts that made us leaders.



Innovative solutions  
for railway networks.



voestalpine  
ONE STEP AHEAD.



## Alstom to at InnoTrans 2022, the broadest sustainable and digital mobility portfolio on the market

ALSTOM

Alstom's latest innovations and digital solutions, present at InnoTrans, enable sustainable mobility for customers and provide greener transport choices for passengers.

A pioneer of the world's 1st hydrogen-powered train, Coradia iLint™, Alstom will bring the market up to date with its green traction solutions -hydrogen and battery - ready for new rolling stock projects and existing projects with green re-tractioning and fleet modernisation.

Alstom will also present its latest developments in digitalisation, both in Signalling and Services. In addition, attendees will be able to learn first-hand about the latest developments in Automatic Train Operation (ATO), European Train Control System



(ETCS), cybersecurity or Services digital predictive and Artificial Intelligence technologies.

In addition, two major Rolling Stock premiers will be revealed in the outdoor area.

## Cybersecurity in the railway sector

TELDAT

Teldat has developed next generation security solutions (NGFW) that helps analyze what is happening within any railway network and to understand the events involved in external attacks as well as react accordingly.

Teldat presents be.Safe solution is an active element that protects the railway network and prevents intrusion (IDS-IPS) by intercepting malicious traffic through the use of configurable policies, traffic inspections and SSL decryption, among others.

Moreover, be.Analyzer which monitors and analyzes physical/virtual networks. It uses telemetry generated by the network as



a passive element to listen, memorize and diagnose user activity,

actions and protocols used for visualization purposes.



## RTP-800, the first MCX cab radio terminal for transport

TELTRONIC

RTP-800 is a next generation on-board radio unit that integrates in one compact rack TETRA, LTE and Wi-Fi technologies.

It is the first MCX cab radio terminal for transport environments in the

market. Its platform supports MCPTT, MCData and MCVideo 3GPP standard functionalities, as well as the rail functions described in the FRMCS specification.

It offers wide connectivity possibilities, including the Train Control Management System (TCMS), and its technology is validated for main signalling applications: ETCS, CBTC and

PTC. A digital audio switching matrix facilitates integration with the train's audio subsystems, such as intercom and PA.

EN50155 and EN45545 certified, it meets all the voice and data communication needs of future trains, offering the levels of availability and quality of service required in such demanding scenario.



## The experience of an operator at the disposal of your mobility projects



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Experience on 4 continents

More info



The **ticketing system** that works via a smartphone without need of physical infrastructure

**Advanced Driver Assistance System** designed to monitor operations and to avoid accidents due to over speeding

**SIMOVE**  
FOR RAILWAYS

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**Chambered system** designed to improve the maintenance of the railway platform

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Technical data





## Thales, innovation for sustainable mobility

### THALES

Thales will be exhibiting at Innotrans with a wide range of products and solutions for conventional and high-speed lines as well as urban transport.

Thales booth #570 (Hub27) is structured in different areas with solutions created to last, to deliver, to adapt or for everyone, where CBTC, OCC, asset management, ETCS, and passenger journey analysis tools, among others, will be on display.

Thales will also showcase in its Lucy Lab different innovations integrated in the lab such as obstacle detection solutions, metro autonomy, passenger information and on-board solutions, and video analytics tools for passenger distribution.



You will be able to experience live connections with rail transport laboratories in other different European cities.

Looking forward to meeting you in person, the company will showcase its new solutions and discover more innovations at booth #570 (Hub27).



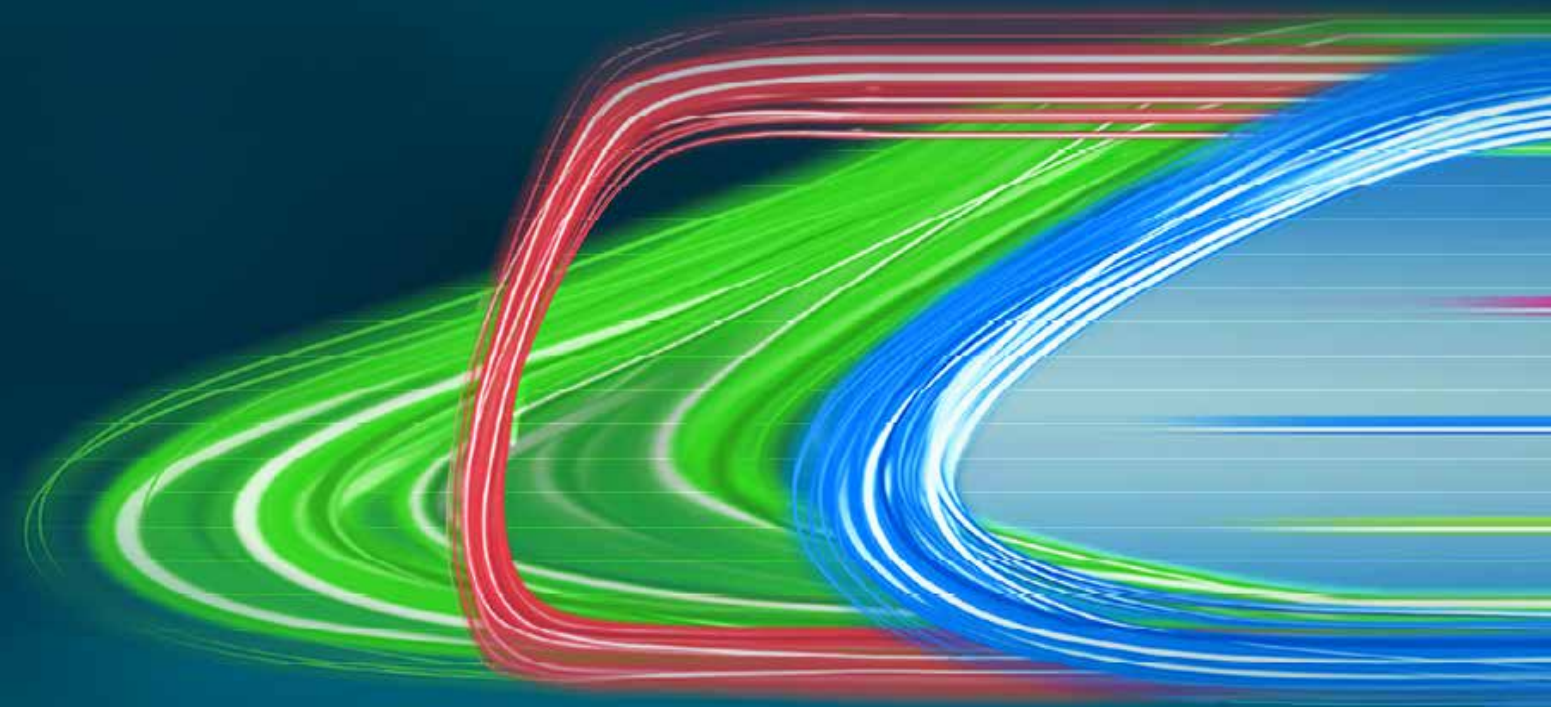
## Zeleros accelerates the shift towards sustainable and smart mobility with hyperloop and solution to boost port logistics

### ZELEROS

Zeleros keeps going forward in the demonstration of its technology to develop the scalable hyperloop. The

company has recently presented together with other partners its proposal for Europe's first hyperloop tender (800M€) to connect Padua and Veneto in Italy and initiated the construction of a 100 meter test track in Sagunto in Spain to both demonstrate in pre-commercial conditions one of Zeleros' hyperloop relevant

technologies -the linear motor- and to propose a new product, called SELF, to optimize the flow of containers within ports in a fully electric, autonomous way. Zeleros also works hand in hand with the European institutions for the creation of a regulatory framework to ensure hyperloop cross-border interoperability.



# SPANISH PARTICIPATION AT INNOTRANS

# 2022





## SPANISH PARTICIPATION AT INNOTRANS

ABB	4.2	150	IDOM CONSULTING, ENGINEERING, ARCHITECTURE	22	710
ACYGS SALES MANAGEMENT	9	325	IKUSI	4.1	355
ADIF	23	590	INDRA	4.1	610
GRUPO ALSTOM	3-2	460	INECO	5.2	165
AMURRIO FERROCARRIL Y EQUIPOS	26	880	INGETEA	9	615
AQUAFRISH	6.2	240		27	700
ARCELORMITTAL	26	880	INDUSTRIAL DE TRANSFORMADOS (ITSA)	3.1	430
ARDANUY INGENIERÍA	5.2	468	IBÉRICA TECNOLOGÍA EN SISTEMAS DE SEGURIDAD FERROVIARIOS. (ITSS)	22	710
ARTECHE	11.1	165	KIMUA	6.2	910
AZVI	22	710	LA FARGA YOURCOPPER SOLUTIONS	22	380
CABLES DE COMUNICACIONES ZARAGOZA	22	710	LANDER SIMULATION & TRAINING SOLUTIONS	4.2	130
CAF	4.2	130	LIMMAT	22	710
CAF MIIRA	20	550	MAFEX	22	710
CAF POWER & AUTOMATION	4.2	130	MAINRAIL	23	220
CAF SIGNALLING	4.2	104	MEREFSA	8.1	120
CAF TURNKEY & ENGINEERING	4.2	130	METROTENERIFE	22	710
CEIT TECHNOLOGY CENTER	24	330	MIERES RAIL	26	880
CERTIFER	CITYCUBE A	850	NEWTEK SOLIDOS	22	710
CENTRO DE ENSAYOS Y ANÁLISIS CETEST	CITY CUBE A	400	RENFE	22	710
COLWAY FERROVIARIA	1.1	530	REVENGA SMART SOLUTIONS	22	300
COMSA CORPORACIÓN	22	720	SATYS INTERIORS RAILWAY SPAIN	1.1	550
CUNEXT GROUP	22B	200	SGS	22	710
DANOBAT	22	620	SICE	4.1	700
DTA	22	710	SIEMENS MOBILITY	HUB27	230
ELECTROSISTEMAS BACH (ELECTRANS)	25	255	SMART MOTORS	24	220
FUNDICIONES DEL ESTANDA (ESTANDA)	22	710	STADLER	2.2	160.
FORGING STEEL PRODUCTS.	22	710		OUTSIDE AREA T04, T08, T09, T10	
FUNORSA	22 A	820	PATENTES TALGO	4.2	450
GAMARRA	1.2	630	TALLERES ALEGRÍA	26	307
GEMINIS LATHES EQUIPOS DE MANTENIMIENTO TALGO	22	610	TALLERES CORRAL MECANIZADOS	22	840
GMV	2.1	265	TEL DAT	4.1	840
GOAL SYSTEMS	2.1	375	TECNIVIAL	22	710
GURUTZPE	22	830	TELTRONIC	4.1	580
HASLERAIL	9	230	THALES	27	670 & 571
INTERNACIONAL HISPACOLD	3.1	260	TÉCNICA Y PROYECTOS (TYPESA)	22	710
S.A.E. IBERTEST	22.A	710	VOESTALPINE RAILWAY SYSTEMS JEZ	21B	150
ICF - INGENIERÍA Y CONTROL FERROVIARIO	5.2	110	XUBI GROUP	20	650
ICON MULTIMEDIA	22	710	ZELEROS GLOBAL	4.2B	238
			ZITRÓN	5.2	720

Railway Technology

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Railway Infrastructure

Tunnel Construction

Public Transport incl. Mobility+ / Mobility+ Corner

Outdoor Display Gleis- und Freigelände

Bus Display

InnoTrans Campus

Opening Ceremony Eröffnungsveranstaltung

InnoTrans Convention

Speakers' Corner

Messe Berlin Studio

Business Lounge (Marshall-Haus)

Press Center Pressezentrum

FoodCourt

Shuttle Lines - Shuttle Linien

Olympischer Platz P+R

BER T1 + T2 - Expo North - Expo Nord

BER T1 + T2 - Expo South - Expo Süd

City Transfer

Hotel Transfer

Fairground Shuttle - Geländeshuttle

Fast Shuttle

South Entrance - Hall 18

Eingang Süd - Halle 18

South Entrance - Hall 20

Eingang Süd - Halle 20

South Entrance - East Entrance

Eingang Süd - Eingang Ost

East Entrance - Outdoor Display

Eingang Ost - Gleis- und Freigelände

76 MAFEX

MAFEX 77



## ABB

ABB makes transportation stronger, smarter and greener through innovative products, solutions and services that support the future of mobility. By providing leading-edge technologies, turnkey systems, superior service and asset management, ABB can help train builders, railway operators and network managers to deliver energy-efficient and cost-effective innovations.

ABB (ABBN: SIX Swiss Ex) is a technology leader that is driving the digital transformation of industries. With a history of innovation spanning more than 130 years, ABB has four customer-focused, globally leading businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by the ABB Ability™ digital platform. ABB operates in more than 100 countries with about 105,000 employees.

► [contact.center@ch.abb.com](mailto:contact.center@ch.abb.com)  
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► HALL 4.2 STAND 150  
► HALL 9 STAND 325

## ACYGS SALES MANAGEMENT

ACYGS offers engineering services to define and manage railway workshop projects, analysing clients' needs and proposing the best solutions for the maintenance workshop equipment in new or existing depots, freight or passenger, 1st or 2nd level maintenance depots from tramways to high-speed projects.

ACYGS supplies Packages of Equipment for workshops and machinery for track maintenance, studying the different types of equipment in the market and adapting to the needs of each client and project.

To demonstrate the commitment to quality, client satisfaction and continuous improvement, ACYGS has been accredited by AENOR with UNE-EN ISO 9001 and 140001 certifications.

► [jleon@acygs.com](mailto:jleon@acygs.com)  
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► HALL 23 STAND 590

## ADIF

Adif is the Railway Infrastructure Manager in Spain, a public entity attached to the Ministry of Transport, Mobility and Urban Agenda. Its aim is to promote the railway as the most sustainable mode of transport and its main functions include the operation and maintenance of the network, both high-speed and conventional, as well as the capacity allocation to the railway undertakings. Adif also manages the passenger stations and freight logistic terminals and is in charge of the planning, design, construction and upgrading the lines.



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## ALSTOM GROUP

This edition of InnoTrans is particularly important for Alstom, as it is the first edition after the acquisition of Bombardier Transportation. On its more than 1,000 m2, the Alstom stand will present its entire portfolio of solutions and global presence. In addition, Alstom will be present on the outdoor track platform, with different rolling stock solutions and a world premiere. All this, with a single objective: to share with customers, partners and collaborators our leadership in innovation for a greener and smarter mobility, worldwide and do not disclose the contents to another person, use it for any purpose or store or copy the information in any medium.

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## AMURRIO FERROCARRIL Y EQUIPOS

Amurrio is a global leader in the design and manufacture of complete railway turnouts for High Speed, Conventional Rail, Urban Rail and Heavy Haul applications.

One of Amurrio's strengths lies in the manufacture of manganese steel monobloc crossings, cast and welded to rail in the company's own facilities. Amurrio also manufactures crossings with other technologies, such as mobile point crossings for High Speed, machined from steel plate, or special solutions for various track gauges.

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## AQUAFRISCH

More than 25 years of experience in the railway sector guarantee Aquafrisch as a manufacturer of Train Washing Tunnels, Bogie Washing Cabins, Toilet Extraction Systems and other equipment for the maintenance of rolling stock in railway workshops. Our equipment is installed in more than 30 countries on 5 continents. Aquafrisch is also a leader in industrial water treatment and purification. At Aquafrisch we deal with the design, manufacture, installation, commissioning, training and maintenance of the machines according to the needs of the client.



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## ARCELORMITTAL

ArcelorMittal Rails & Special Sections operates four rail production facilities in Europe, offering wide portfolio of products for trains, subways, trams, light rails, crane rails, crossings, and rail accessories, building an incomparable knowledge and expertise of these product range. ArcelorMittal is at the forefront of bringing innovative solutions for rails: low carbon vanadium grades for tramway, new hardness grades for heavy haul and ports; RailCor®, corrosion resistant rails; new oriented solutions to citizens increasing passenger comfort and noise mitigation, and our in-house service centre that enable us to offer full solutions and advantages for our customers.

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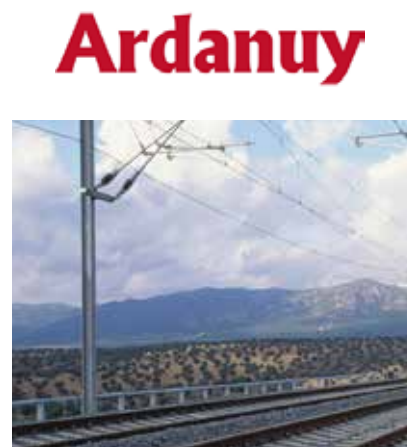


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## ARDANUY INGENIERIA

Ardanuy Ingeniería, S.A. is an engineering consulting firm specialized in studies, design, works management, safety engineering, and technical consultancy for Railways (high-speed, conventional and freight lines), and Urban Transport (metros, trams, cable cars, etc). The company operates worldwide, with collaborations in more than 70 countries in all 5 continents. Currently, more than 60% of our turnover is implemented outside of Spain. This work is carried out from our offices in Spain (Headquarters in Madrid), and in the company's subsidiaries and branches in India, Algeria, Lithuania, Colombia, Peru, Mexico and Brazil.

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## ARTECHE

Arteche's expertise of more than 60 years manufacturing electromechanical relays gives the client the assurance of a technological leader. The dedicated Railway relays are suitable for general purpose and safety critical systems requiring up to SIL-4 safety level for both board and signalling applications. Installed in projects over 45 countries, the relays guarantee a long service life even in extreme situations, helping customers to reduce their operating and maintenance costs. This is further proof of their robustness and reliability that put them at the forefront of railway technology.

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## AZVI

Azvi is a Spanish family business dating back to the mid of the 19th century. Railway is our core business and we drive our efforts to offer the best bespoke solutions in the wide range of railway projects to our clients, from infrastructure activities to railway transport and operation. That is our main goal. We work to develop railways to connect people and territories and to improve mobility in cities and the life of their citizens, through a more efficient, smart, safe, sustainable and environmentally friendly transport. Today, we are an innovative, internationalized and sustainable Company with solid values, experience for over a century and proud of our great human team.

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## CABLES DE COMUNICACIONES ZARAGOZA

Cables de Comunicaciones Zaragoza S.L. is one of Europe's leading companies in the design, manufacture and sale of copper and fibre optic cables for telecommunications and signalling. Since its foundation in 1971, it has contributed to the development and expansion of telecommunications infrastructures.

Operating companies in more than 50 countries on all five continents trust us to manufacture their cables.

Cablescom carries out its activity in Zaragoza, on a surface area of 77,000 m², which includes a production plant, offices and warehouses.

Cablescom has been part of the Hengtong Group since 2016.

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## CAF

CAF is one of the international leaders in the design and supply of comprehensive transportation systems. A benchmark in sustainable mobility solutions, the company offers a wide range of products and services that includes the supply of trains, buses, components, signaling systems, services and concessions and comprehensive systems.

► caf@caf.net  
► www.caf.net



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## CAF MIIRA

CAF MiiRA is a global reference in the supply of comprehensive solutions for rolling gear in the railway sector. We provide state of the art engineering, manufacturing and maintenance solutions for complete wheelsets and portal axles including gearboxes for all kind of train types, as well as services like technological assessment, inspections, and life cycle optimization analysis. MiiRA is moving towards sustainability as it is one of our strategic axis, along with continuous optimization and competitiveness of its solutions, meeting our clients requirements and ensuring their satisfaction.

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## CAF POWER & AUTOMATION

CAF Power & Automation is a global reference in the design and manufacture of railway systems. A technological subsidiary of the CAF Group, it develops solutions for traction, control and communication, and on-board energy accumulation, which are integrated in railway vehicles in 32 countries. Therefore, it has a broad background, in which research, innovation and the desire to excel are constants. The company has a workforce of more than 300 multidisciplinary employees specialised in power electronics, automation and communications, distributed in the headquarters in San Sebastian, Irura and Madrid, as well as in the commercial offices in India and the United States.

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## CAF SIGNALLING

CAF Signalling is the technological division of the CAF Group. It is dedicated to the development, design, manufacture, supply and maintenance of Railway Signalling Systems, for which it provides integral signalling solutions in infrastructure and rolling stock with references in more than 20 countries on 5 continents. It has its own capacity and engineering to undertake highly complex and diverse "turnkey" projects. CAF Signalling has its own products for the integral development of these signalling solutions and has a highly qualified team committed to business objectives and to its customers.

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## CAF TURNKEY & ENGINEERING

We are the CAF Group business unit which manages the development of comprehensive projects for sustainable mobility infrastructures. We design, build and integrate high capacity and performance transport systems under the turnkey scheme. We are distinctive for working with an agile and streamlined process that spans the entire project life cycle, from the planning and requirements definition to the operations, tuning and maintenance phase, optimizing resources and providing tailor-made solutions. We boast an international multidisciplinary team which covers all the needs and requirements that these types of projects entail, thereby allowing us to guarantee the turnkey solution that best adapts to each case.

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## CEIT

Created in 1982, Ceit is a non-profit Technology Centre that uses its high specialisation in advanced manufacturing, mobility, sustainability and information technologies to develop industrial applied research projects in close collaboration with companies. Ceit combines its capabilities and technologies and brings them to the market to offer solutions to key industrial sectors such as Railways, Aeronautics, Energy, Health and Food, Automotive, Environment, ICT and Industrial Manufacturing.

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## CERTIFER

For 25 years, CERTIFER offers certification, inspection, audit and testing services in railway, guided transportation and beyond. With our network of 650 experts, we are committed to making railway, urban transport and new mobilities safer, more reliable and more connected around the world. We are aware of the future needs of rail transport and we involved in several innovation projects related to Cybersecurity, Hyperloop, Supraways, Hydrogen trains, etc. At CERTIFER we work with a collaborative and pragmatic approach in order to help our customers succeed in the certification and placing into service of their products.

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## CENTRO DE ENSAYOS Y ANÁLISIS CETEST

Fully accredited ISO17025, experts in railway vehicles and component testing: structural and fatigue tests, running behaviour, brake, current collection, noise, vibrations, EMC, aerodynamics... Their offering covers a wide variety of test benches at their facilities as well as portable ones. They provide a global on-track measurement deployment capacity.

From validation and verification test in the development phase to product homologation and failure cause analysis in the after-sales operation, CETEST can assist you during the full lifecycle of your product.

CETEST works for passenger, freight and special track vehicle manufacturers, rail operators, engineering firms as well as component suppliers.



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## COLWAY FERROVIARIA

COLWAY Ferroviaria is specialized in toilet modules, interiors and special projects and refurbishment of rolling stock.

For WC modules we offer development, validation and supply of complete STD and PRM modules, in compliance with the TSI.

For interiors and special projects, we offer solutions for the entire interior and for special components such as restaurant and particular seats, PRM or comfort areas or sleeping cabins.

For refurbishment, we offer complete interior and exterior modernization of our clients' coaches at our facilities or customer premises



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► [www.colway-industrial.com/railway-interiors/?lang=en](http://www.colway-industrial.com/railway-interiors/?lang=en)

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## COMSA CORPORACIÓN

COMSA Corporación is a global group focused on infrastructure development, industrial engineering and services with more than 130 years of experience, specialised in railway projects involving the construction and maintenance of high-speed lines, trams, metropolitan and regional railways, as well as railway electrification on high-speed lines, metros, trams and conventional lines. Thus, it carries out all types of electromechanical work in the railway sector, such as traction substations, overhead contact lines, rigid catenary, transformation centres, lighting and ventilation of tunnels, stations, maintenance workshops and track installations.



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## CUNEXT GROUP

One of the main supplier of processed copper and aluminium products. It has production centres in Spain, Italy and EEUU. Leader in the manufacture of efficient materials for energy and data transmission in industries related to mobility, the automotive and railway sector, electrical energy and renewable energies, telecommunications and construction.

Cunext Group is strongly committed to sustainability and innovation through our portfolio of environmentally friendly copper and aluminium products, which bring added value to the market, contributing to technological progress and digitalisation.



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## DANOBAT

Danobat is a leading global solution supplier for the maintenance of railway rolling stock components. We offer specialised Machine Tools and comprehensive solutions to all processes of rolling stock parts: from the axle or the wheel, through the wheelset and to the bogie, offering stand-alone machines as well as turnkey lines.

Danobat offers technologically advanced solutions and services, including among others engineering, consultancy, which are fully adapted to clients' needs.



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## DTA

DTA is a Spanish company with an international vocation specialized in the design and manufacture of automated solutions for the movement of heavy or special loads within plants, from 1 ton to 1,200 tons. Since 1972, our vehicles have been used in all types of heavy industry such as the Railway, Aeronautics, Automotive, Iron and Steel, Ports, Wind Power, Foundries, Construction, in short, for any type of industry where a heavy or special load needs to be moved.



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## ELECTROSISTEMAS BACH (ELECTRANS)

Electrans is leading innovation in the railway industry since 1977.

Electrans stands out for developing its own product line, always being at the technology forefront, and sustaining its competitive advantage in the capacity to be responsive to the needs of each customer.

Our long and successful career path has led us to become a key player in Railway Signalling, particularly in the field of level crossing protection solutions, signals and LED lighting, train detection, and passenger information.

Maximum commitment to each project. Our capacity for adaptation is our biggest asset.

Today, the systems developed by Electrans are found in service around the world, becoming an international reference in the industry.

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## ESTANDA

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## FORGING STEEL PRODUCTS

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## FUNORSA

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## GAMARRA

GAMARRA, S.A. is one of the leading producers of Low and Medium Alloy Carbon Steel Castings in Europe. We produce Steel castings for most freight cars, passenger cars and Locomotive Manufacturers throughout Europe and beyond.

We also produce a wide range of castings for Commercial Vehicles, Off-Road Construction Machinery, Public Works, Defence Industry and General Industrial requirements. Our products can be supplied rough cast, machined or assembled with other accessories. We produce more than 7,000 tonnes of castings per year in the range of 10 kg to 300 kg and dimensions up to 1,100 x 1,100 mm x 600 mm.

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- Shunting Cars: To move car compositions in a simple and efficient way, without any type of coupling.
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- Axle machining lathes: For high-precision finishing of axles.
- Wheel hub boring machines.
- Axle-wheel assemblies lathes: Machining of axle-wheel assemblies, axles, single wheels and brake discs.

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## GMV

Established in 1984, GMV is a leader in the design, development, implementation, and rollout of Intelligent Transportation Systems (ITS) that guarantee compliance with sector standards. GMV offers integrated, fully operational solutions, involved in the complete development of the project and including development of hardware and software and its own manufacturing. With over 950 clients in 35 countries, from Sydney, Warsaw and Tel Aviv, to Madrid and Barcelona, GMV's clients back the company as a global leader in the design and implementation of ITS solutions for rail.



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## GOAL SYSTEMS

Goal Systems is a world leader in planning optimisation software for the passenger transport industry (bus, train and metro). A Spanish company founded in 1992, and present in more than 25 countries in the 5 continents, Goal Systems offers intelligent solutions to help operators and regulatory authorities to move towards an efficient, sustainable, intermodal and user experience-centred transport. Optimising resource planning, improving productivity and profitability to achieve our customers' service and quality objectives. [www.goalsystems.com](http://www.goalsystems.com)



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## GURUTZPE

GURUTZPE supplies horizontal lathes for machining strategic parts in the most demanding industrial sectors.

With over 60 years of experience in the industry, GURUTZPE offers its customers customised, and innovative manufacturing solutions of the highest standards.

GURUTZPE has specific solutions for the railway sector, such as:

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## ITSS IBÉRICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS

Ibérica Tecnología en sistemas de seguridad ferroviarios SL (ITSS) is a leading manufacturer and supplier of railway hazard monitoring equipment, mainly hot axle box (HABD), hot wheel (HWD) and flat wheel detection (FWD) systems for high-speed and conventional traffic railway networks.

The company's flagship PEGASUS, GENIUS and AGUILA systems use state-of-the-art infrared and fibre-optic technology, which makes these systems extremely reliable even under the most challenging operating conditions. ITSS's systems come with self-monitoring and predictive analysis features, which can detect potential problems well ahead of time.

Maintenance overheads are typically low since the systems are modular, auto-calibrating and can be remotely maintained.

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## ICF - INGENIERÍA Y CONTROL FERROVIARIO

ICF offers technical and sustainable solutions for railway signalling. In this area, our vocation is betting heavily on the development and innovation, constantly releasing new products that can be used to improve existed technology solutions.

Sustainability is very important so we have worked hard to design systems that reduces power consumption which allows to use solar power supply, getting zero CO2 emissions and zero external power supply. Following this way of thinking we have designed systems with the possibility of using radio communication, avoiding environmental impact (no cable runs) and reducing time and costs of installation.

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## ICON MULTIMEDIA

With 30 years of profesional experience, ICON Multimedia is specialists in the development and integration of Digital Signage software and Passenger Information Systems for the creation of digital experiences in Smart Cities and Smart Stations.

Our DENEVA Content Manager System is the perfect comprehensive solution for controlling and self-adapting a Digital Signage network. It is specially designed to manage information destined to all users who use public transport. Through the solution, passengers are informed at any moment of any relevant data concerning to their trip: timetables, delays, cancellations, and other communications that allow effective travel planning.

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## IDOM ENGINEERING, CONSULTING AND ARCHITECTURE

IDOM is a multinational firm with offices in over 45 countries. We strive for professional excellence in all our dealings with the Client. Specifically, we have been working for over 20 years on high-speed, designing thousands of kilometres rail, and developing large-scale projects. From conception to operation and maintenance, our specialists draw on tried and tested experience to bring the project to life. The objective is to deliver state-of-the-art projects, clean and efficient transport systems using cutting-edge technologies. These solutions are resilient, resolve the challenges of changing environments, while always considering the the highest standards and environmental sustainability.

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## IKUSI

Ikusi is an integration, engineering and technological development services company for the digital transformation of businesses.

Ikusi has a team of more than 800 highly qualified professionals and customers in more than 80 countries, present in: Spain, Mexico and Colombia. In the railway sector, Ikusi provides a high level of specialization in onboard technology. It addresses the implementation of on-board systems for operational digitalization, also providing flexible and adaptable integrated maintenance services on demand, providing the necessary intelligence to such maintenance through data analytics.

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## INDRA

Indra is a leading technology and engineering company for the aerospace, defense and mobility sectors. It is the technology partner for the digitization and key operations of its customers around the world. Its technology has already modernized railway infrastructure in Spain, Turkey, Lithuania, Colombia, Argentina, Chile, China, Malaysia, USA, UK and Australia, and is currently working on the Irish and Estonian rail networks. Indra also highlights its position as a technological partner of the Mecca-Medina high-speed train, and participates in one of the largest contracts tendered so far to implement the public transport ticketing systems of Riyadh.

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## INECO

Ineco is a leading engineering and consultancy company expert in sustainable mobility and digital transformation. For more than 50 years, has been developing comprehensive, innovative and technological solutions which have allowed to advance towards a new model of mobility. Its activity directly contributes to improving the quality of life of millions of people. With a multidisciplinary team of more than 4,000 employees, the company is present in the five continents, in which it deploys its experience and capacity to undertake challenging projects. All this, thanks to its specialized knowledge and the implementation of state-of-the-art technology.

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## INGETEAM

INGETEAM designs and supplies complete Traction systems, including converters and electrical machines, control (TCMS & Subsystem controllers) and predictive maintenance solutions, based on in-house developments of power and control electronics. Our capacities and the experience on the railway sector allow us to offer advanced solutions, leading to minimize operational costs and focusing on reliability, availability, comfort, maintenance and energy efficiency.

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## ITSA

ITSA is an IRIS certified company specialized in the design and manufacturing of ROLLING STOCK INTERIOR PANELLING. We transform and assemble different composite materials using several special processes such as SMC, RTM, INJECTION, PAINTING, BONDING & WELDING. We optimize costs, weights, and final assemblies through IN-HOUSE ENGINEERING. We manage all projects phases, from product and tool design to logistics and maintenance. With more than 40 projects delivered worldwide and more than 35 years of experience, ITSA is your EXPERT partner in Rolling Stock Interiors.

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## KIMUA

KIMUA is a specialist in designing, integrating, and manufacturing a full range of depot equipment and production tools. From lifting tools to automatic handling solutions. We manufacture bogie drop machines, lifting jackets, mobile work platforms, turners and more standard products. Because we make the best INTELLIGENT SOLUTIONS FOR HANDLING OPERATIONS

► sales@kimuagroup.com  
► www.kimuagroup.com

KIMUA



► Hall 6.2 STAND 910



## LA FARGA YOURCOOPERSOLUTIONS

A pioneering family business in providing sustainable and efficient copper-based solutions for railway sector. The best partner for development of sustainable solutions with our technology and own patented process to offer circular copper solutions with the lowest carbon footprint.

yourcoppersolutions@lafarga.es  
www.lafarga.es

**LA FARGA**  
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HALL 22 STAND 380

## LANDER SIMULATION & TRAINING SOLUTIONS

LANDER Simulation & Training Solutions S.A. is a company which specialises in the design and development of simulators for the training of railway and automotive personnel.

Railway operations have evolved significantly in a short period of time and a comprehensive training approach seems nowadays unavoidable. Training of drivers, dispatchers, OCC operators, maintenance personnel, is essential in order to ensure safety of the operation.

Lander develops custom made solutions that enable the operators to provide a highly realistic training in both individual and collaborative environment ensuring the best training for their personnel.

aohlsson@landersimulation.com  
www.landersimulation.com



HALL 4.2 STAND 130

## LIMMAT

LIMMAT is committed to developing technological products, such as the smart maintenance platform IMAS+®, which improve maintenance efficiency, resource management and facility availability.

The IMAS+® can detect hidden anomalies in data and explore factors that influence them using unsupervised machine learning applications and non-intrusive hardware, offering to the railway maintenance real benefits like:

A 10-20% reduction in maintenance costs.

IMAS+® reduces breakdowns by up to 25% detecting failures before they occur. Increase the safety.

Improvement of the availability and the capacity of the vehicles and the infrastructure.

info@limmat-group.com  
www.limmat-group.com



HALL 22 STAND 710

## MAFEX

Mafex is the Spanish Railway Industry Association. Its main objective is to serve the railway industry and defend the general interest of its more than 100 current partners. All this through the implementation of initiatives in the areas of internationalisation, innovation, competitive improvement and institutional relationships. The association provides strategic and market intelligence services, foreign promotion, R&D&I projects office, talent training and recruitment, open innovation culture, innovative public procurement, forums, working groups, networking and institutional relationships. For all this, Mafex relies on the experience and prestige of the Agex Group Federation to which it belongs. Mafex is also an active member of CEOE (Spanish Confederation of Business Organisations) and UNIFE (Association of the European Railway Industry) in addition to actively collaborating with the main public and private entities both national and international in the sector.

mafex@mafex.es  
www.mafex.es



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**MAFEX** Spanish Railway Association **2022**

FIND OUT MORE ABOUT ALL ACTIVITIES AND SERVICES WE HAVE PREPARED FOR 2022 REGARDING INTERNATIONALISATION AND COMPETITIVENESS AND INNOVATION

mafex@mafex.es



## MAINRAIL

MainRail is a fully customizable modular platform for the comprehensive digitalization of railway infrastructures maintenance. MainRail integrates data from multiple sources, so clients have access to all the information in a single platform, enabling them to manage assets, activities, and resources to make their daily work easier and more efficient.

In addition, to corrective and preventive maintenance, MainRail has a predictive approach based on the hybridization of historical and synthetic data generated by physical and simulation based digital twins.



ana.cano@mainrail.com; info@mainrail.com  
www.mainrail.com

HALL 23 STAND 220

## MEREFSA

Our main processes are environmentally friendly with compact silicone and sponge silicone. The processes are mixing, calendaring, lamination, and formulation of customized silicone bases in platinum and chlorine-free peroxides, extrusion and co-extrusion; molding; welding and cutting.

We are ISO 9001: 2015, ISO 14001: 2015 certified.

From our Headquarters in Sant Boi (Barcelona) we export to more than 40 countries over the world providing the best solutions to the railway, aerospace, automotive, packaging, pharmaceutical, food, lighting, chemical... industries with the best quality systems in line.



export.fr@merefesa.com  
www.merefesa.com

HALL 8.1 STAND 120

## METROTENERIFE

METROTENERIFE is an LRT operator constituted in 2001 in Spain. The accumulated expertise operating and maintaining railway systems, provides the company the ability to offer a variety of consultancy services to other operators and Transport Authorities: planning, design, testing&commissioning, service simulations, trainings, O&M, etc. Furthermore, its engineering team develops innovative solutions that meet the needs of operators worldwide, creating more efficient transport systems, as for instance: SIMOVE for railways, Via-Movil and the Removable Insulating Chamber.

METROTENERIFE has developed projects for clients in Europe, America, Africa and Middle East, involving urban and interurban rail transport.



contact@metrotenerife.com  
www.metrotenerife.com

HALL 22 STAND 710

## MIERES RAIL

Mieres Rail S.A., certified ISO 9001, ISO 14.001, ISO 45.001 e ISO 50.001, is specialized in designing and manufacturing railway turnout systems and manganese steel casted crossings. We provide solutions to our customer's requests regarding geometries or technical specifications, for metro, conventional lines, High Speed lines, industrial railways, high axle loads, depots, ..., for any type of rail and inclination, gauge, type of track, fixed or swing nose crossings, wooden or concrete sleepers, speeds or axle/loads.



mieresrail@mieresrail.com  
www.mieresrail.com

HALL 26 STAND 880

## NEWTEK SOLIDOS

NEWTEK, founded in 1987, is a company dedicated to installations for the handling of granulated or powdered bulk materials for different sectors of industry such as foundry, iron and steel, ceramics, food, railways...

Specialized in the design, manufacture, and assembly of installations for loading sand into trams, trains, and locomotives for use in traction bogies.

It supplies installations consisting mainly of storage silos, fixed and/or mobile sand dispensers, including dust suction systems.

NEWTEK carries out a study of the specific needs of each customer to offer the best solution.



contact@newteksolidos.com  
newteksolidos.com

HALL 22 STAND 710

## PATENTES TALGO

Talgo is a Spanish engineering company with more than 75 years of experience, specialized in designing and manufacturing trains, as well as providing maintenance services to railway operators worldwide. Today, Talgo is the leading global reference for Spanish High Speed Technology and the number one player in Spain's railway market. Its key success factors are innovation, unique technology, sustainability, safety, competitiveness and tailor-made projects with clear focus on customer.



marketing@talgo.com  
www.talgo.com

HALL 4.2 STAND 450



## RENFE

Renfe is Spain's leading rail operator in Passenger and goods transport. We are committed to safe, efficient and quality rail transport. We set ourselves apart from other transport options and adapt to the needs and demands of the most crucial element in this entire structure: our customers. With more than 5,000 trains running every day in Spain, over 500 million passengers a year, 18,3 million tons transported each year, nearly 15,000 employees, and exceptional rates of punctuality, quality and satisfaction, Renfe is working to consolidate its leadership in Spain and extend its international reach, with presence in countries as wide-ranging as the United States, France, Mexico and Saudi Arabia.

renfe



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► www.renfe.com/es/es

► HALL 22 STAND 710

## REVENGA SMART SOLUTIONS

Revenge Smart Solutions will be present at Innotrans 2022, as customary since the company attended the event for the first time near 15 years ago. In this edition, RSS will focus its presence on the presentation of the latest generation of its safety and user experience solutions: XThings, RailXcan and RailRox.

XThings, RSS's solution for real-time sensorization and control of stations and terminals, allows the digitization of all operational processes of the facility. RailXcan, the most advanced solution for real-time sensorization and control of rail tracks and train parameters at a central location. RailRox, the level crossing protection system that stands out for its adaptability to country-specific operation and safety processes.

► marketing@revenga.com  
► www.revenga.com

REVENGA  
Smart Solutions



► HALL 22 STAND 300

## S.A.E. IBERTEST

EN INGLÉS: IBERTEST is a manufacturer of material and component testing systems for the railroad and other sectors, with more than 50 years of experience, worldwide presence and satisfied customers in more than 60 countries. We are specialized in the development of systems for railway infrastructures and rolling stock, as well as the definition and execution of turnkey projects oriented to certifying and research companies or state managers of track infrastructure.

ibertest



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► www.ibertest.com

► HALL 22 STAND 710

MAFEX  
ASOCIACIÓN FERROVIARIA ESPAÑOLA  
SPANISH RAILWAY ASSOCIATION



Find out more about all the activities and services we have prepared for 2022 to promote Internationalization, Competitiveness and Innovation.

mafex@mafex.es | 00 34 944 706 504



## SATYS INTERIORS RAILWAY SPAIN

Satys Interiors Railway has more than 40 years' experience in the design and manufacturing of custom interior systems for new and refurbished trains. Satys Interiors Railway products are lightweight, ready to assemble and reliable with R&D focus on cost effective and sustainable solutions. Presence in France, Spain, Switzerland, United States and China with a total of 400+ dedicated employees.

Examples of latest projects/products made by Satys Interior Railway Spain:

- Galley systems (modulable spaces and easily adaptive to the catering functions),
- Vending machines railway certified,
- Lavatories / toilet cabins

► [mvega@satys.com](mailto:mvega@satys.com)  
► [www.satys.com](http://www.satys.com)



► HALL 1.1 STAND 550

## SEGULA TECHNOLOGIES

SEGULA Technologies Spain is integrated within the Segula Technologies Group, a French engineering company that is positioned as an international leader in the consulting, technical assistance and the research & innovation sector.

Within the Segula Technologies Group, Spain is the reference engineering company in the development of railways systems, specifically rolling stock and signaling, for the main national and international constructors, being the main technological partner of all of them. Currently in full international expansion with new clients, consolidated from its Center of Excellence in Zaragoza (Rolling Stock) and Madrid (Signaling).

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► <https://www.segulatechnologies.com/es/>



► HALL A City Cube STAND 550

## SGS

SGS is the world's leading testing, inspection and certification company. SGS is recognized as the global benchmark for quality and integrity. Our 96,000 employees operate a network of 2,600 offices and laboratories, working together to enable a better, safer and more interconnected world.

Wherever you are, whatever your industry, SGS experts worldwide provide specialized solutions to make your business faster, simpler and more efficient.



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► HALL 22 STAND 710

## SICE

SICE Tecnología y Sistemas is a leading multinational company in the integration of technologies for public infrastructure management. With more than 100 years of history, it has become an international benchmark in the areas of ITS, tunnels, transportation, mobility and intelligent urban services, tolling, water management, security and civil engineering. Offering a transversal vision that includes all phases of the project: consulting, engineering, implementation, maintenance and operation, SICE develops state-of-the-art integrated solutions and applications based on data science and artificial intelligence technologies.

► [sice@sice.com](mailto:sice@sice.com)  
► [www.sice.com](http://www.sice.com)



► HALL 4.1 STAND 700

## SIEMENS MOBILITY

Destination Digital. At Siemens Mobility we will take our customers on a journey to experience how our innovative technologies are enabling the rail industry and countries to master digital transformation, ultimately making rail the backbone of mobility. Digitalization is the key to next-level mobility. By combining intelligent rail infrastructure, optimized life cycle costs and intelligent services we achieve better punctuality and availability rates of up to 100%. Integrating MaaS solutions we also make mainline and public transport more attractive for passengers. Connecting the real with the digital world simply delivers better performance, more flexibility and greater sustainability.

► [comunicacion.web.mobility.es@siemens.com](mailto:comunicacion.web.mobility.es@siemens.com)  
► [www.siemens.es/mobility](http://www.siemens.es/mobility)



► HALL Hub27 STAND230

## smart motors

smart motors® is the strategic partner for those railway operators and maintainers who believe that Digitalization and the uses of advanced analytics are the path towards service excellence. We boost knowledge and introduce railway know-how from the most experienced actors with a real day-to-day contribution, advanced data monitoring and exploitation systems satisfying the requisites of the most demanding environments. DAVANA®, our Digitalization Platform specialized in the rail sector, is the best choice for those who want to drive successfully their Digitalization Strategy.

► [marta.miralpeix@smartmotors.org](mailto:marta.miralpeix@smartmotors.org)  
► [www.smartmotors.org](http://www.smartmotors.org)



► HALL 24 STAND 220



## STADLER

Railways protect the climate. For 80 years, Stadler has therefore been building rail vehicles that make rail transport more attractive, more competitive and more sustainable. So that even more passengers choose to travel by rail. So that even more goods can be transported by rail. So that the transport revolution succeeds.

At InnoTrans 2022 we will show you the technologies that are already making a significant contribution to this today: digital networking of trains and routes, sustainable electric, battery or hydrogen drives. In short: vehicles more sustainable and with maximum comfort.

► [Stadler.valencia@stadlerail.com](mailto:Stadler.valencia@stadlerail.com)  
► [www.stadlerail.com](http://www.stadlerail.com)

STADLER



► HALL 2.2 STAND 160

## TALLERES ALEGRIA

Design, Manufacturing & Supply of Turnout Systems for High Speed Lines, Conventional Lines, metro & LRT.

Manufacturing of End-forged Switch Points and Movable Point Crossings for High Performance Turnout systems.

Design Manufacturing & Supply of Rolling Stock (Freight Wagons & Self-Propelled vehicles).

► [talegria@talegria.com](mailto:talegria@talegria.com)  
► [www.talegria.com](http://www.talegria.com)



► HALL 26 STAND 880

## TALLERES CORRAL MECANIZADOS

TalleresCorral is a medium size company, which was founded in 1958. Its focus is on the production of high quality and security requirement components for the railway industry.

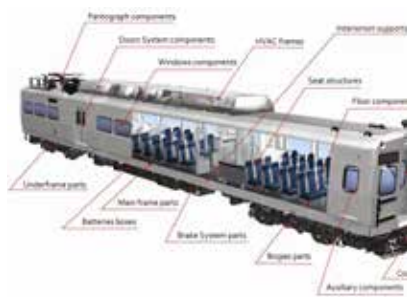
Our company is certified in accordance with the standards: ISO9001, ISO/TS 22163, EN15085 CL1, DIN 6701 A2, ISO3834 and EN1090.

In production of pressure vessels, for brake and air-conditioned systems, TalleresCorral is certificated in module H category I, II and III of 2014/29/UE and 2014/68/EC and the manufacturing of tanks according EN13445 and EN286 codes.

Our principal markets are new projects as well as after-market parts.

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► [www.tallerescorral.com](http://www.tallerescorral.com)

TalleresCorral



► HALL 22 STAND 840

## TÉCNICA Y PROYECTOS (TYPsa)

TYPsa is a leading consulting engineering group providing solutions for transport and mobility, water, clean energy, green buildings and sustainable urban planning. We have 56 years of experience in assisting public, private and institutional clients in transforming concepts into reality. As a completely independent employee-owned firm with presence in 43 countries worldwide, we can leverage a wealth of knowledge and expertise to find optimal solutions for our clients. TYPsa is known for its high level of expertise and its local capacities, and it uses digital technologies and innovative approaches to provide integrated solutions covering technical, economic, environmental and social aspects. Clean, safe and efficient transport is our main areas of expertise, and rail

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► [www.typsa.com](http://www.typsa.com)

TYPsa



► HALL 22 STAND 710

## TECNIVAL

TECNIVAL is its extensive experience in developing highly technological products, offering a wide range of leading products for railways.

NANOTEC SIGNS; the future signalling. TECNIVAL incorporates sustainable railway marker boards. Manufactured in a composite material of fiber/resin and carbon nanoparticles that improve its mechanical properties, while providing extreme toughness and lightness

At TECNIVAL, we are committed to R&D, that makes us pioneers in railway safety products and a specialist in all kinds of Marker Boards for Railways, both conventional and High-speed Lines, being the first company approved by ADIF in this last section

Our strong technical know-how allows us to take part in international projects.

► [iramirez@tecnival.es](mailto:iramirez@tecnival.es)  
► [www.tecnival.es](http://www.tecnival.es)

TECNIVAL



► HALL 22 STAND 710

## TEL DAT

Since 1985, Teldat has been providing solutions for cloud access, remote office communications, cybersecurity and voice/data connectivity for railway, vehicle, offices and industrial environments.

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► [www.teldat.com](http://www.teldat.com)

Teldat



► HALL 4.1 STAND 840



## TELTRONIC

Teltronic provides complete wireless communications solutions for transport sector, satisfying the most demanded needs in matters of voice and data, including integration with signalling applications and other railway subsystem such as Public Address, intercoms, CCTV, Train Control and Management System (TCMS) and Automatic Train Supervision (ATS), among many others. With more than 100 transport communication systems deployed worldwide, Teltronic offers TETRA, 4G/5G, as well as TETRA + broadband hybrid solutions, and has the most complete portfolio of products to provide integrated solutions: communications infrastructure, onboard radio equipment, user consoles, radio terminals, and Integrated Command & Control solutions.

► sales@teltronic.es  
► www.teltronic.es



► HALL 4.1 STAND 580

## THALES

Thales (Euronext Paris: HO) is a global leader in advanced technologies, investing in digital and "deep tech" innovations – connectivity, big data, artificial intelligence, cybersecurity and quantum technologies – to build a confident future crucial for the development of our societies. The Group provides its customers – businesses, organizations and governments – in the defense, aeronautics, space, transport, and digital identity and security domains with solutions, services and products that help them fulfil their critical role, consideration for the individual being the driving force behind all decisions. Thales has 81,000 employees in 68 countries.

► Info.es@thalesgroup.com  
► https://www.thalesgroup.com/en/transportation-spain



► HALL 27 STANDS 670 & 571

## voestalpine Railway Systems JEZ

voestalpine Railway Systems JEZ designs, manufactures, supplies, maintains and give Service to all types of turnouts for railways and trams. Our engineering department develops complete turnouts, including standardisation and installation projects for railway station equipment and the development of customised solutions with our own patents. One of our priorities is to achieve excellence in after-sales customer service. This involves the immediate presence of our technical staff to solve any problems, deal with customer requests, input and suggestions and the commissioning of turnouts.

► juancarlos.sanchez@voestalpine.com  
► www.jez.es



► HALL 21 STANDS 150

## XUBI GROUP

EN: Xubi Gears, founded in 1956, designs and produces all types of precision gears, with a wide experience in the railway industry, offers a wide range of products such as spiral bevel gear sets or helical gear sets.

► comercial@xubi.com  
► www.xubigroup.com



► HALL 20 STANDS 650

## ZELEROS

Zeleros is the European company based in Spain leading the development of a scalable hyperloop system. Zeleros' unique technologies integrated in the vehicle radically reduce hyperloop infrastructure costs per kilometer. The system shortens path-to-market and offers a straight certification journey thanks to its operation at aviation pressure levels, using vastly proven safety systems for airplanes and railway. The company mobilizes more than 180 people worldwide, working with world-renowned leaders in the railway, infrastructure, aviation and energy sectors such as Renfe, Airbus, Acciona, Arcelormittal, Red Eléctrica de España, Capgemini Engineering, EIT Innoenergy, CAF Group, among others.

► press@zeleros.com  
► www.zeleros.com



► HALL 4.2 STANDS 238

## ZITRÓN

Since 1963, ZITRÓN has been designing, manufacturing and supplying custom-made ventilation systems for underground mines, road and railway tunnels, and metro systems. Zitron's commitment to quality and innovation has enabled it to grow into one of the most technologically driven and successful ventilation companies in the world. From its origins in Northern Spain, Zitron's success has seen it expand operations into over 80 countries on 6 continents.

► ouazzani@zitron.com  
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► HALL 5.2 STAND 720





## Catenary-free ground power supply technology for the Barcelona tramway connection

ALSTOM'S APS TECHNOLOGY IS CURRENTLY INSTALLED AND IN OPERATION IN 11 CITIES ON FOUR CONTINENTS.

The Barcelona Metropolitan Transport Authority (ATM) has awarded Alstom a contract for electrification of the first phase of the Barcelona tram network connection with a ground-level power supply system (APS), which will eliminate the use of catenary in the new section. The contract includes the APS equipment for the infrastructure and adapting 18 trams from the current fleet.

The APS system involves installing a third rail on the railway line

that works as a power supply system. This third conductor rail, divided into sections, automatically switches on and off according to whether a tram passes over them, thereby eradicating any risk to other road users (pedestrians, bicycles and motorbikes).

Thanks to the APS system, a pioneer in Spain, installing a catenary on the new section of the tramway network will not be necessary, thus preserving the aesthetics of urban environments. Furthermore, this

highly reliable technology maintains the same levels of availability and maintainability as conventional catenary.

Alstom's APS technology is currently installed and in operation in 11 cities on four continents (Bordeaux, Tours, Rio de Janeiro, Istanbul, Dubai and Sydney, among others). Every day, 245 trams use this solution, which has already covered more than 38 million kilometres worldwide.

This solution allows Barcelona's tramway to establish itself as the central axis of the city's commitment to sustainable mobility, betting on a friendly, accessible, equitable and healthy urban development.

## Test track construction in Sagunto Port to demonstrate **hyperloop technology** and boost port logistics

ARCELORMITTAL, RAILS & SPECIAL SECTIONS HAS DEVELOPED NEW PRODUCTS WITH IMPROVED GUIDING PERFORMANCE TO BE INTEGRATED INTO THE SELF-BOOSTER TEST TRACK.

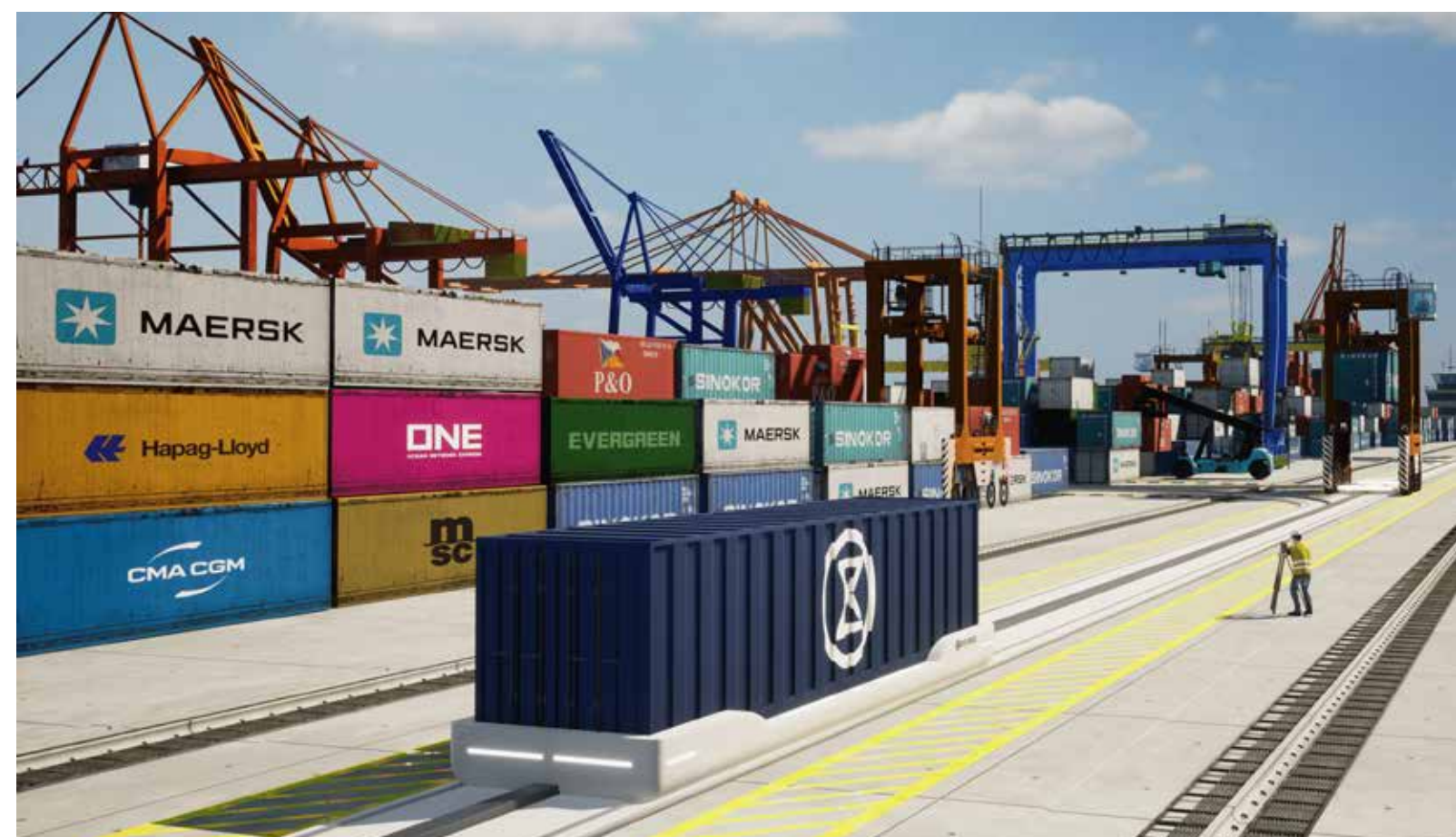
Zeleros lays the first stone of the test track for the SELF-Booster (Sustainable Electric Freight-forwarder), a pilot project that will demonstrate Zeleros' hyperloop technology and its application to automated and fully electric container handling. It will consist of a test track that will automatically move through a fully electric linear motor a vehicle from 0 up to 120 km/h and back to

stop in 100 meters. ArcelorMittal is proud to bring its highly valued R&D expertise in the field of steel, more specifically in the high-efficiency electrical steels required for this project and high added-value long products for the rails.

The collaboration between Zeleros and ArcelorMittal is a co-engineering project. Indeed it is a challenging R&D task due to the extremely

exigent tolerances of the materials and the structure needed to provide an efficient propulsion system; this leads to a detailed mechanical design that take into account induced deformation produced by electromagnetic forces and the integration of new guiding solutions.

Thanks to this collaboration, ArcelorMittal, Rails & Special Sections has developed new products with improved guiding performance to be integrated into the SELF-Booster test track. The combination of high wear resistance properties along with customized geometry fulfils the need for tight tolerances of the propulsion system.





# WMATA 7000 Series Cab Simulators

METRO WASHINGTON DC DRIVERS WILL PRACTICE WITH DRIVER TRAINING SIMULATORS DEVELOPED BY CITEF.

The first eight simulator cabs are installed at Carmen Turner Facility and the remaining twelve will be deployed in several strategic areas located throughout WMATA's network.

The simulators are a replica of the current Kawasaki 7000 series trains and accurately include the six different lines WMATA currently operates. "We have received the first cabins and are very pleased with the results. This is a big step forward in our training, safety, and service quality goals", Lucien Barthelemy, Project Manager at WMATA.

Regardless of the challenges that the pandemic has presented, the team has pressed on and overcome the obstacles given by the unique market situation.

Jose Manuel Mera, CITEF's Director: "CITEF is very excited about the results of this project, and has come a long way to provide WMATA with the best possible simulation and training experience".



# The Ideenzug Project offers passengers different experiences in a single double-decker car

DB tries to offer passengers different experiences in a single double-decker coach and has divided the interior into different areas. COLWAY Ferroviaria has developed, validated and supplied three of these areas, being one of DB's main partners for this project. The areas offer a multitude of special seats, tables and dividing panels that transport the passenger to new experiences.

The first area "Gathering" provides a concept of meeting between passengers, where tables and high stools and side seats are offered. The stools and seats include an innovative HPL sandwich configuration technology and curved plywood board.

COLWAY FERROVIARIA HAS PARTICIPATED AS A DB PARTNER IN A VERY AMBITIOUS INNOVATION PROJECT CALLED "IDEENZUG".

The second area is called "Relaxation". The area offers comfortable side seats, a longitudinal table and dividing screens. Passengers have the option of using USB chargers.

Finally, the area called "Department Banks" is the most traditional since it involves double seat banks. We also incorporate side tables with

USB chargers and side protections. Dividing panels and luggage racks with curved glass are included.

The project has been a great technological challenge for COLWAY Railway.

The Ideenzug will be presented during the Innotrans fair and will enter service in Bavarian regional transport during the year 2022.





# INHELIUM luminaires family

**F**ocused on the field of emergency signaling and lighting in railway tunnels, road tunnels and wind towers, the business activity of Dinámicas de Seguridad SL (Dsaf) prioritizes its commitment to new technologies in the execution of its projects and initiatives in pursuing compliance with the highest safety standards regarding the evacuation of people in risky situations.

Starting from innovation, research, development and application, Dsaf develops products that can be effectively adapted to the problems and conditions of the projects to be implemented, either

INHELIUM IS A FAMILY OF LED EMERGENCY LIGHTING PRODUCTS, DEVELOPED BY DSAF BASED ON THE SPECIFIC NEEDS SHOWN BY OUR 3 AREAS OF APPLICATION: WIND TOWERS, ROAD AND RAILWAY TUNNELS

from the point of view of the fields of application, or from the current regulations and the corresponding security guarantees.

The latest example in these products is the INHELIUM luminaires family.

INHELIUM is a family of LED emergency lighting products, developed

based on the specific needs shown by our 3 areas of application: Wind towers, Road and railway tunnels.

As a result of these needs, 5 different models of LED luminaires have been developed, each one with its specific characteristics, which allow optimal performance by perfectly adapting to the conditions offered by each area.



## Management system for the centralized operation

**T**he system to be developed is integrated with multiple external systems covering the various stages of rail traffic management. On the other hand, the system itself allows it to act on its own in these stages if necessary, providing greater robustness to the set of Euskotren systems. The first stage (or timetable planning) covers the import or preparation and exchange of the operating plans that will be used in the future, plans that contain all the planned traffic, both of the train network and of the Bilbao and Vitoria tram networks for one or more standard days that will be applied on a calendar that will determine the plan to load.

EUSKOTREN, THE PUBLIC TRANSPORT OPERATOR IN THE BASQUE COUNTRY, HAS RECENTLY AWARDED GMV THE DEVELOPMENT OF THE MANAGEMENT SYSTEM FOR THE CENTRALIZED OPERATION OF THE BILBAO AND VITORIA TRAMS, AS WELL AS THE RAILWAY OPERATED BY THIS ENTITY.

The next stage, the real-time stage, allows, for the current day, daily monitoring of the traffic of the different networks, whether it is the train or tram networks. The tool makes it possible to react to deviations that occur, allowing, for example, to modify the loaded plan in various ways, load a different plan, manually reassign affected

materials or personnel, etc. As a result of all this, modifications are made throughout the day keeping other external systems updated.

Finally, in the last stage, the system analyzes the circulations that were carried out in the past, for which a series of personalized reports are available



## The transport Electrification. Global rail operators, new mobility systems

Throughout its almost 40 years of existence, Euskotren has established itself as the transport operator in the Basque Country, satisfying people's mobility needs by rail and cable car (Euskotren Trena), tram (Euskotren Tranbia), bus (Euskotren Autobusa) and freight transit by rail (Euskotren Kargo).

Its mission is to promote sustainable urban and interurban mobility and the New electrification Plan contributes to its achievement.

IDOM is analyzing the maturity of electric technology in the bus sector and the alternatives available on the market (battery technology, autonomy, operating and elec-

IDOM IS DEVELOPING EUSKOTREN'S ELECTRIFICATION STRATEGY AND DESIGN TO TRANSFORM THE MOBILITY OF ITS LAND FLEET NETWORK.

tric recharging strategies, night vs. opportunity recharging systems), with the aim of designing and planning the operation of the new routes and electric buses. This analysis proposes a strategy of Progressive acquisition Programme for the buses as the current fleet ages, proposing the lines on which to progressively implement the electric fleet. Likewise, with consumption calculation tools developed by IDOM REPS, the efficiency

of energy consumption and the sustainability benefits of the chosen solution are analyzed.

After analyzing the currently available technology, an assessment was made of which of the technological alternatives is best suited to the metropolitan transport services provided by Euskotren under the Bizkaibus brand, and an analysis was made of the operation with the new electric buses.



## E-Lau: Discover the customizable e-learning railway tool par excellence



The term e-learning was used for the first time by the education expert Elliott Masie, in a conference he offered in 1999. The term means Electronic Learning, and today, it is undoubtedly a widely used training modality worldwide. Above all, because it offers great advantages for the current operations of companies: greater accessibility of training, flexibility and cost savings.

However, these benefits are joined by numerous challenges that not all e-learning systems have been able to solve successfully. This is where the new E-Lau tool comes into play. Although e-learning has been on everyone's lips for years, it is now in 2022 when LANDER SIMULATION launches a

LANDER SIMULATION LAUNCHES E-LAU THAT TRIES TO RESPOND TO MANY OF THE CHALLENGES THAT DIGITAL TRAINING HAS POSED IN RECENT YEARS.

tool that tries to respond to many of the challenges that this type of digital training has posed in recent years.

The E-lau allows railway professionals to train beyond driving simulators. There are many railway concepts and protocols that can be learned and practiced in this tool, especially those related to trains, perfectly complementing traditional theoretical methods in the classroom, and allowing train protocols to be prac-

ticed without using the driving simulator.

The E-Lau is easily customizable for each client, offers highly interactive content and will allow users to learn concepts from any location, connected to the Internet. As with the simulators, there is nothing better than verifying in the first person that the E-Lau is indeed coming to stay. Visit LANDER at stand 130, hall 4.2. in Innotrans and discover it.



# Mission Critical Services lead the way to FRMCS

The term MCX (Mission Critical Services) refers to a set of critical communication applications for broadband networks that provide voice (MCPTT), data (MCData) and video (MCVideo) services, as well as the infrastructure that supports them.

Defined by 3GPP, they are the foundation on which FRMCS is based, the future railway mobile communication system that will replace GSM-R and, hand in hand with 5G technology, will be key to the digitisation of rail transport.

Mission-critical telecommunication systems have undergone a spectacular evolution, and their implementation in railway environments enables innovations such as autonomous trains, remote surveillance, predictive main-

TELTRONIC HA DESARROLLADO UNA PLATAFORMA MCX QUE SE CONFIGURA COMO UNA SOLUCIÓN INTEGRADA LISTA PARA EL FRMCS.

tenance, more accurate railway signalling and, in general, a more efficient and safer operation.

Teltronic has developed an MCX platform that is configured as an integrated FRMCS-ready solution. This includes private LTE/5G infrastructures, which offer the highest levels of quality of service and availability and even enable integration with TETRA technology.

The solution also includes both the on-board equipment that main-

tains the train-ground connection at all times and enables integration with other subsystems: video surveillance, PIS, public address, intercom, etc., as well as the radio terminals used by security and maintenance personnel.

Finally, Teltronic's control centre solution, CeCoCo, is configured as a platform that integrates the MCX dispatch function, video, train alarms and the different technologies that make the operation possible.



## The port of Seville applies technology to the intelligent management of rail traffic

Ferroport System (FPS) is a digital tool that uses technological solutions to monitor railway operations in real time, in a controlled environment, at a maximum speed of 30 km/h and for freight or other trains without passengers.

By means of an operational support manager, this system allows traffic monitoring from a central command post; the launching of command orders for railway routes within the Port of Seville; and the processing, sharing and receiving of all the information from digital and conventional platforms.

Ferroport System combines virtual technology, new hardware developments for the deployment of

THE SEVILLE PORT AUTHORITY, IN COLLABORATION WITH THE UNIVERSITY OF SEVILLE AND THE TECHNOLOGY COMPANIES SERVIPORT AND THALES, HAS DEVELOPED A NEW CONCEPT FOR THE OPERATION AND AUTOMATION OF RAILWAY MANOEUVRES INSIDE THE PORT.

decentralised field equipment and central equipment, and specific software with rail traffic control rules.

Thanks to automation, manual operation times are reduced and safety is increased throughout rail traffic, shortening reaction times in the event of possible incidents. Likewise, the tool allows an in-

crease in the capacity to move trains at the same time, minimising risks, and favours coordination with all the links in the logistics chain.

The FPS technology designed in the Port of Seville is a benchmark for the port system and can be exported and adapted to other environments.





## Be-access: accessibility assessments for an inclusive design.

TYPSA IS ACTIVELY RESPONDING TO THE NEED OF INTEGRATING ACCESSIBILITY REQUIREMENTS IN TRANSPORT FROM THE DESIGN STAGE AND HAS DEVELOPED AN INNOVATION PROJECT WITH INCLUSIVE TECHNOLOGY THAT CONTRIBUTES TO ENSURING A TRANSPORT FOR ALL.

The innovation proposal facilitates the users' involvement through testing and assessment from the design stage. The BE-access tool allows the participation of all parties involved in the evaluation of the station design before it is built, through a virtual experience. Once the station is built and commissioned, BE-access can extend its functionality and become a user information tool via the operator's website.

The development and testing of the application have been carried out in the Amado Granell-Montolivet underground station within the project extension of line 10 of the Valencia Metro, with the collaboration of the Ferrocarrils de la Generalitat Valenciana.

BE-access offers an interactive tour through all spaces of the station and their assessment. The user evaluation includes aspects such as: the clear location of accessible vertical routes, identification of the tactile routes, easy access to accessible ticket vending equipment, effective signage system, accessible turnstiles line, identification of areas on platforms to access accessible areas in trains, etc

TYPSA has developed BE-access as an innovation tool that supports and promotes the achievement of Sustainable Development Goals 10 and 11, in the social, economic, and political inclusion of all and the access to safe, affordable, accessible, and sustainable transport systems for all.

## Ground improvement under the railway with injections of expansive resin

The high-speed line linking Paris Austerlitz with Bordeaux Saint Jean suffered a deterioration at the base of the railway following the construction of an underpass. There had been instabilities manifested on the surface by a sinkhole.

To solve this problem used our innovative Deep Injections® technology that allowed us to reinforce the decompressed soils of the subplatform with injections of expansive resin. This solution allows us, thanks to our resin injections, to consolidate the foundation ground, improve its mechanical and hydraulic characteristics, eliminate differential seats and recover the bearing capacity.

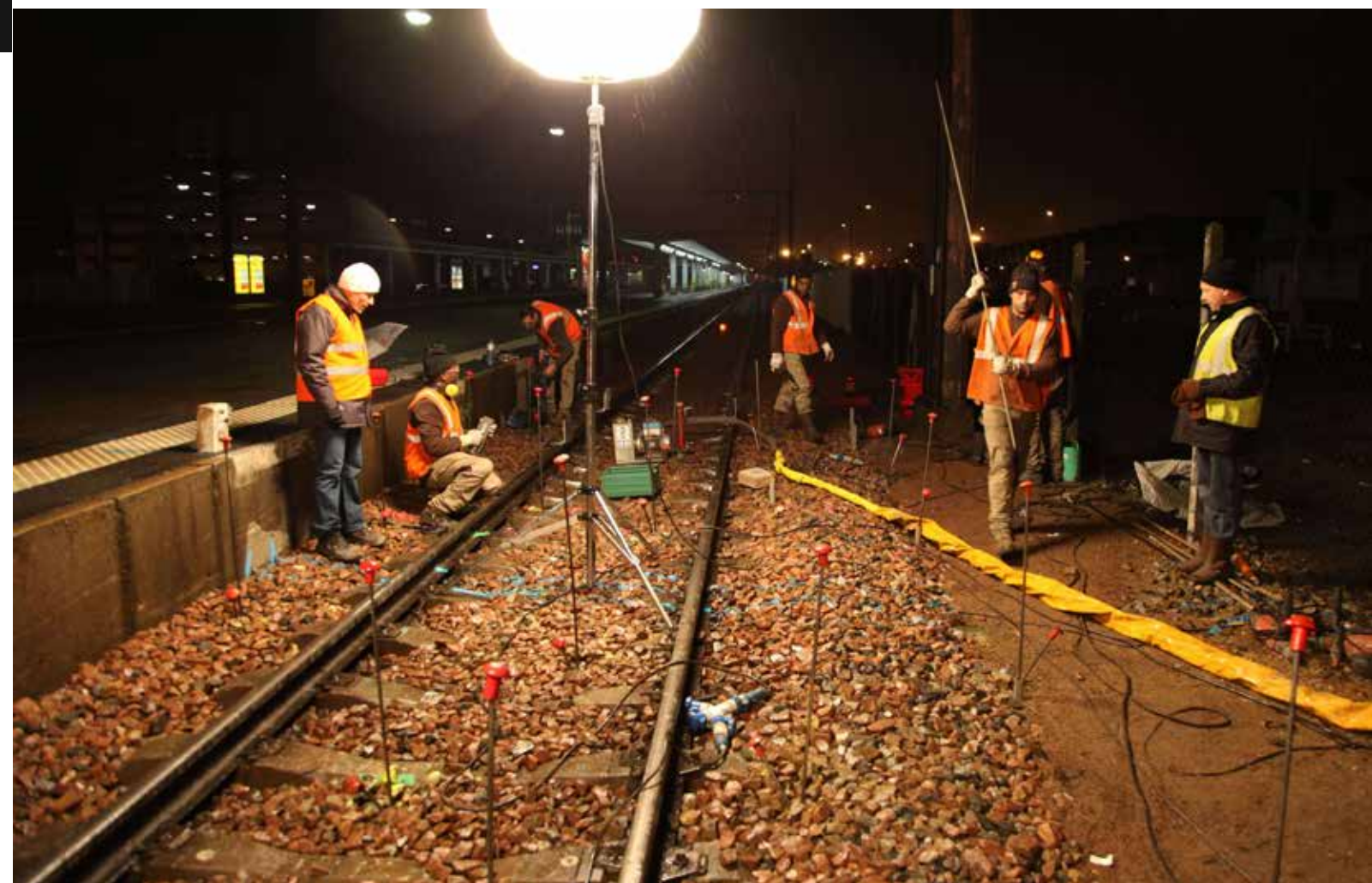
URETEK® RESIN INJECTIONS OFFER THE BEST SOLUTION FOR THE RAILWAY SECTOR, WITH A MINIMALLY INVASIVE, FAST AND WASTE-FREE TECHNIQUE.

minate differential seats and recover the bearing capacity.

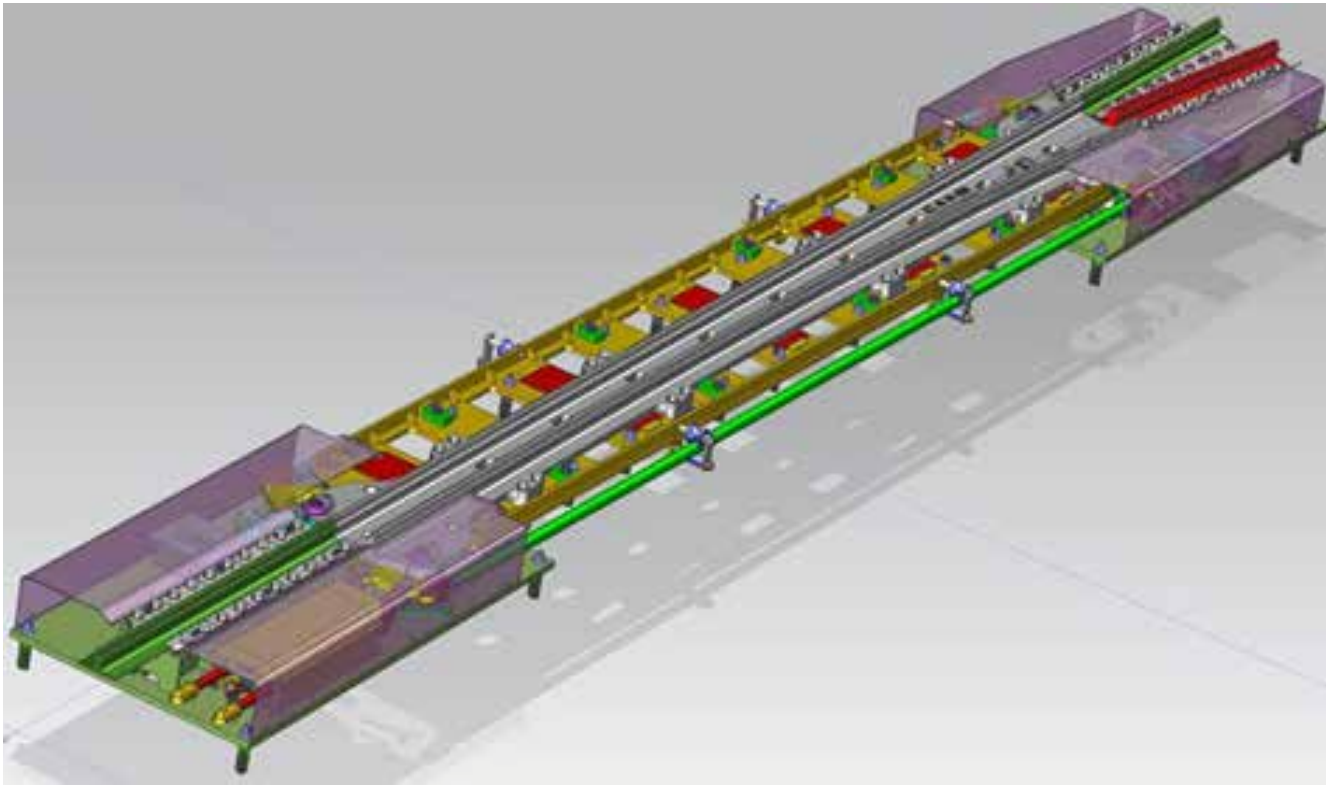
In this intervention, an area of 120 m<sup>2</sup> was covered, injecting the resin up to 3 m deep under the railway. It was carried out in a total of 15 hours, divided into 3 nights of work, adapting to the railway traffic schedule. The flatness checks carried out by SNCF confirmed the effectiveness of the intervention carried out.

All our interventions are controlled in every moment with a laser monitoring system that allows us not to suffer any incidence in the altimetry of the tracks.

With Uretek® resin injections we offer the best solution for the railway sector, with a minimally invasive, fast and waste-free technique.







# The new urban mobility

In today's world, urban mobility takes on a great role, given that it is one of the factors involved in the fight against climate change. A sustainable and ecological mobility in our big cities is a factor of competitiveness and of change towards means of transport with low CO2 emissions.

voestalpine Railway Systems JEZ is the global solutions company in the field of track devices both for urban mobility and for other means of rail transport, such as high-speed, mixed traffic, as well as heavy axle-load railways.

Urban mobility is evolving, and in recent decades railway systems with pneumatic wheels have become more and more frequent. These systems had their origin in the Paris Metro, and today, many European, American and Asian cities enjoy the advantages of them. Among

VOESTALPINE RAILWAY SYSTEMS JEZ HAS THE NECESSARY TECHNOLOGY TO PROVIDE COMPLETE SOLUTIONS TO THE URBAN MOBILITY SYSTEMS ON PNEUMATIC WHEELS.

its characteristics we can mention, a double security system that gives them the system of steel wheels in charge of guiding, the possibility of overcoming large slopes, great acceleration and braking capacity, which is important in the case of stations close to each other, and great ride comfort.

voestalpine Railway Systems JEZ has the necessary technology to provide complete solutions to these urban mobility systems on pneumatic wheels.

Voestalpine Railway Systems JEZ is currently supplying complete turnouts for the pneumatic wheel metro in Lyon (France) on its extension

to the southern hospital. The Paris metro (RATP) also has components for this type of detour manufactured by voestalpine Railway Systems JEZ, as well as the Santiago de Chile, Mexico and Montreal metro.

Within the field of innovation, voestalpine Railway Systems JEZ has two patents for switches for pneumatic wheel metros with center rail guidance - NeoVal. These points & crossings allow the alternative passage of the train on the direct track and on the diverted track, or they allow the crossing of two different tracks, all of them integrating the motorisation and signaling elements of the voestalpine group.

ENGINEERING, CONSULTANCY AND CERTIFICATION

- Projects and infrastructure technical assistances, superstructure, signalling, communications and ticketing
- ▶ ACYGS Sales Management, S.L.
  - ▶ Aimen Centro Tecnológico
  - ▶ Ardanuy Ingeniería, S.A.
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  - ▶ Caf Signalling, S.L.
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  - ▶ Calmell, S.A.
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  - ▶ Dsaf-Dinámicas De Seguridad, S.L.
  - ▶ Mieres Rail, S.A.
  - ▶ Endavamientos y Señalización Ferroviaria ENYSE, S.A.U.
  - ▶ HaslerRail (Secheron Hasler Group)
  - ▶ Ibérica Tecnología en Sistemas de Seguridad Ferroviarios, S.L. (ITSS)
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  - ▶ Idom-Engineering, Consulting, Architecture
  - ▶ Ikusi, S.L.U.
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  - ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
  - ▶ Inse Rail, S.L.
  - ▶ Luznor Desarrollos Electrónicos, S.L.
  - ▶ Segula Technologies España, S.A.U.
  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ SGS Group Spain
  - ▶ Simulaciones y Proyectos, S.L.
  - ▶ Tecnival, S.A.
  - ▶ Teldat, S.A.
  - ▶ Teltronic
  - ▶ Tekniker
  - ▶ Thales España Grp, S.A.U.
  - ▶ TPF Getinsa Euroestudios, S.L.
  - ▶ Trigo Group
  - ▶ Typsa - Técnica Y Proyectos, S.A.
  - ▶ Vicomtech
  - ▶ WSP Spain-Apia, S.A.

- Systems, environmental, financial management and IT consulting
- ▶ Aimen Centro Tecnológico
  - ▶ Aquafirsch, S.L.
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  - ▶ Asea Brown Boveri, S.A.
  - ▶ Citef (Fundación para el fomento de la innovación industrial)
  - ▶ Fundación Gaiker
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  - ▶ Mainrail, S.L.
  - ▶ Nertatec, S.L.
  - ▶ Segula Technologies España, S.A.U.
  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ SGS Group Spain
  - ▶ SQS (Software Quality Systems, S.A.)
  - ▶ Simulaciones y Proyectos, S.L.
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- Technical Specifications Drafting and supervision of rolling stock manufacturing
- ▶ Aimen Centro Tecnológico
  - ▶ Ardanuy Ingeniería, S.A.
  - ▶ Asea Brown Boveri, S.A.
  - ▶ Caf Turnkey & Engineering, S.L.
  - ▶ Hispacold, S.A.
  - ▶ Idom-Engineering, Consulting, Architecture
  - ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
  - ▶ Segula Technologies España, S.A.U.
  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ SGS Group Spain
  - ▶ Trigo Group
  - ▶ WSP Spain-Apia, S.A.

- Work supervision
- ▶ Aimen Centro Tecnológico
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  - ▶ Asea Brown Boveri, S.A.
  - ▶ Caf Turnkey & Engineering, S.L.
  - ▶ Idom-Engineering, Consulting, Architecture
  - ▶ Indra Sistemas, S.A.
  - ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
  - ▶ Inse Rail, S.L.
  - ▶ Intertek Ibérica Spain, S.L.U.
  - ▶ Segula Technologies España, S.A.U.
  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ SGS Group Spain
  - ▶ Sice Tecnología y Sistemas
  - ▶ Tpf Getinsa Euroestudios, S.L.
  - ▶ Typsa - Técnica y Proyectos, S.A.
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- ▶ ACYGS Sales Management, S.L.
  - ▶ Aimen Centro Tecnológico
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  - ▶ Certifer Belgorail, S.A. Sucursal en España
  - ▶ Cetest, S.L.
  - ▶ Citef (Fundación para el fomento de la innovación industrial)
  - ▶ Dsaf-Dinámicas De Seguridad, S.L.
  - ▶ Fundación Gaiker
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  - ▶ Intertek Ibérica Spain, S.L.U.
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  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ SGS Group Spain
  - ▶ SQS (Software Quality Systems, S.A.)
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  - ▶ Trigo Group
  - ▶ WSP Spain-Apia, S.A.

- Drafting of operation and maintenance (O&M) plans and transport and demand studies
- ▶ ACYGS Sales Management, S.L.
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  - ▶ Gantrex Spain
  - ▶ Idom-Engineering, Consulting, Architecture

- ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
- ▶ Segula Technologies España, S.A.U.
- ▶ SGS Group Spain
- ▶ Tekniker
- ▶ Tpf Getinsa Euroestudios, S.L.
- ▶ Typsa - Técnica y Proyectos, S.A.

- Training and simulations tools
- ▶ Aimen Centro Tecnológico
  - ▶ Asea Brown Boveri, S.A.
  - ▶ HaslerRail (Secheron Hasler Group)
  - ▶ Lander
  - ▶ Segula Technologies España, S.A.U.
  - ▶ Simulaciones y Proyectos, S.L.
  - ▶ Tekniker
  - ▶ WSP Spain-Apia, S.A.

INFRASTRUCTURE AND SUPERSTRUCTURE

- Civil works (platforms, stations, depots)
- ▶ Aimen Centro Tecnológico
  - ▶ Azvi, S.A.
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  - ▶ Comsa Corporación
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  - ▶ Inse Rail, S.L.
  - ▶ Lantania
  - ▶ Luznor Desarrollos Electrónicos, S.L.
  - ▶ Sener Ingeniería y Sistemas, S.A.
  - ▶ Uretek Soluciones Innovadoras, S.L.U.

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  - ▶ Asea Brown Boveri, S.A.
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  - ▶ Comsa Corporación
  - ▶ Cunext
  - ▶ HaslerRail (Secheron Hasler Group)
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  - ▶ Inse Rail, S.L.
  - ▶ La Farga Yourcoppersolutions, S.A.
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  - ▶ Telice, S.A.
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- ▶ Aimen Centro Tecnológico
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  - ▶ Cunext
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- Lantania
- Llalco
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- Talleres Zitrón
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- Telice, S.A.

Track assembly

- Alstom Transporte, S.A.
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TRAFFIC CONTROL AND SIGNALLING  
SYSTEMS, COMMUNICATION,  
PASSENGER INFORMATION  
AND TICKETING

Traffic control and signalling (safety)

- Alstom Transporte, S.A.
- Cables de Comunicaciones Zaragoza, S.L.
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- Teltronic, S.A.
- Telice, S.A.
- Thales España Grp, S.A.U.
- Uriarte Safybox
- voestalpine Railway Systems JEZ SL

Protection (security) and infrastructure  
monitoring

- Alstom Transporte, S.A.
- Azvi S.A

- Asea Brown Boveri, S.A.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Dsaf-Dinamicas De Seguridad, S.L.
- HaslerRail (Secheron Hasler Group)
- ICF - Ingeniería y Control Ferroviario
- Indra Sistemas, S.A.
- Inse Rail, S.L..
- Mainrail, S.L.
- Segula Technologies España, S.A.U.
- Siemens Rail Automation, S.A.U.
- Telice, S.A.
- Thales España Grp, S.A.U.
- Vicomtech

Systems and equipment for collection,  
ticketing and access control

- Asea Brown Boveri, S.A.
- Caf Turnkey & Engineering, S.L.
- Calmell, S.A.
- Comsa Corporacion
- Gmv Sistemas, S.A.U.
- Ikusi, S.L.U
- Indra Sistemas, S.A.
- Inse Rail, S.L.
- Revenga Ingenieros S.A:
- Sener Ingeniería y Sistemas, S.A.
- Sice Tecnología y Sistemas
- Siemens Rail Automation, S.A.U.
- Telice, S.A.
- Vicomtech

Communications

- Azvi, S.A.
- Cables de Comunicaciones Zaragoza, S.L.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Cellnex Telecom, S.A.
- Comsa Corporación
- Enclavamientos y Señalización Ferroviaria ENYSE, S.A.U.
- Gmv Sistemas, S.A.U.
- HaslerRail (Secheron Hasler Group)
- ICF - Ingeniería y Control Ferroviario
- Ikusi, S.L.U
- Indra Sistemas, S.A.
- Inse Rail, S.L.
- Revenga Ingenieros S.A.
- Sener Ingeniería y Sistemas, S.A.
- Sice Tecnología y Sistemas
- Siemens Rail Automation, S.A.U.
- Teldat, S.A.
- Teltronic, S.A.U.
- Telice, S.A.
- Thales España Grp, S.A.U.
- Vicomtech

Passenger information and on-board  
entertainment systems

- Alstom Transporte, S.A.
- Caf Turnkey & Engineering, S.L.
- Gmv Sistemas, S.A.U.
- Icon Multimedia, S.L.

- Indra Sistemas, S.A.
- Inse Rail, S.L.
- Ikusi, S.L.U
- Revenga Ingenieros, S.A.
- Sice Tecnología y Sistemas, S.A.
- Siemens Rail Automation, S.A.U.
- Tecnivial, S.A.
- Teldat, S.A.
- Telice, S.A.
- Vicomtech

ROLLING STOCK MANUFACTURERS

High Speed trains (over than 250km/H)  
M.R para tráfico de pasajeros alta  
velocidad (más de 250km/H)

- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Zeleros

Long distance and regional passengers  
trains (up to 250km/H)

- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.

Urban and suburban trains

- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.

Freight wagons and Locomotives

- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegría, S.A.
- Zeleros

Vehicles for infrastructure maintenance

- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Revenga Ingenieros S.A.
- Sener Ingeniería y Sistemas, S.A.
- Siemens Rail Automation, S.A.U.
- Talleres Alegría, S.A.

MANUFACTURERS OF VEHICLE  
COMPONENTS, AUXILIARY  
EQUIPMENT AND SYSTEMS

Traction and propulsion components

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Ariño Douglass, S.A..
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Asea Brown Boveri, S.A.
- Caf Equipos y Componentes
- Caf Power & Automation, S.L.U.
- Flexix, S.A.

- Forging Steel Products, S.L.
- HaslerRail (Secheron Hasler Group)
- Ingeniería Viesca, S.L.
- Ingeteam Power Technology, S.A.
- Mgn Transformaciones del Caucho, S.A.
- Siemens Rail Automation, S.A.U.
- Zeleros

Control, auxiliary and diagnostic systems

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Asea Brown Boveri, S.A.
- Caf Power & Automation, S.L.U.
- CEIT
- Endavamientos y Señalización Ferroviaria ENYSE, S.A.U.
- Gmv Sistemas, S.A.U.
- HaslerRail (Secheron Hasler Group)
- Hispacold S.A
- Ibérica Tecnología en Sistemas de Seguridad Ferroviarios, S.L. (ITSS)
- Indra Sistemas, S.A.
- Ingeniería Viesca, S.L.
- Ingeteam Power Technology, S.A.
- Kimua Group
- Nertatec, S.L.
- NGRT, S.L.
- NRF España, S.A.
- Stadler Rail Valencia, S.A.U.
- Teldat, S.A.
- Zeleros

Assembly equipment

- Agui, S.A.
- Aimen Centro Tecnológico
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Asea Brown Boveri, S.A.
- Danobat, S. COOP.
- Forging Steel Products, S.L.
- Fundiciones del Estanda, S.A.
- Funor, S.A.

Mechanical components

- Agui, S.A.
- Alstom Transporte, S.A.
- Caf Equipos y Componentes
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Flexix, S.A.
- Forging Steel Products, S.L.
- Funor, S.A.
- Fundiciones del Estanda, S.A.
- Hispacold, S.A.
- Metalocauchó, S.L.
- Mgn Transformaciones del Caucho, S.A.
- Nertatec, S.L.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegría, S.A.
- Zeleros

Interiors

- Agui, S.A.
- Ariño Duglass, S.A.
- Colway Ferroviaria, S.L. (Nexus Management)
- Flexix, S.A.

- Fundación Gaiker
- Satys Interiors Railway Spain, S.A.

Safety

- Agui, S.A.
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Dsaf - Dinamicas de Seguridad, S.L.
- Enclavamientos y Señalización Ferroviaria ENYSE, S.A.U.
- Fundación Gaiker
- HaslerRail (Secheron Hasler Group)
- Indra Sistemas, S.A.
- Luznor Desarrollos Electrónicos, S.L.

MAINTENANCE: EQUIPMENT,  
MAINTENANCE SERVICES AND  
REFURBISHMENT

Infrastructure and superstructure  
maintenance

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Amurrio Ferrocarril y Equipos, S.A.
- Azvi, S.A.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Comsa Corporación
- ICF - Ingeniería y Control Ferroviario
- Mainrail, S.L.
- Mieres Rail, S.A.
- Gantrex Spain
- Inse Rail, S.L.
- Ladícm
- Smart Motors
- Urettek Soluciones Innovadoras, S.L.U.

Rolling Stock maintenance

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Azvi, S.A
- Caf Equipos y Componentes
- Caf - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporación
- Grupo Trigo
- Hispacold, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegría, S.A.
- Talleres Zitrón

Maintenance of traffic control and  
signalling, communications, passenger  
information and ticketing systems

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Azvi, S.A.
- Caf Signalling, S.L.
- Caf Turnkey & Engineering, S.L.
- Dsaf-Dinámicas de Seguridad, S.L.

- Electrans, S.A.
- Gmv Sistemas, S.A.U.
- ICF - Ingeniería y Control Ferroviario
- Ibérica Tecnología en Sistemas de Seguridad Ferroviarios, S.L. (ITSS)
- Ikusi, S.L.U.
- Indra Sistemas, S.A.
- Inse Rail, S.L..
- Luznor Desarrollos Electrónicos, S.L.
- Patentes Talgo, S.L.
- Sice Tecnología y Sistemas, S.A.
- Siemens Rail Automation, S.A.U.
- Smart Motors
- Telice, S.A.
- voestalpine Railway Systems JEZ, S.L.

Maintenance of traffic control and  
signalling, communications, passenger  
information and ticketing systems

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Caf Equipos y Componentes
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Caf Power & Automation, S.L.U.
- Caf Turnkey & Engineering, S.L.
- Enclavamientos y Señalización Ferroviaria ENYSE, S.A.U.
- Gmv Sistemas, S.A.U.
- Géminis Lathes
- Grupo Trigo
- HaslerRail (Secheron Hasler Group)
- Hispacold, S.A.
- ICF - Ingeniería y Control Ferroviario
- Indra Sistemas, S.A.
- Ingeteam Power Technology, S.A.
- Kimua Group
- Mgn Transformaciones del Caucho, S.A.
- NGRT, S.L.
- NRF España, S.A.
- Patentes Talgo, S.L.
- Satys Interiors Railway Spain ,S.A.
- Sice Tecnología y Sistemas
- Smart Motors
- Stadler Rail Valencia, S.A.U.

Maintenance of systems, equipment  
and vehicles components

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Aquafirsch, S.L.
- CAF Equipos y Componentes
- Danobat, S. COOP.
- Electrans, S.A.
- Kimua Group
- ICF - Ingeniería y Control Ferroviario
- Ingeniería Viesca, S.L.
- Nertatec, S.L.
- Newtek Solidos, S.L.
- Patentes Talgo, S.L.
- Tecnivial, S.A.



**ASEA BROWN BOVERI, S.A.**

Rail is being rediscovered as a sustainable and energy-efficient form of transport. We understand the importance and implications of running these railway networks.

We provide complete solutions that protect your infrastructure, and meet the expectations of users and transport stakeholders for all key applications. These include infrastructure, passenger stations, control and signaling units, tunnels and rolling stock.

🚩 C/ SAN ROMUALDO, 13 - 28037 (MADRID)

☎ +34 915 81 93 93



✉ contact.center@es.abb.com

🌐 new.abb.com/railway/abb-solutions-for-transportation-rail-and-infrastructure

**ACYGS SALES MANAGEMENT S.L.**

ACYGS is an engineering services consulting company dedicated exclusively to the railway sector and specialized in all the consulting and engineering services associated with a rolling stock maintenance workshop. We offer a personalized railway engineering service for each client, adapting to the needs of each workshop and project, developing its activity at an international level carrying out projects in the 5 continents, providing global solutions backed by the experience of more than 20 years in the rolling stock maintenance sector of the professionals who are part of Acygs.

🚩 C/ Loeches , 65 - Oficina 7 Madrid (MADRID))

☎ +34 914 85 52 88



✉ jazamora@acygs.com

🌐 www.acygs.com

**AGUI S.A.**

AGUI is a B2B subcontractor expert in the manufacturing of electro-mechanical assemblies for OEMs. We collaborate with the client in the design of the product, contributing with our knowledge in process engineering and welding, and once the product is defined, we industrialize and manufacture it according to the takt time. AGUI is certified in ISO-3834 and EN-15085, which positions us as a reference supplier for welded assemblies.

🚩 Pol. Ind. Lintzirin-Gaina. Parcela B-1. 20180 Oiartzun - (GUIPÚZCOA)

☎ +34 943 335 811 / 663 775 753



✉ +34 943 552 066

✉ lm.gil@agui.com

🌐 www.agui.com

**AQUAFRISCH, S.L.**

More than 25 years of experience in the railway sector endorse Aquafrisch as a manufacturer of train washing systems, bogies washing cabins, WC extraction systems (CET) and other products for the maintenance of rolling stock in railway workshops.

Our equipment is installed in more than 30 countries on 5 continents. Aquafrisch is also a leader in industrial water treatment and purification. Aquafrisch takes care of the design, manufacture, installation, commissioning, training and maintenance of the machines according to the customer's needs. Aquafrisch is certified ISO9001:2015, ISO14001:2015 and ISO 45001:2018.

🚩 Margarita Salas 7, 28521 Rivas-Vaciamadrid (MADRID)

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🌐 www.aquafrisch.com

**ARCELOMITTAL**

ArcelorMittal, as the steel industry leader in product and process innovation, is fully geared to meet the future requirements of the rail industry. With rail production facilities in Spain, Poland, Luxembourg and USA offers a wide portfolio of rails for subways, trains, trams, light rails, crane rails, crossings and rail accessories. We are specialist in rail for high-speed net, with over 1 million tons produced, and presence in infrastructure of over 30 countries, the high technologic quality allows participating in the more demanding tenders all over the world. ArcelorMittal has its own R&D Rail Excellence Centre for developing new products and processes.

🚩 ArcelorMittal Asturias. Edif. de Energías, 2 pl. 33691 Gijón (ASTURIAS)

☎ +34 985 187 750



✉ rails.specialsections@arcelormittal.com

🌐 https://rails.arcelormittal.com/

**ARDANUY INGENIERÍA, S.A.**

Ardanuy Ingeniería, S.A. is an engineering consulting firm specialized in studies, projects, works management, safety engineering (ISA), operation / maintenance studies; and technical guidance for railways (high-speed, conventional, freights, metros, trams, cable cars), electrical engineering (sub-stations and high-voltage lines), roads (highways, freeways, BRT's, streets, etc.), buildings (architecture and facilities) and telecommunications.

The company was established in 1992 and is comprised of a permanent team of more than 200 professionals.

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✉ +34 91 799 45 01

✉ madrid@ardanuy.com

🌐 www.ardanuy.com

**AIMEN CENTRO TECNOLÓGICO**

We are an innovation & technology Centre specialized in materials and in advanced manufacturing technologies, especially joining technologies and laser technologies applied to materials processing and robotics. We develop R&D&I in collaboration with companies in the field of the technologies for industry 4.0, and we offer technological services to industry in the field of welding and corrosion engineering, manufacturing engineering, design and simulation and mechatronics; developing customized and integral technological solutions which respond to the needs of our clients and associated companies. Our accredited laboratories provide analysis and testing services, especially failure analysis and in-service behavior of industrial components.

🚩 C/ Relva 27 A - Torneiros | 36410 O Porriño (PONTEVEDRA)

☎ +34 662 489 181



✉ aimen@aimen.es

🌐 www.aimen.es

**ALSTOM ESPAÑA**

As a promoter of sustainable mobility, Alstom offers a complete range of solutions (from high-speed trains to metros, tramways and e-buses), passenger solutions, customized services (maintenance, modernization), infrastructure, signalling and digital mobility solutions. The company recorded sales of €8,2 billion in the 2017/18 fiscal year. Alstom is present in over 60 countries and employs 38,900 people. In Spain Alstom employs around 2,000 people on 18 sites, including a rolling stock manufacturing site and 4 innovation centres where it runs R&D programmes for rolling stock and railway signalling, safety, security, digital mobility and services.

🚩 Martínez Villergas, 49 - Edificio V - 28027 Madrid (MADRID)

☎ +34 91 334 58 00



✉ +34 91 334 58 01

🌐 www.alstom.com

**AMURRIO FERROCARRIL Y EQUIPOS, S.A.**

Design, production, installation of turnouts, track devices, crossings. For all type of purpose. Metro, tram, regional, conventional, high speed, heavy haul, ports and industrial.

🚩 Maskuribai, 10 01470 Amurrio (ÁLAVA)

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✉ +34 945 892 480

✉ comercial@amufer.es

🌐 www.amufer.es

**ARIÑO DUGLASS, S.A.**

50 years' experience behind us as a company specialised in glass for architecture and railway. An extensive presence in the Spanish, European and world markets has enabled us to obtain the knowledge and know-how in order to offer the most technologically advanced products of high quality.

It is in our DNA to continuously research and develop technology that allows us to adopt the very latest manufacturing methods, resulting in business excellence and ongoing innovations. In partnership with a number of organisations and institutions, we collaborate, cooperate and lead different research projects.

🚩 Pol. Ind. Royales Bajos, S/N, 50171 La Puebla de Alfindén (ZARAGOZA)

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**ARTECHE**

The Artech Group is focused on offering equipment and solutions for the electricity and railway business worldwide. The expertise of more than 70 years manufacturing instrument transformers and electromechanical relays gives the client the assurance of a technological leader. With projects over more than 40 countries, our dedicated range of railway relays are designed to meet the highest standard requirements of the sector and its reliability and durability allow them to be used not only as general purpose relays, but also in all kind of safety functions, both for on-board and signalling applications making them suitable to be used in circuits requiring up to SIL-4 safety integrity level.

🚩 Derio Bidea, 28 48100 Mungia (VIZCAYA)

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✉ +34 946 155 628

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🌐 www.artech.com

**AZVI**

Azvi is the company which undertakes construction within Grupo Azvi. For over 100 years, Azvi has carried out a significant number of large scale civil engineering and building projects. Azvi has extended its activity to all construction areas in Europe, America and the Middle East, without losing sight of its origins and railway background. By applying principles of responsibility to the whole business sphere, seeking the creation of value, maintaining a strong commitment to all its stakeholders in all countries where it is present and investing in R&D Azvi continues constructing a company capable of facing the new challenges of an increasingly globalised market.

🚩 Almendralejo, 5. 41019 (SEVILLA) / Maudes, 51, 2º. 28003 (MADRID)

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### CERTIFER BELGORAIL SA SUCURSAL IN ESPAÑA

Certifer Belgorail SA is a certification, inspection and safety evaluation entity for the guided transport sector, both conventional railways and subways and trams. We are an accredited body for the certification of interoperability (NoBo), national regulations (DeBo), safety evaluations under CENELEC standards (ISA) and under CE Regulations (AsBo). We are part of the Certifer Group, with a presence, in addition to Spain, in Belgium, France, the Netherlands, Germany, Austria, Italy, Sweden, Turkey, Algeria, Brazil, Australia, Vietnam, the United Arab Emirates and China.

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🌐 www.belgorail.es



### CABLES DE COMUNICACIONES ZARAGOZA, S.L.

Cables de Comunicaciones is one of the main European companies dedicated to the design, manufacturing and commercialisation of telecommunication, signalling and optic fibre cables. Ever since its foundation in 1971, it has contributed to the development and extent of the telecommunications infrastructures. Railway companies from the main European countries entrust us with the manufacture of their cables. Among them, they stand out: Adif, SNCF, NetworkRail, Infrabel etc. Cablescom undertakes its activity in Zaragoza, in the Malpica industrial park, over a surface of 77,000 m<sup>2</sup>, which includes a production plant, offices and warehouses.

🚩 Polígono de Malpica, C/D, 83  
50016 Zaragoza (ZARAGOZA)  
☎ +34 976 729 900  
✉ j.alzorric@cablescom.com  
🌐 www.cablescom.com



### CAF - CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S.A.

CAF is one of the world leaders in the design and implementation of comprehensive transit systems. CAF provides comprehensive project and engineering management throughout all stages of the project including feasibility analysis and investigations, system design, civil work, signalling, electrification and other electromechanical systems, rolling stock supply and system operation and maintenance. In terms of rolling stock, CAF supplies and maintains high speed trains, regional and commuter trains, locomotives, metro units, trams and buses.

🚩 J.M. Iturriz, 26 20200 Beasain  
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✉ caf@caf.net  
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### CAF TURNKEY & ENGINEERING

CAF Turnkey & Engineering was created in 2007 with its head office in the Technological and Scientific Park of Biscay (Zamudio). It began its business in Integrated Engineering of Transport Services and in 2015, after merging with the company CMFS (Mexico), it increased its portfolio of services with the inclusion of EPC projects for both civil works and subsystems. Following solid and constant growth, the company currently has a workforce of 200 with offices in Zamudio, Madrid and Mexico, providing service to both companies within the CAF Group and national and international private and public customers.

🚩 Parque Científico y Tecnológico de Bizkaia,  
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### CALMELL, S.A.

The Calmell Group is the leader in access control and identification, through its companies Calmell S.A., Affix S.L., Idoneum S.A., which are respectively engaged in producing the supports (tickets, cards...), developing specific software and hardware, personalization and security. In the public transport sector it works for integrators and operators supplying any kind of support for ticketing and reader/writer systems. With a strong international presence through its network of representatives and distributors, the Calmell Group is able to satisfy your needs on a global level.

🚩 Pol. Ind. Pla d'en Coll C/ Fresser, 12 C  
08110 Montcada i Reixac (BARCELONA)  
☎ +34 93 564 14 00  
✉ dsala@calmell.net  
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### CEIT

We are a Basque Technology Center founded by the University of Navarra, whose main objective is to develop applied R+D+i projects with companies to improve their competitiveness. We are part of BRTA (Basque Research & Technology Alliance), which includes 16 agents that constitute the Basque Network of Science, Technology and Innovation (RVCTI). We also participate in Shift2Rail Joint Undertaking as associated members. We focus our R+D+i activity within the railway sector in the following topics: energy efficiency, maintenance, railway dynamics, component design and characterisation, embedded systems (SIL4), positioning, data intelligence.

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### CAF EQUIPOS Y COMPONENTES

CAF Equipment and Components is a key player within CAF Rail Services, the CAF Group's services division, as a Centre of Excellence in Equipment and Components to address the challenges of the railway industry. Our extensive experience as a key player in the CAF Group, has enabled us to develop a portfolio of products and services focused on the operational improvement of our customers' maintenance activities:

- Maintenance and improvement of Equipment and Components
- Supply and management solutions of Spare Parts and Components
- Comprehensive solutions in Workshop Equipment
- Refurbishment and Accident Repair

🚩 Pol. Ind. Apatia Erreka C/Uzturre 1,  
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✉ abarrena@cafgroup.net  
🌐 www.cafgroup.net



### CAF POWER & AUTOMATION

CAF Power & Automation designs and develops electric traction systems, energy storage systems and control & communication, which guarantee adaptable reliable and committed solutions with transport. Our systems are modular and flexible and can be integrated both in new vehicles and in those in service or that need refurbishment. Traction systems; Energy Storage (GREENTECH) and Control & Communication (COSMOS). Railway systems modernisation and refurbishment: Equipment and components, system integration, installation, maintenance and guarantee. Railway system maintenance: Technical support, spare parts, training courses, test benches.

🚩 Mikeletegi, 58 - 2, Parque Tecnológico  
de San Sebastián (GUIPÚZCOA)  
☎ +34 943 309 251  
✉ info@cafpower.com  
🌐 www.cafpower.com



### CAF SIGNALLING, S.L.

CAF Signalling, the technological subsidiary of the CAF Group, designs and provides Integral Signalling Solutions, both in Spain and abroad. The company has its own advanced technology products, both for onboard and wayside applications that make up the core of its integral solutions. As a result of a significant and growing effort in R&D&I, particularly in the area of critical safety systems, CAF Signalling promotes continuous innovation and customer focus.

CAF Signalling, boasts the Company's own in house engineering and expertise to take on "turn-key" railway signalling projects.

🚩 Avda. de la Industria, 51 28108  
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🌐 www.cafsignalling.com



### CELLNEX TELECOM, S.A.

Cellnex manages a portfolio of more than 130,000 sites – including forecast roll-outs up to 2030 – in Spain, Italy, the Netherlands, France, Switzerland, the United Kingdom, Ireland, Portugal, Austria, Denmark, Sweden and Poland. Cellnex's business is structured in four major areas: telecommunications infrastructure services; audiovisual broadcasting networks, security and emergency service networks and solutions for smart urban infrastructure and services management (Smart cities and the "Internet of Things" [IoT]).

🚩 Passeig de la Zona Franca, 105, 08038  
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☎ +34 935 03 10 00  
✉ global.bids@cellnextelecom.com  
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### CETEST, S.L. Centro de Ensayos y Análisis

Fully accredited ISO17025, CETEST is an experienced laboratory in railway vehicles and components testing. Its offering covers a wide variety of component test benches at their facilities as well as portable ones. CETEST provides a global on-track measurement deployment capacity. From validation and verification test in the development phase to product homologation and failure detection / root cause analysis in the after-sales operation, CETEST can assist you during the full lifecycle of your product. Their customers include passenger, freight and special track maintenance vehicle manufacturers, component suppliers, as well as Notified Bodies, engineering firms and authorities.

🚩 Lazkaibar, s/n Edif. CETEST 20200  
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### CITEF (FUNDACIÓN PARA EL FOMENTO DE LA INNOVACION INDUSTRIAL)

CITEF (Railway Technology Research Centre) was created in 1997 as part of F2I2 (the Foundation for the Development of Industrial Innovation) for research, innovation, experimentation, study and teaching purposes within the railway knowledge area. It is a non-profit organisation pursuing aims of general interest within any rail transport technology sector.

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🌐 www.citef.es



**COLWAY FERROVIARIA, S.L.**

COLWAY FERROVIARIA S.L., a company belonging to the COLWAY Group, is specialized in the design, engineering, manufacture, installation and commissioning of turnkey railway interiors and toilet modules projects. Revamping of seats and floors for a significant improvement of the coaches, with a controlled investment, is included among its capabilities. Through the integrated management of modular supplies & systems, based on experience, research and innovation, satisfaction and expectations of railway constructors and Public Administrations are achieved. Its work is based on the application of strong values: commitment, professionalism, ethics and agility.

🚩 Botánica, 149-151, 08908, Hospitalet de Llobregat (BARCELONA)  
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 ☎ +34 93 639 86 10  
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 🌐 <http://colway-08.com/site/es>

**COMSA**

COMSA is the company of COMSA Corporación specialised in railway infrastructures. Founded in 1891, the company provides a comprehensive service in the field of construction, maintenance, electrification and control and communication systems for high-speed and conventional lines, metros and tramways. In this business activity, it is leader in Spain, where has been involved in the carrying out of all high-speed lines, and has permanent operations in Argentina, Brazil, Croatia, Denmark, Mexico, Poland, Portugal and Uruguay. It has also taken part in a large number of projects in other markets such as Italy, the Philippines, Taiwan, Malaysia, India, etc.

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**CUNEXT COPPER INDUSTRIES**

Cunext in the way to continuous development has created the entire cable product range for overhead line electrification adapting at any speed from local transport to high speed line. Our modern technology together with a wide experience at cable and alloy manufacturing makes us the best partner for railway companies offering best product quality and service. Cunext Group locate production plants at strategic places such as Cordoba for copper products, Vitoria and Brescia for aluminium products.

🚩 Av. de la Fábrica, s/n  
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 ✉ josep\_anfruns@cunext.com  
 🌐 [www.cunext.com](http://www.cunext.com)

**ELECTROSISTEMAS BACH, S.A.**

Electrans, established in Barcelona in 1977, has had a successful career path that turn it in an international relevant supplier in signalling, particularly in the field of level crossing protection solutions, railway and tramway signalling, detection systems and LED lighting, obtaining its products and solutions worldwide recognition.

Electrans' constant progress is motivated by the commitment to innovation, at the service of the adaptability of systems and products for the current needs of railway projects.

🚩 Calle de la Mar Mediterrània, 9 Pol.  
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 🌐 [www.electrans.es](http://www.electrans.es)

**FLEXIX, S.A.**

FLEXIX, develops, manufactures worldwide since 1950 INJECTION and EXTRUSION RUBBER PARTS, rubber-metal, rubber-plastic, special elastomers and assemblies. We are part of the KÄCHELE-FLEXIX Group, with 2 plants in Germany, 1 in Spain and a warehouse in USA. For the RAILWAY SECTOR we produce mainly for infrastructures, absorption of vibrations under track, tie pads for sleepers, different range of stiffness (14-152 kN/mm). We provide development in geometries (FEM), materials, (conductivity, non-harmful gases...) TYPE OF PARTS: Pads, Ducts, bellows, tubes, silent-blocks, joints, bumpers, axles, links, valves, bearings. MIXTURES: NR, SBR, EPDM, CR, H/NBR, ECO, AEM, ACM, Silicone, FPM.

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 Martín Zamudio (VIZCAYA)  
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 ✉ flexix@flexix.com  
 🌐 [www.flexix.com](http://www.flexix.com)

**FORGING STEEL PRODUCTS, S.L.**

Manufacturing of machined and if needed painted forged components ready for assembly destined to the railway rolling stock manufacturers for chassis, brakes, clutches, hooks etc.

🚩 Barrio Arregui s/n 48340 Amorebieta-Etxano (VIZCAYA)  
 ☎ +34 946 300 211  
 ✉ ja.ros@forgingsteelproducts.com  
 🌐 [www.forgingsteelproducts.com](http://www.forgingsteelproducts.com)

**DANOBAT S.COOP.**

Specialised Machine Tools and production systems for railway industry offering technologically advanced solutions and services, including among others engineering, consultancy, which are fully adapted to clients' needs. DANOBAT focuses its activity in the supply of turnkey solutions for the manufacturing and maintenance of railways rolling stock, incorporating own leading technology products, together with those manufactured by specialised companies.

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 🌐 [www.railways.danobatgroup.com](http://www.railways.danobatgroup.com)

**DINÁMICAS DE SEGURIDAD, S.L.**

DSAF is a entrepreneurial society focused on the safety of the movement of people at risk. Committed to the new technologies applied to the design of signaling systems, prevention and emergency in safety, DSAF promotes the development of products that guarantee the highest grade of security according to the standards of type approval current in generalized risk societies such as global ones. The activity of DSAF focuses on these two major sectors: road / rail tunnels and wind towers.

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**ENCLAVAMIENTOS Y SEÑALIZACIÓN FERROVIARIA ENYSE S.A.U.**

Enyse is a Signalling company belonging to the Industrial Services division of the ACS group. For Enyse, the success of their projects is based on a high level of adaptation to functional and operational needs of the various railways - flexibility is the key word. In an industry increasingly integrating technology standards, the required Reliability, Availability, Maintainability and Safety standards not only apply to system design level, but are the actual premises to properly implementing and commissioning turn-key Signalling projects.

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**FUNDICIONES DEL ESTANDA, S.A.**

Since 1957 Estanda has been providing various sectors with steel castings. The half of all its activity is focused on the high-speed train brake discs manufacturing, being one of the first worldwide manufacturers, the other half is focused on a wide range of sectors such as the cement and mining industry, defence, off-shore, automotive industry, and bogie components for the railway equipment. Mostly low alloy steels, wear resistant steels, refractory steels, stainless steels and white irons are casted. With its 14.000 tonnes per year production capacity, Estanda manufactures from 10 to 2000 kgr. parts in all kinds of batch sizes, with 2.400 mm as its maximum part dimension.

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**FUNORSA**

Funorsa is a Steel casting foundry with more than 20 years in the railway sector. We are specialized in pieces of high responsibility as couplers, Pivots, connection rods and different parts of the bogies. We are able to cast low alloy, alloy and inox castings up to 1.300 kg with a capacity of 2.000 Tons per year.

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**GAIKER CENTRO TECNOLÓGICOS**

GAIKER Technology Centre, located in the Technological Park of Bizkaia, is devoted to the development of new technologies to be transferred to the industry. Since 1985, the Centre has carried more than 2,000 R&D Projects in the areas of Plastics and Composites, Environment and Recycling and Biotechnology. Besides, GAIKER offers to its customers Advanced Technological Services, Analysis and Tests and Technological Dissemination Services. GAIKER counts on 87 employees and was awarded in 2008 by the European Foundation for Quality Management (EFQM) with the "Prize Winner" for the best European organisation in "Management for Process and Facts".

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**GANTREX SPAIN, S.A.**

Gantrex is the global market leader in production, distribution installation and maintenance of high quality crane rail solutions. Gantrex products are used in many different applications and end-markets including ports, shipyards, steel mills, aluminium smelters, railway depots and heavy industries.

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**GEMINIS LATHES, S.A.**

Leaders in the development of horizontal and multiprocess lathes, and specialized in railway sector, where we are proud to support the manufacturers of trains and maintenance lines, among other agents in the value chain. We offer customized solutions with highly reliable machines for the maintenance of rolling stock. Our lathes are specialized in the machining of axles, axle-wheel set and wheels.

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**GLOBAL QUALITY ENGINEERING SER. UNA COMPAÑÍA DE TRIGO GROUP**

TRIGO Spain is a supplier of quality services and support in the supply chain in industrial sectors. Founded in 2001, it offers quality assurance services in products, maintenance, industrial means management and metrology with more than 600 quality professionals in Spain. TRIGO GROUP is present in 25 countries with a team of more than 10,000 professionals.

TRIGO Spain exports to the railway sector good practices of high added value developed in sectors such as aerospace and automotive.

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**INGENIERÍA Y CONTROL FERROVIARIO, SAU**

ICF offers technical and sustainable solutions for railway signalling. In this area, our vocation is betting heavily on the development and innovation, constantly releasing new products that can be used to improve and optimize existing technology solutions. All the level crossings since June 2001 have been protected by ICF with its level crossing protection system SPN-900. We are working worldwide with more than 1000 international references. For us it's very important to be sustainable so we have worked hard to design systems that reduce dramatically its power consumption which allows it to work taking its energy only from sun, getting a zero CO2 emissions and zero external power supply.

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**IDOM CONSULTING, ENGINEERING AND ARCHITECTURE S.A.U.**

IDOM is one of the leading companies in the field of professional services in Engineering, Architecture and Consultancy. An independent company established in 1957 and it has participated in over 30,000 projects in five continents. In 25 countries with 42 offices. More than 3,500 staff possesses the expertise and experience to cover all the phases of a railway project (high speed, conventional, freight, metro, light rail, tramway, depot and workshops). From conception to commissioning and beyond and facing the challenges of an innovative, efficient and resilient Transport System. IDOM accompanies the client by providing the correct technical assistance required for the decision making process.

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**IKUSI, S.L.**

At Ikusi, we provide complex turnkey integration project design, engineering and development services both for rolling stock and for infrastructure, with the agility and flexibility required by the rail industry. We are oriented towards improving our clients' competitiveness and innovation capacities, thanks to our deep business knowledge developed during these years. Our business focus is the design and supply of innovative technological solutions to help vehicle builders, transport operators and authorities optimize and transform their business while guaranteeing quality of service and enhancing passenger experience in terms of security, information, comfort and accessibility.

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**GMV SISTEMAS S.A.U.**

GMV is a leading firm in the design, development, implementation and rollout of Intelligent Transportation Systems (ITS) guaranteeing compliance with the railway sector standards. Main products and services: On board units for location and communications, Fleet Management Systems, Fare Collection Systems, Passenger information systems, CCTV systems, PA & Intercom system, Systems for security reinforcement, Eco-driving systems, Software for planning and scheduling of services. Conceived for all railway modes (tram, metro, commuter train, long distance, high speed trains...)

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**HASLERRAIL:**

Sécheron Hasler Group is a leading global supplier of electrical and electronic safety components and solutions and traction power systems for the railway industry and also provides solutions for renewable energy, DC grid, and other industrial systems. HaslerRail is the world's leading supplier of innovative On-Board Electronics, Data Acquisition and Recording, Speed Sensors and Odometry, Visualisation solutions and Speed Indicators, Energy Metering, Control, Protection and I/O, Software and data management solutions, and Cybersecurity for the railway industry. Our solutions are backed by our extensive global service and support network.

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**HIERROS Y CARBONES, S.A.**

Since 1997 Hicasa is specialised in transformation, tailored cut, storage and distribution of railway tracks materials, all kinds of rails and railways accessories with a permanent stock of more than 3,500 MT.

In 2006 we have incorporated to our Group of companies a factory specialised in manufacturing light rails from 7 kg/m to 48 kg/m, manufacture according to European and American Standard, Australian or South African together with other types of Standard (AREMA).

Our own experience allows us the optimal management of the supply chain, exporting to more than 30 countries all over the world.

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**ICON MULTIMEDIA, S.L.**

With over 25 years of experience, we have an extensive experience in the Digital Signage sector.

Our DENEVA Digital Signage platform is specially designed for high availability environments such as Smart Cities or as a powerful and comprehensive marketing tool for 'Smart Stations', guaranteeing a reliable and safe travelers and users experience.

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**INDRA**

Indra is one of the leading global technology and consulting companies and the technological partner for core business operations of its customers world-wide. It is a world-leader in providing proprietary solutions in specific segments in Transport and Defense markets, and a leading firm in Digital Transformation Consultancy and Information Technologies in Spain and Latin America through its affiliate Minsait. Its business model is based on a comprehensive range of proprietary products, with a high-value focus and with a high innovation component. In the 2018 financial year, Indra achieved revenue of €3.104 billion, with 43,000 employees, a local presence in 46 countries and business operations in over 140 countries.

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**INECO**

Global leader in transport engineering and consultancy, it has contributed to the development of transport infrastructures for over 50 years in more than 50 countries. Its high level technical specialisation allows its activity to diversify into new markets and reinforce its presence in those where it is already established. Its participation in the whole railway system in Spain has led the company to develop important international projects like the Makkah-Madinah high speed in Saudi Arabia, the HS2 project in the United Kingdom or the deployment of ERTMS in Europe.

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**INGENIERÍA VIESCA S.L.**

We are specialists in design and manufacture of power electronic equipment. Our equipment work satisfactorily in all the continents with high reliability and availability, making efficient use of the available energy. We adapt our products to customer needs and requirements according with the applicable standards and the best quality. The expected functionality is guaranteed by means of specific test protocols. Our innovation is present in all our products: auxiliary power converters, battery chargers, flat battery starters, ...

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**INGETEAM POWER TECHNOLOGY, S.A.**

Ingeteam is an international group specializing in power and control electronics (inverters, frequency converters, controllers and protections) and electrical engineering and automation projects. The company operates in 22 countries, with 3,900 employees. R&D is at the backbone of its business activities. In railways, the traction converters INGETRAC are based on an smart integration of proved Proved Modules, comprising all necessary elements to be fully operational, on each required application.

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**INSE RAIL S.L.**

Inse Rail is an engineering firm that is highly specialized in the railway industry and specifically its installations and systems. Founded in 1994, it is dedicated to engineering, consulting and project management in the railway, industrial, energy and building construction industries, carrying out its activities in the different stages of planning, design, construction and operation of investments. Inse Rail participates in the international development of the High Speed Rail and metropolitan transportation, with a strong specialization in electrification, signaling, security and communication systems, and other railway transport installations.

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**INTERNACIONAL HISPACOLD, S. A.**

Hispacold, a World leader Company for climate systems with more than 40 years' experience is specialized in passengers comfort. Hispacold designs and manufactures HVAC solutions for all rail vehicles: trams, metros, EMUs, DMUs, LRVs... with proven and reliable technology solutions. Hispacold is certified in the most recognized International quality management, environment and safety standards: ISO 9001, ISO 14001, OSHAS 18001, EN 15805-2 and the prestigious IRIS ISO/TS 22163.

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**LA FARGA YOUR-COPPERSOLUTIONS, S.A.**

La Farga is able to produce all the range of railway products in an integrated process. Our railway range includes all alloys used, the different measures of grooved contact wire and all supporting and electricity supply elements, feeders, hangers and cables. Furthermore, we offer technical visits and assessment to our clients and we constantly develop new railway products with the aim of introducing the best copper solutions into the market. La Farga is a family-run metallurgical company, with more than 210 years of history. We produce semi-finished copper products and their alloys for several technological sectors.

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**LADICIM - UNIVERSIDAD DE CANTABRIA**

LADICIM participates in R&D projects focused on the innovation of the railway superstructure, carrying out studies on the development of its elements, acc to national (Adif), European (EN) and American (AREMA) reference standards. The results are reflected in more than 500 reports, 25 research papers with a high impact index and 7 Doctoral Theses. The projects include collaborations in countries such as the USA, Canada, Saudi Arabia, Turkey, Germany, Senegal, Tanzania, Morocco or Ethiopia. LADICIM has implemented a quality system according to the UNE-EN ISO/IEC 17025 standard, being accredited by ENAC (Spanish Accreditation Board) for the testing of fastenings, sleepers and rail welds.

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**LANDER SIMULATION & TRAINING SOLUTIONS**

Lander Simulation & Training Solutions, S.A. specialises in designing, developing and implementing cutting-edge commercial simulation devices for training purposes. On the basic premise of preventing accidents and loss of human life, Lander works with each customer to build training simulators which meet the specific needs of each operation. Lander was incorporated in 2002, and now operates in more than 20 countries across all 5 continents. Its solutions cover the entire range of railway operations - suburban trains, long-distance units, high-speed trains, freight, monorail systems, metros or light rail..

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**INTERTEK IBÉRICA SPAIN SLU**

Intertek has agreements with governments, customs and standard organizations to ensure that imported products meet the quality and safety regulations of the country of destination, thus protecting consumers from sub-products. Conformity Verification Programs provides smooth customs clearance for exporters. Intertek also supports the energy, engineering and construction sectors, supporting the design, commissioning, maintenance and decommissioning phases of infrastructures, plants and equipment to assure their integrity. Services include technical inspection and audit, non-destructive testing and technical staffing, and others.

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**IBÉRICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS SL (ITSS)**

IBERICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS SL (ITSS), founded in 2005, is a leading manufacturer and supplier of railway hazard monitoring equipment, focusing mainly on hot axle box / hot wheel and Wheel impact load / Weighing in motion detectors. The ITSS systems use state-of-the-art infrared and fibre-optic technology. The PEGASUS HABD/HWD multi beam system monitors the axle box and brake temperatures of coaches. The AGUILA WIM/WILD system uses fibre-optic sensors to detect off-centre wheels and flat spots. It can also report train weight and overloading. ITSS products are the model representation of a perfect combination of experience and innovation.

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**KIMUA ENGINEERING, S.L.**

Kimua designs and produces different types of auxiliary tools for lifting, transporting, assembling and doing maintenance of rolling stock and its components during any stage of the Railway value chain. Additionally, Kimua has added 2 new business units to its portfolio; one for providing renting services of standard solutions and a second one for providing its clients with specific training courses in areas like handling and lashing of big and large loads.

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**LANTANIA**

Lantania specializes in the construction of heavy civil works (roads, highways, dams, water treatment plants, maritime works, railways and airports), building construction and energy projects. The company began its activity in 2018 with the acquisition of the construction, energy and services business units of the Isolux Corsán Group and the subsequent purchase of the Velasco Group in 2019. One of the differential characteristics of Lantania is its ability to execute any kind of rail project in an integral way. The company has built more than 150 km of infrastructure, tunnels and railway viaducts, as well as more than 50 traction power substations and more than 1,500 km of overhead line..

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**LLALCO FLUID TECHNOLOGY**

Llallo Fluid Technology is one of the few manufacturers and suppliers of impact absorption technology for end of track rail lines -Buffer Stops. World Class Technology that protects people, machinery and the Environment. Their products are highly sophisticated end of rail track shock absorbers with a unique performance. Llallo has a wide range of models with gas hydraulic buffers, sliding friction shoes or a combination of both. Their technology allows to control the deceleration to the desired value. They have been delivering high quality Buffer Stop projects in Spain & Portugal since 1970 and in America and other European Countries since 2004. Llallo is also ISO9001, 14001 & 45001 Certified.

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### LUZNOR DESARROLLOS ELECTRONICOS, S.L.

LUZNOR is a company specialized in the design and manufacture of professional torches, emergency lighting and other electronic security devices. LUZNOR puts at your disposal highly qualified technicians, a high quality standard, efficient development, manufacturing and control systems and, above all, a philosophy of commitment to clients that allows LUZNOR to offer innovative products with advanced technology and recognised prestige.

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### MAINRAIL S.L.

MainRail is a high-tech startup devoted to providing IT-based solutions to help you digitizing and optimizing the railway infrastructure maintenance operations. We combine our expertise in a wide range of technologies (e.g. big data analysis and visualization, digital twins, IoT, machine learning, etc.) with a solid knowledge in railway maintenance and operations. Our solutions are based in a customizable IT platform (MainRailMT) for the management of all maintenance-related operations and a family of IoT devices (MainRailID) for a continuous and cost-effective inspection of your infrastructure.

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### METALOCAUCHO, S.L. (MTC)

MTC, being part of Wabtec Corporation, designs and manufacture rubber-metal components for suspension and vibration control systems used on railway, automotive and industrial applications. With headquarters in Spain, MTC has 4 production facilities in 1) Spain, 2) China, 3) India and 4) USA, which offers to customers the possibility to localize production in any of these countries. Thanks to a wide commercial presence in any country of the world, MTC gives local support to develop projects for both OE and Aftermarket business. Our main products are related to Primary Suspensions, Secondary Air Springs, Bushings, Buffers, Layer Springs, Subassemblies, Elastic Wheels, etc.

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### NEXT GENERATION RAIL TECHNOLOGIES, S.L. (NGRT)

NGRT S.L. is a company focusing on railway safety, working with railway regulators and helping infrastructure managers and train operators secure their infrastructure and operations. NGRT's products are designed to detect any anomalies that occur in the railway infrastructure. The NGRT applications will detect rolling stock, independent of speed, direction and track conditions at any location, in all weather conditions, as well as anomalies impacting on the railway infrastructure.

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### NEWTEK SOLIDOS, S.L.

NEWTEK is mainly active in the manufacture of systems for filling sand in trams, trains and locomotives. NEWTEK supplies installations composed of storage silos, fixed sand feeders, sand feeding mobile units, aspiration systems and dust collection devices. The company also designs, manufactures and maintains custom installations according to the needs of each client.

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### NRF

Since 1927 NRF is a leading manufacturer and supplier of cooling products for the automotive market, industrial, railway and marine sector. NRF is known for the production of high quality radiators, but also produces and supplies a large range of other engine cooling and air conditioning products. NRF has global engineering, testing and development facilities. Railway and ship manufacturers, large retailers of vehicle parts, radiator shops and specialists in more than 80 countries worldwide daily rely on NRF's high quality products.

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### MGN TRANSFORMACIONES DEL CAUCHO, S.A.

MGN was established in 1957 and since then it has been developing its activity both designing and manufacturing rubber-metal components, mainly for the railway industry. MGN invests in research and innovation as a basis for the development of elements to be adapted in the new understanding of passenger and freight trains, taking the latest technological advances of the rubber world, vibration control and damping systems. - Primary and secondary suspensions. - Conical springs - Bushes and spherical bearings - Rods, Bogie subsystems - Pivot Bushes - Elastic Supports - Compression buffer and Draw Gear springs - Bellows, Gangway protections - Profiles, o-rings and seals.

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### MIERES RAIL S.A.

Design, manufacturing and supply of turnout systems, and their components, for Metro, classic or conventional lines, industrial and heavy haul or High Speed up to 350 km/h. Design, manufacturing and supply of casted manganese steel crossings. Trimetallic flash butt welding. Insulated glued joints, transition rails, fastening systems, locking systems, wear measuring devices.

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### NERTATEC S.L.

NERTATEC is an engineering company specialized in design, instrumentation and automation applied in the railway field. Based on the development or analysis of test procedures, NERTATEC designs and builds (or adapts) automatic, semi-automatic or manual test benches, addressing the stages of 3D and constructive design, electronic electrical design, control and automation software, manufacturing, training, calibration and maintenance. NERTATEC is also working on projects for the development of analytical models of energy consumption and technical assistance for the engineering of transformation of railway vehicles powered by LNG and Hydrogen with fuel cell.

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### PARRÓS OBRAS, S.L.

Family business with over 25 years experience in civil construction and iron and steel industry for the railway sector. Parros Group which is specialized in pile driving and catenary foundations, has implemented the 80% of the foundations of the entire Spanish High Speed Network. Whether conventional railway network or Highspeed Railway (AVE), PARROS GROUP is distinguished by the versatility of our machines adapted "Ad hoc" for auxiliary civil works from the railway, with automatic switching to the three Spanish gauges. Also innovative is our implementing system of noise barriers from the railway track and its foundations. Generic activities of building and general construction.

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### PATENTES TALGO, S.L.U.

Talgo is a Spanish company with more than 70 years of experience, specialized in designing and manufacturing trains, maintenance equipment as well as providing maintenance services to railway operators worldwide. Today, Talgo is the leading global reference for Spanish High Speed Technology and the number one player in Spain's railway market. Due to Talgo's successful expansion strategy and its globally acclaimed products, the company has become truly international. Its key success factors are innovation, unique technology, sustainability, safety, competitiveness and tailor-made projects with clear focus on customer. Talgo trains are internationally recognized as the best in their category.

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### PREFABRICACIONES Y CONTRATAS, S.A.U. (PRECON)

PRECON is the Spanish leader in design and supply of precast concrete products for railway tracks, either ballast and ballastless tracks. It has supplied monoblock, twinblock, block slabs and sleeper for switches and crossings, Either for high speed, conventional lines, haul, subways and tramways.

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 🌐 www.preconsa.es



**PRETENSADOS DEL NORTE, S.L.**

PRETENSADOS DEL NORTE, is one of the most important producers of pre-stresses steel in the word. Our products are recognised for having the best quality on the market. Our high standards of quality mean that we are talking about the best pre-stresses steel you can find. Our company has more than 30years' experience in manufacturing and investment tha have led to what we are today: PRETENORTE. Technologically, we have equipped our company in Vitoria-Gasteiz with the best state-of-the-art machinery. We continue to incorporate the latest novelties for your complete satisfaction. Pretenorte is highly specialised in pre-stressed sttel and its many applications.

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**REVENGA SMART SOLUTIONS**

Revenga Smart Solutions offers comprehensive solutions for the transport sector: railways and metros, roads, ports & airports. In railways & metros we focus on passenger experience solutions, ranging from intercomms, public address and information panels, to systems related with revenue/cost issues, like ticketing, tolling and access control, and also with operator oriented solutions like railway telephony, signalling (level crossings, point heaters and inspection systems) and station control. More than 45 years of experience. Projects deployed in 24 countris.

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**RICARDO CERTIFICATION IBERIA S.L.**

Ricardo Certification Iberia is part of Ricardo Group. We provide independent assurance, certification, testing and consultancy services for railway and other sectors. We are accredited as NoBo, DeBo, AsBo and ISA in line with national and international standards. With capabilities in all disciplines - rolling stock, signalling and telecommunications, energy efficiency, safety management, operational planning and so on, we help our customers to overcome the technical, regulatory, operational and commercial demands of the industry. By maintaining constructive dialogue throughout the process, we help to eliminate inefficiencies, thereby to reduce risks, delays and costs overruns.

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SGS is the world's leading inspection, verification, testing and certification company. We are recognized as the global benchmark for quality and integrity. With more than 97,000 employees, we operate a network of more than 2,600 offices and laboratories around the world.

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**SICE TECNOLOGÍA Y SISTEMAS, S.A. (SICE TYS)**

SICE Tecnología y Sistemas, (SICE TYS) is a group of companies that provides solutions and systems for Transport and Traffic, Environment and Energy efficiency, Smartcities and Telecommunications. SICE TyS, as systems integrator, offers technological solutions adapted to the railways sector, conceiving a centralized management with functionalities oriented to the operation of public and private transport, integrating: - Security Systems - Telecommunications Systems - Signaling (Interlockings, Level Crossings, CTC) (ENYSE) - Automatic Fare Collection - Traffic Prioritization of Public Transport - Engineering (OFITECO): railway lines; Tunnel monitoring; Load test (railways bridges).

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**SIEMENS MOBILITY, SLU**

Siemens Mobility is a separately managed company of Siemens AG. As a leader in transport solutions for more than 160 years, Siemens Mobility is constantly innovating its portfolio in its core areas of rolling stock, rail automation and electrification, turnkey systems, intelligent traffic systems as well as related services. With digitalization, Siemens Mobility is enabling mobility operators worldwide to make infrastructure intelligent, increase value sustainably over the entire lifecycle, enhance passenger experience and guarantee availability.

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**SATYS INTERIORS RAILWAY SPAIN**

Satys is a Spanish company specializing in the design and manufacture of galley systems for railway rolling stock.

A galley system is broken down into 3 main families of equipment:

- Refrigerated cabinets
- Functional systems. Cooling, electricity, water, lighting, etc.
- Interiors. Countertops, lining, etc.

Satys offers a wide range of products specifically for each one. Thanks to the unique and highly efficient Satys technology, our products are internationally recognized as the best in their class in terms of quality, safety, availability, reliability, accessibility and environmental friendliness.

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**SEGULA TECHNOLOGIES**

SEGULA Technologies is an engineering group with a global presence, helping boost competitiveness within all of the major industrial sectors: automotive, aerospace, energy, rail, naval and defense, pharmaceutical and oil & gas. Present in 30 countries and with 140 offices worldwide, the Group fosters a close relationship with its customers thanks to the expertise of its 12,000 employees. A leading engineering specialist placing innovation at the heart of its strategy, Segula Technologies conducts large-scale projects, ranging from studies to industrialisation and production.

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**SENER INGENIERÍA Y SISTEMAS, S.A.**

SENER is one of the leading engineering and technology groups in Europe with over one billion euros of annual turnover, more than 2,000 professionals and a continuously growing international presence with offices in over 15 countries. In the field of railway engineering, Sener counts on an extensive experience in metros, light rail trains systems and tramways, conventional railway line, freight transport and High Speed Lines. SENER's activities range from preliminary, conceptual and feasibility studies, basic and detailed engineering to project management services, supervision of works, value engineering and ICE services.

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**SIMULACIONES Y PROYECTOS S.L.**

Simulaciones y Proyectos (SyP) is a company dedicated to solving complex fluid dynamics problems using CFD (Computational Fluid Dynamics) tools. SyP solves any fluid dynamics problem thanks to its engineering team and state-of-the-art software tools (FLOW-3D, HELYX, ANSYS DISCOVERY, SpaceClaim, FluidFlow...).

Among others, we can solve:

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- Optimization of ventilation shafts, tunnels.
- Studies of aerodynamics and aero acoustics in trains.
- Train-tunnel pressure studies.

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**SMART MOTORS**

Smart Motors applies new technologies to generate added value from the monitoring of critical railway assets that believe that Digitalization and the uses of advanced analytics are the way to service excellence. The priority is to generate new knowledge about the operation of railway assets that satisfies the requirements of the most demanding environments and with a real day to day contribution.

Smart motors has its own Digitalization Platform to help maintenance and operation that brings together signaling monitoring systems, infrastructure and rolling stock, as well as IoT sensors adapted to the railway sector.

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**SOFTWARE QUALITY SYSTEMS, S.A.**

SQS is a company specialised in software validation and verification with extensive experience in safety critical systems and, specifically, in the railway sector.

We accompany our clients throughout their development process, optimizing it and guaranteeing compliance with specific regulations and standards for their sector in terms of safety, functionality, quality, etc.

Likewise, we design and implement automated test environments and complement our offer with training activities in the field of software testing and quality.

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**STADLER****STADLER RAIL VALENCIA, S.A.U.**

International rail vehicle construction company, Stadler, is headquartered in Bussnang in Eastern Switzerland. Founded in 1942, it has a workforce of over 8,500 based in various production and over 40 service locations. Stadler provides a comprehensive range of products in the heavy and urban transport segments: High-speed trains, intercity trains, regional and commuter heavy rail trains, underground trains, tram trains and trams. Stadler also manufactures main-line locomotives, shunting locomotives and passenger carriages, including the most powerful diesel-electric locomotive in Europe. It is the world's leading manufacturer in the rack-and-pinion rail vehicle industry.

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Talleres Alegría, s.a. is a family owned company devoted since 1900 to design, manufacturing and after sales assistance of all kind of fixed track material, its accessories and spare parts. Developing of Designing and Commissioning Integral projects of turnouts to be installed at Depots and Industrial Ports and Factories. Design, manufacturing, repair and maintenance of self propelled vehicles to carry out works at the infrastructure. Design, manufacturing, retrofitting, repair and maintenance of freight wagons.

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**TECNIVIAL, S.A.**

In TECNIVIAL we specialize in all types of fixed signalling for track ( Marker Boards), conventional lines and High Speed lines. We are one of the companies approved by the Spanish Railway Infrastructure Administrator (Adif) and the others. The last product boosted to the market have been the NANOTEC SIGNS ( R+D). The incorporation of cutting-edge materials (carbon nanoparticles) to the signs manufacturing , allows the improvement of its behavior and mechanical features: light, corrosion-free, low residual value and maintenance, eco-friendly, resistant to loads ( snow/wind). Besides, we develop Corporative Image projects according to the needs of the customer; design & installation.

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- Product engineering: new product development, tribological testing, fault diagnosis.

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Backed by over 40 years of experience in the design, manufacturing, and deployment of Professional mobile radio projects on a turnkey basis, Teltronic presents a broad portfolio of critical communication solutions for transport sector, providing complete solutions: network infrastructure, control centre, and end-user equipment, including specialized onboard systems specifically designed for train, metro, tram and LTR. Besides voice and data transmission solutions, the company offers integration services with other subsystems: PA and intercom, applications to manage and control fleets and for operating aid, real time CCTV or communications support for signalling systems ETCS, CBTC, PTC...

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**THALES****THALES ESPAÑA GRP S.A.U.**

Thales is a World leader in Mission Critical Solutions for Land Transportation. Thales Spain, with more than 60 years of experience, has been pioneer and leader in the technological development of the Spanish railways, being one of the main suppliers of safety and telecommunication systems for the Spanish Railways Administrations and present in countries as Turkey, Mexico, Algeria, Malaysia and Morocco. Its activity goes from the development, manufacturing installation, commissioning to the maintenance of equipments and systems for railway signalling, train control, Telecommunication, Supervision ticketing and critical infrastructures security.

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**TYPESA**

Founded in 1966, TYPESA is a leading consulting engineering group in the fields of transport, buildings, water, environment, energy and rural development. We have a long-standing relationship with public, private and institutional clients in the Americas, Europe, Africa, Asia and the Middle East, assisting them in the development of infrastructure, energy and city projects from concept to completion. In addition to providing world-class engineering services, TYPESA has extensive experience in building the capacity of local firms and in strengthening institutions to guarantee the sustainability of the infrastructure.

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Since 1985, Teldat has been providing solutions for cloud access, remote office communications, cybersecurity and voice/data connectivity both in the office and in specific environments (industrial, railway, vehicles or public services). Teldat invests heavily in R&D&I including technologies such as network virtualisation, artificial intelligence, Federated Learning, 5G and DLT. Combined with its ability to work closely with its customers according to the specific needs of each project, it is among the European leaders in the corporate communications market. Present in more than 40 countries, it has headquarters in both Spain and Germany.

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**TELICE, S.A**

Telice is an international company, with more than 45 years of experience in different markets related to cutting-edge technology and standing out in the railway market. Its activity covers the design, installation and maintenance of railway electrification systems, safety and railway signalling, electrical substations, civil engineering projects, industrial electricity, fibre optic installation, industrial automation and safety systems in tunnels, underground and mining projects. Due to its wide expertise, Telice has become preference collaborator for the main railway administrations. Telice has international presence in Norway, United Kingdom, Portugal, Peru, Chile and Brazil.

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Our priority : developing solutions that meet our client needs. This approach is based on three pillars: expertise, efficiency and continuous innovation.  
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**URIARTE SAFYBOX**

Uriarte SafyBox is part of the Uriarte Enclosures Group: an international holding with production plants in Spain, Poland and Portugal, with presence and certifications in more than 70 countries on 5 continents.  
We specialize in manufacturing fiberglass-reinforced polyester enclosures since 1972. Our non-metallic boxes provide the best protective space to any electrical, water, gas, telecommunications equipment, photovoltaic plants, railways installations, and underground infrastructures. They are ideal for the most demanding and aggressive environments.

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**VALDEPINTO, S.L.**

Valdepinto, S.L. was established in 1986 and focuses its activities in the Railway sector.

We have four main product lines:

- All types of machining (specialists in electrical insulation).
- Screen printing, Signs and Engraving low-relief.
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**VICOMTECH**

Vicomtech is an applied research centre specialising in Artificial Intelligence, working on technological solutions based on Computer Vision, Data Analytics, Computer Graphics, Advanced Media Technologies and Language Technologies. It aims at meeting the innovation requirements of the local companies and institutions to face new economic and social challenges, and improving their competitiveness in a global market. The transfer mechanism for this research is the creation of R+D+i projects geared to companies' needs. Furthermore, the centre works intensively on cooperation projects, through cooperative technology development promotion schemes at local, national and international level.

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**voestalpine Railway Systems JEZ SL**

We are committed to the designing, manufacturing, supplying and maintenance of all types of manganese steel switches and railway track systems for railways and tramways, in addition to moulded cast steel parts for the general industry. Our Technical Department (Department R&D) ensures we have the capability of designing and producing points and crossings (turnouts, crossovers, scissor crossovers and diamond crossings) or parts for them, such as hard steel manganese crossings, spare tongues... as well as the generation of patents.

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**WSP SPAIN**

As one of the world's leading professional services firms, WSP provides engineering and design services to clients in the Transportation & Infrastructure, Property & Buildings, Environment, Power & Energy, Resources and Industry sectors, as well as offering strategic advisory services. Our experts include engineers, advisors, technicians, scientists, architects, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals. With approximately 49,000 talented people globally, we are uniquely positioned to deliver successful and sustainable projects, wherever our clients need us.

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**ZELEROS**

Zeleros is the Spanish company developing a hyperloop transport system, already considered as "the fifth means of transport". Its focus on the vehicle optimization allows to reduce infrastructure costs and to operate at safer pressures for the passengers. Zeleros has already raised substantial private and public support, and collaborates with companies such as Renfe (Trenlab) and Altran, research centers (Universitat Politècnica de València, CIEMAT, UPM) and is supported by investors such as Plug and Play, Angels or ClimateKIC. Currently Zeleros is preparing the construction of its own 2-kilometer test-track in Sagunto to demonstrate the system at high speed.

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**ZITRON, S.A.**

ZITRON is a world-wide leading company in designing, manufacturing, commissioning and maintenance complete ventilation systems for metro and tunnels. ZITRON has the world's biggest aerodynamic test bench, certified by AMCA, for testing fans at full load and 100 % speed. ZITRON's extensive reference list includes more than 500 metro and tunnel projects. The latest and more significant ones are Crossrail in London and Doha Metro. Experience and know-how, providing innovative and tailor-made solutions, are our most appreciated values. The global growing market of ZITRON's fans, along with the high level of satisfaction of the Clients is the best mark of its equipment and services quality.

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At InnoTrans 2022, we will present technologies that are already significantly contributing to this, such as digitally networking trains and routes and sustainable electric, battery and hydrogen-powered. In short, vehicles that offer maximum comfort. We are on the fast track to the future of mobility. Visit us and find out more at InnoTrans 2022.

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 **InnoTrans 2022**  
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